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Publication Updates and Translations

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WARNING

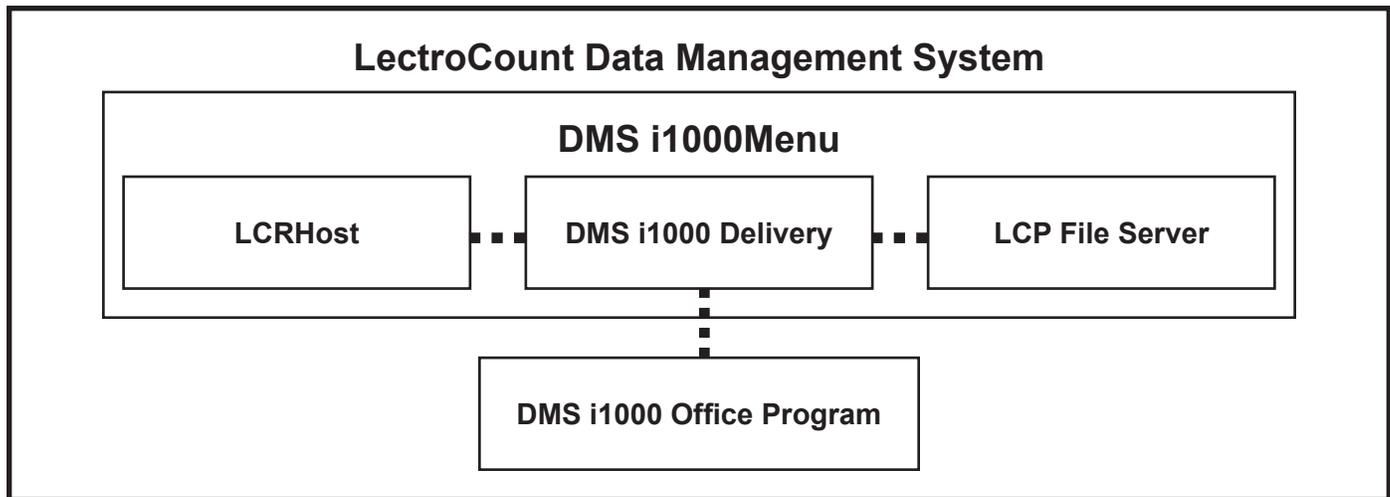
- Before using this product, read and understand the instructions.
- Save these instructions for future reference.
- All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of equipment and/or systems in accordance with all applicable codes and ordinances.
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DMS i1000 i1000 Overview



LectroCount DMS i1000 is a “Data Management System” comprised of a DMS i1000 Module, DMS i1000 Lap Pad, and function specific software applications. The DMS i1000 Module is a hardware component which the LectroCount registers, printer, DMS i1000 Lap Pad, and power supply are connected.

The DMS i1000 software components consist of a system operating software, DMS i1000Menu, LCRHost, DMS i1000 Delivery, and LCP File Server. The DMS i1000 software applications are function specific.

DMS i1000Menu: An application which allows an operator ability to switch between LCRHost, DMS i1000 Delivery, and LCP File Server. DMS i1000Menu also provides ability to transfer and receive information from a DMS i1000 Office program.

LCRHost: An application providing an operator ability to setup LCR Networks, calibrate LectroCount LCR and LCR-II electronic registers, and make deliveries.

DMS i1000 Delivery: An application providing an operator ability to select customers from a customized list, make deliveries, record/track deliveries, review shift information, and transmit completed delivery information to a DMS i1000 Office Program using a USB flash memory.

LCP File Server: An application providing an operator ability to access files of the DMS i1000 Module from other computer systems in a manner similar to Windows® Explorer. Files on other devices running LCP File Server are also accessible.

DMS i1000 Office Program: This program runs on an office computer. It is used to configure the DMS i1000 Delivery application an operator will use while making deliveries, as well as customization of a delivery ticket. It is also responsible for converting data files between office software formats and the DMS i1000 Module.

DMS i1000 Delivery component of the LectroCount DMS i1000 Data Management System is an application designed to record and maintain delivery information. DMS i1000 Delivery is not covered in this publication. Instead, this publication covers the DMS i1000Menu, LCRHost, and LCP File Server applications. These applications are accessed via the DMS i1000 Lap Pad.

The DMS i1000 Lap Pad is a terminal interface device with a display having up to eight lines of information. It attaches directly to the DMS i1000 Module.

DMS i1000Menu instruction (page 11).

LCRHost instruction (page 18).

LCP File Server instruction (page 65).

DMS i1000 Delivery instructions are covered in the LectroCount DMS i1000 Operator’s Manual: 500344.

Other LectroCount DMS i1000 publications include:

- LectroCount DMS i1000 Installation Manual: 500343
- Quick Reference Card: 500345.
- Office Installation & Operation Manual: 500346.

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DMS i1000 i1000 System Components



M-10 Meter with LectroCount LCR-II Electronic Register, Optical Air Eliminator, Hi Capacity Strainer, and E-7 Valve.



DMS i1000 Module



DMS i1000 Lap Pad



Epson Slip Printer



Support Brackets

Typical vehicle delivery system components:

Metering System

Metering system is typically mounted to the back or side of the delivery vehicle and measures the flow of product being delivered. Components of this system can include the meter, electronic register, strainer, air eliminator, and control valve.

DMS i1000 Module

DMS i1000 Module provides connections for the printer, DMS i1000 Lap Pad, electronic registers, and a USB flash memory (optional). Powered from the vehicle's accessory panel and often mounted on support brackets in the cab of the vehicle.

DMS i1000 Lap Pad

DMS i1000 Lap Pad is the user interface device which allows initial set up and calibration of the system and an interface for daily deliveries.

Printer

Printer is used to print out a record of the delivery. This ticket is typically a multi-layer ticket providing a copy with the customer and a copy retained for physical record of the delivery.

Specifications

DMS i1000 Module

Enclosure

Dimensions

6.875" W x 2.625" H x 7.25" L

Material

Powder painted steel

Operating Voltage

+9 to 30 VDC, less than 3A

Temperature Rating

-13° to 158°F (-25° to 70°C)

Microprocessor

133 MHz, 486

Memory (Primary Hard Drive)

Internal flash memory

DMS i1000 Lap Pad

Housing

Lightweight, high impact, molded plastic.

Housing Rating

NEMA 3, IP54

Display

LCD, dot matrix, 240 x 64 pixels, backlit.

5.2" wide, 1.55" tall; 8 rows, 30 characters per row.

Keyboard

6 row, 5 column membrane with tactile metal dome switch contacts and silicon rubber overlay.

Supply Current

150 mA maximum

Temperature

-13°F to 158°F (-25° to 70°C)

Vibration

2 g between 10-150 sinusoidal sweep cycle. 20 sweep cycles per axis.

Electrostatic Discharge

IEC801-2

8 kV for air discharges

6 kV for contact discharges

Electromagnetic Susceptibility

IEC 801-3

3 V/m 26-500 MHz

1 V/m 500-1000 MHz

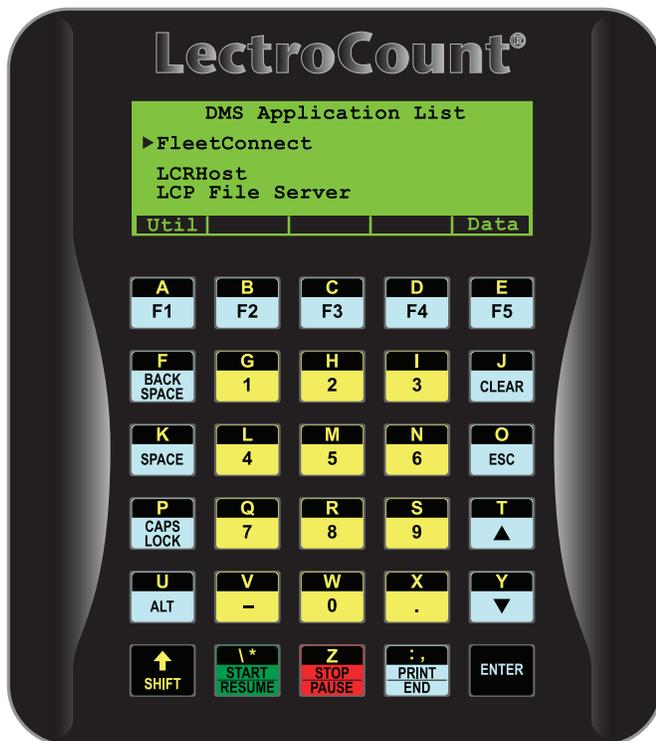
Interface

RS-232 at 115,200 baud rate

DMS i1000 Lap Pad Setup

```
DMS i1000 Lap Pad Setup v.1.00
(c) Liquid Controls LLC 2005
Adjust Contrast with ▲ and ▼
Backlight:                               On
Blink Cursor?                             Yes
Auto Repeat:                              Off
CR and LF as Graphic?                     Yes
Press ESC to exit.
```

DMS i1000 Lap Pad Setup Screen



DMS i1000 i1000 Lap Pad

DMS i1000 Lap Pad Setup

The DMS i1000 i1000 Lap Pad is the user interface device for the DMS i1000 i1000. In the DMS i1000 i1000 Lap Pad Setup screen, you can change the settings for the lap pad's operation and display. While this screen is loaded, the DMS i1000 i1000 Lap Pad is off line with the DMS i1000 i1000.

To access the DMS i1000 i1000 Lap Pad Setup:

Press and hold the **ALT** and **ENTER** keys simultaneously.

In the setup screen, the active field is displayed in reverse video. For example, in the example to the left, **Adjust Contrast** is the active option. Pressing **ENTER** drops the active field to the next item. From the bottom option, the active field simply wraps back to the top option.

Adjust Contrast with ▲ and ▼

Alters the DMS i1000 i1000 Lap Pad display for optimal viewing. The up arrow increases the contrast; the down arrow decreases the contrast.

Backlight:

Turns the light behind the display on and off. Use either arrow key to change the setting.

Blink Cursor?

Switches the cursor display between solid and blinking. If set to **Yes**, the blink rate is 250 ms.

Auto Repeat:

Enables or disables auto repeat when a key is held down. If set to **On**, the character being held down will start to repeat after 250 ms and repeat again every 50 ms.

CR and LF as Graphic?

This option is used to turn the CR/LF graphic on or off. This field should be set to **Yes**, when used with a DMS i1000 i1000 application. If the Lap Pad is being used as a standard terminal device, for example, processing DOS command lines, this field should be set to **No**.

Exiting the Lap Pad Setup

Press **ESC** to exit the DMS i1000 i1000 Lap Pad setup and reestablish communication with the host computer (DMS i1000 i1000). The values entered will be retained each time the unit is powered up.

DMS i1000 Lap Pad Navigation

Navigating the DMS i1000 Lap Pad

The DMS i1000 i1000 Lap Pad has an 8-line, 30 character per line display. Screen layouts vary according to function. Some screen lines are fixed, and some lines can be modified. Since there are so many unique screens throughout the suite of DMS i1000 i1000 application software, the setup and operation manuals for DMS i1000 i1000 application software will layout each screen and explain screen navigation according to function.

| | | |
|--------|---------------------|---------|
| Line 1 | ACCOUNT INFORMATION | (2/3) |
| Line 2 | 1111113 | 2 |
| Line 3 | Albert Constantine | |
| Line 4 | ►Presets | |
| Line 5 | Miscellaneous Fees | \$25.00 |
| Line 6 | Discounts | 0 |
| Line 7 | Price and Tax | |
| Line 8 | | |

| | | | | |
|----|------|------|-----|----|
| | Util | Back | Fwd | |
| F1 | F2 | F3 | F4 | F5 |

DMS i1000 Lap Pad Display Layout

Line 1:

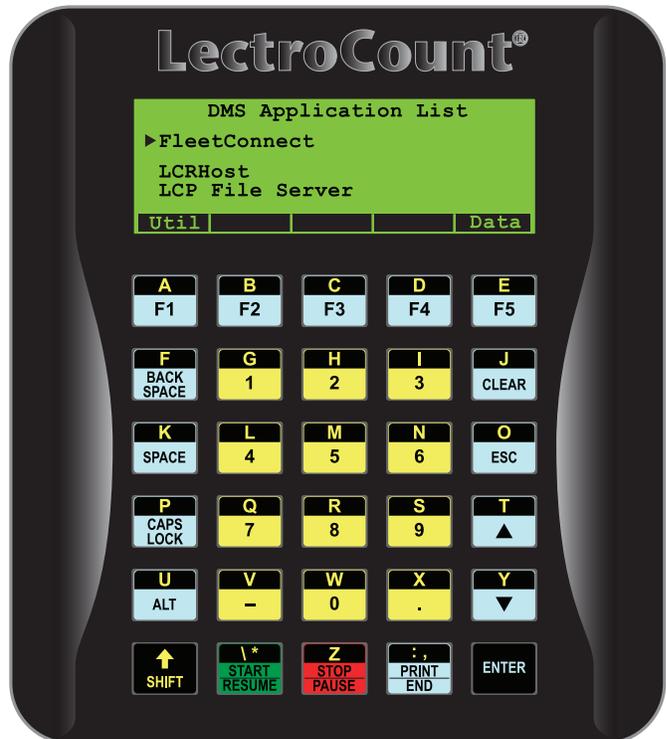
A fixed standard field. The screen title, **LOAD TRUCK**, is displayed on the left, and the time, **14:45:07**, is displayed to the right. If there is more than one screen necessary for a screen title, the screen number will be displayed between the title and the time (Example **(1/3)**).

