GE

Sensing & Inspection Technologies

Transport® PT878

Portable Liquid Ultrasonic Flowmeter

Abridged Manual

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Abridged Manual
914-219E
August 2008

Warranty

Each instrument manufactured by GE Sensing is warranted to be free from defects in material and workmanship. Liability under this warranty is limited to restoring the instrument to normal operation or replacing the instrument, at the sole discretion of GE Sensing. Fuses and batteries are specifically excluded from any liability. This warranty is effective from the date of delivery to the original purchaser. If GE Sensing determines that the equipment was defective, the warranty period is:

- one year for general electronic failures of the instrument

- one year for mechanical failures of the sensor

If GE Sensing determines that the equipment was damaged by misuse, improper installation, the use of unauthorized replacement parts, or operating conditions outside the guidelines specified by GE Sensing, the repairs are not covered under this warranty.

The warranties set forth herein are exclusive and are in lieu of all other warranties whether statutory, express or implied (including warranties of merchantability and fitness for a particular purpose, and warranties arising from course of dealing or usage or trade).

Return Policy

If a GE Sensing instrument malfunctions within the warranty period, the following procedure must be completed:

1. Notify GE Sensing, giving full details of the problem, and provide the model number and serial number of the instrument. If the nature of the problem indicates the need for factory service, GE Sensing will issue a RETURN AUTHORIZATION number (RA), and shipping instructions for the return of the instrument to a service center will be provided.

2. If GE Sensing instructs you to send your instrument to a service center, it must be shipped prepaid to the authorized repair station indicated in the shipping instructions.

3. Upon receipt, GE Sensing will evaluate the instrument to determine the cause of the malfunction.

Then, one of the following courses of action will then be taken:

*   If the damage <u>is</u> covered under the terms of the warranty, the instrument will be repaired at no cost to the owner and returned.

*   If GE Sensing determines that the damage <u>is not</u> covered under the terms of the warranty, or if the warranty has expired, an estimate for the cost of the repairs at standard rates will be provided. Upon receipt of the owner's approval to proceed, the instrument will be repaired and returned.

Table of Contents

Table of Contents (cont.)

Table of Contents (cont.)

Chapter 5: Data Logging

Appendix A: Menu Maps

Chapter 1

Installation & Operation

Introduction

The PT878 is a transit-time flowmeter that combines all the features of a full-size flowmeter with the advantages of a portable instrument:

- measure the flow rate of acoustically-conductive single-phase fluids

- measure flow velocities from ±0.03 to ±12 m/sec

- energy flow rate may be calculated for water, glycol, and water/glycol mixtures

- one linear 0/4-20 mA analog output

- two 4-20 mA analog inputs

- runs on rechargeable or alkaline batteries for up to 10 hours

- LCD display for measurements in numeric and graphical format

- store site data in files

- log over 100,000 flow data points internally

- communicate with a PC via an infrared port

- context-sensitive on-line help

- uses all standard GE Sensing transducers

The Flowcell

In addition to the PT878, a complete flowmeter system includes a *flowcell*. The flowcell is that part of the system that uses ultrasonic pulses to interrogate the flow. It consists of:

- *Flowcell Pipe* - The flowcell can either be created in the existing piping (for example, by inserting wetted transducers into the pipe, or clamping non-wetted transducers onto the pipe), or inserted as a substitute pipe section (spoolpiece). The flowcell must provide mechanical support for the transducers and assure stable fluid conditions for accurate flow measurement.

- *Transducers* - The transducers convert electrical energy into ultrasonic pulses when in a transmit cycle, and convert the ultrasonic pulses back to electrical energy when in a receive cycle. In the PT878 system, each transducer acts as both a receiver and transmitter, since a series of ultrasonic pulses are alternately sent upstream and then downstream through the flowcell.

Making Electrical Connections

Before taking measurements with the PT878, you must make all the necessary electrical connections to the unit. This includes:

- power (required)
- transducers (required)
- Input/Output (optional)
- infrared interface (optional)

All electrical connections are made to the top of the PT878 as shown in Figure 1-1 below.
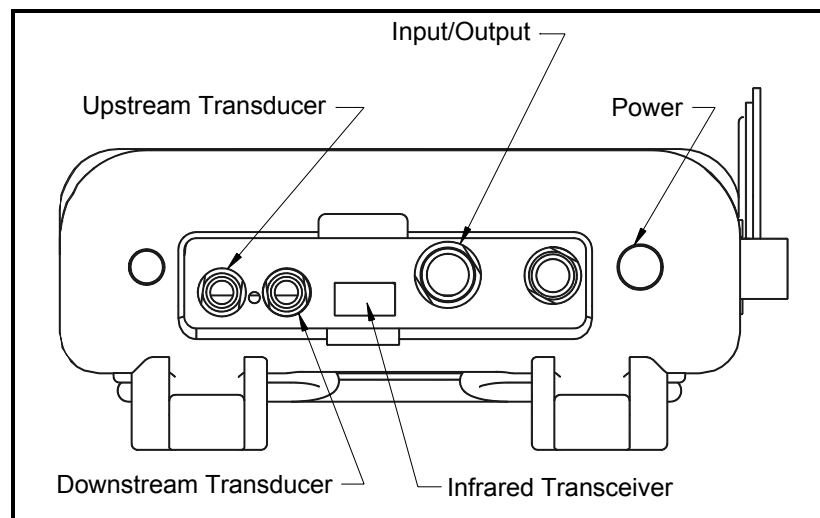

Figure 1-1: Electrical Connection Locations

!WARNING!
To ensure the safe operation of the PT878, you must install and operate it as described in this manual. In addition, be sure to follow all applicable safety codes and regulations for installing electrical equipment in your area. The PT878 and its transducers are designed for use in general-purpose locations only.

Power Connection

The PT878 may be powered by either of the following:

- a 100-120/200-260 VAC wall-mount plug-in module

- 5 internal C_s-size NiCad high-energy rechargeable batteries

- a pack of 3.0 Ahr NiMH batteries

Note: *An optional power supplement, part #703-1283, uses 6 AA alkaline batteries.*

Regardless of which power option is chosen, you must connect the power cord as shown in Figure 1-1 on the previous page.

IMPORTANT: *When you receive the PT878, the batteries are not charged. Therefore, to take measurements on battery power, you must first charge the batteries as described on page 1-5.*

Transducer Connections

The transducer cables connect to the PT878 with LEMO$^®$ coaxial type connectors. Each color-coded cable should have a collar labeled UPSTREAM or DOWNSTREAM. Make transducer cable connections to the top of the flowmeter as shown in Figure 1-1 on the previous page. Because there are various types of transducers and installations, detailed transducer installation is discussed separately in the *Liquid Transducer Installation Guide* (916-055).

Input/Output Connections

The PT878 provides one 0/4-20 mA current output and two 4-20 mA analog inputs with switchable 16V supply for loop- powered temperature transmitters. It also supports digital, frequency, and totalizer outputs. Connect the inputs/outputs using a LEMO$^®$ multi-pin connector as shown in Figure 1-1 on the previous page. The pin numbers for the connector and the color code for the standard input/output cable are shown in Table 1-1 on the next page.

Input/Output Connections
(cont.)

Table 1-1: Cable Assembly for Analog Inputs/Outputs

Pin #	Wire Color	Description
1	Black	Analog Out 1
2	Red	16 V (switched)
3	White	Temperature Transmitter Supply or Return (Input A)
4	Yellow	Temperature Transmitter Supply or Return (Input B)
5	Green	Analog Ground
6	Orange	Digital Output (frequency output, pulse totalizer, diagnostic output or calibration gate)
7	Blue	Digital Ground
8	Violet	Receive Monitor

The Infrared Interface

The PT878 comes equipped with an internal infrared transceiver (shown in Figure 1-1 on page 1-2) that enables communication between the meter and other IR devices, particularly the IR ports or dongles (IR to RS232 adapters) of Windows®-based PCs. Users can send and receive site and log data; they can also program the meter via the optional PanaView™ software interface. The PT878 was designed for use with products that comply with the IrDA protocol.

Caring for the PT878 Batteries

The PT878 is equipped with built-in rechargeable batteries to support portable operation. To maintain optimum performance, these batteries require a minimum of maintenance.

Charging the Batteries

When you receive the PT878 or if the batteries have not been used for a long period of time, you must charge the batteries before operation. To fully charge the batteries, eight hours is required. When fully-charged, the batteries provide 8 to 10 hours of continuous operation. An internal battery gauge indicates the remaining power in the batteries.

Charging the Batteries
(cont.)

IMPORTANT: *To ensure the maximum charge, charge the batteries in an ambient temperature of 50 to 104°F (10 to 40°C).*

To charge the batteries, simply plug the AC power module cord into the power jack (shown in Figure 1-1 on page 1-2) and be sure the battery pack is installed. When the PT878 is plugged into line voltage, the internal battery charger automatically charges the batteries, whether the PT878 is ON or OFF. If the PT878 is ON, the Battery icon in the upper right corner of the screen indicates battery status (as shown in Table 1-2 below).

Note: *For version* 1B *of the PT878 software, you must also press the red power key in the upper right corner of the keypad.*

Table 1-2: Battery Status Icons

Icon	Battery Status
▯	Full battery
▯	Partially full battery
▯	Empty battery
▯	Fully charged battery, connected to AC power
▯ ▯ ▯ ▯	Charging battery
▯ ▯ ▯ ▯	Discharging battery
▯	Failure/missing battery
▯	Notification to check battery

Storing the Batteries

Always observe the following battery storage temperature ranges:

• 2 days or less: -40 to 158°F (-40 to 70°C)

• less than 1 month: -4 to 131°F (-20 to 55°C)

• more than 1 month: 32 to 104°F (0 to 40°C)

Replacing the Batteries

!WARNING!
Replace batteries only with the specified rechargeable batteries. The battery charges even when the unit is OFF. Do not attempt to recharge non-rechargeable batteries.

If you need to replace the rechargeable batteries, use the recommended 3.0 Ahr NiMH batteries (part number 200-081). To replace the batteries:

1. Remove the rubber boot.

2. Open the panel located on the back of the PT878 unit.

3. Disconnect the old batteries and dispose of them properly.

4. Install the new batteries (see Figure 1-2 below).

Battery Located Behind Panel
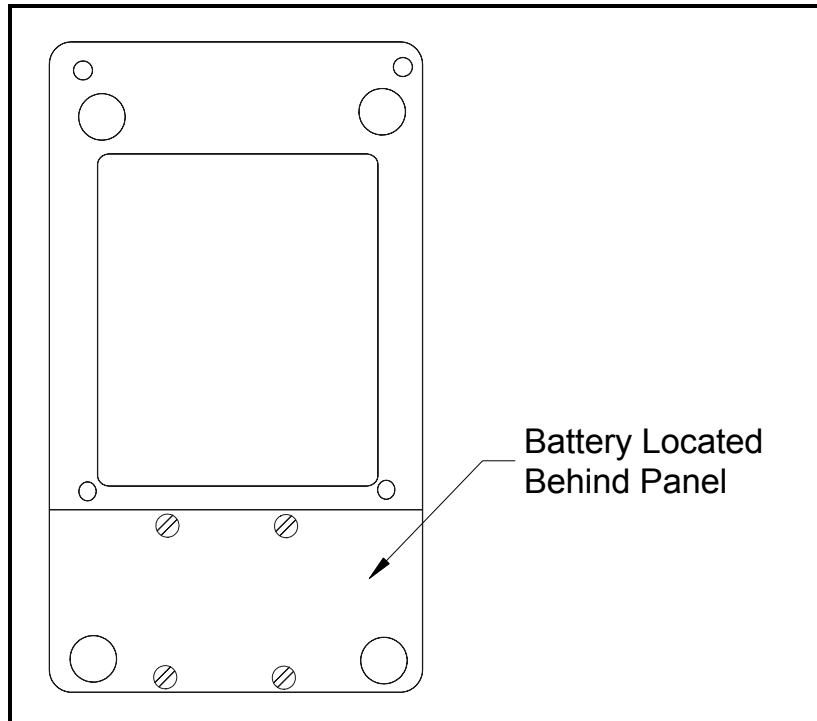
Figure 1-2: Back Panel of PT878

Note: *To further extend the battery power of the PT878, the GE Sensing Part #705-1283 option uses 6 AA alkaline batteries.*

Powering ON and OFF

> **Caution!**
> For CE compliance, the PT878 is classified as a battery-powered device, not to be used with the AC adapter. To comply with CE certification, do not operate the meter with the charger plugged in.

To power the PT878 ON, press the red button in the upper-right-hand corner of the keypad. Immediately upon power up, the PT878 emits a short beep and displays a *"PCI Loader"* message. It then validates the instrument programming, displays the GE Sensing logo and the software version, and emits a long beep. If the meter fails any of these tests, contact GE Sensing.

> **!WARNING!**
> If the meter fails the backup battery test, you must send the unit back to the factory for a battery replacement.

After the meter conducts all the self checks, a screen similar to Figure 1-3 below appears.
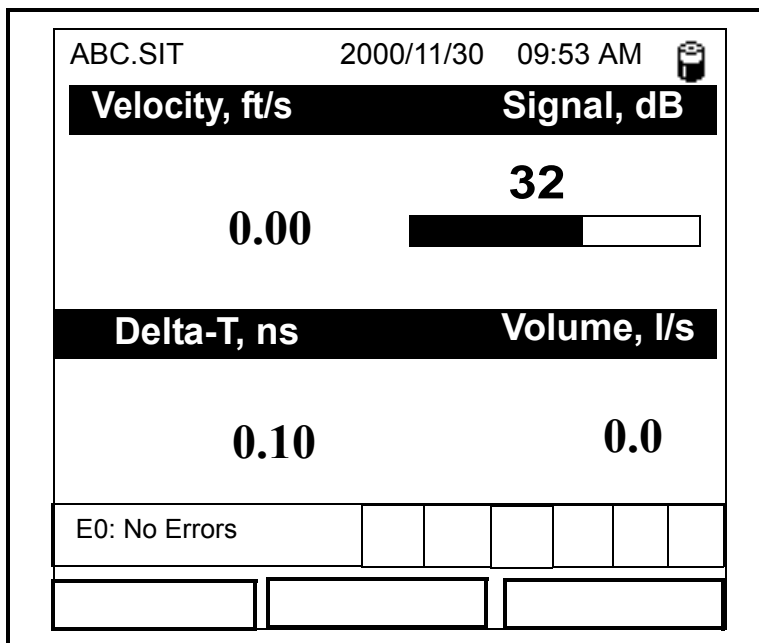
Figure 1-3: Screen After Powering ON

Powering ON and OFF (cont.)

To turn the PT878 OFF, press the red key and hold it for 3 seconds. The screen now appears similar to Figure 1-4 below.

```
SHUTDOWN: Meter OFF
SLEEP: Meter Idle
CANCEL: Resume Operations




┌──────────┐  ┌──────────┐  ┌──────────┐
│ Shutdown │  │  Sleep   │  │  Resume  │
└──────────┘  └──────────┘  └──────────┘
```
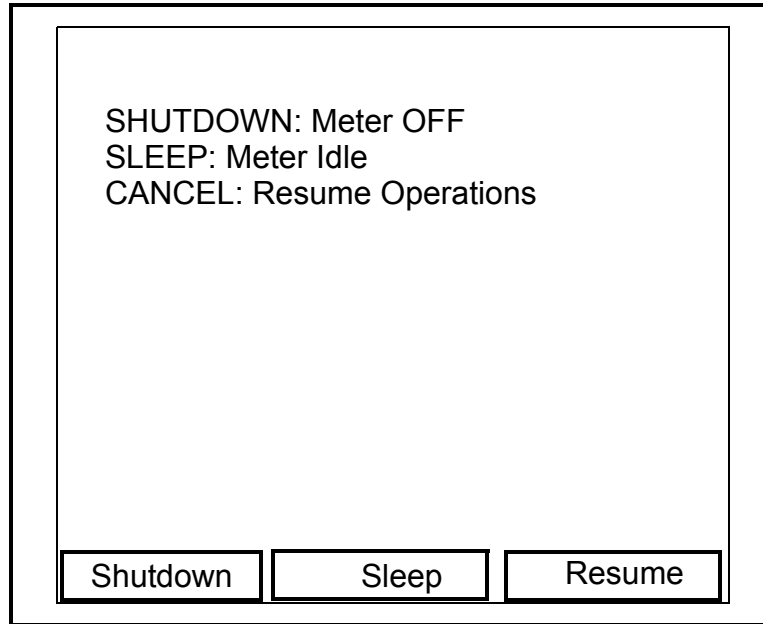
Figure 1-4: The Shutdown Menu

Three options are now available:

• Press [F1] to shut down the PT878 - This turns it completely OFF.

• Press [F2] to send the PT878 into sleep mode - In this mode, the PT878 remains in a standby mode and you can resume taking measurements immediately by pressing the power button again.

• Press [F3] to cancel the command - This returns the PT878 to normal operation.

Note: *If the PT878 locks up, you can reset it by pressing the power key (the red key in the upper right corner) and holding it for 15 seconds.*

Using the Screen and Keypad

The essential features for operating the PT878 are the screen and keypad. Although these features are common on portable instruments, the PT878 design offers special features to simplify and speed the operation.

The Screen

The primary function of the screen is to display information in order for you to accurately and easily take measurements. The PT878 screen consists of seven parts (see Figure 1-5 below).
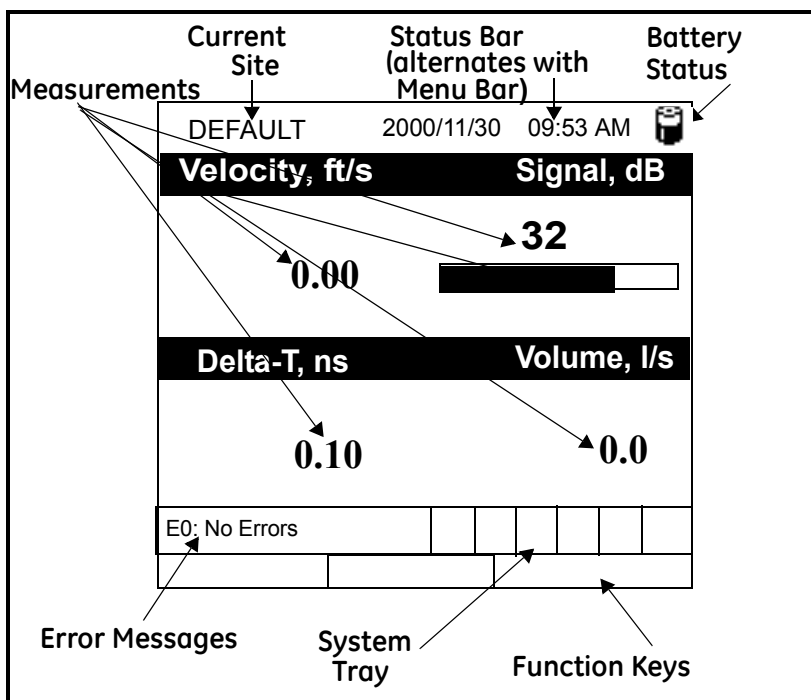
Figure 1-5: The PT878 Screen in Operate Mode

The top line of the screen is the **status bar,** which normally displays the time and date. However, when you press [MENU] (the menu key), the **Menu Bar** replaces the status bar.

The middle of the screen is the **work area,** which displays the measured parameters, numeric measurements, and both bar and line graphs. However, when you enter a selection on the Menu Bar, this area displays menu prompts instead. Also, a line at the bottom of the work area also displays error code messages.

The Screen (cont.)

The **system tray** displays icons that indicate meter operations not otherwise shown. Table 1-3 below lists the icons and their meanings.

Table 1-3: Icons in the System Tray

Icon	Function	Meaning
⇄	IR Transfer	IR data transfer in progress.
!	Alert	Indicates the meter encountered an error in operation.
≡\	Log	Indicates a log is pending (no marks) or running (marks).
❄ 🜄	Heating/ cooling	Indicates heating or cooling energy mode.
⏱	Stopwatch	Calibration Gate Operation: Watch is stopped when the gate is closed, or runs when it is open.
▣ ⎙	Snapshot (To file) (To Printer)	Indicates that the Snapshot function has been activated, so users can take screen captures.

The bottom of the screen displays the three **function key** options: [F1], [F2] and [F3]. These keys have different functions, depending on the task you are performing.

The Keypad

The PT878 keypad has 25 keys. The functions for each key are described on the following page (see Figure 1-6 below):
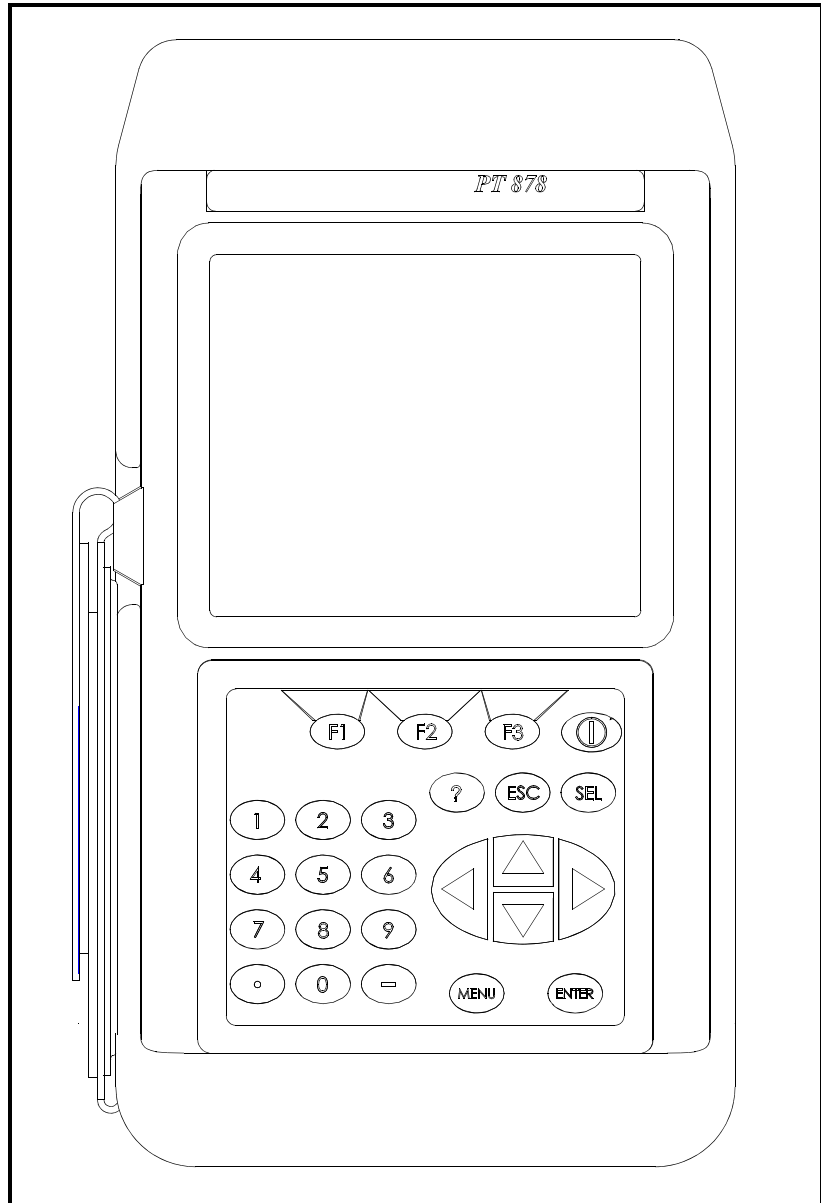
Figure 1-6: The PT878 Keypad

The Keypad (cont.)

- 3 function keys ([F1], [F2], [F3]) — enable you to select the special functions which appear at the bottom of the screen.

- 12 numeric keys (including [-] and [.]) — enable you to enter numeric data.

- 4 arrow keys ([◀], [▶], [▲], [▼]) — enable you to move through the menu options.

- [?] Help key— enables you to access on-line help.

- [MENU] Menu key — enables you to access the Main Menu.

- [ENTER] — enables you to enter a particular menu, and enters selected values into the PT878 memory.

- [SEL] — enables you to move between data measurements on the screen.

- [ESC] — enables you to exit menus or menu options at any time; cancels a numeric entry.

- Red key [⏻] — turns the power ON or OFF, and toggles the backlight ON or OFF.

Chapter 2

Initial Setup

Introduction

The PT878 *Program Menu* enables you to program the parameters that define an installation site. As a minimum, the transducer, pipe and fluid data must be entered into the meter before measurements can be taken. The programmed data can then be saved as a *site file*, and the PT878 can store up to 1 MB (or 32 site files) of data.

IMPORTANT: *For menu options not discussed in this abridged manual or if you see an error or warning screen while programming your meter, refer to your full* User's Manual *(910-219) for further instructions.*

Entering the Program Menu

To enter the *Program Menu*, press the [MENU] key at the lower right of the PT878 keypad. The *Menu Bar* replaces the *Status Bar* at the top of the screen. Press the [▶] arrow key once to scroll to the *Program Menu* and press [ENTER] (see Figure 2-1 below).

Note: *As an aid in following the programming instructions in this manual, refer to Appendix A,* Menu Maps.

Figure 2-1: The Program Menu

Use the [▼]and [▲] arrow keys to scroll through the menu options. Then press [ENTER] to select that option.

Entering the Program Menu (cont.)

When entering information in an option window, press:

• the [▼] key to scroll down the list

• the [▲] key to scroll up the list

• the [F2] key (Cancel) or the [ESC] key to close a window at any time and return to *Operate Mode* without changing the data.

Note: *If you enter an incorrect numeric value, press the* [◀] *key to erase the last digit entered.*

Entering the Transducer Parameters

To program the Transducer data, scroll to the *Transducer* option on the *Program Menu* and press [ENTER] (see Figure 2-2 below).

Note: *Refer to your* Transducer Installation Guide *for additional information about transducers and configurations.*

Figure 2-2: The Transducer Option Window

1. At the *Type* prompt, use the [◀] and [▶] keys to select the type of transducer used in your installation (*wetted* or *clamp-on*). Press [ENTER] to confirm the choice.

Note: *Each choice made in the* Transducer *and* Pipe *menus will determine the additional options that must be programmed.*

Entering the Transducer Parameters (cont.)

2. Press the [▼] key to reach the *Transducer* prompt and press [ENTER]. A drop-down list of transducer numbers for your chosen transducer type opens. Scroll to the number engraved on your transducer body, or scroll to *Special* if there is no transducer number. Press [ENTER] to confirm your selection.

Note: *To speed scrolling, you can press the [▶] key to scroll down by a page, or the [◀] key to scroll up by a page.*

3. Complete one of the following steps:

   a. If you entered a *transducer number* in the previous step, press [F3] (OK) to confirm your selections and exit the *Program Menu*. Otherwise, you can press [F2] (Cancel) or the [ESC] key to exit the *Program Menu* without confirming your selections. Proceed to the next section to enter your pipe parameters.

   b. If you selected *Special* in the previous step, continue your programming below.

Special Transducers

If you have *Special* transducers (see Figure 2-2 on the previous page), the information required in the following steps will be supplied with the transducers.

1. Use the [▼] key to reach the *Frequency* prompt. Press [ENTER] and a drop-down list of five frequencies opens. Scroll to the correct frequency (in MHz) for your transducer, and press [ENTER].

2. Use the [▼] key to reach the *Tw* prompt and press [ENTER]. Use the numeric keys to enter the time delay (in μs) value provided with your transducer. Press [ENTER] to confirm your entry.

3. Complete one of the following steps:

   a. If you are programming a *special wetted transducer*, press [F3] (OK) to confirm your selections and exit the *Program Menu*. Otherwise, you can press [F2] (Cancel) or the [ESC] key to exit the *Program Menu* without confirming your selections. Proceed to the next section to enter your pipe parameters.

   b. If you are programming a *special clamp-on transducer*, continue your programming below.

4. Use the [▼] key to reach the *Wedge Ang* prompt and press [ENTER]. Use the numeric keys to enter the wedge angle (in degrees) value provided with your transducer. Press [ENTER] to confirm your entry.

Special Transducers
(cont.)

5. Use the [▼] key to reach the *Wedge Tmp* prompt and press
[ENTER]. Use the numeric keys to enter the wedge temperature
value provided with your transducer. Press [ENTER] to confirm
your entry.

6. Use the [▼] key to reach the *Wedge SS* prompt and press [ENTER].
Use the numeric keys to enter the wedge sound speed (in ft/sec or
m/sec) value provided with your transducer. Press [ENTER] to
confirm your entry.

7. Press [F3] (OK) to confirm your selections and exit the *Program
Menu*. Otherwise, you can press [F2] (Cancel) or the [ESC] key to
exit the *Program Menu* without confirming your selections.
Proceed to the next section to enter your pipe parameters.

**Entering the Pipe
Parameters**

To program your pipe parameters, scroll to the *Pipe* option on the
Program Menu (see Figure 2-3 below) and press [ENTER].

Note: *Refer to* Sound Speeds and Pipe Size Data (914-004) *for
additional information about pipe sizes and sound speeds.*
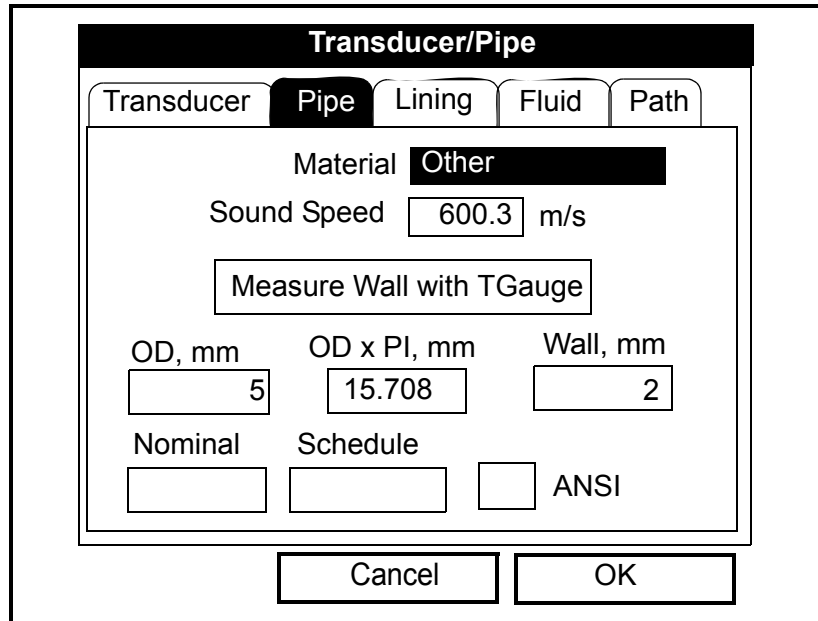
Figure 2-3: The Pipe Option Window

1. At the *Material* prompt, press [ENTER] to open a list of options (see
Table 3-1 on the next page). Use the [▼] or [▲] keys to scroll to
your material or choose *"Other"* if your material is not on the list.

Entering the Pipe Parameters (cont.)

Table 2-1: Pipe Material Options

Material Category	Specific Material
Al - Aluminum	Rolled
Brass	None
Cu - Copper	Annealed or Rolled
CuNi - Copper/Nickel	70% Cu 30% Ni or 90% Cu 10% Ni
Glass	Pyrex, Flint, or Crown
Gold	Hard-drawn
Inconel	None
Iron	Armco, Ductile, Cast, Electrolytic
Monel	None
Nickel	None
Plastic	Nylon, Polyethylene, Polypropylene, PVC (CPVC), or Acrylic
Steel	Carbon Steel or Stainless Steel
Tin	Rolled
Titanium	None
Tungsten	Annealed, Carbide, Drawn
Zinc	Rolled
Other*	Any material

2. Press [ENTER] to confirm your choice.

3. If you selected *"Other,"* enter the sound speed for your material and press [ENTER].

Note: *For some materials, you have the option of entering your pipe size using an ANSI pipe schedule table in the next step.*

4. At the next prompt, choose whether you wish enter your pipe size as an outside diameter (OD) or as a circumference. After the chosen box is highlighted, enter your value and press [ENTER] to confirm the value.

5. At the next prompt, enter your pipe wall thickness and press [ENTER] to confirm the value.

Note: *The measurement units used above depend on the choice you made when setting up the meter.*

6. To return to *Operate Mode*, press [F3] (OK) to confirm your entries or press [F2] (Cancel) to cancel your entries.

Entering the Pipe Lining Parameters

To program your pipe lining. scroll to the *Lining* tab on the *Program Menu* (see Figure 2-4 below) and press [ENTER].

Note: *The* Lining *option is only available for clamp-on transducers.*

```
┌─────────────────────────────────────────────┐
│         ┌─────────────────────────────────┐  │
│         │      Transducer/Pipe            │  │
│    ┌────────┐┌──────┐┌───────┐┌──────┐┌──────┐│
│    │Transducer││ Pipe ││Lining ││Fluid ││ Path ││
│    └────────┘└──────┘└───────┘└──────┘└──────┘│
│    │                                       │  │
│    │                                       │  │
│    │         Material  Tar/Epoxy           │  │
│    │      Sound Speed   2000   m/s         │  │
│    │        Thickness      0   mm          │  │
│    │                                       │  │
│    │                                       │  │
│    └───────────────────────────────────────┘  │
│              ┌──────────┐┌──────────┐         │
│              │  Cancel  ││    OK    │         │
│              └──────────┘└──────────┘         │
└─────────────────────────────────────────────┘
```

Figure 2-4: The Lining Option Window

1. Press [ENTER] to open the drop-down list of pipe lining materials.

2. Scroll to your material, or if your material is not listed, select *"Other."* Press [ENTER] to confirm your choice.

Note: *If your pipe lining material is not listed, consult GE Sensing for assistance.*

3. If you selected pipe lining material from the list, the correct sound speed is entered automatically. However, if you selected *"Other,"* you must enter the sound speed for your material and press [ENTER] to confirm the value.

4. Use the numeric keys to enter lining thickness, and press [ENTER] to confirm the value.

5. To return to *Operate Mode*, press [F3] (OK) to confirm your entries or press [F2] (Cancel) to cancel your entries.

Entering the Fluid Parameters

To program your fluid parameters, scroll to the *Fluid* tab on the *Program Menu* (see Figure 2-5 below) and press [ENTER].

Figure 2-5: The Fluid Option Window

1. Indicate if you want to use *"Tracking Windows"* by scrolling to the *"No"* or *"Yes"* button. Press [ENTER] to confirm your selection.

Note: *The* "Tracking Windows" *feature is used to detect the transducer signal when you are unsure of your fluid sound speed (the default setting is* "No"*).*

2. At the *"Fluid"* prompt, press [ENTER] to open the drop-down list. Scroll to your fluid type (see the list of available fluids in Table 3-2 on the next page), or if your fluid is not listed, select *"Other."* Press [ENTER] to confirm your selection

Note: *The list of available fluid types will vary, depending on the choices you made for the* Tracking Windows *and* Energy *options.*

3. To return to *Operate Mode*, press [F3] (OK) to confirm your entries or press [F2] (Cancel) to cancel your entries.

Entering the Fluid Parameters (cont.)

Table 2-2: Fluid Type Selection

Energy	Tracking Windows OFF	Tracking Windows ON
OFF	Other	Water (0-260°C)
	Water (0-260°C)	Oil
	Sea Water	Other
	Oil (22°C)	
	Crude Oil	
	Lube Oil (X200)	
	Methanol	
	Ethanol	
	LN2 (-199°C)	
	Freon (R-12)	
ON	Water/0-260°C	Water/0-260°C
	Water/Glycol (with glycol %)	Water/Glycol (with glycol %)
	Other (single soundspeed)	Other (min./max. soundspeeds)

Entering the Signal Path Parameters

To program your signal path parameters, scroll to the *Path* tab on the *Program Menu* (see Figure 2-6 below) and press [ENTER].
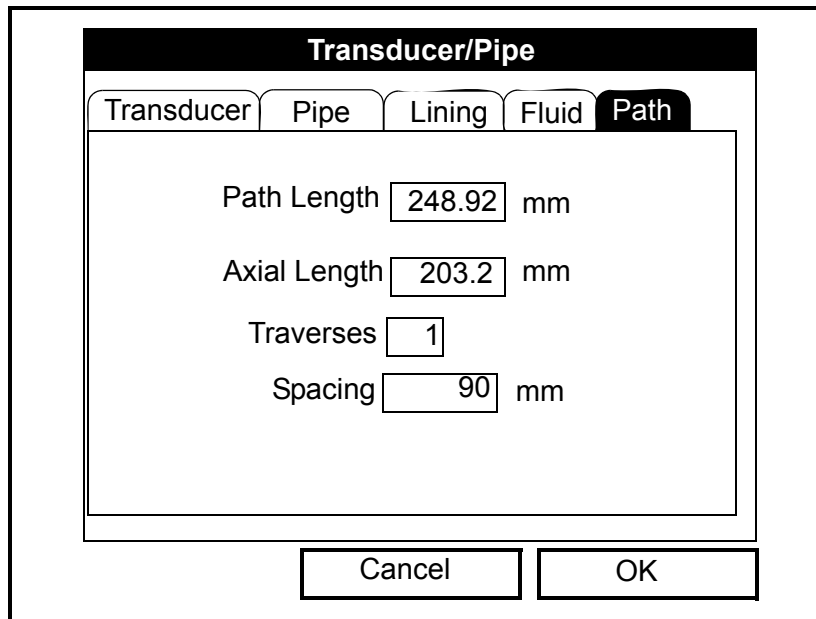
Figure 2-6: The Path Option Window

Entering the Signal Path Parameters (cont.)

The prompts available in the *Path* option depend on whether you have selected *clamp-on* or *wetted* transducers in the *Transducer* option. Proceed to the appropriate section for your transducer type.

Clamp-On Transducers

1. At the *"Traverses"* prompt, press [ENTER] to open the drop-down list. Scroll to the number of traverses for your installation and press [ENTER] to confirm the selection.

Note: *The number of traverses is the number of times the ultrasonic signal crosses the pipe before being received.*

2. The next prompt displays the *"Spacing"* of the transducers, as calculated from the information previously entered. Record this number and use it to space your transducers during installation.

IMPORTANT: *It is recommended that you always use the spacing calculated by the PT878. Only override this value if instructed to do so by GE Sensing.*

3. To return to *Operate Mode*, press [F3] (OK) to confirm your entries or press [F2] (Cancel) to cancel your entries.

Wetted Transducers

1. At the *"Path Length"* prompt, use the numeric keys to enter the path length (P) value provided by GE Sensing and press [ENTER] to confirm the value.

2. At the *"Axial Length"* prompt, use the numeric keys to enter the axial length (L) value provided by GE Sensing and press [ENTER] to confirm the value.

3. To return to *Operate Mode*, press [F3] (OK) to confirm your entries or press [F2] (Cancel) to cancel your entries.

Entering Correction Factors

To enter *Reynolds Correction* or *Calibration Factor* data, scroll to the *Correction Factors* tab in the *Program Menu* and press [ENTER].

Entering Reynolds Correction Data

Scroll to the *"Reynolds Correction"* tab (see Figure 2-7 below), then press [ENTER] and proceed as follows:

Note: *The* Reynolds Correction *factor is based on the kinematic viscosity and the flow rate of the fluid. The default condition is* ON*, and it should be left that way for all clamp-on transducer applications and most wetted transducer applications.*

Correction Factors

Reynolds Correctio | Calibration Factor

Re Correction ● On   ○ Off

K/V Factor ● Single   ○ Table

K/V (v) [10] m^3/s

Data Source [   ]

[Edit Table]

[Cancel] [OK]

Figure 2-7: The Reynolds Correction Window

---

1. To enable or disable *Reynolds Correction*, use the [◄] and [►] keys to scroll to the appropriate radio button and press [ENTER].

Note: *If you disable* Reynolds Correction*, you cannot enter any other data in this window. Skip the remaining steps.*

2. You must now choose to enter either a single *K/V* (kinematic viscosity) value or a table of values. Use the [◄] and [►] keys to scroll to the desired radio button and press [ENTER].