Lines 2 - 7:

A list of configuration options or DMS i1000 i1000 commands that can be selected using the pointer. Using the up and down arrows on the DMS i1000 i1000 Lap Pad, the pointer moves up and down along the left side of the options. The **ENTER** key selects the option to the right of the pointer.

Line 8:

The commands assigned to the function keys (F1 - F5) on the top row of the DMS i1000 i1000 Lap Pad keyboard. These commands open new screens, scroll through screens of the same title, and provide navigation options. This manual will define the commands available on every screen.



DMS i1000 i1000 Lap Pad

Field Edit and List Box Windows

```
SETUP NETWORK
Network#:
▶ Name :
Network Name
|_      |
Home | <-- | Ins | --> | End
F1   | F2   | F3   | F4   | F5
```

Field Edit Window

Home (F1) moves the cursor to the first position

Ins (F3) toggles between insert mode and over-write mode

F2 and **F4** moves the cursor one space to the left or right

End (F5) moves the cursor to the last position in the field

SHIFT must be held down to type in letters

BACK SPACE erases the character to the left of the cursor

CLEAR erases all characters in a field edit window

ESC backs out of the window without making changes

ENTER accepts the characters inside the field edit window

```
Product Type
▶ Aviation
Distillate
Gasoline
Methanol
LPG
Lube Oil
Home | PgUp | Find | PgDn | End
```

List Box Window

Home (F1) sends the pointer to the first item in the list

PgUp (F2) and **PgDn (F4)** scrolls forward or backward through the list by full screens

Find (F3) opens a field edit window into which parameters can be entered for a search

End (F5) jumps to the end of the list

ENTER accepts the option to the right of the ▶ pointer

The (F#) function keys are activated only if there are more than six options

Field Edit and List Box Windows

There are two editable fields in DMS i1000 i1000 applications: field edit windows and list box windows. Field edit windows appear above the function commands (line 8) as a box in which alpha-numeric characters can be entered. List box windows also appear above the function commands (line 8), as a box with a list of options. Both fields are titled in the upper left corner of the field and surrounded by a border. In the example to the upper right, the field edit window title is **Customer Name**. In the example to the lower right, the list box window is titled **Button ID**.

Field Edit Window

Field edit windows allow you to key unique information into the DMS i1000 i1000. Using the keys of the DMS i1000 i1000 Lap Pad, you can type alpha-numeric characters into the window, and DMS i1000 i1000 will assign them to the field (in the upper right example **Customer Name**). While the field edit window is in the display, the function keys (**F1 - F5**) will provide tools to help you maneuver the cursor inside the window. When you are finished keying in your information, press the **ENTER** key to accept and exit the field edit window.

Parameters for each specific field edit window will be defined throughout this manual.

List Box Window

List box windows display a searchable list of options for you to choose from. Use the DMS i1000 i1000 Lap Pad arrow keys to scroll the ▶ (pointer) up and down the list. Press the **ENTER** key to select the option to the right of the pointer. If there are more than six options and the list will continue to another screen, the function keys (**F1 - F5**) will provide navigational tools to accelerate the search.



DMSMenu Application

System Utilities

Screen 1: Program Initialization

For newly installed LectroCount DMS i1000 systems, DMS i1000Menu will launch the first time the system is powered up. The display to the right will appear on the DMS i1000 Lap Pad prompting the operator to press **Util (F1)** to advance to the System Utilities menu.

NOTE: If DMS i1000Menu is not displayed upon initial startup, press **ALT** and **ESC** together to access DMS i1000Menu. Press **Util (F1)** to advance to **Screen 2a** shown below.

```
Data Management System v1.00

Welcome to the DMS i1000!

To set up your system, go to
SYSTEM UTILITIES by pressing
the F1/Util key.
Util
```

Screen 2a: System Utilities (1/3)

System Utilities consists of three screens. To advance through these screens, press **Next (F1)**. To exit this menu, press **Exit (F5)**.

Move pointer to **Language** and press **ENTER** to open a list box window with options for the language to be used by DMS i1000Menu. Move pointer to desired option and press **ENTER** to accept.

Press **Vers (F4)** to open **DMS i1000 Version Display** (shown below) which contains version numbers of the application and supporting software libraries. There are a minimum of six applications, it will be necessary to scroll up and down to view all installed application version numbers.

```
SYSTEM UTILITIES (1/3)
▶Language: English
DMS i1000 Password:

DMS i1000 Date FormatMM/DD/YY
DMS i1000 Date: 12/11/05
DMS i1000 Time: 16:00:31
Next Vers Exit
```

```
SYSTEM UTILITIES (1/3)
▶Language: English
DMS i1000 Password:

DMS i1000 Date FormatMM/DD/YY
Language
▶English
```

DMS i1000 Version Display

Shows current version numbers of all installed applications and supporting software libraries. Use **PgDn (F4)** to scroll down to view version numbers.

```
DMS i1000 Menu 1.02
(c) Liquid Controls LLC

ROM-DOS (c) Datalight Inc.

===== Support SDKs =====
PgDn End
```

Screen 2a: System Utilities (1/3)

```
SYSTEM UTILITIES (1/3)
Language: English
DMS i1000 Password:
DMS i1000 Password
| |
Home <-- Ins --> End
```

System Utilities contain system critical information, an option is provided to lock out this menu using a password. Move pointer to **DMS i1000 Password** and press **ENTER** to open a field edit window.

Enter a password in the space provided. This can be an alpha-numeric string of up to ten characters. Next, press **ENTER** to accept password and close field edit window. Once password is entered, it will be required to regain access to the **System Utilities** menu as well as **LCRHost** and **LCP File Server**. Retain this password in a safe place.

```
SYSTEM UTILITIES (1/3)
Language: English
DMS i1000 Password:
DMS i1000 Date Format
▶ MM/DD/YY
  DD/MM/YY
Home <-- Ins --> End
```

Move pointer to **DMS i1000 Date Format** and press **ENTER** to open a list box window with options:

MM/DD/YY (month/day/year)
DD/MM/YY (day/month/year)

Move pointer to desired option and press **ENTER** to accept.

Move pointer to **DMS i1000 Date** and press **ENTER** to open a field edit window. Enter date to be used by LectroCount DMS i1000 and press **ENTER** to accept. Three characters can be used as a separator: period (.), dash (-), and colon (:).

```
SYSTEM UTILITIES (1/3)
Language: English
DMS i1000 Password:
DMS i1000 Date
|12-11-05|
Home <-- Ins --> End
```

Move pointer to **DMS i1000 Time** and press **ENTER** to open a field edit window. Enter time to be used by LectroCount DMS i1000 and press **ENTER** to accept. Press **Next (F1)** to advance to **Screen 2b** on page 14.

```
SYSTEM UTILITIES (1/3)
Language: English
DMS i1000 Password:
DMS i1000 Time
|16:00:31|
Home <-- Ins --> End
```

NOTE: It will be assumed that the operator can now readily navigate list box windows and field edit windows. Therefore, these windows will no longer be shown for the remainder of this section.

System Utilities

Screen 2b: System Utilities (2/3)

Startup Caps Lock is used to designate whether the DMS i1000Menu should boot with caps lock on or off. Press **ENTER** to open a list box window with options **Off** or **On**.

Startup Insert Flag is used to designate whether the DMS i1000Menu should boot with the system set to insert or overwrite. Press **ENTER** to open a list box window with options **Off** or **On**.

Office Node Address allows operator to specify LCP node address used by an office computer when communicating with a wireless transmitter. This can be any number in the range from **0** to **255**. Leave this set to **0**.

Office Path is used to identify a path to where transaction and database files are located on an office computer when a wireless transmitter is in use. This can be an alpha-numeric string up to **244** characters in length. As an example:

C:\ or
C:\DMS i1000 or
C:\DMS i1000\DATA or
C:\SOURCE\DMS i1000

Leave this field blank.

USB Path is used to identify path to where transaction and data base files are located on the DMS i1000 USB flash memory. This field can be an alpha-numeric string up to **244** characters in length. As an example:

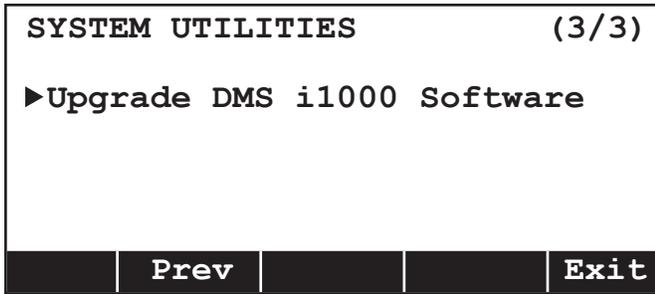
D:\ or
D:\DMS i1000 or
D:\DMS i1000\DATA

Press **Next (F1)** to advance to **Screen 2c** on page 15.

Press **Prev (F2)** to return to **Screen 2a** on page 13.

Press **Exit (F5)** to exit System Utilities menu and advance to **Screen 3** on page 16. **Screen 1** may not appear again during normal operation.

| | | |
|-------------------------|-----------------------------|---------------------|
| SYSTEM UTILITIES | | (2/3) |
| ▶ | Startup Caps Lock: | Off |
| | Startup Insert Flag: | Off |
| | Office Node Address: | 255 |
| | Office Path: | C:\SOURCE\DMS i1000 |
| | USB Path: | D:\DMS i1000 |
| Next | Prev | Exit |



Screen 2c: SYSTEM UTILITIES (3/3)

Upgrade DMS i1000 Software is a function that enables operator to upgrade system software of a LectroCount DMS i1000 Module. Press **ENTER** to open a list box window with options **Yes** or **No**.

Move pointer to **Yes** and press **ENTER**. Software on the USB flash memory will load to flash memory of DMS i1000 Module.

Press **Exit (F5)** to exit System Utilities menu and advance to **Screen 3** on page 16. **Screen 1** may not appear again during normal operation.

Data Application List

Screen 3: Data Management System

This screen is the main launch point for other applications in the system. To access this screen, press **ALT** and **ESC** simultaneously from any other application. This screen must be accessed in order to navigate between available applications. There is no direct link between **LCRHost**, **LCP File Server**, and **DMS i1000 Delivery**. They must all be accessed from this screen.

DMS i1000 Delivery

Application providing the operator ability to select customers from a customized list, make deliveries, record and track deliveries, review shift information, and transfer completed delivery information to a DMS i1000 office program using the USB flash memory.

The DMS i1000 Delivery application is not covered in this publication. Refer to Operator's Manual: 500344, for detailed information on DMS i1000 Delivery Application.

LCRHost

Application provides operator ability to setup an LCR Network, configure and calibrate a LectroCount register and meter, and make deliveries.

The LCRHost application description begins on page 19.

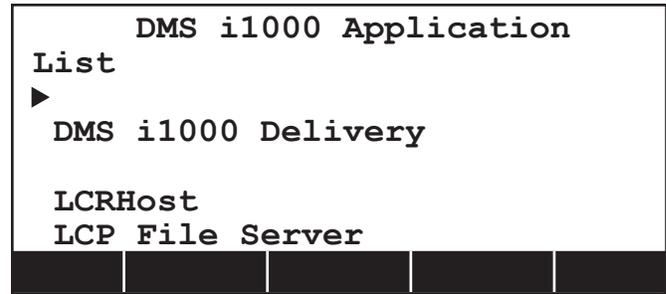
LCP File Server

Provides operator ability to access hard drive of the DMS i1000 interface from other computer systems.