Proceed to the appropriate sub-section on the next page.

Entering Reynolds
Correction Data (cont.)

Entering a Single K/V Value

 a. If you chose to enter a single value, press [ENTER] to open the text box.

 b. Use the numeric keys to enter the K/V value for your fluid (see the *Sound Speeds and Pipe Size Data* booklet).

 c. Press [ENTER] to confirm your data.

Entering a Table of K/V Values

 a. If you chose to enter a table of values, press [ENTER] to open the data source box.

 b. Press [F3] (OK) to confirm *velocity* as the source parameter.

 c. At the *Edit Table* prompt, press [ENTER] to open the table of data. Use the arrows keys to scroll to each table cell, and use the numeric keys to enter the value for each cell.

 d. When done, press [F3] (OK) to confirm the new table.

3. To return to *Operate Mode*, press [F3] (OK) to confirm your entries or press [F2] (Cancel) to cancel your entries.

Entering a Calibration
Factor

Scroll to the *"Calibration Factor"* tab (see Figure 2-8 below), then press [ENTER] and proceed as follows:

Note: *The* Calibration Factor *is a multiplier used to match the readings of the PT878 to another flow reference.*

Figure 2-8: The Calibration Factor Window

Entering a Calibration
Factor (cont.)

1. To enable or disable *Calibration Factor*, use the [◀] and [▶] keys to scroll to the appropriate radio button and press [ENTER].

2. You must now choose to enter either a single *K Factor* or a table of values. Use the [◀] and [▶] keys to scroll to the desired radio button and press [ENTER].

Proceed to the appropriate sub-section below.

Entering a Single K Factor

a. If you chose to enter a single value, press [ENTER] to open the text box.

b. Use the numeric keys to enter the desired K Factor.

Note: *If you have enabled the* Reynolds Correction *factor, the* K-Factor *should be set to* 1.00. *Otherwise, a typical K-Factor is between 0.5 and 2.00).*

c. Press [ENTER] to confirm your data.

Entering a Table of K/V Values

a. If you chose to enter a table of values, press [ENTER] to open the data source box.

b. Press [F3] (OK) to confirm *velocity* as the source parameter.

c. At the *Edit Table* prompt, press [ENTER] to open the table of data. Use the arrows keys to scroll to each table cell, and use the numeric keys to enter the value for each cell.

d. When done, press [F3] (OK) to confirm the new table.

3. To return to *Operate Mode*, press [F3] (OK) to confirm your entries or press [F2] (Cancel) to cancel your entries.

Chapter 3

Operation

Configuring The Display Options

The PT878 allows you to view 1 to 4 different measurement parameters simultaneously in either numeric or graphical format. To configure the display, press [SEL] from the *Operate Mode* window and a cursor appears next to the parameter closest to the upper left corner (see Figure 3-1 below). Use the [SEL] key to scroll through the displayed measurements until you reach the desired parameter. Then, press [ENTER] to open the *Display Menu* for that parameter.

Proceed to the appropriate section for detailed instructions.
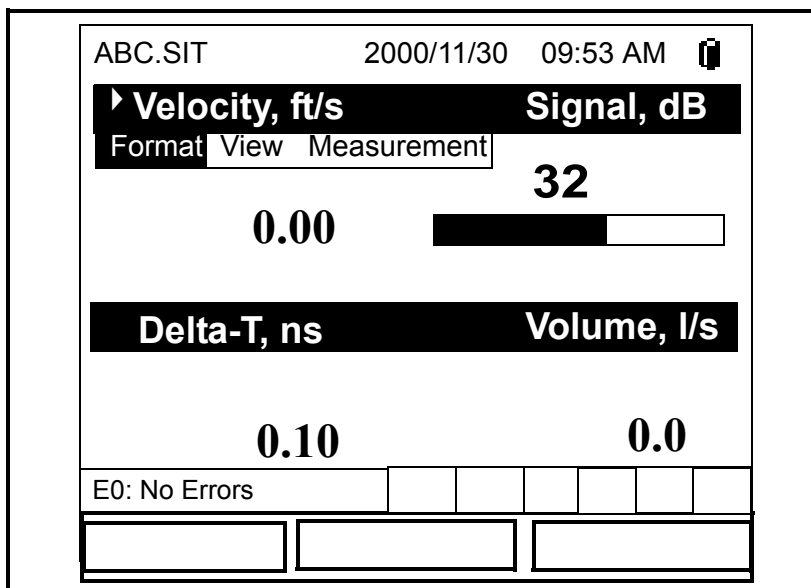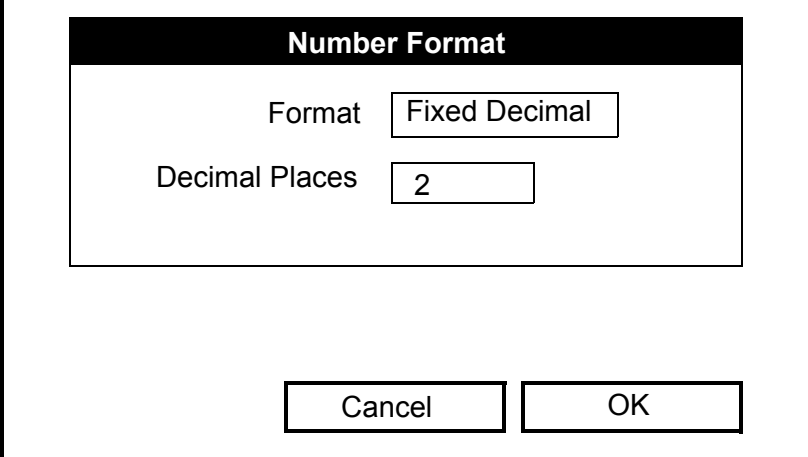
Figure 3-1: Display After Pressing [SEL]

The *Format* Option

The *Number Format* option, allows you to specify the type of notation and the number of decimal places for the selected parameter (see Figure 3-2 below).

Note: *For a line or bar graph display, the* Limits *option appears instead of the* Format *option.*

Number Format

Format   Fixed Decimal

Decimal Places   2

Cancel   OK

Figure 3-2: The Number Format Window

1. Use the arrow keys to select the *Format* option and press [ENTER] to open the drop-down list of three format choices (*Default*, *Fixed Decimal*, and *Scientific*).

2. Scroll to the desired number format and press [ENTER] to confirm your choice.

3. Use the arrow keys to select the *Decimal Places* option and press [ENTER] to open the drop-down list of choices (0, 1, 2, 3, and 4).

4. Scroll to the desired number of decimal places and press [ENTER] to confirm your choice.

5. Press [F3] (OK) to confirm your selections and return to *Operate Mode*. Otherwise, you can press [F2] (Cancel) or the [ESC] key to exit the *Format Menu* without confirming your selections.

The *View* Option

The *View* option, allows you to specify the type of display for the selected parameter.

1. Use the arrow keys to select the *View* option.

2. Press [ENTER] to open the drop-down list of three display types (*Numeric*, *Line Graph*, and *Bar Graph*).

3. Scroll to the desired display type and press [ENTER] to confirm your choice.

The display immediately changes to reflect the choice made above. For example, if you chose a *Line Graph* display, the screen appears similar to Figure 3-3 below.
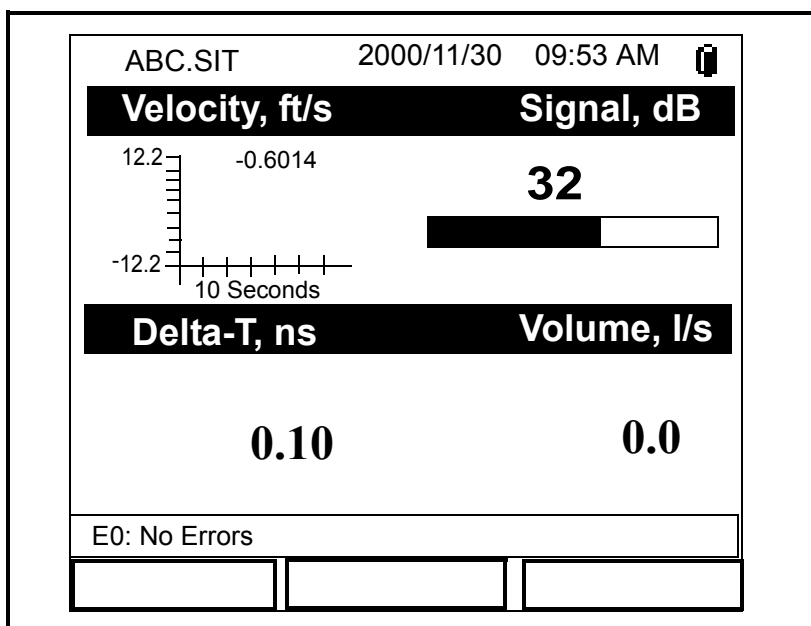
Figure 3-3: Display After Format Change

The *Limits* Option

For a graphical display, the *Limits* option enables you to program:

- the minimum or maximum values displayed

- the time interval

- the display of the average value

Note: *For a numeric display, the* Format *option appears instead of the* Limits *option.*

1. Use the arrow keys to select the *Limits* option and press [ENTER].

2. At the *Change* drop-down menu option, press [ENTER] again and a window similar to Figure 3-4 below appears.

Figure 3-4: The Line Graph Parameters Window

3. Scroll to the *Minimum* text box and press [ENTER] to open the box.

4. Use the numeric keys to enter the minimum value to be displayed on the graph. Press [ENTER] to confirm the value.

5. Scroll to the *Maximum* text box and press [ENTER] to open the box.

6. Use the numeric keys to enter the maximum value to be displayed on the graph. Press [ENTER] to confirm the value.

The *Limits* Option (cont.)   For a bar graph display, skip the following steps and proceed directly to the final paragraph below. For a line graph display, complete the following additional steps:

1. Scroll to the text box for the x-axis interval value and press [ENTER] to open the box.

2. Use the numeric keys to enter the desired interval value and press [ENTER] to confirm the value.

3. Scroll to the text box for the x-axis units and press [ENTER] to open the box.

4. Use the numeric keys to enter the desired interval units (seconds, minutes, hours, or days) and press [ENTER] to confirm the choice.

5. The final three menu options permit you to configure some of the display details:

   a. If you want to use lines to connect the data points, scroll to the *Use Lines* option and press [ENTER] to select it.

   b. If you want to show the average value for the displayed parameter, scroll to the *Plot Average value* option and press [ENTER] to select it.

   c. If you want to show the minimum and maximum values for the displayed parameter, scroll to the *Show Minimum and Maximum* option and press [ENTER] to select it.

Press [F3] (OK) to confirm your selections and return to *Operate Mode*. When you return to *Operate Mode*, the screen will display any changes you have made. Otherwise, you can press [F2] (Cancel) or the [ESC] key to exit the *Format Menu* without confirming your selections.

The *Measurement* Option   The *Measurement* option allows you to specify which parameter is
displayed in the current window and to select the measurement units.

1. Use the arrow keys to select the *Measurement* option and press
[ENTER].

2. At the *Change* drop-down menu option, press [ENTER] again and a
window similar to Figure 3-5 below appears.

Note: *The left column in the window lists the available display
parameters, and the right column list the available
measurement units for the highlighted parameter.*
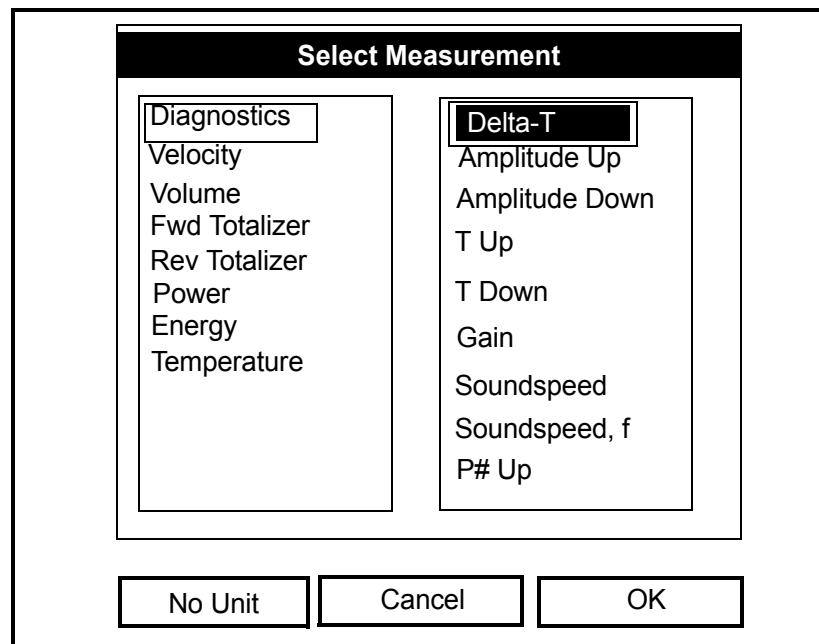
Figure 3-5: The Measurement Parameters Window

1. Use the [▼] and [▲] arrow keys to highlight the desired
parameter for display, and press [SEL].

2. Then, use the [▼] or [▲] arrow keys to select the desired
measurement unit (or diagnostics parameter).

3. Press [F3] (OK) to confirm your selections and return to *Operate
Mode*. Your changes will be displayed on the screen. Otherwise,
you can press [F2] (Cancel) or the [ESC] key to exit the menu
without confirming your selections.

Customizing the Display Screen

The *Site Menu* enables you to customize your display screen. To enter the *Site Menu*:

Note: *As an aid in following the programming instructions in this manual, refer to Appendix A,* Menu Maps.

1. Press the [MENU] key at the lower right of the PT878 keypad. The *Menu Bar* replaces the *Status Bar* at the top of the screen.

2. With the *Site Menu* highlighted, press [ENTER] and a screen similar to Figure 3-6 below appears.
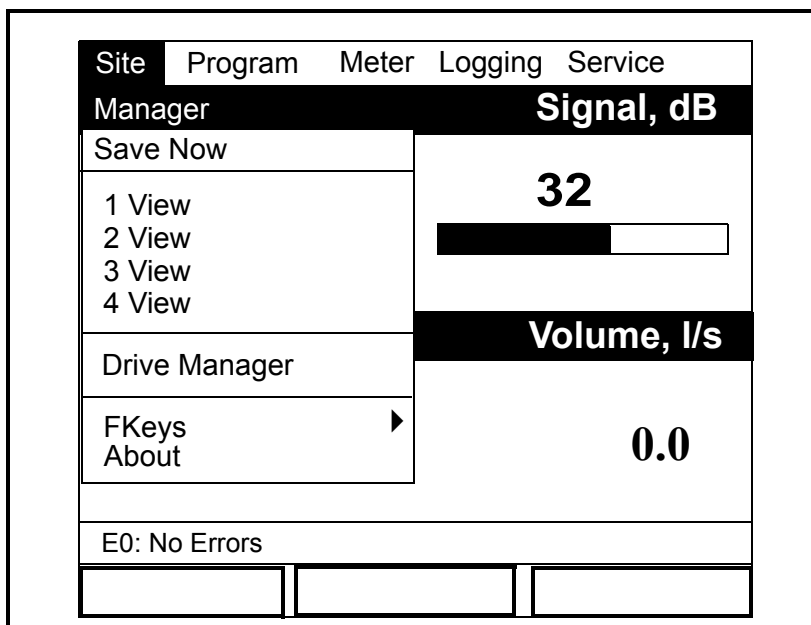
Figure 3-6: The Site Menu

Proceed to the appropriate section to specify the number of displayed parameters or to customize the softkeys.

Specifying the Number of Displayed Parameters

To change the number of open display windows, use the [▼]or [▲] arrow keys to move to the desired number of views (1 View, 2 View, 3 View, or 4 View) and press [ENTER]. The screen then displays the specified number of windows. For example, Figure 3-7 below shows a screen configured to display one window.
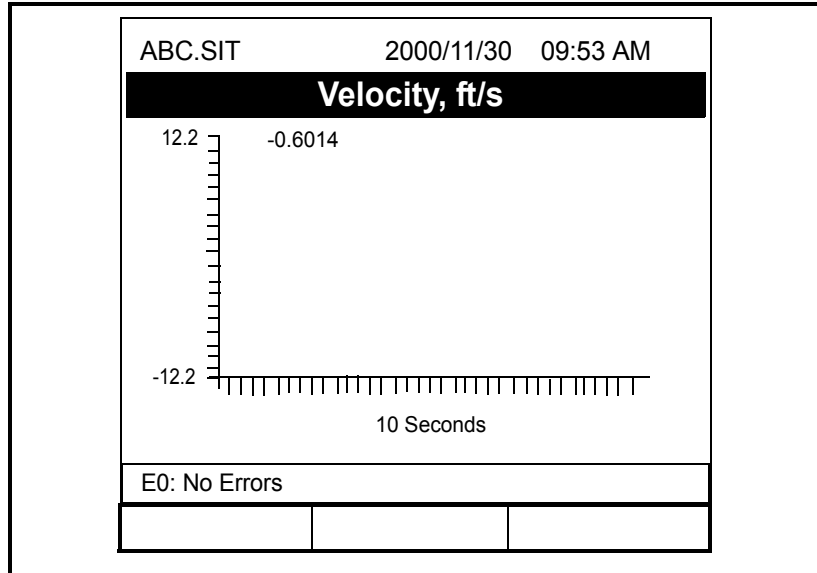
Figure 3-7: "1 View" Display

Note: *The PT878 display windows are numbered with #1 at the upper left, #2 at the upper right, #3 at the bottom left, and #4 at the bottom right. The number of views selected will use the appropriate number of these windows in numerical order. For example, if you select a* "2 View" *display, windows #1 and #2 will be displayed.*

Customizing the Softkeys If you use certain menus frequently, you can program your PT878 to access these menus directly from *Operate Mode* by customizing the softkeys ([F1], [F2] and [F3]). Then, pressing the associated softkey at any time will open the programmed menu directly. To program your softkeys, proceed to the appropriate section.

IMPORTANT: *Softkey programming is saved globally. Thus, the same assignments apply to all site files.*

Setting a Softkey from the Site Menu:

1. Press the [MENU] key at the lower right of the PT878 keypad. The *Menu Bar* replaces the *Status Bar* at the top of the screen.

2. With the *Site Menu* highlighted, press [ENTER] to open the *Site Menu* window (see Figure 3-6 on page 3-7).

3. Use the [▼] or [▲] arrow keys to move to the *FKeys* option and press [ENTER]. A screen similar to Figure 3-8 below appears.
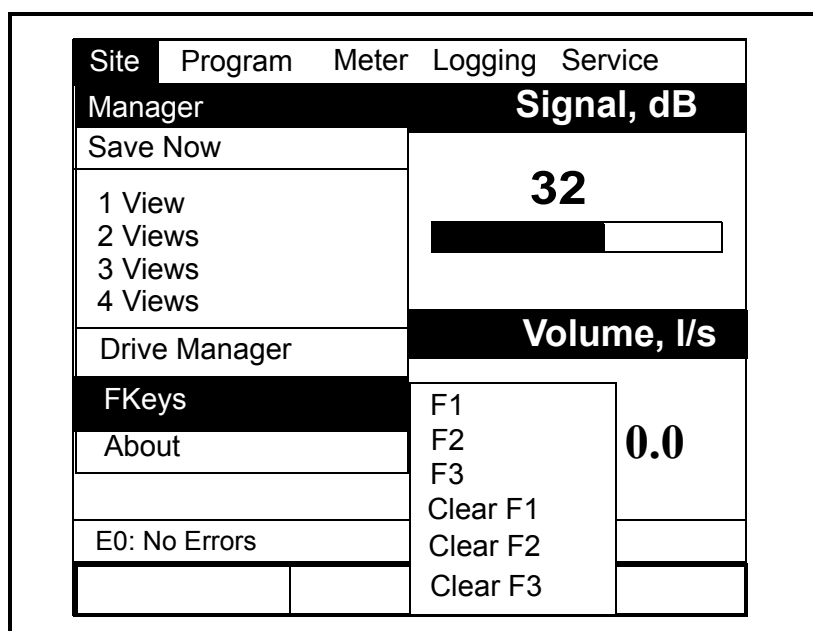
Figure 3-8: The FKeys Menu

4. Use the [▼] or [▲] arrow keys to select the desired *FKey* (for example, *F1*) and press [ENTER]. The *Configure FKey* window (see Figure 3-9 on the next page) opens.