The LCP File Server application description begins on page 65.

Press **Util (F1)** to return to **Screen 2a** on page 12.

Press **Data (F5)** to advance to **Screen 5** on page 17.



NOTE: **PgUp (F2)** and **PgDn (F4)** are activated **only** if more applications are available than appear on the screen.

Screen 4: Database Management

Database Management screen is used to transfer completed transaction files to an office computer and to retrieve an updated database from an office computer.

Send Transactions to Office display is used to transfer completed transaction files to an office computer. This is typically done at the end of a shift or often as required. When **ENTER** is pressed, appearance of the screens will depend on the LectroCount DMS i1000 configuration.

To ensure system recognizes the USB memory device, press **USB (F3)**. This locates the USB memory device. Once communication with USB memory device is established, proceed with **Send Transactions to Office** as described above.

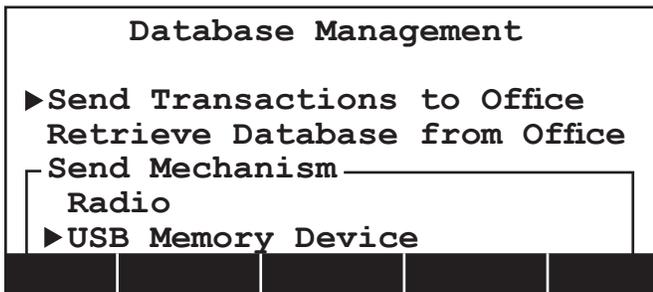
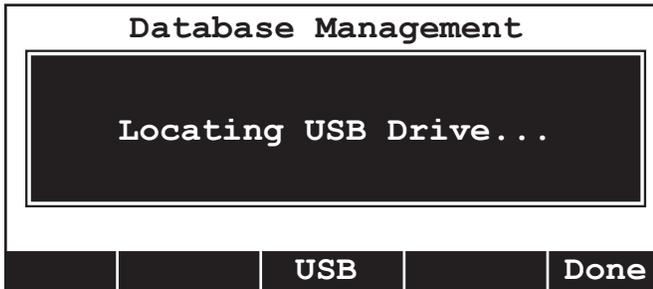
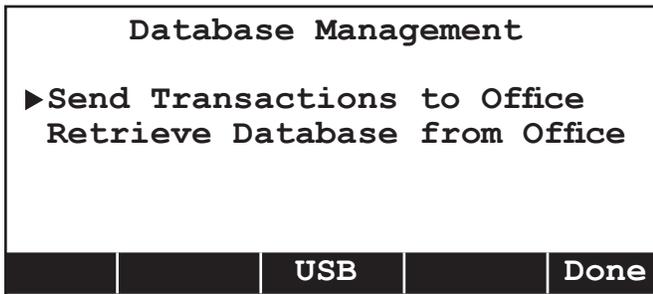
When **ENTER** is pressed, the system will transfer the transaction file (**CompTran.trn**) to the USB flash memory. A status indicator will appear and indicate progress of file transfer. As this file is sent, the transaction records are also automatically appended to an archive file (**CompTran.tra**) in the DMS i1000. This archive file will increase in size indefinitely until deleted by the operator via the LCR File Server application. When file transfer is complete, the display will indicate:

“The transactions were successfully sent.
Press ENTER to proceed”.

Press **ENTER** to close this window.

Retrieve Database from Office display functions in a similar fashion as **Send Transactions to Office** display.

Move pointer to **Retrieve Database from Office** and press **ENTER**. This will copy all files from the USB flash memory with the extension “.sif” to DMS i1000 internal flash memory. A transfer status indicator will display progress of the file download. When complete, press **Done (F5)** to return to **Screen 3** on page 16.





LCRHost Application

Main Menu

Screen 1: Program Initialization

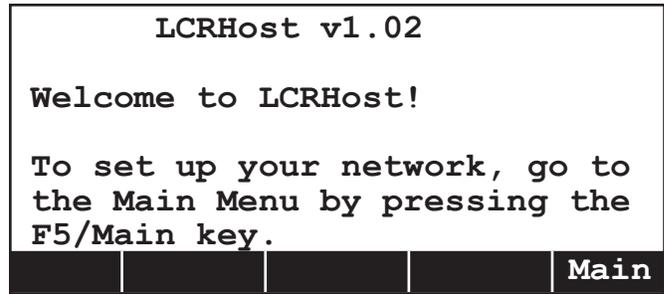
When the LCRHost application is initialized at start-up, screen to the right appears. This screen contains information about the operating software. The first line contains program name and revision.

The message shown in lines 4-7 which appear after the introduction lines, will then appear under the following condition:

LCRHost detects that the LCRConfig.slf file does not exist.

If system was already configured, the display will advance to **Screen 19a: Preset and Delivery (1/7)** on page 54. If communication cannot be established with the LCR, then display will show **Screen 20: Device Not Found** on page 59.

If this is the initial set and configuration of the system, press **Main (F5)** to advance to **Screen 2** shown below.



Screen 2: Main Menu

Main Menu is the launch point for system setup, calibration, and configuration. Items appearing on the Main Menu are typically used for initial setup and configuration of the system but may be reset should the system or application change.

By default, the pointer position will be the first available function on the screen. To move pointer from **Setup Network** to another line, use up or down arrow of the DMS i1000 Lap Pad. The up arrow is on shares **T** key and down arrow shares **Y** key.

Setup Network

Advances display to **Screen 3** on page 21.

System Parameters

Advances display to **Screen 6a** on page 26.

Configure LCR#

Advances display to **Screen 7** on page 28.

Save Configuration

Advances display to **Screen 14** on page 51.

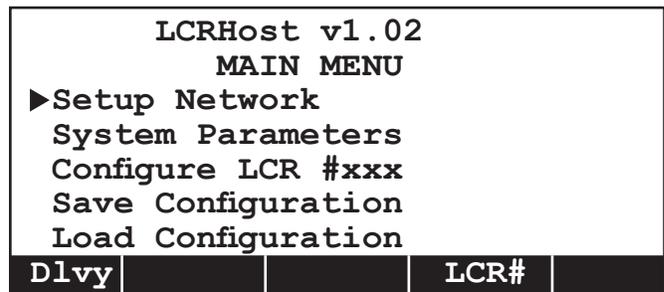
Load Configuration

Advances display to **Screen 15** on page 52.

Dlvy appears above function key **F1**. Press **Dlvy (F1)** to advance to **Screen 19a** on page 54.

LCR# appears above function key **F4**. Press **LCR# (F4)** to open a list box window with options for selecting an LCR to communicate with.

Press **Esc** to exit list box window. Move pointer to **Setup Network** and press **ENTER** to advance to **Screen 3** on page 21.



```

SETUP NETWORK
Steps to create a new network.

F3/New: Create a new network.
Edit Port field if necessary.
F1/Next:Setup device database.
F1/Next:Setup network devices.
    
```

| | | | |
|--|--|------------|-------------|
| | | New | Main |
|--|--|------------|-------------|

Screen 3: Setup Network

If no network files have been set up, the screen to the right will be displayed. This display is not editable, but indicates the steps to be taken to set up a new network.

Press **New (F3)** to create a new network. This advances the display to **Screen 4a** shown below.

NOTE: The default values for each of the SETUP NETWORK fields will effectively communicate with a LectroCount register.

```

SETUP NETWORK (1/3)
▶Network #:
Name:

Port: COM2 at 19200 Baud
    
```

| | | | | |
|-------------|--|------------|------------|-------------|
| Next | | New | Del | Main |
|-------------|--|------------|------------|-------------|

Screen 4a: Setup Network (1/3)

The SETUP NETWORK screens allow a new installation to define the network. There are two editable items on this first of these screens. The first field, **Network #**, opens a list box window with a default set of network identifiers. If this is a single meter network, select **1 |1-METER SYSTEM**. This populates **Network #** and **Name** fields for this screen.

If a different Network # and Name are required, a new network can be established. Initiated by pressing **New (F3)**.

New opens a field edit window. **Network Number** can have a numeric value from **1** to **65535**. Enter a number and press **ENTER** to accept the value. For example, enter **1** as the Network Number and press **ENTER**.

Move pointer to **Name** and press **ENTER** to open a field edit window. **Network Name** is an optional field and can be a maximum length of 14 alpha-numeric characters. Enter desired **Network Name** and press **ENTER** to accept the value. For example, enter **TRUCK 2112** then press **ENTER**.

If more than one network is required for the application, press **New (F3)** to enter next **Network Number**.

To delete a **Network #**, select that network number from the list box window, press **ENTER**, and then press **Del (F4)** to delete that network from the program.

When task is complete, press **Port (F2)** to advance to **Screen 5: Setup Network Port** on page 24.

```

SETUP NETWORK (1/3)
Network #:
Network Number
▶ 1 : 1-METER SYSTEM
  2 : 2-METER SYSTEM
  3 : 3-METER SYSTEM
    
```

```

SETUP NETWORK (1/3)
Network #: 1
▶Name: Single Meter
Network Name
|1-METER SYSTEM|
    
```

| | | | | |
|-------------|-----------------|------------|-----------------|------------|
| Home | << | Ins | >> | End |
|-------------|-----------------|------------|-----------------|------------|

Setup Network

Screen 4b: Setup Network (2/3)

This screen is used to establish communication with LectroCount Registers (LCRs). By default, all LCRs are shipped with a node address of 250. This information will be helpful when establishing communication with new LCRs.

Based on examples provided, one network has been defined and this is **Network # 1**. Move pointer to **Device** and select **New (F3)**. The device number can be between **1** and **249**. Enter the number "1" and press **ENTER** to accept.

Next, move pointer to **Name** and press **New (F3)** to open a field edit window. This field can be from 0 to 16 alpha-numeric characters in length. Enter a suitable name for the device number 1. For example, type in "LCR1" and press **ENTER** to accept.

```
SETUP NETWORK (2/3)
Network:      1|1-METER SYSTEM

▶Device:      1
Name:        METER-1

Next  Prev  New  Del
```

```
SETUP NETWORK (2/3)
Network:      1|1-METER SYSTEM

New Device Number
|1_ |

Home <--  Ins  --> End
```

```
SETUP NETWORK (2/3)
Network:      1|1-METER SYSTEM

Device:      1
▶Name:      METER-1

Next  Prev  New  Del
```

```
SETUP NETWORK (2/3)
Network:      1|1-METER SYSTEM

Device Name
|METER-1 |

Home <--  Ins  --> End
```

Setup Network Devices

Screen 4c: Setup Network (3/3)

Move pointer to **Last Device** and enter **Setup (F5)** this allows automatic selection of an active LCR device.

Under Set Up LCR Devices, move pointer to **Yes** then press **ENTER**. This will display **The setup process has completed successfully**.

When a new device is found, enter a name for it and continue with setup.

To remove a device from the network configuration, select device and press **Del (F4)**. This deletes the selected device. Deleting a device connected to the network will cause it's node address to be reset to 250. When programming of network devices is complete, press **Exit (F5)** to return to **Screen 4a** on page 21. Then press **Main (F5)** to return to **Screen 2** on page 20.

Move pointer to **System Parameters** and press **ENTER** to advance to **Screen 6a** on page 26.

```
SETUP NETWORK (3/3)
Network:      1|1-METER SYSTEM

=====SEARCH FOR DEVICES=====
First Device:                1
▶Last Device:                1
Prev | Addr | Srch | Setup
```

```
SETUP NETWORK (3/3)
Network:      1|1-METER SYSTEM

Set Up LCR Devices
No
▶Yes
Prev | Addr | Srch | Setup
```

```
SETUP NETWORK (3/3)
Network:      1|1-METER SYSTEM

Finding active device

Last Device:
Prev | Addr | Srch | Setup
```

```
LCRHost: 31025

The setup process has
completed successfully.
Press ENTER to proceed.
▶Last Device:
Prev | Addr | Srch | Setup
```

NOTE: It will be assumed the operator can now readily navigate list box windows and field edit windows. Therefore, these windows will no longer be shown for remainder of this manual.

Setup Network

Screen 5: Setup Network Port

Setting up network port sets up communication parameters between LectroCount DMS i1000 and LectroCount electronic register.

Port is used to select the port and interrupt request line used by the active network. Press **ENTER** to open a list box window for **Communications Port**. The following options will be available:

- COM1
 - COM2
 - COM3
 - COM4
- Use Base Address of UART

A standard DMS i1000 Module is wired to communicate with the LCR network on COM2, IRQ3, at a baud rate of 19200, therefore select **COM2** and press **ENTER**. This will open another list box window. The new list box window is for selecting the **IRQ** used by the port. This list box window contains interrupt request (IRQ) values between **2** and **15**. Select IRQ **"3"** and press **ENTER** to accept the COM and IRQ choices and return to **SETUP NETWORK PORT**. The changes for **Port** are now displayed on the screen.

Move pointer to **Bits/Second** (baud rate) and press **ENTER**. This opens the **Bits/Second** list box window. This value is the baud rate used to communicate with the network of LectroCount registers. The following options are available:

- 2400
- 4800
- 9600
- 19200
- 57600

It is recommended to use a baud rate of **19200**. Select **19200** and press **ENTER** to accept the value. If there is no printer connected to the system, a baud rate of **57600** can be selected.

```
SETUP NETWORK PORT
▶Port:          COM2 using IRQ 3
Bits/Second (Baud): 19200
Tx Enable Bit:   RTS
Maximum Retries: 1
Timeout (ms):   100
Baud Synchronization : Yes
Exit
```

```
SETUP NETWORK PORT
Communications Port
COM1
▶COM2
COM3
COM4
Use Base Address of UART
```

```
IRQ
▶3
4
5
6
7
8
Home PgUp Find PdDn End
```

```
SETUP NETWORK PORT
Bits/Second
▶2400
4800
9600
19200
57600
```

Screen 5: Setup Network Port Continued

Move pointer to **Tx Enable Bit** and press **ENTER** to open **Transmit Enable Bit** list box window. The Transmit Enable Bit is used in an RS-485 network when data is to be transmitted to a LectroCount register. The following options are available:

```
!DTR
!RTS
!RTS!DTR
DTR
None
RTS
RTSDTR
```

For a standard DMS i1000 Module, select **RTS** and press **ENTER** to accept the value.

Move pointer to **Maximum Retries** and press **ENTER** to open a field edit window.

Maximum Retries represents number of times system attempts to communicate with a LectroCount register should first attempt fail. The maximum number of retries can have a value between **0** and **255**. Enter desired number of retries and press **ENTER** to accept the value.

Move pointer to **Timeout** and press **ENTER** to open a field edit window. **Timeout** value is the length of time (in milliseconds) a single communication is attempted before returning a communication failure. The timeout value may be between **100** and **9999** ms. Enter desired value and press **ENTER** to accept. The recommended value is **100**.

Move pointer to **Baud Synchronization** and press **ENTER** to open a list box window and chose **Yes** or **No**. If **Yes** is selected, the system will try all available baud rates should the baud rate set earlier result in a communication error. Select **Yes** and press **ENTER** to accept.

NOTE: Care should be taken when setting the **Maximum Retries** and **Timeout** values. If an LCR is not present in the network, it will take:

$$5 \times (R + 1) \times T = \text{milliseconds}$$

before it is determined an LCR is not present. **5** is the number of baud rates if **Baud Synchronization** is set to **Yes**, **R** is the number of **Maximum Retries** and **T** is the **Timeout** value in milliseconds. If the number of retries is **3** and the timeout value is **500**, then the time before an error is returned is:

$$5 \times (3 + 1) \times 500 = 10,000 \text{ or } 10 \text{ seconds.}$$

Press **Exit (F5)** to exit **SETUP NETWORK PORT** and return to **SETUP NETWORK**. Then press **Dev (F1)** to advance to **Screen 5: SETUP NETWORK DEVICES** on page 24.

```
Transmit Enable Bit
▶!RTS
!RTS!DTR
DTR
None
RTS
RTSDTR
Home PgUp Find
```

```
SETUP NETWORK PORT
Port: COM1 using IRQ 3
Bits/Second (Baud): 19200
Maximum Retries:
|1_ |
Home <-- Ins --> End
```

```
SETUP NETWORK PORT
Port: COM1 using IRQ 3
Bits/Second (Baud): 57600
Timeout:
|250_ |
Home <-- Ins --> End
```

```
SETUP NETWORK PORT
Port: COM1 using IRQ 3
Bits/Second (Baud): 19200
Tx Enable Bit: RTS
Baud Synchronization
▶No
Yes
```

System Parameters

Screen 6a: System Parameters (1/2)

System Parameters screens are used to set up user interface and system information.

Move pointer to **Language** and press **ENTER** to open a list box window of languages. Select desired language to be used by LCRhost and displayed on the DMS i1000 Lap Pad. Language options currently include **English**.

Move pointer to **LCRHost Password** and press **ENTER** to open a field edit window. Enter an alpha-numeric code up to 10 characters in length. Once **LCRHost Password** is entered, the operator is required to enter this code in effort to access the **Main Menu** from delivery screens.

NOTE: If password protection of **Main Menu** is not desired, leave this field blank.

The fields are for setting date and time of LCRHost processor (not the LCR). Date and time are field edit windows. Enter current date and time for each field.

Date/Time Master designates which device will have the master copy of the date and time. When a new delivery is started, date and time from the master device will be sent to a slave device. Move pointer to **Date/Time Master** and press **ENTER** to open a list box window with the options:

HOST
LCR
None

If **HOST** is selected, date and time are maintained in the LCRHost processor. When a delivery is started, HOST date and time will be sent to the LCR. If **LCR** is selected, date and time are maintained in the active LCR to be retrieved and set in the LCRHost processor at start of each delivery.

If **None** is selected, then date and time will **not** be synchronized between LCRHost processor and active LCR. Date and time information appearing on delivery ticket will be from the LCR.

Press **Next (F1)** to advance to **Screen 6b** on page 27.

Press **Vers (F4)** to open DMS i1000 About Display shown on the bottom of page 12.

| | | | |
|--------------------------|--|-----------------|-------------|
| SYSTEM PARAMETERS | | (1/2) | |
| ► Language: | | English | |
| LCRHost Password: | | | |
| Host Date: | | 01/16/06 | |
| Host Time: | | 16:00:23 | |
| Date/Time Master: | | Host | |
| Next | | Vers | Main |

| | |
|-------------------------|------|
| SYSTEM PARAMETERS (2/2) | |
| ▶Startup Caps Lock: | Off |
| Startup Insert Flag: | Off |
| Prev | Main |

| | | | |
|---------------------------|---|------|--|
| LCRHost (DMS i1000) v1.02 | | | |
| MAIN MENU | | | |
| Setup Network | | | |
| System Parameters | | | |
| ▶Configure LCR # | 1 | | |
| Save Configuration | | | |
| Load Configuration | | | |
| Dlvy | | LCR# | |

Screen 6b: System Parameters (2/2)

Startup Caps Lock is used to designate whether the DMS i1000 Lap Pad should boot with caps lock on or off. Pressing **ENTER** opens a list box window with options **Yes** or **No**.

Startup Insert Flag is used to designate whether the DMS i1000 Lap Pad should boot with the system set to insert or overwrite. Pressing **ENTER** opens a list box window with the options **Yes** or **No**.

When programming of this screen is complete, press **Main (F5)** to return to the **MAIN MENU** (shown to the right), move pointer to **Configure LCR# 1**, and press **ENTER** to advance to **Screen 7** on page 28.

Configure LCR

Screen 7: Configure LCR

Network and LCR Device must be assigned first.

Configure LCR is similar to **Main Menu** as a launching point for several other sub-menus. Within **Configure LCR** are:

General Setup

Advances display to **Screen 8a** on page 29.

System Calibration

Advances display to **Screen 9a** on page 32.

Product Calibration

Advances display to **Screen 10a** on page 37.

Diagnostics

Advances display to **Screen 11a** on page 48.

Security

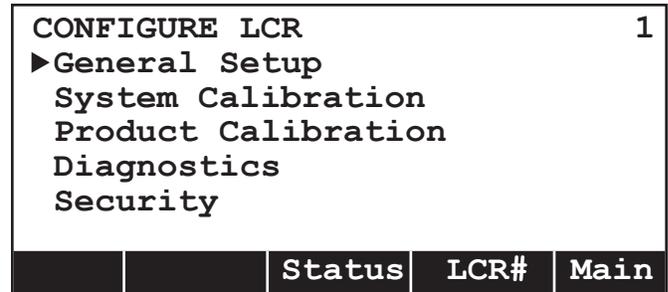
Advances display to **Screen 12** on page 49.

Pressing **Stat (F3)** advances display to **Screen 21** on page 60.

Pressing **LCR# (F4)** allows the operator to select the LectroCount register to be configured.

Pressing **Main (F5)** returns display to **Screen 2** on page 20.

Ensure pointer is on **General Setup** and press **ENTER** to advance to **Screen 8a** on page 29.



| | | |
|------------------|-------|-----------|
| GENERAL SETUP | (1/5) | 1 |
| ►Unit ID: | | |
| Presets Allowed: | | Net |
| Date Format: | | MM/DD/YY |
| Date: | | 01/11/05 |
| Time: | | 11:27:36 |
| Next | | Cnfg Main |

Screen 8a: General Setup (1/5)

General Setup screens are used to set up system information, deliveries, and ticket printing.

Unit ID is an alpha-numeric identifier up to 10 characters in length used to identify the active LectroCount register. Press **ENTER** to open a field edit window and enter desired value. Press **ENTER** to accept.

Presets Allowed defines presets an operator can set while making deliveries. Preset deliveries allow an operator the ability to enter a preset volume for delivery. Upon reaching the preset volume, LectroCount will typically close a security valve (if equipped) and print a delivery ticket.

There are four options for **Presets Allowed**.

BOTH - for both net and gross presets

GROSS - for gross (non-compensated) presets only

NET - for net (temperature compensated) presets
or

NONE - for no presets allowed

Move pointer to desired option and press **ENTER** to accept.

NOTE: If the preset feature is used, ensure the **S1 CLOSE** field on page 38 is set for a preset value to work properly.

Date Format is used to determine the format date displayed and printed. Press **ENTER** to open a list box window with the options: **DD/MM/YY** (Day/Month/Year) and **MM/DD/YY** (Month/Day/Year). Select desired format and press **ENTER** to select.

Date and **Time** are fields where current date and time are entered for the LCR (not for LCRHost). Open the field edit window for each and enter current date and time. Three characters used as a separator are period (.), forward slash (/), and colon (:). Press **ENTER** to accept each value.

Pressing **Next (F1)** advances display to **Screen 8b** on page 30.

Pressing **Cnfg (F4)** returns display to **Screen 7** on page 28.

Pressing **Main (F5)** returns display to **Screen 2** on page 20.

General Setup

Screen 8b: General Setup (2/5)

Sale # is used to track number of transactions LectroCount processes. This number will increment each time a delivery is started.

Press **ENTER** to open a field edit window to enter starting number for **Sale #** and press **ENTER** to accept. The LectroCount will use this as the starting value for **Sale #** and increment by 1 each time a delivery is started. Once a **Sale #** reaches **999999**, it will return the count to zero and resume counting from 1.

Ticket # is similar to **Sale #** however, **Ticket #** will increment each time LectroCount prints a ticket.

If multiple or duplicate tickets are used for transactions, the ticket number will increment more than the **Sale #**.

Press **ENTER** to open a field edit window and enter starting number for **Ticket #** and press **ENTER** to accept. LectroCount will use this as the starting value for **Ticket #** and increment by 1 each time a delivery ticket is printed. Once **Ticket #** reaches **999999**, it will return the count to one and resume counting from 1.

NOTE: If **0** is entered for **Ticket #**, the **Ticket #** will not print on the delivery ticket and it will not increment.

Print Gross & Param? is used to enable or disable printing of gross volume and compensation parameter on the delivery ticket if the product is temperature compensated. In many applications this is required. Check local Weights & Measures requirements.

Press **ENTER** to open a list box window. Select **No** if it is **NOT** desired to print the gross volume and compensation parameter on the ticket. Select **Yes** if it **IS** desired to print the gross volume and compensation parameter on the ticket.