Customizing the Softkeys
(cont.)
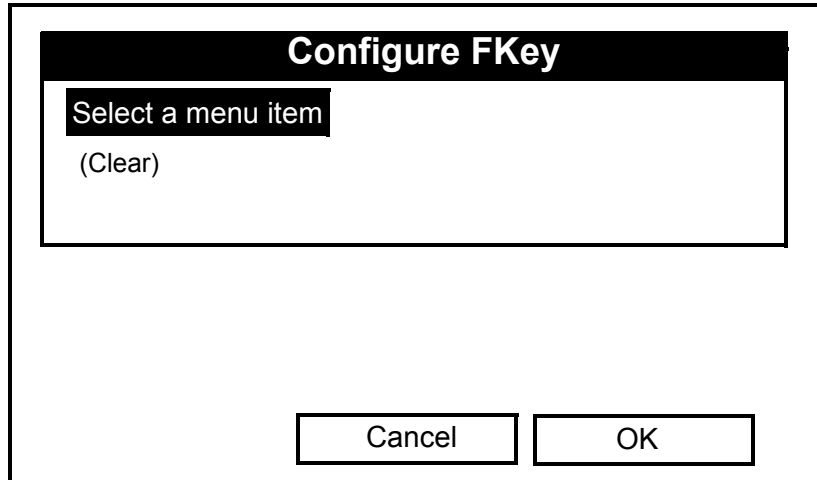
Figure 3-9: The Configure FKey Window

5. Press [ENTER] to open the menu drop-down list and use the [▼] and [▲] arrow keys to scroll to the desired menu (for example, *Contrast*).

6. Press [ENTER] to program your selection. Then, press [F3] (OK) to confirm the entry and close the window. (Press [F2] (Cancel) to close the window without changing the key.)

The display now appears similar to Figure 3-10 below, and you can enter the *Contrast* menu directly by pressing the [F1] softkey.
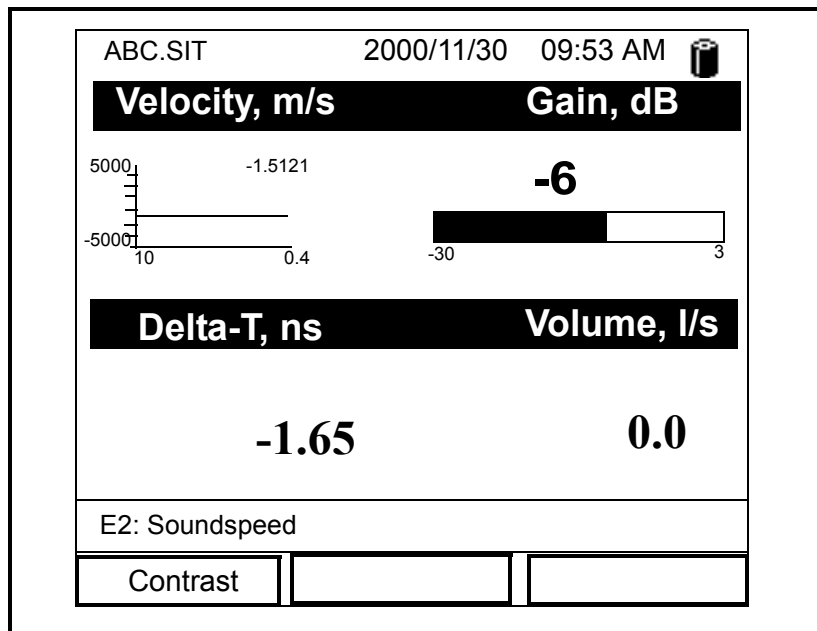
Figure 3-10: The Programmed Softkey

Customizing the Softkeys
(cont.)

Setting a Softkey from the Target Menu:

1. Press the [MENU] key at the lower right of the PT878 keypad. The *Menu Bar* replaces the *Status Bar* at the top of the screen.

2. Navigate to the desired menu (see the *Menu Maps* in *Appendix A* for guidance).

3. Use the [▼] or [▲] arrow keys to move to scroll to the desired menu option.

4. Press the desired softkey. A window appears with the question, *"Assign current menu command to FKeyX?"*

5. Press [F3] (Yes) to confirm the assignment and close the window. (Press [F2] (No) to close the window without changing the key.)

Clearing a Softkey:

1. Press the [MENU] key at the lower right of the PT878 keypad. The *Menu Bar* replaces the *Status Bar* at the top of the screen.

2. With the *Site Menu* highlighted, press [ENTER] to open the *Site Menu* window (see Figure 3-6 on page 3-7).

3. Use the [▼] or [▲] arrow keys to move to the *FKeys* option and press [ENTER]. A screen similar to Figure 3-8 on page 3-9 appears.

4. Use the [▼] or [▲] arrow keys to move to the desired *Clear FKey* (F1, F2 or F3) option on the menu. Press [ENTER].

The meter returns to *Operate Mode*, and the corresponding softkey is now cleared.

Note: *A softkey can also be cleared in the* Configure FKey *window (see Figure 3-9 on page 3-10) by selecting the* Clear *option and pressing* [ENTER] *and then* [F3] (OK).

Error Messages

To indicate a possible problem during a measurement, *Error Messages* may occasionally appear on the PT878 display. The possible *Error Messages*, along with tips for isolating and correcting the problem, are listed in Table 3-1 below.

Note: *On a graphical display, errors are indicated by a vertical gray bar at the point of the error. On a numeric display, errors are indicated by an error code in place of the measurement.*

Table 3-1: Error Code Messages

Error	Problem	Possible Cause	Action
E0	No error	• Displays briefly after clearing another error message	None required - measurement is valid.
E1	Low Signal - Poor ultrasonic signal strength	• Broken cable • Flowcell problem • Transducer problem • Electronic failure	• Check transducer cable • Check programming and transducer spacing • Contact the factory if problem persists.
E2	Sound Speed Error	• Poor flow conditions • Incorrect programming • Bad transducer spacing • Measurement is very different from the programmed sound speed	• Check sound speed against nominal sound speed • Check programming and transducer spacing
E3	Velocity Range - Velocity exceeds programmed limits	• Programming error • Poor flow conditions • Bad transducer spacing	• Make sure flow rate is within ±12 m/s (±40 ft/s) • Check programming and transducer spacing
E4	Signal Quality	• If too high - electronic failure • If too low - flowcell, electrical problem	• Check for source of electrical interference • Check electronics with a test flowcell • If unit still fails to operate, contact the factory
E5	Amplitude Error	• Excessive particles or bubbles in fluid • High second phase percentage	• Check for flowcell problems
E6	Cycle skip, Acceleration	• Poor flow conditions • Bad transducer spacing	• Check transducer spacing as programmed and as set on pipe
E7	Analog Out Error	• Under current output	• Check that output load is <550 ohm
E8	Temperature Input Supply	• Supply temperature input out of range	• Check cable and transmitter
E9	Temperature Input Return	• Return temperature input out of range	• Check cable and transmitter

Programming Global Meter Settings

Using the *Meter Menu*, you can program global settings for the meter that suit your individual preferences. To enter the *Meter Menu*:

Note: *As an aid in following the programming instructions in this manual, refer to Appendix A,* Menu Maps.

1. Press the [MENU] key at the lower right of the PT878 keypad. The *Menu Bar* replaces the *Status Bar* at the top of the screen.

2. Scroll across until the *Meter Menu* tab is highlighted, and press [ENTER]. A window similar to Figure 3-11 below opens.
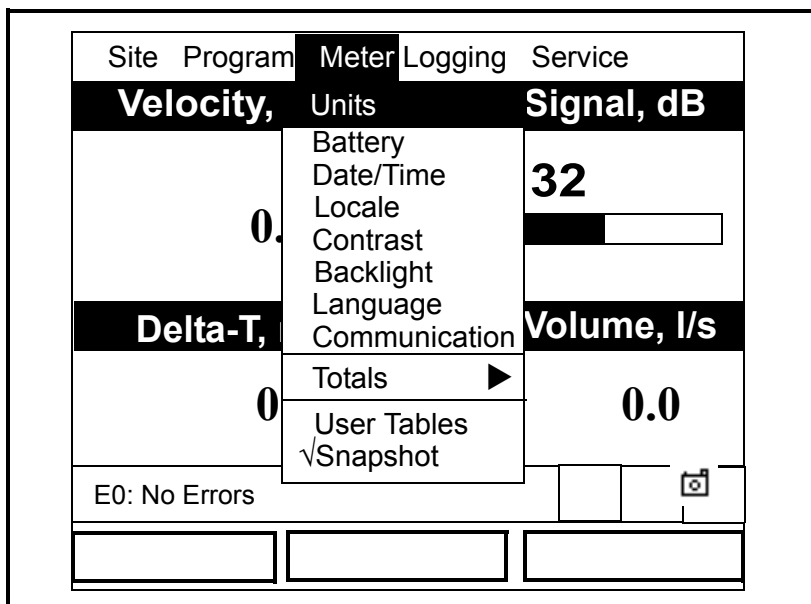
Figure 3-11: The Meter Menu Window

Use the [▼] or [▲] arrow keys to highlight the desired menu option and press [ENTER] to open the option window. Proceed to the appropriate section for programming instructions.

Note: *The* Language*,* User Tables*, and* Snapshot *options are not discussed in this abridged manual. Refer to your full PT878 manual (910-219) information on these options.*

The *Units* Option

The *Units* option enables you to select either *English* or *Metric* as the global measurement units for the PT878. The selected units then become the default for every measurement that is taken.

1. Access the *Meter Menu* as described on page 3-13.

2. Scroll to the *Units* option and press [ENTER]. The *Meter Settings* window opens (see Figure 3-12 below).

Meter Settings

Units

(●) English (○) Metric

Date:
2000/11/1

Time:
10:08:53
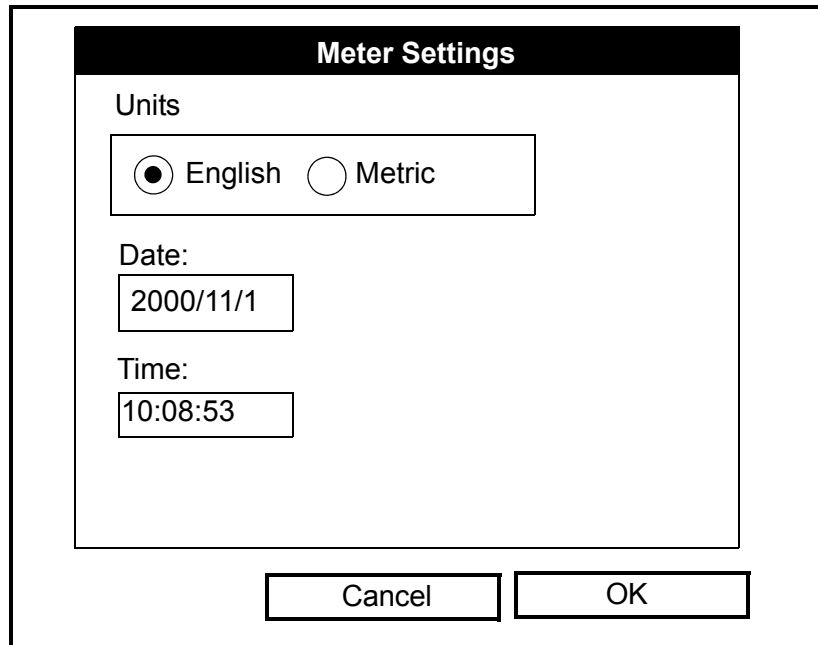
Cancel   OK

Figure 3-12: The Meter Settings Window

3. Use the [◄] and [►] keys to select the desired measurement units, and press [ENTER] to confirm the choice.

4. Press [F3] (OK) to confirm the choice and close the window, or press [F2] (Cancel) to close the window without making the change.

The *Battery Charger* Option

The *Battery* option allows you to monitor the run time and status of the internal rechargeable batteries, as well as to condition NiCad batteries to maintain the maximum life.

Note: *When conditioning the batteries, be sure you have plugged the AC adapter into the PT878 and pressed the power key. NiMH batteries normally do not require conditioning.*

1. Access the *Meter Menu* as described on page 3-13.

2. Scroll to the *Battery* option and press [ENTER]. The *Battery Charger* window opens (see Figure 3-13 below).
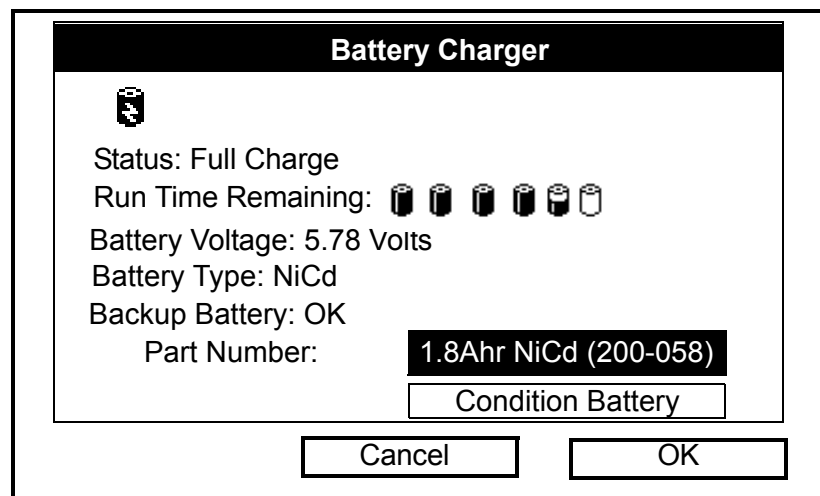
Figure 3-13: The Battery Charger Window

3. Press [ENTER] to open the *Part Number* list box. Scroll to the battery type you have installed [1.8 Ahr NiCd (200-058) or 3.0 Ahr NiMH (200-081)] and press [ENTER].

Note: *If you do not set the correct battery type in the* Part Number *window, the battery continues to function, but the battery status icons will not be accurate.*

4. With the *Condition Battery* box selected, press [ENTER]. The *Condition Battery* window status line should change from *Stop* to *Discharging* within 30 seconds.

Note: *You should condition NiCad batteries when the* Run Time Remaining *is reduced to 50% of their previous run time.*

5. To stop the discharge cycle, press [ENTER] and note that the status line in the *Condition Battery* window changes to *On Charger*.

6. Press [F3] (OK) to return to *Operate Mode*.

The *Date/Time* Option   In *Operate Mode*, the PT878 *Status Bar* displays the current date and time in the upper right corner of the screen. The *Date/Time* option allows you to set these values to ensure accurate data logging.

1. Access the *Meter Menu* as described on page 3-13.

2. Scroll to the *Date/Time* option and press [ENTER]. The *Meter Settings* window opens (see Figure 3-12 on page 3-14).

3. Scroll to the *Date* text box, which displays the current meter date, and press [ENTER].

4. Use the [◀] and [▶] keys to scroll to the year, month, or day and use the numeric keys to enter the desired number.

5. When done, press [ENTER] to confirm the new date.

Note: *Instead of using the numeric keys, you may use the* [▼] *or* [▲] *arrow keys to change the date numbers in 1-digit increments.*

To change the time, proceed in a similar manner:

1. Access the *Meter Menu* as described on page 3-13.

2. Scroll to the *Date/Time* option and press [ENTER]. The *Meter Settings* window opens (see Figure 3-12 on page 3-14).

3. Scroll to the *Time* text box, which displays the current meter time, and press [ENTER].

4. Use the [◀] and [▶] keys to scroll to the hours, minutes, or seconds and use the numeric keys to enter the desired number.

5. When done, press [ENTER] to confirm the new time.

Note: *Instead of using the numeric keys, you may use the* [▼] *or* [▲] *arrow keys to change the time numbers in 1-digit increments.*

Press [F3] (OK) to confirm your entries and return to *Operate Mode*. Your changes will be displayed on the screen. Otherwise, you can press [F2] (Cancel) or the [ESC] key to exit the menu without confirming your entries.

The *Locale* Option

In addition to setting the correct date and time, you can also change their format to suit local preferences. This is accomplished using the *Locale* option.

1. Access the *Meter Menu* as described on page 3-13.

2. Scroll to the *Locale* option and press [ENTER]. The *Locale* tab of the *Display Options* window opens (see Figure 3-14 below).

```
┌─────────────────────────────────────────────────┐
│            Display Options                        │
│  ┌──────────┬──────────┐                          │
│  │ Display  │  Locale  │                          │
│  │  ────────┴──────────────────────────────────┐ │
│  │  Separators:                                 │ │
│  │     Date │ / │   Time │ : │   Decimal │ · │  │ │
│  │                                              │ │
│  │         Date Format │ MM/DD/YYYY │           │ │
│  │         Time Format │  12 Hour  │            │ │
│  │                                              │ │
│  │   Date/Time, Decimal Formats:                │ │
│  │    MM/DD/YYYY HH:MM:SS PM, 123.45            │ │
│  └──────────────────────────────────────────────┘ │
│              ┌──────────┐    ┌──────────┐         │
│              │  Cancel  │    │    OK    │         │
│              └──────────┘    └──────────┘         │
└─────────────────────────────────────────────────┘
```
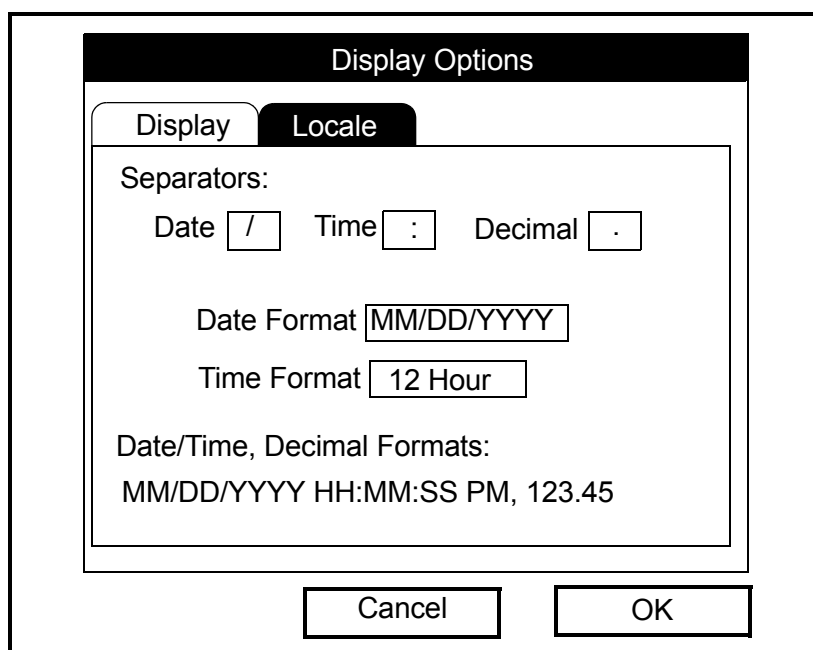
Figure 3-14: Locale Tab Window

3. The *Separators* section allows you to select the symbols used in the following items:

   a. Scroll to the *Date* text box and press [ENTER] to open the drop-down list. Select a dash (-), comma (,) or slash (/) for the date separator and press [ENTER] to confirm your choice.

   b. Scroll to the *Time* text box and press [ENTER] to open the drop-down list. Select a period (.) or colon (:) for the time separator and press [ENTER] to confirm your choice.

   c. Scroll to the *Decimal* text box and press [ENTER] to open the drop-down list. Select a period (.) or comma (,) for the decimal separator and press [ENTER] to confirm your choice.

The *Locale* Option (cont.)

4. Use the [▼] or [▲] arrow keys to scroll to the *Date Format* text box and press [ENTER]. The drop down menu offers the following options:

- YYYY/MM/DD (year/month/day)
- MM/DD/YYYY (month/day/year)
- DD/MM/YYYY (day/month/year)

Use the [▼] or [▲] arrow keys to scroll to the desired format and press [ENTER] to confirm your selection.