Volume Corrected Message? is used to enable or disable printing of the base temperature of net deliveries on the delivery ticket. In many applications, this is required. Check local Weights & Measurements requirements.

| | | | |
|---------------------------|------|---------|------|
| GENERAL SETUP | | (2/5) | 1 |
| ▶Sale #: | | | 1 |
| Ticket #: | | | 1 |
| Print Gross & Parameter? | | Yes | |
| Volume Corrected Message? | | Yes | |
| Pulse Output Edge: | | Falling | |
| Next | Prev | Cnfg | Main |

There are two options for **Vol Corrected Msg?**. Select **No** if the volume corrected message is **NOT** printed on the delivery ticket. Select **Yes** to have the volume corrected message printed on the delivery ticket. If **Yes** is selected, the LectroCount will print a message on the delivery ticket indicating the delivery volume has been corrected to a specified base temperature.

If base temperature is in °C, the message will read:
TEMPERATURE VOLUME CORRECTED TO 15 °C

If the base temperature is in °F, the message will read:
TEMPERATURE VOLUME CORRECTED TO 60 °F

NOTE: The base temperature for Linear C and Linear F can be set to a value other than their default values.

All LectroCount registers feature a calibrated pulse output which cycles once per least significant unit of delivery. The **Pulse Out Edge** field allows the LectroCount to synchronize the calibrated pulse output waveform with the requirements of an external counter. Depending on the manufacturer, some counters may increment on the rising pulse edge of the waveform, some on the falling pulse edge. Refer to the manufacturer's manual to determine the specific requirements.

The List Box Window has two options. Select **Rising** for the rising edge of the pulse output. Select **Falling** for the falling edge of the pulse output.

Press **Next (F1)** to advance to **Screen 8c** on page 31.

| | | | |
|---------------|------|-------|------|
| GENERAL SETUP | | (3/5) | 1 |
| Header Text | | | |
| ▶ 1: | | | |
| 2: | | | |
| 3: | | | |
| 4: | | | |
| 5: | | | |
| Next | Prev | Cnfg | Main |

Screen 8c: General Setup (3/5)

The next three consecutive screens all deal with header information to be printed on a delivery ticket. The header lines are edited individually. Press **ENTER** to open a field edit window for each line. Enter alpha-numeric information up to 35 characters in length per line. Any or all of these fields may be left blank.

NOTE: Since display is set to 30 character width, header text information may scroll off the screen. This will be indicated by » at the end of the header text line. All information will, however, print on the delivery ticket.

| | | | |
|---------------|------|-------|------|
| GENERAL SETUP | | (4/5) | 1 |
| Header Text | | | |
| 6: | | | |
| 7: | | | |
| 8: | | | |
| 9: | | | |
| 10: | | | |
| Next | Prev | Cnfg | Main |

Screen 8d: General Setup (4/5)

Header lines 6 through 10. Refer to description above.

| | | | |
|---------------|------|-------|------|
| GENERAL SETUP | | (5/5) | 1 |
| Header Text | | | |
| 11: | | | |
| 12: | | | |
| | Prev | Cnfg | Main |

Screen 8e: General Setup (5/5)

Header lines 11 and 12 print conditionally. Header line 11 prints only if **Aux1** is set to **ON DURING DELIVERY**. Similarly, Header line 12 prints only if **Aux2** is set to **ON DURING DELIVERY**. For example, if an additive injector is activated by **Aux1**, it may be desirable to note this on the ticket by adding a header line such as "**Prist added to this delivery**".

Press **Cnfg (F4)** to return to **Screen 7** on page 28. Move the pointer to **System Calibration** and press **ENTER** to advance to **Screen 9a** on page 32.

System Calibration

Screen 9a: System Calibration (1/5)

System Calibration screens cover configuration and calibration of the metering system.

Meter ID is an alpha-numeric value used to uniquely identify a Meter attached to a LectroCount register. It is important a unique number is selected and recommended the meter serial number be entered. This number will print on all calibration and diagnostic tickets for future reference.

Press **ENTER** to open a field edit window and enter a unique identifier up to 10 alpha-numeric characters in length. Press **ENTER** to accept this value.

Flow Direction is used to set direction of flow through the meter. If the LectroCount display counts in reverse (decreasing numbers) after unit is installed, it will be necessary to select opposite **Flow Direction**.

Ticket Required is used to select whether a delivery ticket will be required for each delivery. Most Weights & Measures governed truck applications will require a ticket.

There are two options for **Ticket Required?**. If **No** is selected, the system will **NOT** require a ticket to be printed after each delivery. If **Yes** is selected, the LectroCount will not allow deliveries to be made unless a ticket is in the printer and the printer is operational. It will also require a ticket be printed before another delivery can be started.

Move pointer to desired option and press **ENTER** to accept.

NOTE: Selecting **No** will still allow a ticket to be printed if a printer is connected, loaded with paper, and ready to print.

Printer is used to select printer model to communicate with the LectroCount. Selecting a wrong printer model may result in miscommunication between LectroCount and printer.

There are six options for the **Printer**. Use the following guide to select the correct option:

BLASTER (select for use with Cognitive Solutions Thermal Printer).

EPSON NewFontA (select for use with EPSON TM-T88iii)

EPSON NewFontB (select for use with EPSON 200 Roll and EPSON 220 Roll)

EPSON OldFontA (select for use with EPSON 290 Slip and EPSON 295 Slip)

EPSON OldFontB (select for use with EPSON 300 Roll)

Okidata ML184T (select for use with Okidata ML184T)

| | | | |
|--------------------|--|----------------|------|
| SYSTEM CALIBRATION | | (1/5) | 1 |
| ▶Meter ID: | | 4545 | |
| Flow Direction: | | -> | |
| Ticket Required? | | Yes | |
| Printer | | Epson OldFontA | |
| dP Shutdown Value: | | xx.x | |
| Next | | Cnfg | Main |

dP Shutdown Value represents differential pressure that will cause current active delivery to shutdown. This function is only active when the following conditions exist:

1. A Differential Pressure device is installed.
2. LectroCount Register has **SR214** software installed.
3. Value is set to a number other than "0"

When these three conditions exist, reaching or exceeding the **dP Shutdown Value** will end the delivery. Press **ENTER** to open a field edit window and enter a value between **0** and **59.9**.

Press **Next (F1)** to advance to **Screen 9b** on page 33.

| | | | |
|---------------------|------------|-------|------|
| SYSTEM CALIBRATION | | (2/5) | 1 |
| ►Units of Measure: | Gallons | | |
| Flow Rate Base: | Per Minute | | |
| Decimals: | Hundreths | | |
| Residual Processing | Truncate | | |
| Next | Prev | Cnfg | Main |

Screen 9b: System Calibration (2/5)

Units of Measure is used to define base unit of measure for delivery quantities. Press **ENTER** to open a list box window with the options:

- Gallons
- Litres
- Cubic M
- LBS
- KGS
- Barrels
- Other

Move pointer to selection and press **ENTER**.

Flow Rate Base is used to define rate base used by flow rate field. Press **ENTER** to open a list box window with the options:

- Per Hour
- Per Minute
- Per Second

Move pointer to desired option and press **ENTER**.

Decimals is used to define the number of digits maintained to right of decimal point in quantity fields. Press **ENTER** to open a list box window with the options:

- Hundredths** = 2 decimal places (e.g. 120.22)
- Tenths** = 1 decimal place (e.g. 120.2)
- Whole** = 0 decimal places (e.g. 120)

Move pointer to desired option and press **ENTER**.

Residual Processing is used to define what happens with residual amounts. Press **ENTER** to open a list box window with the options:

- Round
- Truncate

Selecting **Round** causes quantity residuals to be rounded in the displayed values. Selecting **Truncate** causes quantity residuals to be truncated from the display values.

For example, if actual quantity registered is 100.26 and **Decimals** is set to **Tenths**, the **Round** value would be 100.3, and **Truncated** value would be 100.2.

Press **Next (F1)** to advance to **Screen 9c** on page 34.

System Calibration

Screen 9c: System Calibration (3/5)

The first three items on this screen are used to define parameters of an odometer sensing device (if installed as part of the LCR).

The fields of **Pulses/Distance**, **Calibrated Distance**, and **Odometer** are used to calibrate an odometer pulser if an odometer input is being used with an LCR.

NOTE: LectroCount LCR-II does not have an odometer input option. If the register is required to maintain an odometer reading, use **LectroCount LCR**.

Pulses/Distance represents number of pulses from an odometer pulser the LectroCount LCR counts per unit of distance (miles or kilometers). For initial calibration of the odometer, enter **4000** as a starting point. The frequency of the odometer pulser must be no more than 25 pulses per second or inaccuracies will result.

If odometer feature is not being used, this number must be set to **2**.

If LCR odometer input terminals are being used for optional START/STOP feature, **Pulses/Distance** must be set to **0**.

Calibrated Distance is used to calibrate the odometer. To begin odometer calibration, enter **0** for **Calibrated Distance**. Drive vehicle a known distance (minimum of 5 miles recommended) using truck's odometer for reference. Enter actual distance traveled in the **Calibrated Distance** field. This will automatically adjust **Pulses/Distance** to reflect corrected number.

Odometer represents truck's odometer once odometer function has been calibrated.

Enter truck's current odometer reading in **Odometer** field edit window. Press **ENTER** to accept value.

NOTE: The **next two** fields will only be displayed when a LectroCount register has software SR216 installed.

Password Usage is used to determine when a password will be required on front panel of the LCR-II. Press **ENTER** to open a list box window with the options:

- Delivery
- None
- Shift

Select **None** to indicate password field will not be used.

Select **Delivery** to specify password will need to be entered before each delivery.

Select **Shift** to specify password will need to be entered before each shift.

| | | | |
|----------------------|------|----------|------|
| SYSTEM CALIBRATION | | (3/5) | 1 |
| ▶Pulses/Distance: | | 2.000000 | |
| Calibrated Distance: | | ----- | |
| Odometer: | | 0.0 | |
| Password Usage: | | Delivery | |
| Customer Usage: | | Delivery | |
| Next | Prev | Cnfg | Main |

Customer Usage allows operator to specify when customer number will be required on the front panel of the LCR-II. Press **ENTER** to open a list box window with the options:

- Delivery
- None

Select **None** to indicate customer number will not be required and will be set to **0** for each delivery.

Select **Delivery** to indicate customer number will be required for each delivery.

Press **Next (F1)** to advance to **Screen 9d** on page 35.

| | | |
|--------------------|----------|-----------|
| SYSTEM CALIBRATION | (4/5) | 1 |
| ►Temperature: | 80.54 | |
| Offset: | .30 | |
| Temperature Unit: | Deg. F | |
| RTD Slope: | 0.025000 | |
| RTD Offset: | 0.000 | |
| Next | Prev | Cnfg Main |

Screen 9d: System Calibration (4/5)

Temperature displays current reading from the temperature probe with the offset applied. If LectroCount is not equipped with a temperature probe, the display will show dashes. This field allows entry from a Weights & Measures calibrated thermometer.

To calibrate temperature probe, run enough product through the meter to allow temperature to stabilize. Compare **Temperature** reading with current Weights & Measures thermometer reading. If the readings do not match, enter the Weights & Measures reading in the field edit window for **Temperature**. This value will overwrite the previous value and the **Offset** field will be recalculated by the LectroCount.

Offset adjustments are limited to $\pm 0.3^{\circ}\text{C}$ ($\pm 0.54^{\circ}\text{F}$). Adjustments greater than these offset values require replacement of the RTD Probe.

Offset represents the difference between the official Weights & Measures temperature reading and the LectroCount probe's temperature reading. The offset is automatically calculated if an entry is made in the **Temperature** field. If a temperature probe is not present, this field will show dashes.

If a Weights & Measures temperature reading was not entered in **Temperature**, subtract **Temperature** value from Weights & Measures temperature reading. Enter this value in the field edit window for **Offset**. If the difference is a negative number, enter "-" before the value.

Offset adjustments are limited to $\pm 0.3^{\circ}\text{C}$ ($\pm 0.54^{\circ}\text{F}$). Adjustments greater than these offset values require replacement of the RTD Probe.

Temperature Unit is used to define the temperature unit to be used for the application. The two options for Temperature Unit are **Deg. C** (degrees Celsius) and **Deg. F** (degrees Fahrenheit). Move pointer to desired option and press **ENTER** to accept.

RTD Slope and **RTD Offset** are used for factory calibration of the LectroCount and are not editable.

RTD Slope indicates slope used to calculate the raw temperature value from the raw ADC value.

RTD Offset indicates offset used to calculate the raw temperature value from the ADC value.

Press **Next (F1)** to advance to **Screen 9e** on page 36.

System Calibration

Screen 9e: System Calibration (5/5)

These calibration information fields are for metrology use and are not editable.

Calib Date displays date and time when the red selector switch on the LectroCount register was last moved from the calibration position to **SHIFT PRINT** position.

Calib Number displays number of times the red selector switch of the LectroCount has been switched from the calibration position to **SHIFT PRINT** position.

Calib Event displays number of times a calibration event has occurred.

Config Event displays number of times a configuration event has occurred.

For more information on **Calib Event** and **Config Event**, refer to page 64.

Press **Cnfg (F4)** to return to the **Screen 7** on page 28. From there, move pointer to **Product Calibration** and press **ENTER** to advance to **Screen 10a** on page 37.

| | | |
|---------------------------|--------------------------|------------------|
| SYSTEM CALIBRATION | (5/5) | 1 |
| Calib Date: | 01/11/05 11:50:25 | |
| Calib Number: | | 1 |
| Calib Event: | | 24 |
| Config Event: | | 29 |
| | Prev | Cnfg Main |

| | | | |
|-----------------------------|--|----------------|------|
| PRODUCT CALIBRATION (1/6) 1 | | | |
| ▶Product #: X | | Units: Gallons | |
| Product Code: | | | |
| Name: | | | |
| Product Type: | | Gasoline | |
| Next | | Cnfg | Main |

Screen 10a: Product Calibration (1/6)

Product Calibration screens are used to calibrate the metering system for product(s) which will be measured.

Product # is used to select product number to be calibrated. The product number will correspond to one of the product types/calibrations set up in the LectroCount. At least one product must be calibrated to allow for deliveries. Press **ENTER** to open a list box window with options: **1, 2, 3, or 4.**

Product Code will correspond to the **Product Number**. The **Product Code** can also be entered in the **Preset and Delivery** menu. Press **ENTER** to open a field edit window. Enter an alphanumeric product code up to five characters in length.

Name contains a description of the product that will appear on the delivery ticket. Press **ENTER** to open a field edit window and enter an alphanumeric name up to 18 characters in length. Ensure product **Name** is descriptive of the **Product Type** and **Product Code**.

Product Type is used to specify type of product to be delivered. Press **ENTER** to open a list box window with the following eight options:

- Ammonia
- Aviation
- Distillate
- Gasoline
- Methanol
- LPG
- Lube Oil
- (blank)

Move pointer to desired **Product Type** and press **ENTER** to accept. If **(blank)** is selected, it indicates there is no product type associated with the product being calibrated and delivered.

Press **Next (F1)** to advance to **Screen 10b** on page 38.

Product Calibration

Screen 10b: Product Calibration (2/6)

If temperature volume compensation is being used for deliveries, the type of temperature volume compensation must be selected for the **Product #**. It is necessary to make a selection for proper Net (temperature compensated) calculations.

Move pointer to **Comp Type** and press **ENTER** to open a list box window with the following options:

None
 Linear F
 Linear C
 Table 24
 Table 54
 Table 6B
 Table 54B
 Table 54C
 Table 54D
 NH3

Move pointer to desired option and press **ENTER** to accept.

NOTE: If **None** is selected, deliveries can only be made in gross (non-compensated) quantities.

Refer to **Compensation Types and Parameters** table on page 39 to assist in making the correct selection.

Comp Parameter is the coefficient of expansion per degree, the base temperature density, the API gravity, or the base temperature specific gravity that will be used with the **Comp Type** selected. Press **ENTER** to open a field edit window and enter a value based on the following guideline:

| Selection | Range |
|-----------|--------------------------------------|
| None | 0.0 |
| Linear F | 0.0000 to 0.0025 (per °F) |
| Linear C | 0.000 to 0.005 (per °C) |
| Table 24 | 0.500 to 0.550 (SGU) |
| Table 54 | 0.500 to 0.600 (KG/Litre) |
| Table 6B | 0.0 to 85.0 (°API) |
| Table 54B | 653.0 to 1075.0 (KG/M ³) |
| Table 54C | 0.000486 to 0.001674 (per °C) |
| Table 54D | 800.0 to 1164.0 (°API) |
| NH3 | N/A |

If **Comp Type** selection is either **Linear C**, or **Linear F**, then **Base Temp** is used to set the base temperature for temperature compensated deliveries.

If **Linear C** is selected for **Comp Type**, the **Base Temp** value will default to **15.0** (for 15 °C). If **Comp Type** is set to **Linear F**, the **Base Temp** default value is **60.0** (for 60°F).

To change this value, press **ENTER** to open a field edit

| | | | |
|-----------------------------|------|----------------|------|
| PRODUCT CALIBRATION (2/6) 1 | | | |
| ▶ Product #: 1 | | Units: Gallons | |
| Comp Type: | | | |
| Comp Parameter: | | | |
| Base Temperature: | | | |
| S1 Close: | | | 10.0 |
| Next | Prev | Cnfg | Main |

window and enter a number in this field based on the following guideline:

| Selection | Range |
|-----------|-----------------|
| Linear F | -130.0 to 212.0 |
| Linear C | -90.0 to 100.0 |

S1 Close represents the number of measurement units remaining on a preset delivery before the valve is placed in a bypass, trickle, or dwell mode. This field is only used when a two-stage valve is used in the application and is connected to the LectroCount register. An **S1 Close** value must be set for each product if presetting is being employed.

When the **S1 Close** value is reached, Solenoid 1 is deactivated and Solenoid 2 is activated.

For example: If value entered is 10 and the preset delivery is set to 100, then S1 will close and S2 will open when the register reaches 90. This reduces the delivery flow rate, slowing down the flow of product through the meter.

Press **ENTER** to open field edit window and enter a value between **0.0** and **99999.0**. It is recommended not to use a value smaller than 10% of preset volume.

Press **Next (F1)** to advance to **Screen 10c** on page 40.

Compensation Types and Parameters

| Product | VCF Type | Parameter Coefficient | Range | °Celsius/ °Fahrenheit | Tbase | Tmin | Thold | Tmax |
|---|---------------|------------------------------|-------------------------|--------------------------|-------|------|-------|------|
| General | Linear | Linear | 0 to 0.003 | °C | 15 | -90 | N/A | +100 |
| General | Linear | Linear | 0 to 0.005 | °F | 60 | -130 | N/A | +212 |
| LPG <i>USA</i> | API Table 24 | Specific Gravity | 0.5 to 0.550 | °F | 60 | -50 | -50 | +140 |
| LPG <i>Europe & Canada</i> | API Table 54 | Density kg/L | 0.5 to 0.600 | °C | 15 | -46 | -46 | +60 |
| Refined Petro- leum Products <i>Europe & Canada</i> | API Table 54B | Density kg/m ³ | 653.0 to 1075.0 | °C | 15 | -50 | -40 | +95 |
| Refined Petro- leum Products <i>USA</i> | API Table 6B | API Gravity | 0 to 85 | °F | 60 | -50 | -40 | +200 |
| General | API Table 54C | Coefficient | 0.000486 to 0.001674 | °C | 15 | -50 | -40 | +95 |
| Lube Oil <i>Europe & Canada</i> | API Table 54B | Density kg/m ³ | 800 to 1164 | °C | 15 | -50 | -40 | +95 |
| Ammonia <i>Canada</i> | NH3 | N/A | N/A | °C | 15 | -30 | -30 | +40 |

Thold is the temperature below which no additional compensation correction is applied.

Tmin and **Tmax** are the limits beyond which a diagnostic of **TEMP OUT OF RANGE** will be triggered.

Product Calibration

Screen 10c: Product Calibration (3/6)

Linearization Mode is used either to enable multi-point linearization in the LectroCount, or to disable linearization so base calibration can be set up. Press **ENTER** to open a list box window with the two options:

Setup
Applied

Select **Setup** for single-point calibration. Select **Applied** for multi-point calibration.

NOTE: Always perform initial calibration in **Setup**.

Single-point and Multi-point Calibration are covered on Pages 44-47.

Pulses/Unit represents number of pulse edges counted by the LectroCount per unit of measure. This number is also known as the product's **K-factor**. This number is used to scale **Prover Quantity**. Only gross volume applies. Press **ENTER** to open a field edit window and enter a value based on the following guideline:

| <u>Decimal Setting</u> | <u>Range</u> |
|------------------------|-------------------------|
| Whole | 2.0 to 20000.0 |
| Tenths | 20.0 to 20000.0 |
| Hundreths | 20.00 to 20000.0 |

Since this will change during calibration, leave the default value of **0** and proceed to rest of editable fields in **Product Calibration**.

Prover Quantity displays amount of product measured during the last prover run. When this value is overwritten with actual **Prover Volume** read during a calibration run, a new **Pulses/Unit** will be recalculated automatically. This field should only be edited during meter calibration.

NOTE: If this is the initial calibration for the meter, enter the rest of the **Product Calibration** data before entering this field.

Press **Next (F1)** to advance to **Screen 10d** on page 44.

| | | | |
|-----------------------------|------|----------------|------|
| PRODUCT CALIBRATION (3/6) 1 | | | |
| ▶Product #: 1 | | Units: Gallons | |
| Linearization Mode: | | Setup | |
| Pulses/Unit: | | 492.506104 | |
| Prover Quantity: | | ----- | |
| Next | Prev | Cnfg | Main |

| | | | |
|-----------------------------|------|----------------|------|
| PRODUCT CALIBRATION (4/6) 1 | | | |
| ▶Product #: 1 | | Units: Gallons | |
| Gross Quantity: | | 48.8 | |
| Gross Preset: | | 0.0 | |
| Temperature: | | 80.5 | |
| Net Quantity: | | 47.1 | |
| Next | Prev | Cnfg | Main |

Screen 10d: Product Calibration (4/6)

Gross Quantity is a read-only field. The gross quantity of fluid measured by the meter during a product calibration prover run is represented here. This is covered in detail in the sections on Single-Point Calibration and Multi-Point Calibration.

Gross Preset can be used to set a prover run volume. This represents a volume of liquid to be run through the meter during a proving run. This is covered in detail in the sections on Single-Point and Multi-Point Calibration.

Temperature displays current temperature reading of the probe. This field is not editable.

Net Quantity represents temperature compensated quantity of current delivery. This field is not editable.

Press **Next (F1)** to advance to **Screen 10e** on page 42.

Product Calibration

Screen 10e: Product Calibration (5/6)

Aux Multiplier is used to convert quantity delivered to an alternate volume or inferred mass. In order for this to be valid, the operator must furnish applicable conversion factor. For example: To convert from **GALLONS** of water to **LBS** of water, the **Aux Multiplier** value is **8.345**.

Press **ENTER** to open a field edit window and enter a value between **0.000** and **9999.999**. If this value is set to **"0"**, the **AUX MULT** value will NOT print on delivery ticket.

Aux Quantity is not an editable field. It represents current quantity of **Aux Units** for current delivery.

Aux Units is the auxiliary unit of measure that will print on the delivery ticket. Press **ENTER** to open a list box window with the following options:

- Gallons
- Litres
- Cubic M
- LBS
- KGS
- Barrels
- Other

Move pointer to desired value and press **ENTER**. This selection, as well as **Aux Quantity** will print on the delivery ticket.

Gross Totalizer is the amount of non-temperature compensated product that has passed through the meter.

Net Totalizer is the amount of temperature compensated product passed through the meter.

Press **Next (F1)** to advance to **Screen 10f** on page 43.

| | | | |
|---------------------|------|--------|---------|
| PRODUCT CALIBRATION | | (5/6) | 1 |
| ▶Product #: | 1 | Units: | Gallons |
| Aux Multiplier: | | | 0.000 |
| Aux Quantity: | | | 0.0 |
| Aux Units: | | | Other |
| Gross Totalizer: | | | 899.3 |
| Net Totalizer: | | | 877.1 |
| Next | Prev | Cnfg | Main |

| | | | |
|-----------------------------|------|--------|---------|
| PRODUCT CALIBRATION (6/6) 1 | | | |
| ►Product #: | X | Units: | Gallons |
| Linearization Mode: | | Setup | |
| Point Number: | | 1 | |
| Flow Rate: | | 0.00 | |
| Percent Error: | | 0.000 | |
| Prover Quantity: | | ----- | |
| | Prev | Cnfg | Main |

Screen 10f: Product Calibration (6/6)

Point Number represents a point on the calibration curve for Multi-Point Calibration. Up to 10 points on a curve may be calibrated for near perfect accuracy.