5. Use the [▼] or [▲] arrow keys to scroll to the *Time Format* text box and press [ENTER]. The drop down menu offers the following options:

- 12 Hour (for example, 11:53:23 PM)
- 24 Hour (for example, 23:53:23)

Use the [▼] or [▲] arrow keys to scroll to the desired format and press [ENTER] to confirm your selection.

Note: *A line at the bottom of the* Locale *windows shows how your selections will appear on the display screen.*

6. When you are satisfied with your selections, use the arrow keys to return to the *Locale* tab.

7. Press [F3] (OK) to confirm your selections and return to *Operate Mode*. Your changes will be displayed on the screen. Otherwise, you can press [F2] (Cancel) or the [ESC] key to exit the menu without confirming your selections.

The *Contrast* Option

For more comfortable viewing, the PT878 enables you to adjust the screen contrast. To use the *Contrast* option:

1. Access the *Meter Menu* as described on page 3-13.

**2.** Scroll to the *Contrast* option and press [ENTER]. The *Display Options* window opens (see Figure 3-15 below).

```
┌─────────────────────────────────────────────┐
│  ┌─────────────────────────────────────────┐ │
│  │           Display Options               │ │
│  └─────────────────────────────────────────┘ │
│   ╱────────╲ ╱────────╲                       │
│  │ Display  │ │ Format  │                     │
│  │          └─┴─────────┴──────────────────┐ │
│  │    ┌──────────────────────────────────┐ │ │
│  │    │             Darker               │ │ │
│  │    └──────────────────────────────────┘ │ │
│  │    ┌──────────────────────────────────┐ │ │
│  │    │             Lighter              │ │ │
│  │    └──────────────────────────────────┘ │ │
│  │                                          │ │
│  │           Backlight Off │  3  │ Min      │ │
│  │                                          │ │
│  │            Language │ English │          │ │
│  │                                          │ │
│  └──────────────────────────────────────────┘ │
│         ┌──────────────┐ ┌──────────────┐     │
│         │    Cancel    │ │      OK      │     │
│         └──────────────┘ └──────────────┘     │
└─────────────────────────────────────────────┘
```
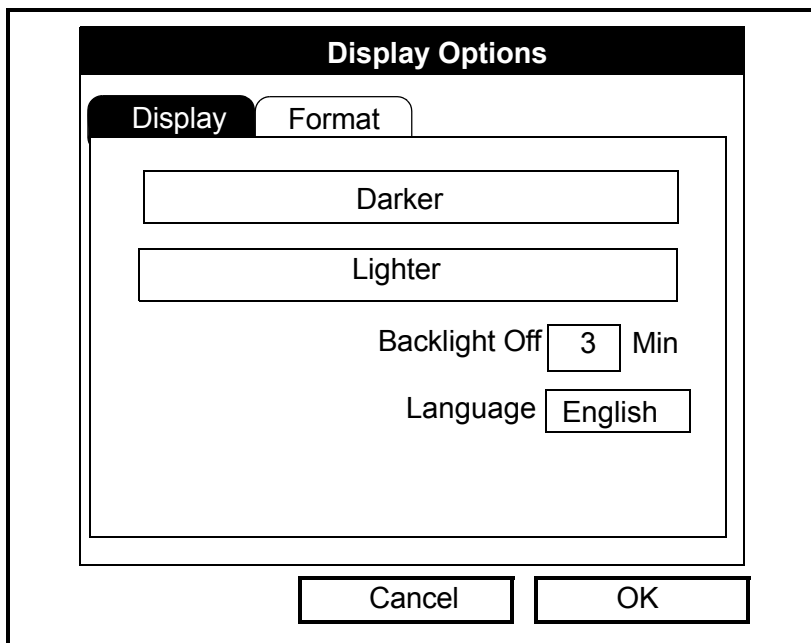
Figure 3-15: Display Tab Window

3. Scroll to the *Darker* or *Lighter* box, and press the [ENTER] button repeatedly until the screen has the desired contrast.

Note: *If the screen becomes too dark or too light, scroll to the other box and press* [ENTER] *until you have adjusted the screen to your satisfaction.*

4. Press [F3] (OK) to confirm your adjustments and return to *Operate Mode*. Your changes will be displayed on the screen. Otherwise, you can press [F2] (Cancel) or the [ESC] key to exit the menu without confirming your adjustments.

The *Backlight* Option

To conserve battery power, the PT878 enables you to adjust how long the backlight remains ON without any user input. To use the *Backlight* option:

Note: *You can manually turn the backlight* ON *or* OFF *at any time by pressing the power switch for 1 second.*

1. Access the *Meter Menu* as described on page 3-13.

2. Scroll to the *Backlight* option and press [ENTER]. The *Display Options* window opens (see Figure 3-15 on the previous page).

3. Scroll to the *Backlight Off* text box, and press the [ENTER] button to access the text box.

4. Use the numeric keys to enter the number of minutes that the backlight remains ON (from 0 to 99), and press [ENTER] to confirm the value.

5. Press [F3] (OK) to confirm your entry and return to *Operate Mode*. Otherwise, you can press [F2] (Cancel) or the [ESC] key to exit the menu without confirming your entry.

The *Language* Option

IMPORTANT: *Before using this option, one or more of the available language translation files must be loaded into the meter. Contact GE Sensing for assisitance.*

The PT878 offers a selection of several languages for its display. To change the current display language (US English is the default):

1. Access the *Meter Menu* as described on page 3-13.

2. Scroll to the *Language* option and press [ENTER]. The *Display Options* window opens (see Figure 3-15 on the previous page).

3. Scroll to the *Language* text box, and press the [ENTER] button to access the drop-down list.

4. Scroll to the desired language and press the [ENTER] button to confirm the selection. Then, press [F3] (OK).

The *Language* Option
(cont.)

5. Changing the language requires restarting the PT878. When a window like the one in Figure 3-16 below appears, press [F2] to cancel the change or [F3] to confirm the change.

Change Language

Changing the meter's language requires a restart.

Choose CANCEL to exit or OK to proceed.

Cancel   OK
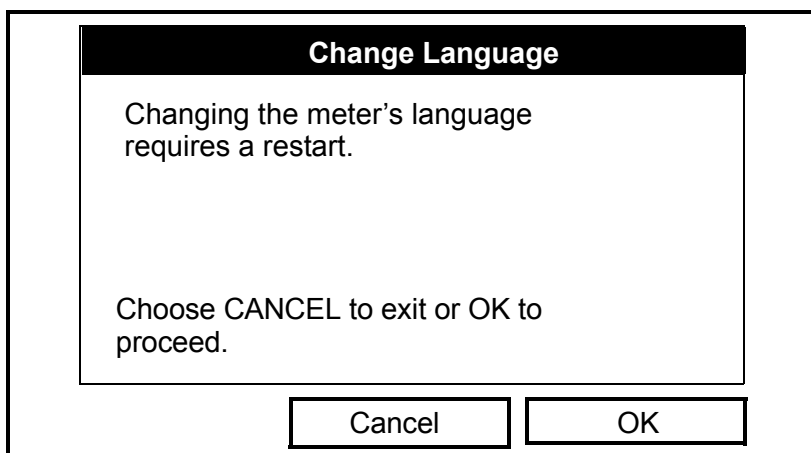
Figure 3-16: Change Language Confirmation Window

The meter will now restart in *Operate Mode* in the new language.

The *Communications* Option

To configure the PT878 wireless infrared interface, use the *Communication* option:

1. Access the *Meter Menu* as described on page 3-13.

2. Scroll to the *Communication* option and press [ENTER]. The *Communications* window opens (see Figure 3-17 below).

Communications

Node ID   2

Comm Interface ◯ IrDA ◉ IR 232

Baud Rate   9600   bps

Parity   None

Stop Bits ◉ 1   ◯ 2

Data Bits ◯ 7   ◉ 8

Cancel   OK
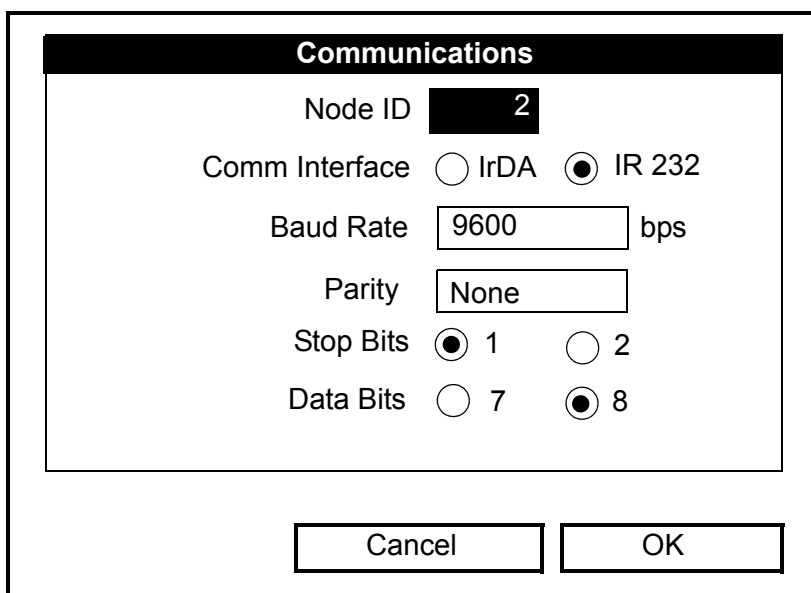
Figure 3-17: The Communications Window

The *Communications Option* (cont.)

3. Scroll to the *Node ID* prompt and press [ENTER] to open the text box. Use the numeric keys to enter a node identification number (must be an integer between 1 and 240) for your PT878 and press [ENTER] to confirm the entry.

IMPORTANT: *Do* <u>NOT</u> *change the default* Node ID *unless instructed to do so by GE Sensing.*

4. Scroll to the *Comm Interface* prompt and use the [◀] and [▶] keys to select either the *IrDA* (Infrared Data Association) option or the *IR232* (virtual interface) option. Press [ENTER] to confirm your selection.

Note: *You <u>must</u> choose the IrDA option when using an IR printer or a file transfer application such as QuickBeam.*

IMPORTANT: *If you select the* IR232 *option above, you <u>must</u> use the default values in the next four steps.*

5. Scroll to the *Baud Rate* prompt and press [ENTER] to open the drop-down list. Use the [▼] or [▲] arrow keys to scroll to the desired baud rate (the default is *9600*), and press [ENTER] to confirm your selection.

6. Scroll to the *Parity* prompt and press [ENTER] to open the drop-down list. Use the [▼] or [▲] arrow keys to scroll to the desired parity setting (the default is *None*), and press [ENTER] to confirm your selection.

7. Scroll to the *Stop Bits* prompt and use the [◀] and [▶] keys to select either the *1* option or the *2* option (the default is *1*). Press [ENTER] to confirm your selection.

8. Scroll to the *Data Bits* prompt and use the [◀] and [▶] keys to select either the *7* option or the *8* option (the default is *8*). Press [ENTER] to confirm your selection.

Press [F3] (OK) to confirm your selections and return to *Operate Mode*. Otherwise, you can press [F2] (Cancel) or the [ESC] key to exit the menu without confirming your selections.

The *Totals* Option

The PT878 features both *Forward and Reverse Totalizer* functions. If it becomes necessary to reset one or both of these totalizers, use the *Totals* option as follows:

1. Access the *Meter Menu* as described on page 3-13.

2. Scroll to the *Totals* option and press [ENTER]. A submenu with the options shown in Figure 3-18 below opens.
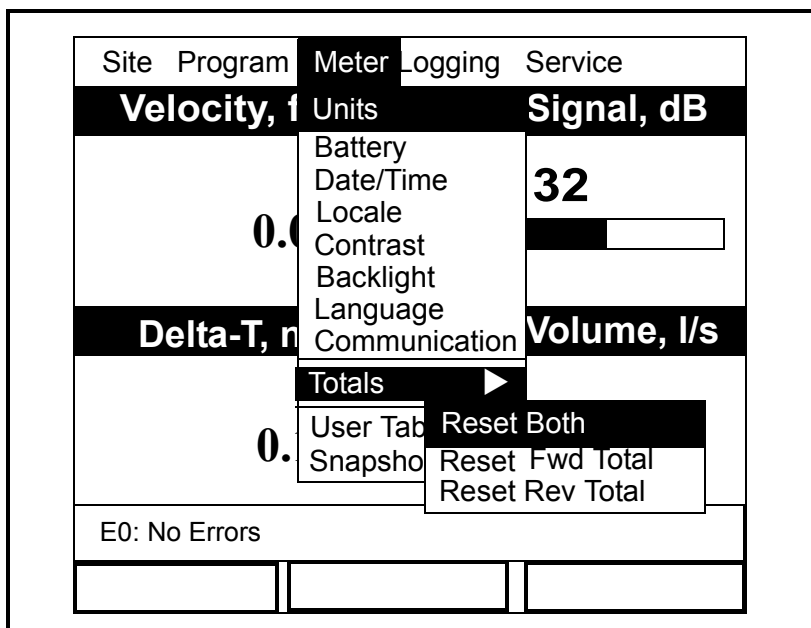
Figure 3-18: The Totals Submenu

3. Use the [▼] or [▲] arrow keys to choose the desired option, and press [ENTER] confirm your choice.

Based on the selection you made above, the meter immediately resets both totalizers, the forward totalizer, or the reverse totalizer to 0.0 and returns to *Operate Mode*.

Chapter 4

Managing Site Files

The Site Menu

So that you don't need to reenter all of your initial setup data (see Chapter 1) each time you use the meter, the PT878 can store this site data in files. Then, the *Site Menu* enables you to create and manage these *site files*.

To access the *Site Menu*, proceed as follows:

1. Press the [MENU] key at the lower right of the PT878 keypad. The *Menu Bar* replaces the *Status Bar* at the top of the screen.

2. With the *Site Menu* highlighted, press [ENTER] and a screen similar to Figure 4-1 below appears.

Note: *As an aid in following the programming instructions in this manual, refer to Appendix A,* Menu Maps*.*
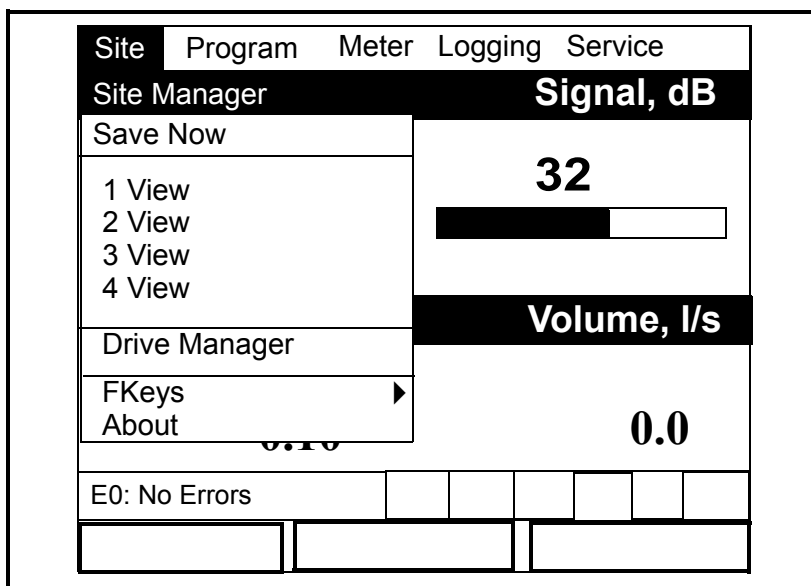
Figure 4-1: The Site Menu

The Site Manager Window

The *Site Manager* is the tool that is used to perform a variety of operations on site files. To access the *Site Manager*, proceed as follows:

1. Access the *Site Menu*, as described on the previous page.

2. With the *Site Menu* highlighted, scroll to the *Site Manager* option and press [ENTER]. A screen similar to Figure 4-2 below appears.

```
┌─────────────────────────────────────────────┐
│          Site Manager                        │
│  File   Site   Sort                          │
│  ┌──────────┐        Info: DEFAULT:SIT        │
│  │ DEFAULT  │        New Site                 │
│  │          │                                 │
│  │          │         **CURRENT SITE**        │
│  │          │                                 │
│  │          │                                 │
│  │          │         09/04/00 14:51:10       │
│  │          │         5111 bytes              │
│  │          │         118272 bytes free       │
│  └──────────┘                                 │
│                                               │
│  ┌─────────┐  ┌─────────┐  ┌─────────┐        │
│  │ Convert │  │ Cancel  │  │   OK    │        │
│  └─────────┘  └─────────┘  └─────────┘        │
└─────────────────────────────────────────────┘
```
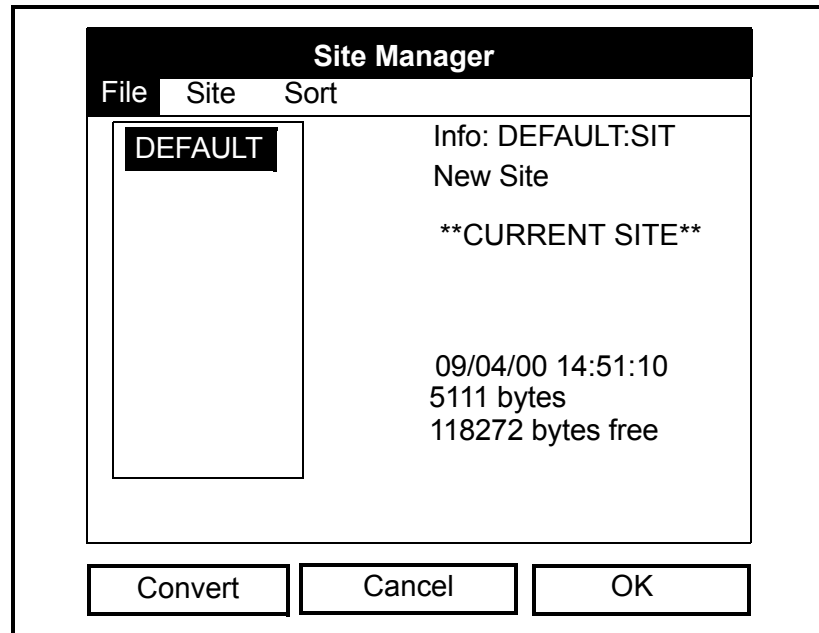
Figure 4-2: The Site Manager Window

Note: *Each PT878 comes preprogrammed with a basic site, called* Default, *that can be used as a template for creating new sites.*

The box on the left site of the *Site Manager* window lists all of the site files currently in the PT878 memory. You can use the [▼] and [▲] arrow keys to scroll through this list. The right section of the window shows information for the highlighted site, such as its date, time and size, as well as the remaining amount of free memory.

The Site Manager Menu To open the *Site Manager* menu, proceed as follows:

1. At the *Site Manager* window, press [MENU] and then [ENTER]. A window similar to Figure 4-3 below opens.
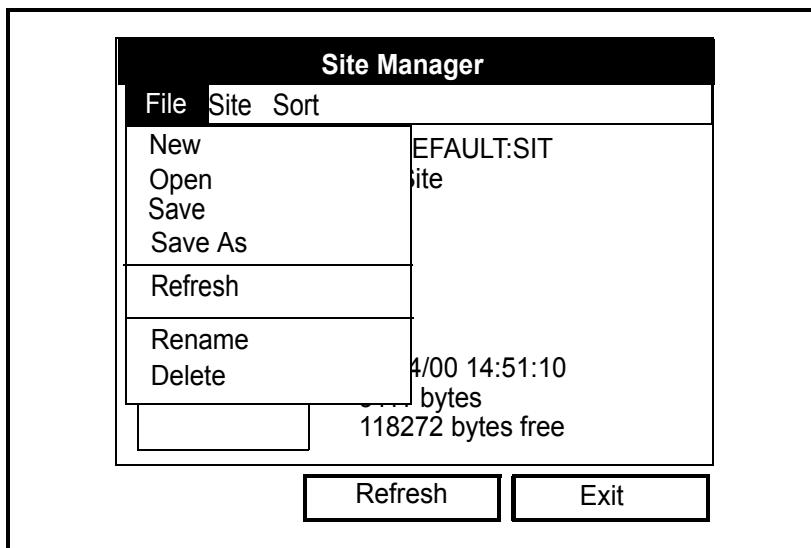
Figure 4-3: The Site Manager Menu

Use the [▼] and [▲] arrow keys to select the desired option from the above menu and proceed to the appropriate section for instructions.

The *New* Option

1. Scroll to the *New* option in the *Site Manager* menu and press [ENTER]. A screen similar to Figure 4-4 below appears.
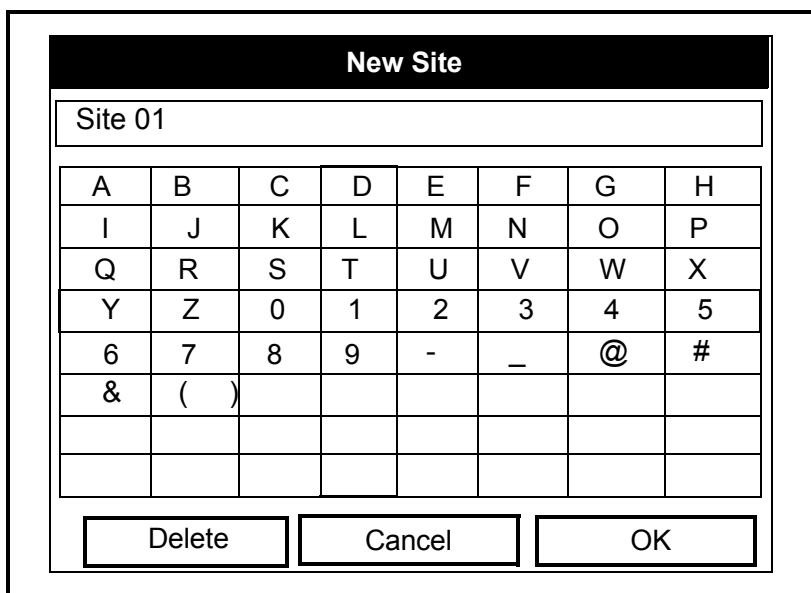
Figure 4-4: Site Name Window

The *New* Option (cont.)

2. To begin entering a name for the new site, use the four arrow keys to scroll to the desired letter or number, and press [ENTER].

3. Repeat the previous step until you have created a site name of up to eight characters.

Note: *At any time, you may press* [F1] (Delete) *to remove the last character entered.*

4. When you have finished, press [F3] (OK) to accept the name, or press [F2] (Cancel) to leave the window without creating a new site.

If you pressed [F3] above, a window similar to that in Figure 4-5 below appears.

New Site

New Site

A
I
Q
Y
6

Use the selected site
'DEFAULT.SIT' as a template?

H
P
X
5

No   Yes
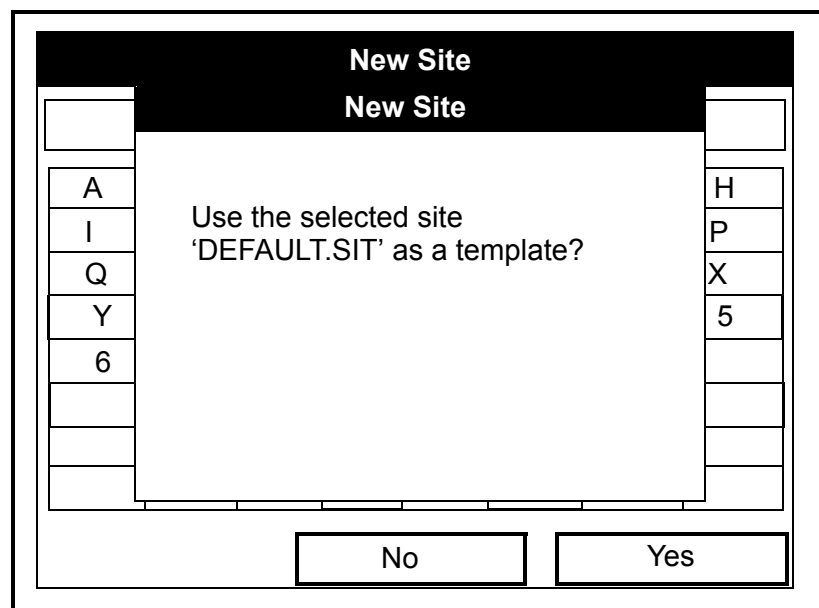
Figure 4-5: Template Confirmation Window

You must now decide if you want to use the site that was highlighted in the *Site Manager* window (see Figure 4-2 on page 4-2) as a template for the new site:

• Press [F2] (No) if you do not want to use the selected site as a template (you will use the current setup data instead)

• Press [F3] (Yes) if you do want to use the selected site as a template for the new site

After you make your selection, the meter returns to *Operate Mode*, and the new site name is shown in the upper left corner of the display.

The *Open* Option

To recall a site that has been previously created and saved:

1. Highlight the desired site in the *Site Manager* window (see Figure 4-2 on page 4-2).

2. Press [MENU] to open the *File* menu.

3. Scroll to the *Open* option, and press [ENTER]. A window similar to Figure 4-6 below opens.

IMPORTANT: *When you open a previous site, all of the site data currently in memory will be erased.*

Site Manager
Open Confirmation

Fi

Open File DEFAULT
Are You Sure?

| No | Yes |
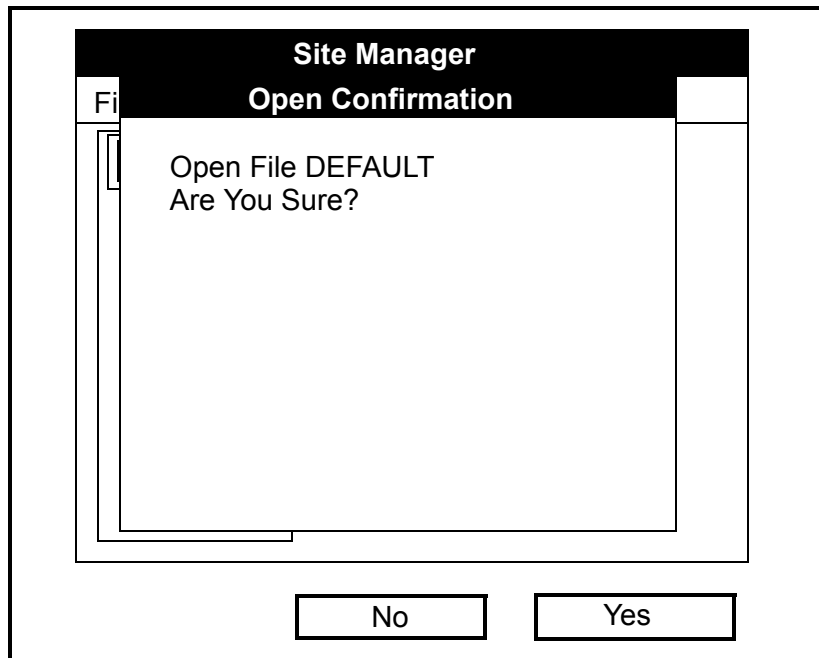
Figure 4-6: The Open Site Confirmation Window

4. Select one of the following options:

 • Press [F2] (No) to cancel opening the selected site

 • Press [F3] (Yes) to open the selected site

5. If you decided to open the selected site above, you must decide if you want to save any changes to the current site:

 • Press [F2] (No) to erase the changes

 • Press [F3] (Yes) to confirm and save the changes

If you pressed [F3] above, the PT878 returns to *Operate Mode*, and the selected site is shown in the upper left corner of the display.

The *Save* Option

You can save the current site in one of two ways:

*   From the *Site Menu* (see Figure 4-1 on page 4-1), scroll to the *Save Now* option and press [ENTER]. Or,

*   From the *Site Manager* (see Figure 4-3 on page 4-3), press [MENU] to open the *File* menu. Then, scroll to the *Save* option, and press [ENTER].

In either case, a window similar to Figure 4-7 below opens.

```
┌─────────────────────────────────────────────┐
│     ┌───────────────────────────────────┐    │
│     │           Save Site               │    │
│     ├───────────────────────────────────┤    │
│     │  Save the current site            │    │
│     │  (DEFAULT.SIT)?                   │    │
│     │                                   │    │
│     │                                   │    │
│     │                                   │    │
│     │                                   │    │
│     │                                   │    │
│     └───────────────────────────────────┘    │
│                                               │
│              ┌─────────┐   ┌─────────┐        │
│              │   No    │   │   Yes   │        │
│              └─────────┘   └─────────┘        │
└─────────────────────────────────────────────┘
```
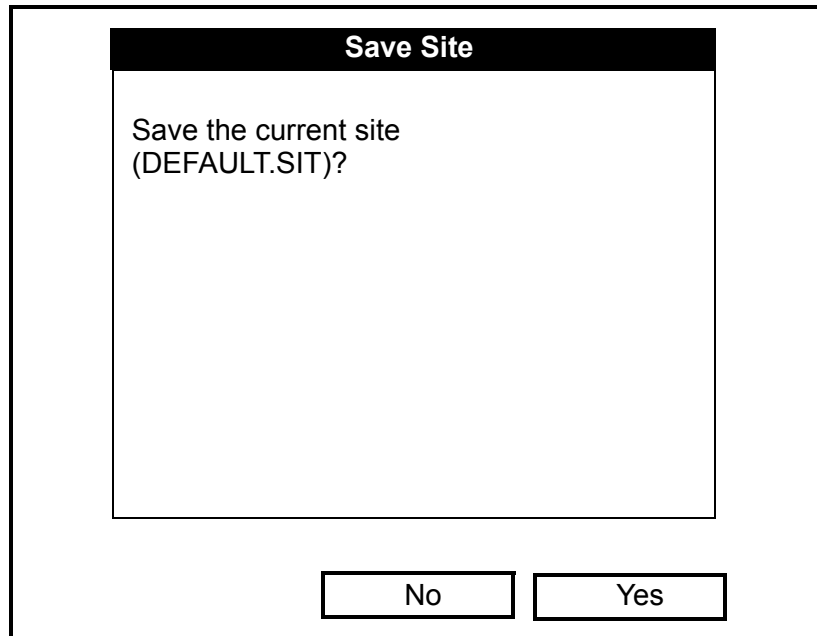
Figure 4-7: The Save Site Window

When the above window opens, respond as follows:

*   Press [F2] (No) to cancel saving the current site, or

*   Press [F3] (Yes) to save the current site

If you pressed [F3] above, the current site is saved, and the PT878 remains in the current window (*Operate Mode* or *Site Manager*).

The *Save As* Option

To save the current site with a different name:

1. From the *Site Manager* (see Figure 4-2 on page 4-2), press [MENU] to open the *File* menu.

2. Scroll to the *Save As* option and press [ENTER]. A window similar to Figure 4-8 below opens.

Save Current Site							
A	B	C	D	E	F	G	H
I	J	K	L	M	N	O	P
Q	R	S	T	U	V	W	X
Y	Z	0	1	2	3	4	5
6	7	8	9				
Delete		Cancel			OK		

Figure 4-8: The Save Current Site Window

3. To begin entering a new name for the current site, use the four arrow keys to scroll to the desired letter or number, and press [ENTER].

4. Repeat the previous step until you have created a site name of up to eight characters.

Note: *At any time, you may press* [F1] (Delete) *to remove the last character entered.*

5. When you have finished, press [F3] (OK) to accept the name, or press [F2] (Cancel) to leave the window without creating a new site.

6. When the *Save Site* window (see Figure 4-7 on page 4-6) appears, press [F2] (No) to cancel saving the site, or press [F3] (Yes) to save the site with the new name.

If you pressed [F3] above, the current site is saved with both the old and new names, and the meter remains in the *Site Manager* window.

The *Refresh* Option

To update the meter with the most current information, open the *Site Manager* (see Figure 4-2 on page 4-2). Then, proceed as follows:

- Press [F2] (Refresh), or

- press [MENU] to open the *File* menu. Then, scroll to the *Refresh* option and press [ENTER].

The updated site information appears in the *Site Manager* window.

IMPORTANT: *To save the site with the updated data, you must use the* Save *option (see page 4-6).*

The *Rename* Option

To rename a site, proceed as follows:

1. Highlight the existing site in the *Site Manager* (see Figure 4-2 on page 4-2), and press [MENU] to open the *File* menu.

2. Scroll to the *Rename* option and press [ENTER]. A window similar to Figure 4-9 below opens.

Rename Site							
DEFAULT							
A	B	C	D	E	F	G	H
I	J	K	L	M	N	O	P
Q	R	S	T	U	V	W	X
Y	Z	0	1	2	3	4	5
6	7	8	9				
Delete		Cancel		OK			

Figure 4-9: The Rename Site Window

3. To begin entering a new name for the site, use the four arrow keys to scroll to the desired letter or number, and press [ENTER].

4. Repeat the previous step until you have created a site name of up to eight characters.

Note: *At any time, you may press* [F1] (Delete) *to remove the last character entered.*

The *Rename* Option (cont.) **5.** When you have finished, press [F3] (OK) to accept the new name, or press [F2] (Cancel) to leave the window without renaming the site.

The PT878 remains in the *Site Manager* window, and the site is now listed with the new name.

The *Delete* Option

To delete a site, proceed as follows:

1. Highlight the existing site in the *Site Manager* (see Figure 4-2 on page 4-2), and press [MENU] to open the *File* menu.

2. Scroll to the *Delete* option and press [ENTER]. A window similar to Figure 4-10 below opens.

```
                    Site Manager
     Fi          Delete Confirmation

                Delete The Site 'A.SIT'
                Are You Sure?




                              No              Yes
```
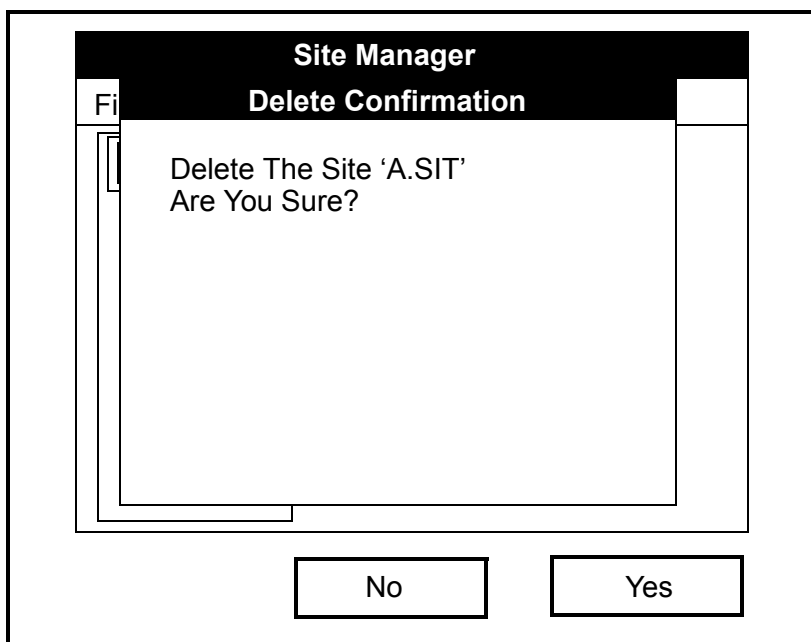
Figure 4-10: The Delete Confirmation Window

When the above window opens, respond as follows:

• Press [F2] (No) to cancel deleting the indicated site, or

• Press [F3] (Yes) to delete the indicated site

If you pressed [F3] above, the indicated site is deleted and the meter returns to the *Site Manager* window.

The *Message* Option

The *Message* option in the *Site* menu allows you to add a descriptive message of up to 30 characters to a site. To create a site message:

1. From the *Site Manager* (see Figure 4-2 on page 4-2), press [MENU] to open the *File* menu.

2. Press the [▶] arrow key once to scroll from the *File* menu to the *Site* menu.

3. Press [ENTER] and a window similar to Figure 4-11 below opens.
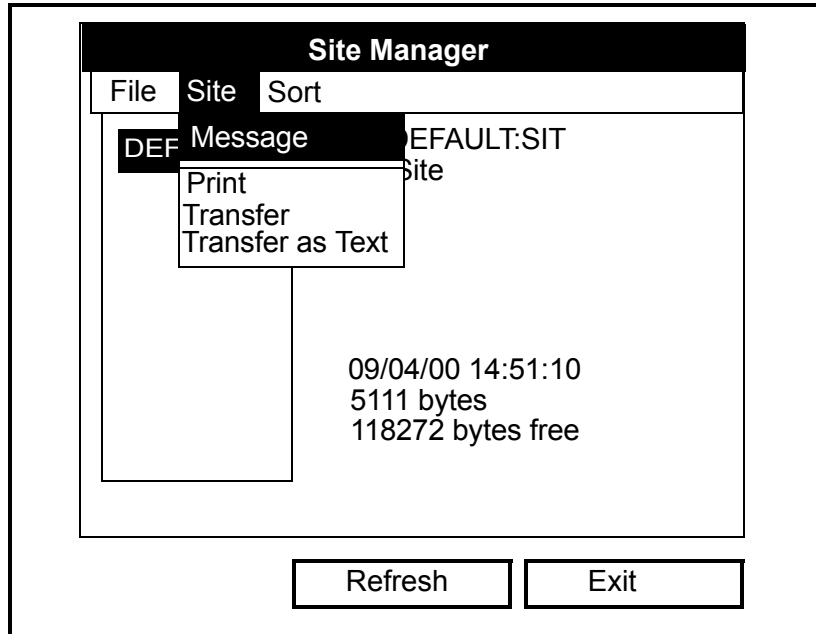
Figure 4-11: The Site Manager>Site Menu

Note: *The* Transfer *and* Transfer as Text *options are not discussed in this abridged manual. See your full PT878* User's Manual.

The *Message* Option (cont.)

4. Scroll to the *Message* option and press [ENTER]. A text entry window similar to Figure 4-12 below opens.

A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	0	1	2	3
4	5	6	7	8	9	.	/	,	"
'	=	<	>						

Delete	Cancel	OK

Figure 4-12: The Text Entry Window

5. To begin entering the site message, use the four arrow keys to scroll to the desired character, and press [ENTER].

Note: *Pressing* [SEL] *alternates between windows with upper-case (capital) letters, lower-case letters, and symbols.*

6. Repeat the previous step until you have created a site name of up to 30 characters.

Note: *At any time, you may press* [F1] (Delete) *to remove the last character entered.*

7. When you have finished, press [F3] (OK) to accept the site message, or press [F2] (Cancel) to leave the window without adding the site message.

The PT878 returns to the *Site Manager* window.

The *Print* Option

To print the current site, proceed as follows:

1. From the *Site Manager* (see Figure 4-2 on page 4-2), press [MENU] to open the *File* menu.

2. Press the [▶] arrow key once to scroll from the *File* menu to the *Site* menu (see Figure 4-11 on page 4-10).

3. Scroll to the *Print* option and press [ENTER].

4. Observe the following responses:

   a. The PT878 shows a message indicating that its infrared sensor is searching for a printer.

   b. If no printer is found, a window appears indicating that the PT878 cannot find a suitable device.

   c. If more than one compatible infrared device is found, you will be required to select the desired device.

5. If a suitable printer is found and selected, the *Site Manager* window appears.

6. Press [F2] (No) to cancel printing, or press [F3] (Yes) to print the current site.

If you pressed [F3] above, The PT878 returns to *Operate Mode* and the current site is printed.

Chapter 5

Data Logging

The Logging Menu   A powerful feature of the PT878 is data logging. The logged data is
                             stored internally in battery-backed-up memory, and a fixed amount of
                             memory is assigned to data logging.

                             To access the *Logging Menu*, proceed as follows:

                             1. Press the [MENU] key at the lower right of the PT878 keypad. The
                             Menu Bar replaces the *Status Bar* at the top of the screen.

                             2. Scroll to the *Logging Menu* and press [ENTER]. A screen similar to
                             Figure 5-1 below appears.