Move pointer to **Point Number** and press **ENTER** to open a list box window with options 1 through 10. Select a point for calibration.

Flow Rate is used during calibration to assign a rate of flow to a linearization **Point Number**. As additional **Point Numbers** are selected, a unique **Flow Rate** must be assigned to that **Point Number**. This **Flow Rate** should be the actual flow rate observed during calibration of the given **Point Number**.

Press **ENTER** to open a field edit window and enter a value in the range 0.00 to 9999.99. Use a different flow rate for each **Point Number** during calibration.

Percent Error is either calculated automatically during calibration, or it can be entered manually. This field represents the difference between meter quantity and prover quantity during a calibration run.

$$\text{Delivery Percent Error} = \frac{(\text{Prover Qty} - \text{Meter Qty})}{\text{Prover Qty}} \times 100$$

Press **ENTER** to open a field edit window and enter a value range -3.000 to 3.000.

More information on **Percent Error** is covered in the Multi-Point Calibration section.

Prover Qty represents the actual amount of product in the Volumetric Prover used for calibration. Press **ENTER** to open a field edit window and enter a value in the range -999999.999 to 999999.99. When this value is entered, the actual **Percent Error** against the base number will be calculated automatically.

For detailed information on Single Point and Multi-Point Calibration, refer to pages 44-47. If the system will not be calibrated at this point, press **Cnfg (F4)** to return to the **Screen 7** on page 28 then select **Diagnostics**. This advances the display to **Screen 11a** on page 48.

Assuming the system will be calibrated, turn to page 44. At least one product must be calibrated before deliveries can be made.

Single-Point Calibration

Single-Point Calibration (Initial Calibration) must be performed before Multi-Point Calibration. Single-Point Calibration sets the calibration curve for the meter. Multi-Point Calibration sets the percentage deviation from the curve at specific points along the curve.

Performing Single-Point Calibration requires use of a volumetric prover or other calibrated device to compare the meter delivery quantity against a standard.

As describe on page 40, **Pulses/Unit** represents the number of pulse edges counted by the LectroCount per unit of measure. Since the unit may not have been previously calibrated, leave the value set to the default value of **0.00000000**, or enter the nominal value of pulses/unit for that meter size. For example, a Liquid Controls M7 flowmeter with a 1:1 packing gland will produce a nominal 2,200 pulses per unit.

1. Ensure the LectroCount is in Calibration mode. This is accomplished by removing the switch plate and rotating the red selector switch counterclockwise to 6 o'clock position.
2. Press **START** Key on keypad.
3. Fill a reliable Volumetric Prover at a typical flow rate for the system. **Prover Quantity** will increment as the product is dispensed into the prover. This reading is based on existing value for **Pulses/Unit**.
4. After prover has been filled, press **PRINT/END** on the keypad.
5. Enter exact prover reading in the **Prover Quantity** field in place of the current value. The **Pulses/Unit** field will update based on information entered.
6. Repeat Steps 2 through 5 to verify calibration. If value read by the meter, does not match the volume measured by the prover, re-enter the **Prover Quantity** value with the new reading and repeat Steps 2 through 5 until prover quantity and meter quantity are equal.
7. Rotate LectroCount selector switch counterclockwise out of the calibration position and reattach switch plate.

Multi-Point Calibration may not be required for the application in which the system is installed. If this is the case, press **Cnfg (F4)** to return to **Screen 7** on page 28. Then move pointer to **Diagnostics** and press **ENTER** to advance to **Screen 11a** on page 48.

If desired or required to perform Multi-Point Calibration, continue to next page for detailed instructions.

| | | | |
|-----------------------------|------|----------------|------|
| PRODUCT CALIBRATION (3/6) 1 | | | |
| ▶Product #: 1 | | Units: Gallons | |
| Linearization Mode: | | Setup | |
| Pulses/Unit: | | 100.000000 | |
| Prover Quantity: | | ----- | |
| Next | Prev | Cnfg | Main |

Multi-Point Calibration

```
PRODUCT CALIBRATION (6/6) 1
▶Product #: 1 Units: Gallons
Linearization Mode: Setup
Pointer Number: 1
Flow Rate:
Percent Error:
Prover Quantity:
Prev Cnfg Main
```

Once Single Point Calibration is completed, Multi-point Calibration may be performed on the system. Multi-Point Calibration calculates percent deviation at specific points along the calibration curve. This increases overall meter accuracy across full flow range.

After determining percent deviation of the meter at a variety of flow rates and entering the information into LectroCount’s multi-point calibration table, accuracy corrections are continuously made by the LectroCount based on the measured flow rate.

There are two ways to obtain multi-point information for a flow meter:

1. Manufacturer’s data supplied with the meter can be entered directly.
2. Meter can be field calibrated by proving at various flow rates.

NOTE: It is not required to enter flow rates in any specific order. The LectroCount sorts values internally when it uses the data.

Method 1 - Manufacturer’s Data Supplied with the Meter

```
PRODUCT CALIBRATION (6/6) 1
▶Product #: 1 Units: Gallons
Linearization Mode: Setup
Pointer Number:
Flow Rate:
Percent Error:
Prover Quantity:
Prev Cnfg Main
```

Move pointer to **Point Number** and press **ENTER** to open a list box window with options of **1** to **10**. Move pointer to **1** and press **ENTER**.

Move pointer to **Flow Rate** and press enter to open a field edit window and enter a value in the range **0.00** to **9999.99**. Enter maximum flow rate shown on manufacturer’s data sheet and press **ENTER**.

Move pointer to **Percent Error** and press **ENTER** to open a field edit window and enter the error percentage corresponding to highest flow rate shown for the meter on the manufacturer’s data sheet. This field can have a value in the range **-3.000** to **3.000**.

Select up to nine additional points from the manufacturer’s data sheet to characterize the remainder of the meter’s accuracy curve and enter this data in the **Flow Rate** and **Percent Error** fields.

(Multi-point Calibration continued on Page 46.)

Multi-Point Calibration

Method 1 - Continued

When **Point Number** programming is complete, move pointer to **Linearization Mode** and press **ENTER** to open the list box window with options **Applied** and **Setup**. Move pointer to **Applied** and press **ENTER**.

This puts Linearization algorithm into effect. If error message **ADJACENT POINTS OUT OF 0.25% RANGE** is displayed, **Applied** function will not take effect. The Linearization Points will need to be re-selected to ensure no two adjacent points, based on flow rate, are more than 0.25% apart in their corresponding **Percent Error** fields.

Field prove the meter using the method described for Single-point Calibration. Assuming data provided by manufacturer is correct, it should be possible to fill a prover at any flow rate within the linearized range and obtain near perfect accuracy.

When **Setup** is selected for **Linearization Mode**, the algorithm is not activated. **Setup** should be used **during** the multi-point calibration process. **Applied** is used **after** the multi-point calibration process is completed.

Method 2 - Field Proving Technique

In situations where the meter's accuracy curve is not provided by the manufacturer, Multi-Point Calibration must be performed by proving the meter at various flow rates.

1. Ensure the LectroCount is in Calibration mode. This is accomplished by removing the switch plate and rotating the red selector switch counterclockwise to the 6 o'clock position.
2. Verify **Linearization Mode** is set to **Setup**.
3. Start a proving run by pressing the **START/RESUME** Key. Monitor **Screen 10f: Product Calibration** during this proving run. The meter should be running at normal high flow rate. **Flow Rate** field displays the current flow rate of the meter.
4. When prover is full, press **PRINT/END** Key on keypad.
5. Move pointer to **Prover Qty** and press **ENTER** to open a field edit window and enter exact quantity shown in the prover.
6. From **Screen 10f: Product Calibration**, move pointer to **Point Number** and press **ENTER** Key to open a list box window and verify **Linearization Point** is set to **1**. Press **ENTER**.
7. Press **START/RESUME** to begin a new prover run at the same flow rate as Step 3. Note the maximum flow rate observed during the proving run. When prover is full, press **PRINT/END**.
8. Move pointer to **Prover Qty** and press **ENTER** to open a field edit window and enter exact quantity shown in the prover. When this is entered, the **Percent Error** field will update to show calculated error for that flow rate.
9. Move pointer to **Flow Rate** and press **ENTER** to open a field edit window and enter the maximum flow rate observed during the run. Press **ENTER**.
10. Move pointer to **Point Number** and press **ENTER** to open a list box window and select next point number, **2**.
11. Begin a second prover run at a different flow rate. Press **START/RESUME** and monitor the display for maximum flow rate for the run. When prover is filled, press **PRINT/END**.
12. Move pointer to **Prover Qty** and press **ENTER** to open a field edit window and enter exact quantity shown in the prover. When entered, the **Percent Error** field will update to show the calculated error for that flow rate.

| | | | |
|-----------------------------|--|------|------|
| PRODUCT CALIBRATION (6/6) 1 | | | |
| Product #: 1 Units: Gallons | | | |
| Linearization Mode: Setup | | | |
| Pointer Number: | | | |
| ▶Flow Rate: | | | |
| Percent Error: | | | |
| Prover Quantity: | | | |
| Prev | | Cnfg | Main |

Method 2 - Continued

13. Move pointer to **Flow Rate** and press **ENTER** to open a field edit window and enter the maximum flow rate observed during the run. Press **ENTER**.
14. Continue proving at various flow rates using additional **Point Numbers** and repeat procedure (return to Step 8) for each additional number. A minimum of three points is recommended (high, medium, and low flow rates) to obtain a good fit to the meter's curve.

All ten points can be used to obtain optimum results. Any unused points should be left at "0.00" for **Flow Rate** and 0.000 for **Percent Error**.

15. When all the required points have been calibrated, move pointer to **Linearization Mode** and press **ENTER** to open a list box window and select **Applied**. This puts Linearization algorithm into effect. If the error message **ADJACENT POINTS OUT OF 0.25% RANGE** is displayed, **Applied** function will not take effect and more points will need to be added to ensure that no two adjacent points, based on flow rate, are more than 0.25% apart in their corresponding **Percent Error** fields.

When Linearization is complete, press **Cnfg (F4)** to return to **Screen 7** on page 28, or press **Main (F5)** to return to **Screen 2** on page 20.

From **Screen 7**, move pointer to **Diagnostics** and press **ENTER** to advance to **Screen 11a** on page 48.

Diagnostics

Screen 11a: Diagnostics (1/2)

Diagnostics screens contain LectroCount diagnostic information.

Pulser Faults represents number of false or missing pulses detected during last delivery.

Gross Count indicates current non-compensated amount passed through the metering device for the current delivery.

Flow Rate indicates the current flow rate through the metering device.

Unit of Measure indicates unit of measurement and **Flow Rate Base** the time unit used by the flow rate.

Press **Next (F1)** to advance to **Screen 11b** shown below.

| | | |
|------------------|-------|------------|
| DIAGNOSTICS | (1/2) | 1 |
| Pulser Faults: | | 0 |
| Gross Count: | | 48.8 |
| Flow Rate: | | 0.0 |
| Unit of Measure: | | Gallons |
| Flow Rate Base: | | Per Minute |
| Next | | Cnfg Main |

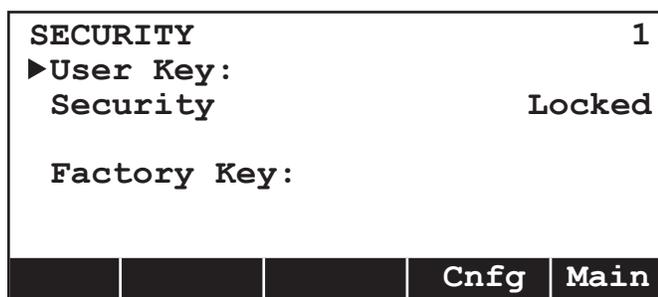
Screen 11b: Diagnostics (2/2)

The first 3 lines indicate software part numbers and versions in use by the LectroCount.

Supply Voltage represents the current voltage being supplied to the system. If supply voltage is greater than 17 volts, this reading will be inaccurate.