                             Note: *As an aid in following the programming instructions in this
                             manual, refer to Appendix A,* Menu Maps*.*
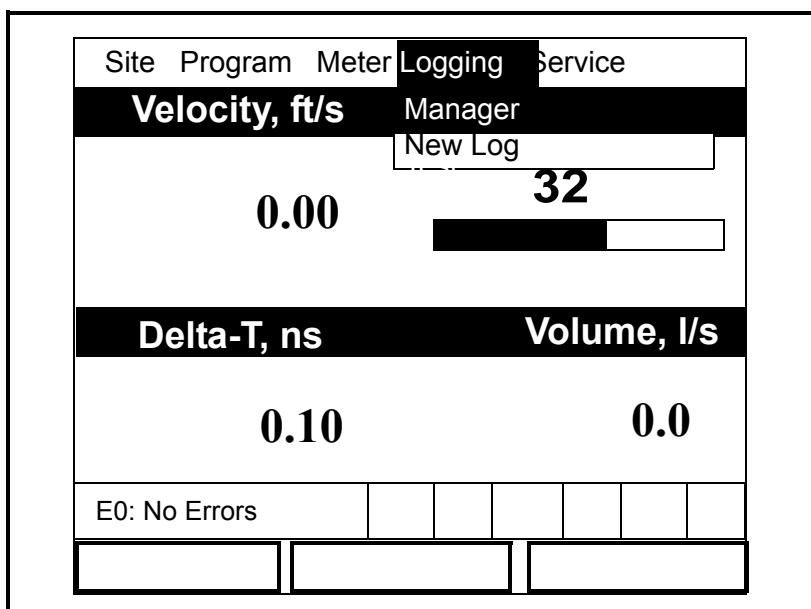
Figure 5-1: The Logging Menu

                             Note: *For any menu options not discussed in this abridged manual,
                             see your full* User's Manual *(910-219).*

The Log Manager Window

The *Log Manager* is the tool that is used to perform a variety of operations on logs and log files. To access the *Log Manager*, proceed as follows:

1. Access the *Log Menu*, as described on the previous page.

2. With the *Log Menu* highlighted, scroll to the *Manager* option and press [ENTER]. A screen similar to Figure 5-2 below appears.

```
┌──────────────────────────────────────────────┐
│                Log Manager                     │
│  File   Log    View   Sort                     │
│  ┌──────────────┐       Info: AAA.LOG          │
│  │ AAA          │       State: Finished         │
│  │ BBB          │       S:03/01/01 13:13:41     │
│  │ CCC          │       E:03/01/01 13:23:41     │
│  │              │       Interval: 10 Seconds    │
│  │              │       Records:51              │
│  │              │                               │
│  │              │        03/01/01 13:23:21      │
│  │              │        1216 bytes             │
│  │              │        109568 bytes free      │
│  │              │                               │
│  └──────────────┘                               │
│            ┌──────────┐   ┌──────────┐         │
│            │ Refresh  │   │   Exit   │         │
│            └──────────┘   └──────────┘         │
└──────────────────────────────────────────────┘
```
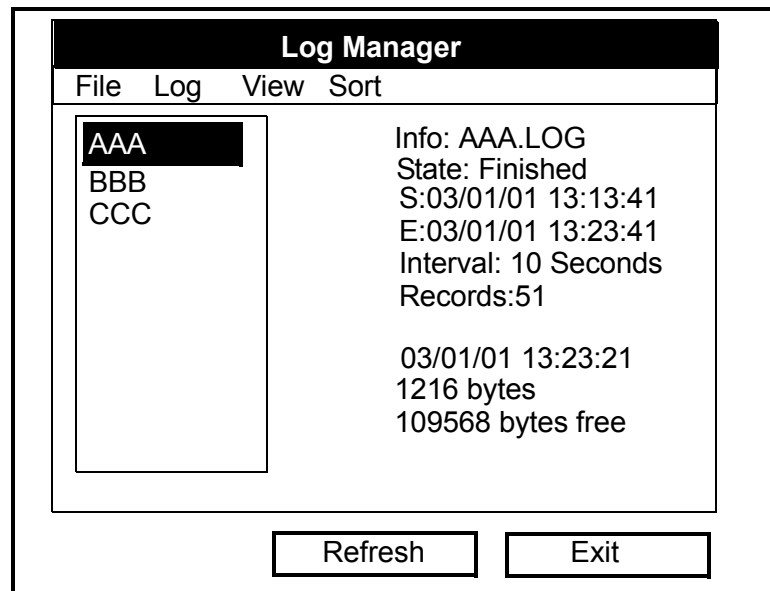
Figure 5-2: The Log Manager Window

The box on the left site of the *Log Manager* window lists all of the logs currently in the PT878 memory. You can use the [▼] and [▲] arrow keys to scroll through this list. The right section of the window shows information for the highlighted log.

IMPORTANT: *Logs are associated with the site in use at the time the log is created. By default, the* Log Manager *lists only the logs for the current site.*

The Log Manager Menu

To open the *Log Manager* menu, proceed as follows:

1. At the *Log Manager* window, press [MENU] and then [ENTER].

2. Use the arrow keys to scroll through the menus and menu options until the desired menu option is highlighted.

3. Press [ENTER] to open the menu.

Proceed to the appropriate section for instructions on specific menus.

The File Menu

The *File* menu is used to manage your existing log files and to set up new logs. To access the *File* menu, proceed as follows:

1. At the *Log Manager* window, press [MENU] and then [ENTER]. A window similar to Figure 5-3 below opens.

Log Manager

| File | Log | View | Sort |

New
Clone Selected Log
Rename
Delete
Delete All Logs?

Refresh

Print
Transfer

Info: AAA.LOG
State: Finished
S:03/01/01 13:13:41
E:03/01/01 13:23:41
Interval: 10 Seconds
Records:51

03/01/01 13:23:21
1216 bytes
109568 bytes free

| Refresh | Exit |
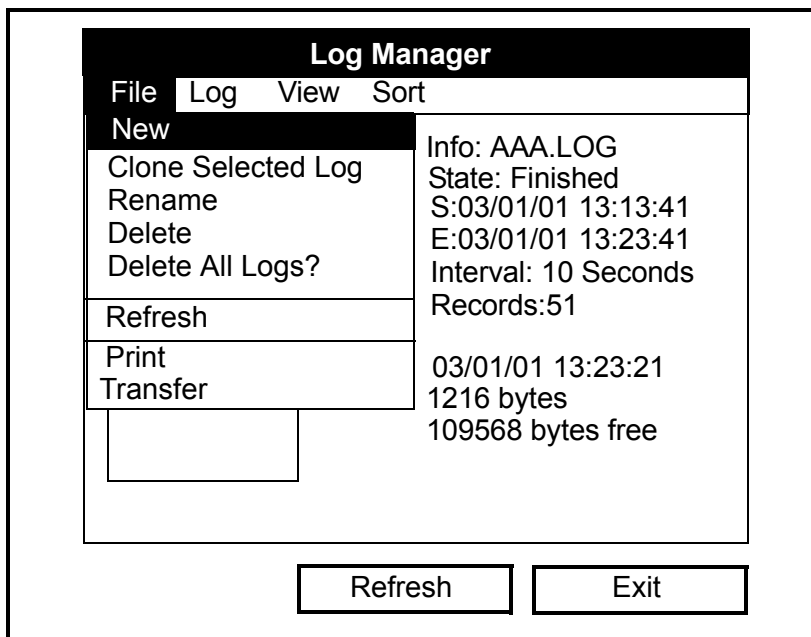
Figure 5-3: File Menu in the Log Manager

Use the [▼] and [▲] arrow keys to select the desired option from the above menu and proceed to the appropriate section for instructions.

The New *Option*

The *New* option enables you to set up the parameters for creation of a new log. To do so, proceed as follows:

1. Perform one of the following procedures:

   • In the *Log Manager>File* menu (see Figure 5-3 on the previous page), scroll to the *New* option and press [ENTER]. Or,

   • In the *Logging* menu (see Figure 5-1 on page 5-1), scroll to the *New Log* option and press [ENTER].

2. When the *Create New Log* windows opens (see Figure 5-4 below), start entering a name for the log by using the four arrow keys to scroll to the desired character and pressing [ENTER].

Create New Log							
A	B	C	D	E	F	G	H
I	J	K	L	M	N	O	P
Q	R	S	T	U	V	W	X
Y	Z	0	1	2	3	4	5
6	7	8	9	-	_	@	#
&	(	)					

Delete	Cancel	OK

Figure 5-4: The Create New Log Window

3. Repeat the above procedure until you have completed the log name.

Note: *At any time, you may press* [F1] (Delete) *to remove the last character entered.*

4. When you have finished, press [F3] (OK) to accept the name, or press [F2] (Cancel) to leave the window without creating a new log.

If you pressed [F3] above, the *General* tab of the log configuration window opens (see Figure 5-5 on the next page). Continue on the next page to enter the parameters for the new log.

The New *Option (cont.)*

Note: *The* Log Name *shown in the window is the one you entered on the previous page.*

```
┌──────────────────────────────────────────────┐
│  ┌─────────┐┌──────────────┐                   │
│  │ General ││ Measurements │                   │
│  └─────────┘└──────────────┘                   │
│  ┌──────────────────────────────────────────┐ │
│  │  Log Name   │10SEC.LOG│                    │ │
│  │     Format  ● Linear    ○ Circular         │ │
│  │       Type  ● Standard  ○ Error            │ │
│  │  Start Date/Time │2000/11/01│ │01:38:08│   │ │
│  │  End Date/Time   │2000/11/01│ │09:38:08│   │ │
│  │                                            │ │
│  │  Logging Interval │      10│ secs          │ │
│  │                                            │ │
│  │                                            │ │
│  └──────────────────────────────────────────┘ │
│          ┌──────────┐    ┌──────────┐          │
│          │  Cancel  │    │ Activate │          │
│          └──────────┘    └──────────┘          │
└──────────────────────────────────────────────┘
```

Figure 5-5: The General Log Format Window

1. Scroll to the *Format* option and use the [◀] and [▶] keys to select either a *Linear* log or a *Circular* log. Press [ENTER] to confirm your selection.

2. Scroll to the *Type* option and use the [◀] and [▶] keys to select either a *Standard* log or an *Error* log. Press [ENTER] to confirm your selection.

3. Scroll to the *Start Date/Time* option and press [ENTER]. Use the [◀] and [▶] keys to highlight each date/time number and enter the desired value. Press [ENTER] to confirm each value.

Note: *You may change a value either by entering the new value with the numeric keys or by using the* [▼] *or* [▲] *arrow keys to scroll to the desired number.*

4. Scroll to the *End Date/Time* option and press [ENTER]. Use the [◀] and [▶] keys to highlight each date/time number and enter the desired value. Press [ENTER] to confirm each value.

5. Scroll to the *Logging Interval* option and press [ENTER]. Use the numeric keys to enter the desired logging interval (in seconds), and press [ENTER] to confirm your entry.

The final step is to specify the parameters to be logged. To do this, proceed to the next page.

The New *Option (cont.)*

1. Use the [▼] and [▲] arrow keys to scroll until the *General* tab is highlighted.

2. Press the [▶] key to select the *Measurements* tab. Press [ENTER] and the *Measurements* window (see Figure 5-6 below) opens.

General	Measurements
NO UNIT	NO UNIT
NO UNIT	NO UNIT
NO UNIT	NO UNIT
NO UNIT	NO UNIT
NO UNIT	NO UNIT
NO UNIT	NO UNIT

Cancel   Activate
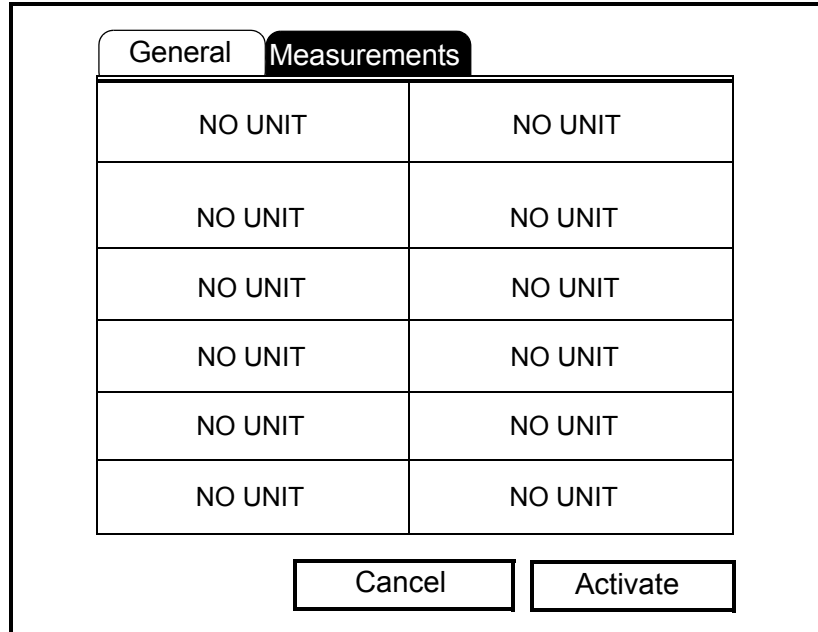
Figure 5-6: The Measurements Window

3. Scroll to the first table cell and press [ENTER]. The *Select Measurement* window opens (see Figure 5-7 below).

Select Measurement

Diagnostics
Velocity
Volume

Fwd Totalizer
Rev Totalizer
Energy

Meters/sec
Feet/sec

No Unit   Cancel   OK
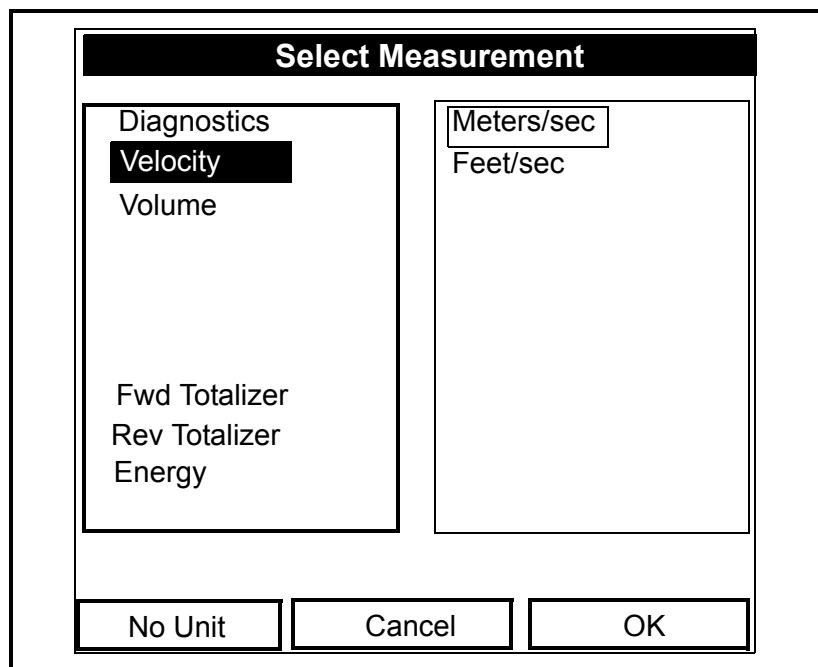
Figure 5-7: The Select Measurement Window

The New *Option (cont.)*

4. In the list on the left side of the window, scroll to the output parameter you wish to log and press [SEL] to confirm the choice.

5. When the prompt moves to the list of measurement units on the right side of the window, scroll to the desired units and press [F3] (OK) to confirm your selection.

6. Repeat the previous steps to assign a parameter and measurement units to as many of the 12 table cells as you wish.

7. Press [F3] (Activate) to start the log, or press [F2] (Cancel) to cancel the log.

If you started from the *Log Manager>File>New* option, the PT878 returns to *Operate Mode*, with a Pencil icon in the System Tray; if you started it from the *Logging Menu>New Log* option, the meter returns to the *Log Manager*.

The Delete *Option*   To delete a log from the PT878 memory, proceed as follows:

1. In the *Log Manager* window (see Figure 5-2 on page 5-2), use the [▼] and [▲] arrow keys to highlight the log you wish to delete.

2. At the *Log Manager* window, press [MENU] and then [ENTER].

3. In the *File* menu, scroll to the *Delete* option and press [ENTER]. A *Delete* confirmation window opens (see Figure 5-8 below).

Log Manager

Fi   **Delete**

Delete Log '555.LOG?'

No   Yes

Figure 5-8: The Delete Confirmation Window

4. Press [F3] (Yes) to delete the selected log, or press [F2] (No) to cancel the deletion.

If you pressed [F3] (Yes) above, the log is no longer listed when you return to the *Log Manager* window.

The Delete All Logs?
Option

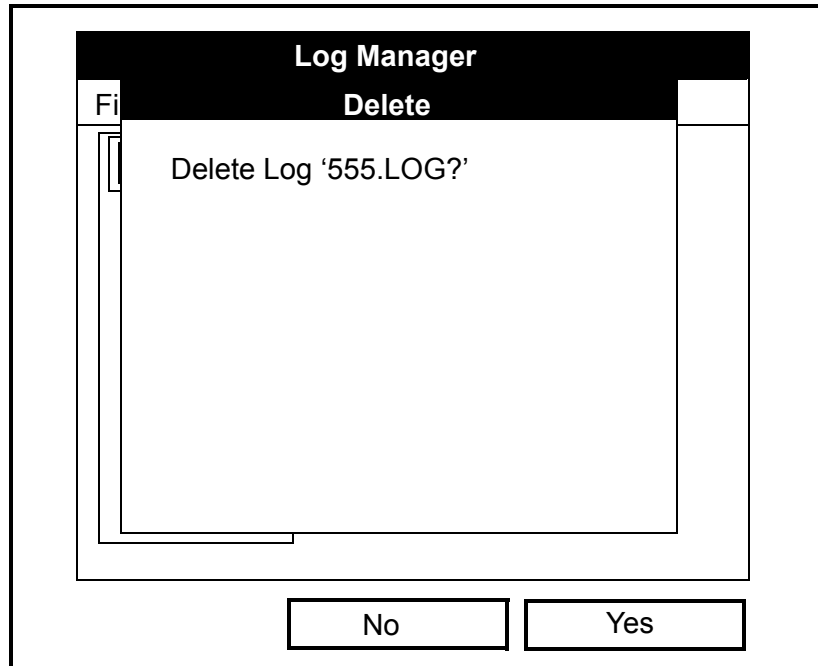The Delete All Logs? option is used to remove all logs from the PT878 memory. To do this, proceed as follows:

1. In the *Log Manager>File* menu (see Figure 5-3 on page 5-3), scroll to the *Delete All Logs?* option and press [ENTER].

2. A window opens and you are asked if you wish to *"Delete All Logs?"* Press [F3] (Yes) to delete all logs, or press [F2] (No) to cancel the deletion.

If you pressed [F3] above, no logs will be listed when you return to the *Log Manager* window.

The Transfer *Option*

To transfer a log file from the PT878 memory to the hard drive on a PC, complete the following steps:

Note: *You cannot transfer log files from a PC into the PT878 memory.*

1. Make sure that the PT878 wireless communications port has been set to the *IrDA* protocol and that the infrared beam from the PT878 has clear access to the infrared sensor on the PC.

Note: *For* Windows NT 4.0 *systems, make sure the* QuickBeam *software is running.*

2. In the *Log Manager* window (see Figure 5-2 on page 5-2), use the [▼] and [▲] arrow keys to highlight the log you wish to transfer.

3. At the *Log Manager* window, press [MENU] and then [ENTER].

4. In the *File* menu, scroll to the *Transfer* option and press [ENTER].

5. Observe the following events:

• The screen shows a message indicating that the PT878 is searching for an infrared receiving device.

• If the sensor spots no device, a window appears and you are asked if you want to try again.

• If a device is found, the PT878 shows a message indicating that it is uploading the log (the meter also displays a message if the upload fails).

• When the upload is complete, the meter returns to the *Site Manager.*

You can open the transferred file with *PanaLog Viewer* or *PanaView* and convert it to *Microsoft Excel* format.

The Log Menu

The *Log* menu is used to manage your active logs. To access the *Log* menu, proceed as follows:

1. At the *Log Manager* window, press [MENU] and then [ENTER].

2. Press the [▶] key to highlight the *Log* menu. Then, press [ENTER] and a window similar to Figure 5-9 below opens.

```
                        Log Manager
      File   Log   View   Sort
              Start
      AA               Info: AAA.LOG
      BB    Pause      State: Finished
      CC    End        S:03/01/01 13:13:41
                       E:03/01/01 13:23:41
             Pause All Logs    Interval: 10 Seconds
             Start All Logs    Records:51
             End All Logs
                        03/01/01 13:23:21
             View All Sites    1216 bytes
                               109568 bytes free




              ┌──────────────┐  ┌──────────┐
              │   Refresh     │  │   Exit   │
              └──────────────┘  └──────────┘
```
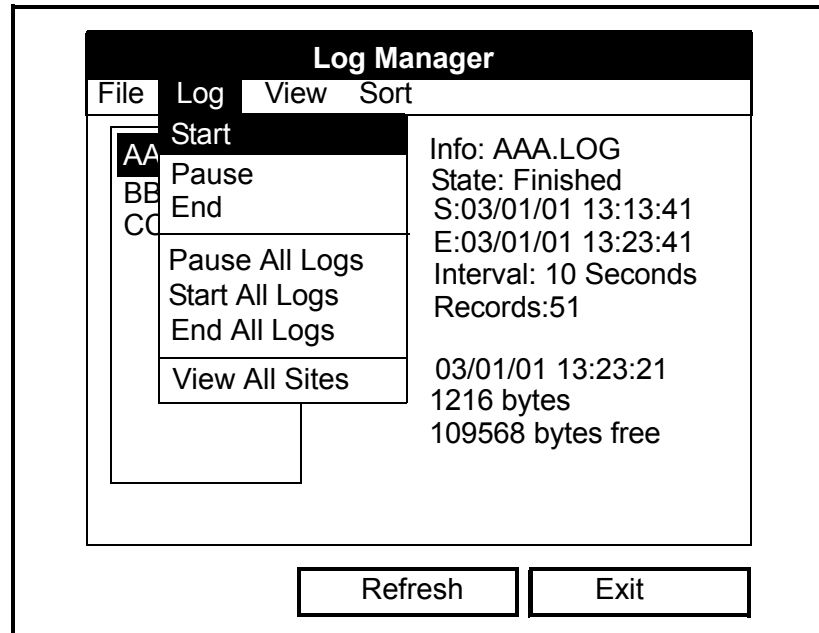
Figure 5-9: Log Menu in the Log Manager

Use the [▼] and [▲] arrow keys to select the desired option from the above menu and proceed to the appropriate section for instructions.

The Pause *Option*

Use the *Pause* option to temporarily stop a log that is currently pending or running:

1. In the *Log Manager* window (see Figure 5-2 on page 5-2), use the [▼] and [▲] arrow keys to highlight the log you wish to stop.

2. At the *Log Manager* window, press [MENU] and then [ENTER].

3. Press the [▶] key to highlight the *Log* menu and press [ENTER].

4. In the *Log* menu, scroll to the *Pause* option and press [ENTER].

The PT878 returns to the *Log Manager* window, which now shows the highlighted log as *Paused* in the status line.

The Start *Option*

Use the *Start* option to restart a log that has been paused:

1. In the *Log Manager* window (see Figure 5-2 on page 5-2), use the [▼] and [▲] arrow keys to highlight the log you wish to start.

2. At the *Log Manager* window, press [MENU] and then [ENTER].

3. Press the [▶] key to highlight the *Log* menu and press [ENTER].

4. In the *Log* menu, scroll to the *Start* option and press [ENTER].

The PT878 returns to the *Log Manager* window, which now shows the highlighted log as *Pending* or *Running* in the status line.

The End *Option*

Use the *End* option to permanently stop a log that is currently pending or running:

IMPORTANT: *You cannot restart a log that you end. You must create a new log with the same parameters.*

1. In the *Log Manager* window (see Figure 5-2 on page 5-2), use the [▼] and [▲] arrow keys to highlight the log you wish to stop.

2. At the *Log Manager* window, press [MENU] and then [ENTER].

3. Press the [▶] key to highlight the *Log* menu and press [ENTER].

4. In the *Log* menu, scroll to the *End* option and press [ENTER].

The PT878 returns to the *Log Manager* window, which now shows the highlighted log as *Finished* in the status line. Any memory allocated to the finished log is now available for use by other logs.

The Pause All Logs *Option*

Use the *Pause All Logs* option to temporarily stop all logs that are currently pending or running:

1. At the *Log Manager* window (see Figure 5-2 on page 5-2), press [MENU] and then [ENTER].

2. Press the [▶] key to highlight the *Log* menu and press [ENTER].

3. In the *Log* menu, scroll to the *Pause All Logs* option and press [ENTER].

The PT878 returns to the *Log Manager* window, which now shows all active logs as *Paused* in their status line.

The Start All Logs *Option*

Use the *Start All Logs* option to restart all logs that have been paused:

1. At the *Log Manager* window (see Figure 5-2 on page 5-2), press [MENU] and then [ENTER].

2. Press the [▶] key to highlight the *Log* menu and press [ENTER].

3. In the *Log* menu, scroll to the *Start All Logs* option and press [ENTER].

The PT878 returns to the *Log Manager* window, which now shows all active logs as *Pending* or *Running* in their status line.

The End All Logs *Option*

Use the *End All Logs* option to permanently stop all logs that are currently pending or running:

1. At the *Log Manager* window (see Figure 5-2 on page 5-2), press [MENU] and then [ENTER].

2. Press the [▶] key to highlight the *Log* menu and press [ENTER].

3. In the *Log* menu, scroll to the *End All Logs* option and press [ENTER].

The PT878 returns to the *Log Manager* window, which now shows all active logs as *Finished* in their status line.

The View All Sites *Option*

Use the *View All Sites* option to examine all logs that are associated with sites other than the current site:

1. At the *Log Manager* window (see Figure 5-2 on page 5-2), press [MENU] and then [ENTER].

2. Press the [▶] key to highlight the *Log* menu and press [ENTER].

3. In the *Log* menu, scroll to the *View All Sites* option and press [ENTER].

The PT878 returns to the *Log Manager* window, which now lists all the logs for all sites.

The View Menu

The *View* menu is used to display the data from individual logs. To access the *View* menu, proceed as follows:

1. At the *Log Manager* window, press [MENU] and then [ENTER].

2. Press the [▶] key until the *View* menu is highlighted. Then, press [ENTER] and a window similar to Figure 5-10 below opens.

Log Manager

File   Log   View   Sort

Details
AAA   Graph   fo: AAA.LOG
BBB   Spreadsheet ate: Finished
CCC   :03/01/01 13:13:41
                         E:03/01/01 13:23:41
                         Interval: 10 Seconds
                         Records:51

                          03/01/01 13:23:21
                          1216 bytes
                          109568 bytes free
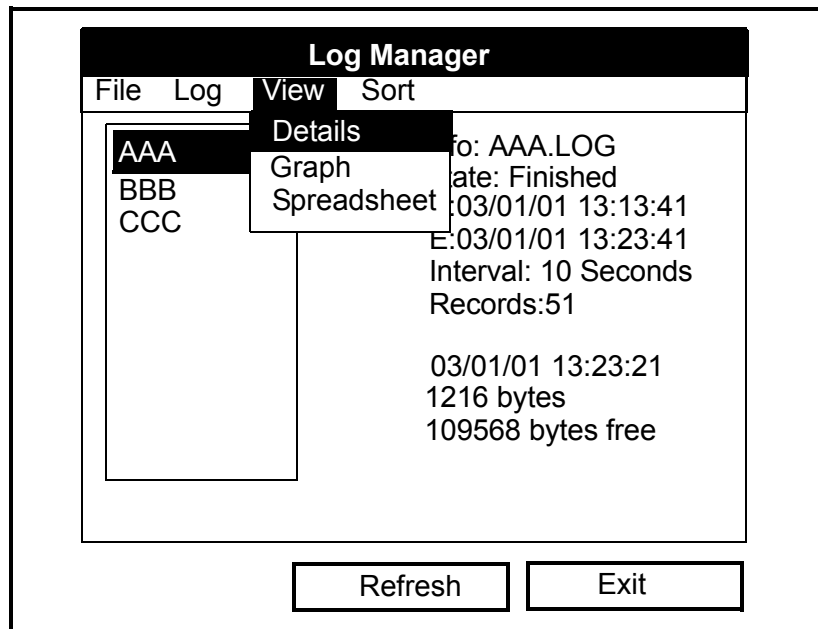
Refresh   Exit

Figure 5-10: View Menu in the Log Manager

Use the [▼] and [▲] arrow keys to select the desired option from the above menu and proceed to the appropriate section for instructions.

The Details *Option*

Use the *Details* option to view the log data in text format:

1. In the *Log Manager* window (see Figure 5-2 on page 5-2), use the [▼] and [▲] arrow keys to highlight the log you wish to view.

2. At the *Log Manager* window, press [MENU] and then [ENTER].

3. Press the [▶] key twice to highlight the *View* menu and press [ENTER].

4. In the *View* menu, scroll to the *Details* option and press [ENTER]. A window similar to Figure 5-11 below opens.

Log Info

State: Finished
S:03/01/01 13:13:41
E:03/01/01 13:23:41
Interval:10 Seconds
Records:51
Precision: 8 Error:No (Basic)
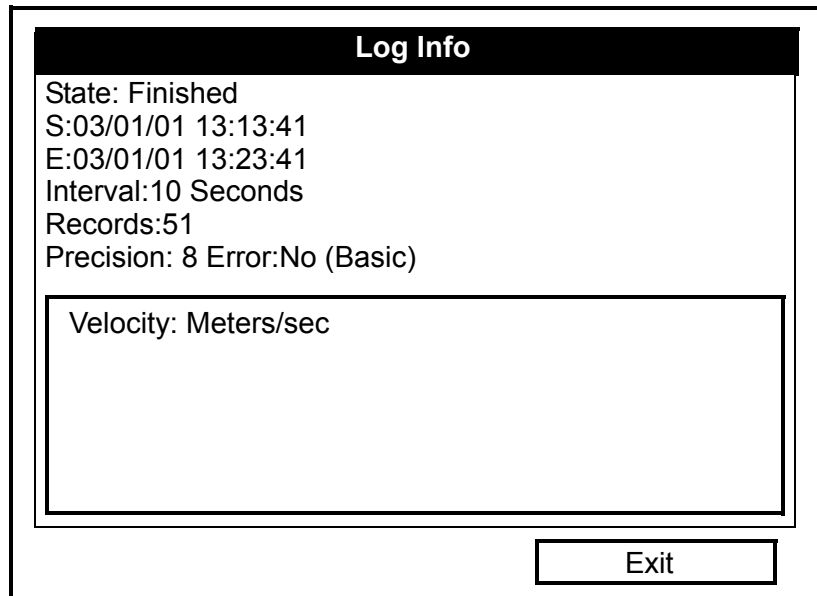
Velocity: Meters/sec

Exit

Figure 5-11: The Log Info Window

Note: *The actual records (data points) for the log will be listed in the box above.*

5. When you have finished viewing the log data, press [F3] (Exit) to return to the *Log Manager* window.

The Graph *Option*

Use the *Graph* option to view the log data in graphical format:

1. In the *Log Manager* window (see Figure 5-2 on page 5-2), use the [▼] and [▲] arrow keys to highlight the log you wish to view.

2. At the *Log Manager* window, press [MENU] and then [ENTER].

3. Press the [▶] key twice to highlight the *View* menu and press [ENTER].

4. In the *View* menu, scroll to the *Graph* option and press [ENTER]. This opens the *Select Measurement* window (see Figure 5-7 on page 5-6), which lists the log measurement parameters.

5. If the log contains more than one measurement, scroll through the list to highlight the parameter you wish to graph. Then, press [F3] (View) and a window similar to Figure 5-12 below appears.
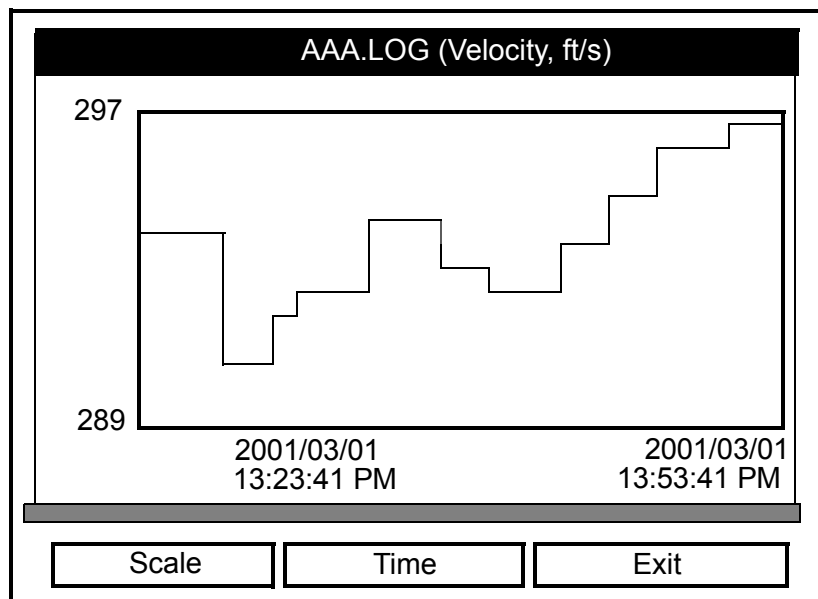
```
┌─────────────────────────────────────────────┐
│          AAA.LOG (Velocity, ft/s)            │
│  297 ┌──────────────────────────────────┐    │
│      │                                   │    │
│      │                                   │    │
│      │                                   │    │
│      │                                   │    │
│      │                                   │    │
│  289 └──────────────────────────────────┘    │
│         2001/03/01            2001/03/01      │
│         13:23:41 PM           13:53:41 PM     │
│                                               │
│  ┌──────────┐  ┌──────────┐  ┌──────────┐    │
│  │  Scale   │  │   Time   │  │   Exit   │    │
│  └──────────┘  └──────────┘  └──────────┘    │
└─────────────────────────────────────────────┘
```

Figure 5-12: The Log Graph Window

The following choices are now available:

- Press [F1] (Scale) if you wish to change the y-axis limits.

- Press [F2] (Time) if you wish to change the x-axis limits.

- Press [F3] (Exit) when you have finished viewing the graph.

The Spreadsheet *Option*   Use the *Spreadsheet* option to view the log data in spreadsheet format:

1. In the *Log Manager* window (see Figure 5-2 on page 5-2), use the [▼] and [▲] arrow keys to highlight the log you wish to view.

2. At the *Log Manager* window, press [MENU] and then [ENTER].

3. Press the [▶] key twice to highlight the *View* menu and press [ENTER].

4. In the *View* menu, scroll to the *Spreadsheet* option and press [ENTER]. A window similar to Figure 5-13 below appears.

123.LOG	
Time 03/20/2001 14:24:46	Diagnostics P# Up
14:24:56	450
14:25:06	448
14:25:17	451
14:25:27	453
14:25:37	450
14:25:47	449

Time	Refresh	Exit

Figure 5-13: The Log Spreadsheet Window

5. To view the data points, use the four arrow keys to scroll through the cells in the spreadsheet. At any time, you may select one of the following options:

• Press [F1] (Time) to display data from different times in the log.

• Press [F2] (Refresh) to update the window with the most current data.

• Press [F3] (Exit) when you have finished viewing the data.
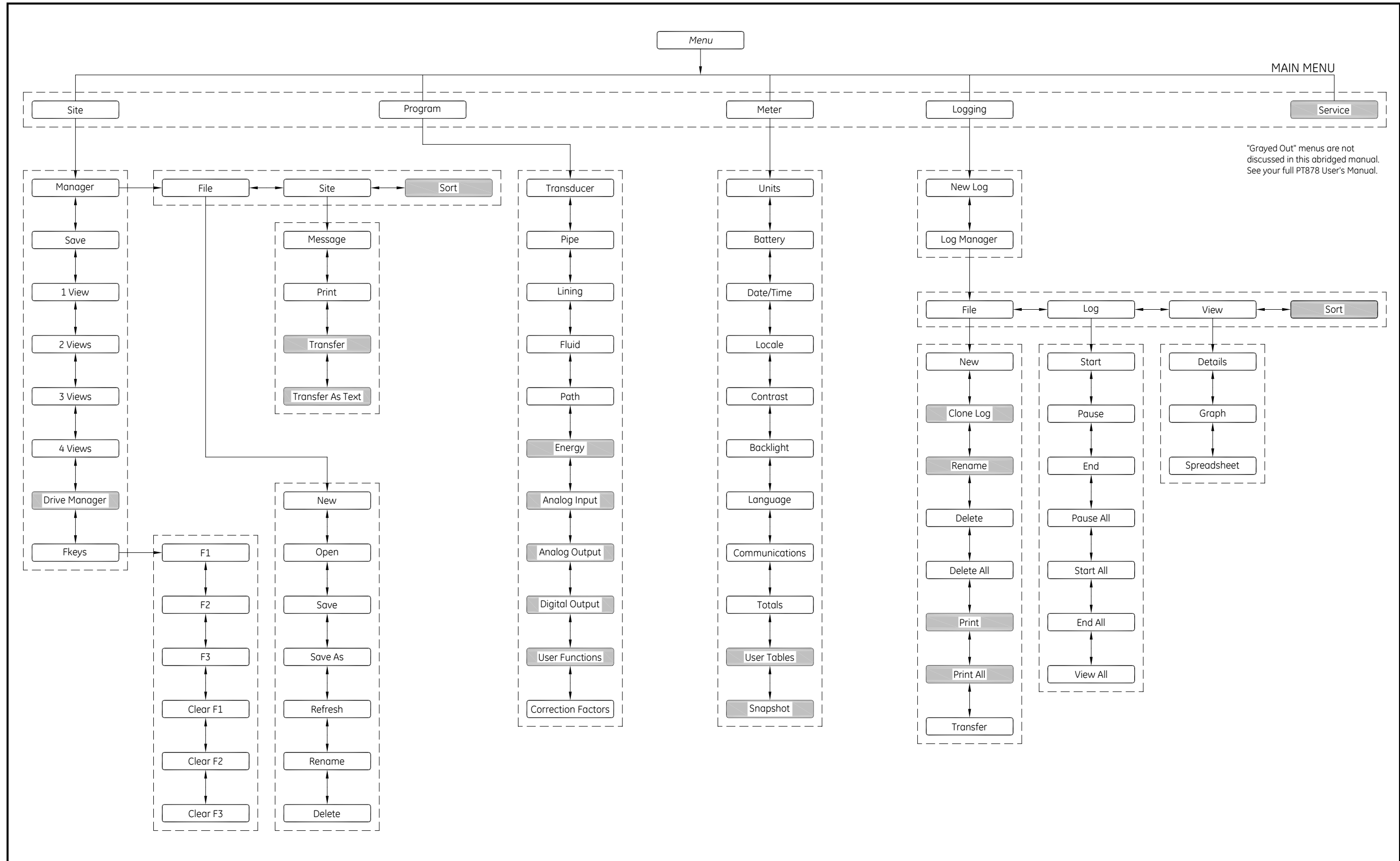
Appendix A

Menu Maps

Figure A-1: Main Menu

"Grayed Out" menus are not discussed in this abridged manual. See your full PT878 User's Manual.

GE
Sensing & Inspection Technologies

We,

**GE Sensing
1100 Technology Park Drive
Billerica, MA 01821
U.S.A.**

declare under our sole responsibility that the

TransPort® PT878 Portable Liquid Ultrasonic Flowmeter
TransPort® PT878GC Clamp-On Portable Liquid Ultrasonic Flowmeter

to which this declaration relates, are in conformity with the following standards:

- EN 61326:1998, Class A, Annex C, Continuous Unmonitored Operation

following the provisions of the 89/336/EEC EMC Directive.

The *units listed above and any transducers supplied with them (spoolpieces are addressed under a separate declaration of conformity)* do not bear CE marking for the Pressure Equipment Directive, as they are supplied in accordance with Article 3, Section 3 (sound engineering practices and codes of good workmanship) of the Pressure Equipment Directive 97/23/EC for DN<25.

November 14, 2007
_____
Date of Issue

Gary Kozinski
_____
Mr. Gary Kozinski
Certification & Standards, Lead Engineer

CE

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August 2004