Press **Cnfg (F4)** to return to **Screen 7** on page 28. Move pointer to **Security** and press enter to advance to **Screen 12** on page 49.

| | | |
|--------------------|-------|------------|
| DIAGNOSTICS | (2/2) | 1 |
| Software Revision: | | SR210v4.03 |
| Language Revision: | | SL200v4.00 |
| Ticket Revision | | ST200v1.06 |
| Supply Voltage | | 13.5 |
| | Prev | Cnfg Main |



Screen 12: Security

User Key is the access code used to unlock the LectroCount. If LectroCount is currently locked, entering the correct **User Key** will unlock it. If LectroCount is currently unlocked, setting the **User Key** will change the access code used to unlock it.

Press **ENTER** to open a field edit window and enter an alphanumeric code up to ten characters in length.

After **User Key** has been programmed, the system can be unlocked by re-entering the **User Key** access code.

Move pointer to **Security** and press **ENTER** to open a list box window with options **Locked** or **Unlocked**. To lock the system, select **Locked** and press **ENTER**. To unlock the system, return to **User Key** and enter the access code.

Factory Key is for factory use only. If correct Factory Key access code is entered, the display will advance to **Screen 13a** on page 50.

If the **Factory Key** access code is not known, press **Main (F5)** to return to **Screen 2** on page 20. Move pointer to **Save Configuration** and press **ENTER** to advance to **Screen 14** on page 51.

NOTE: If Factory Key access code is required, contact the Liquid Controls Group service department.

Factory Setup

Screen 13a: Factory Setup (1/2)

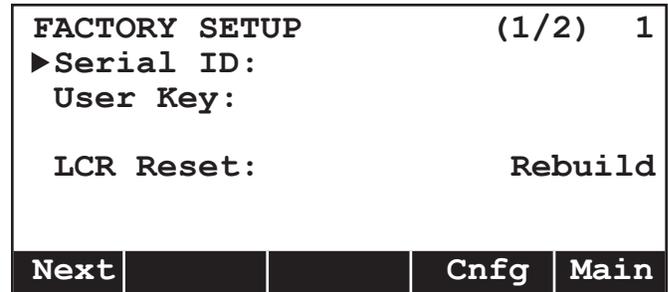
The Factory Setup screens are not accessible unless the Factory Key access is entered from **Screen 12** on page 49. This access code may be obtained from the Liquid Controls service department.

Serial ID represents serial ID of the LectroCount.

User Key allows user to set the **User Key** used to unlock the LectroCount from **Screen 12** on page 49.

LCR Reset is used to rebuild or clear all of the fields in the LectroCount.

Press **Next (F1)** to advance to **Screen 13b** shown below.



Screen 13b: Factory Setup (2/2)

R100.0 is the Raw ADC value reading when a 100.0Ω resistor was connected to the temperature probe during calibration.

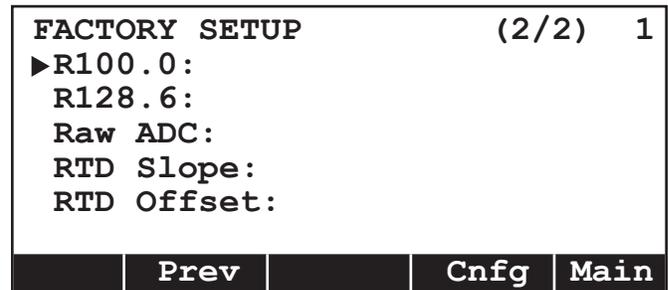
R128.6 is the Raw ADC value reading when a 128.6Ω resistor was connected to the temperature probe during calibration.

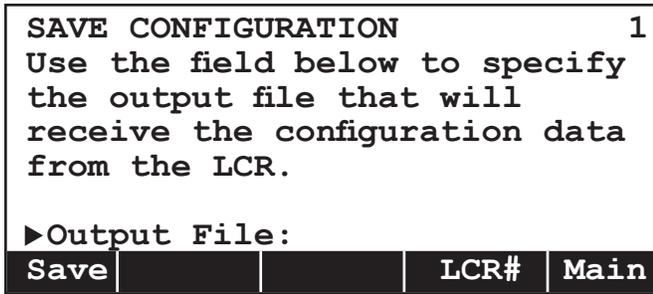
Raw ADC is the current raw ADC value.

RTD Slope is the slope used to calculate the raw temperature value from the raw ADC value.

RTD Offset is the offset used to calculate the raw temperature value from the raw ADC.

Press **Main (F5)** to return to **Screen 2** on page 20. Move pointer to **Save Configuration** and press **ENTER** to advance to **Screen 14** on page 51.





Screen 14: Save Configuration

This feature allows the user of LCRHost to save the calibration and configuration parameters of an LectroCount in a file. This file can then be used to set up other LectroCount registers with same data without having to manually enter data individually.

Press **ENTER** to open a field edit window and enter an alphanumeric **Output File** name up to 15 characters in length. When complete, press **Save (F1)** to save output file. When **Save (F1)** is pressed, system will prompt the operator with the list box window that asks if the current file should be overwritten with the selected **Output File**. Select **Yes** or **No** and press **ENTER**.

The fields saved in the output file are:

| | |
|-----------------------|------------------------------|
| DateFormat | product calibrations: |
| Decimals | Aux1 |
| FlowDirection | Aux2 |
| MeterID | AuxMult |
| NoFlowTimer | AuxUnit |
| Odometer | BaseTemp |
| PresetsAllowed | CompensationParam |
| PresetType | CompensationType |
| Printer | GrossPreset |
| PrintGrossAndParam | GrossTotal |
| PulseOutputEdge | Linearize |
| PulsesPerDistance | NetPreset |
| QtyUnits | NetTotal |
| Residual | PercentTax |
| SaleNumber | PricePerUnit |
| TempScale | ProductCode |
| TicketNumber | ProductDescriptor |
| TicketRequired | ProductType |
| TimeUnit | PulsesPerUnit |
| UnitID | S1Close |
| VolCorrecteDMS i1000g | TaxPerUnit |

For each of the four

For each of the 10 linearization points:

LinearFlowRate
LinearError

For each of the 12 ticket header lines:

TicketHeaderLine

Press **Main (F5)** to return to **Screen 2** on page 20. Move pointer to **Load Configuration** and press **ENTER** to advance display to **Screen 18** on page 52.

Load Configuration

Screen 15: Load Configuration

The Load Configuration feature loads a LectroCount with calibration data previously saved with Save Configuration option.

Press **ENTER** to open a list box window which contains a list of all previously saved configurations. Select desired **Input File** and press **ENTER**. After the Input File has been selected, press **Load (F1)** to load the configuration data to the LectroCount. When **Load** is selected, the system will prompt the operator with the a list box window that asks if the current file should be overwritten with the selected **Input File**. Select **Yes** or **No** and press **ENTER**.

NOTE: For this function to be implemented, the LectroCount register must be in calibration mode.

| | |
|--|------------------|
| LOAD CONFIGURATION | 1 |
| Use the field below to select the input file that contains the configuration data that is to be sent to the LCR. | |
| ▶ Input File: | |
| Load | LCR# Main |

Making Deliveries with LCRHost

Preset and Delivery

Screen 19a: Preset and Delivery (1/7)

When power is applied to the LectroCount DMS i1000, the system runs diagnostics internally. If the system detects the LCRConfig.slf file does not exist, **Screen 1** on page 19 will be displayed. If the LCRConfig.slf file does exist, the display will advance to the first of the Preset and Delivery screens as shown to the right.

The first line displays the active **Product #** and its unit of measure. The unit of measure was defined in System Calibration and cannot be changed from this screen. The **Product #** can be changed by positioning the pointer on **Product #** and pressing the **ENTER** key. This opens a list box window which will contain the product numbers of all calibrated products. Select desired product number to be delivered and press **ENTER**.

The next three items are preset values. A preset delivery can be made based on Price, Net volume, or Gross volume. The column under **Delivery** displays last delivered values for each.

Price is used to set a preset delivery based on total price. Move pointer to **Price** and press **ENTER** to open a field edit window. Enter a value representing the total price for the delivery, for example, **200.00** dollars. The delivery will automatically end when this value, or a value near this (without exceeding it), is reached. The value may not be exactly **200.00** as the volume delivered may not translate exactly to **200.00**. For instance, a preset of **200.00** is entered and the price per unit volume is **1.27**. This would result in a Gross volume delivery of \$200.00 ÷ \$1.27 = 157.48031. If the decimal setting is whole, this will show up as 157. This then results in a delivery of 157 x \$1.27 = \$199.39.

Net and **Gross** are both preset deliveries based on volume (as apposed to price). If the preset delivery is a temperature compensated delivery, use **Net** for the preset delivery. If the delivery is not temperature compensated, use **Gross** for the preset delivery.

Move pointer to either **Net** or **Gross** and press **ENTER** to open a field edit window. This preset value can have the following range based on the decimal setting: _____

| Decimal Setting | Range |
|-----------------|--------------------|
| Whole | 0 to 10,000,000 |
| Tenths | 0.0 to 1,000,000.0 |
| Hundreths | 0.00 to 100,000.00 |

Enter desired value and press **ENTER** to accept.

Preset Type defines how preset values are handled after a delivery is complete. Move pointer to **Preset Type** and press **ENTER** to open a list box window with the following options:

| | | | |
|------------------------------------|---------------|-----------------------|-------------|
| PRESET AND DELIVERY (1/7) 1 | | | |
| ▶ Product #: 1 | | Units: Gallons | |
| | Preset | Delivery | |
| Price: | | | 0.00 |
| Net: | 0.0 | | 47.1 |
| Gross: | | | 48.8 |
| Preset Type: | | | Clear |
| Next | Status | LCR# | Main |

Clear: This option clears the preset value after a delivery. This requires the operator to enter a preset amount prior to each delivery where a preset delivery is desired.

Multiple: This option pauses the delivery when the preset value is reached. The delivery can then be continued by the same preset amount when it will pause again. When the delivery is completed, the preset amount will clear. If the No-Flow Timer times out during a pause, the delivery will end and a ticket will print out.

Inventory: This option is similar to the Multiple option with the exception that the preset value is not reset to the original value when the pause occurs. This option is typically used to monitor the inventory on the delivery vehicle. The delivery can then be ended by pushing the **PRINT/END** key on the DMS i1000 Lap Pad.

Retain: This option is similar to Clear. The delivery ends when the preset value is reached, however, the preset value is not cleared. For instance, if a Gross preset is set to **100** gallons, it will reset to **100** gallons at the end of each delivery, until it is changed by the operator. The retain value will reflect the last programmed preset value.

Press **Next (F1)** to advance to **Screen 19b** on page 55.

Press **Stat (F3)** to advance to **Screen 21** on page 60.

Press **LCR# (F4)** to select a different LCR for the delivery.

Press **Main (F5)** to return to **Screen 2** on page 20.

| | | | | |
|-----------------------------|------|--------|---------|------|
| PRESET AND DELIVERY (2/7) 1 | | | | |
| ▶Product#: | 1 | Units: | Gallons | |
| Product Code: | | | | |
| Name: | | | | |
| Price/Unit: | | | 0.0000 | |
| Tax/Unit: | | | 0.0000 | |
| Percent Tax: | | | 0.0000 | |
| Next | Prev | Status | LCR# | Main |

Screen 19b: Preset and Delivery (2/7)

The second Preset and Delivery screen continues with defining the parameters of a delivery. The **Product #** will be carried forward from the previous screen, but it can be changed again in this screen.

Product Code will display the current product code associated with the product number as set up in the calibration screens. **Name** will also reflect the name associated with the product number.

Price/Unit is used to set the price per unit volume as defined by **Units**. For instance, if **Units** is **Gallons** then this represents price per gallon. If **Units** is changed to **Litres** then the price represents price per litre. Move the pointer to **Price/Unit** and press **ENTER** to open a field edit window. Enter a value in the range **-9999.9999** to **9999.9999**.

Tax/Unit is used to set the tax per unit volume as defined by **Units**. Move the pointer to **Tax/Unit** and press **ENTER** to open a field edit window. Enter a value in the range **-9999.9999** to **9999.9999**. For instance, if the **Tax/Unit** is **.034** and the total delivery volume is 300 units, then the total Tax/Unit is $\$.034 \times 300 = \10.20 . This is added to the sale.

Percent Tax is used to set the percent tax rate. Move the pointer to **Percent Tax** and press **ENTER** to open a field edit window. Enter a value in the range **-1000.0000** to **1000.0000**. This value is determined by the sale price multiplied by a percentage. For instance, if the delivery results in a charge of \$200.00, and the **Percent Tax** entered is **6.5**, then percent tax charged is $200.00 \times .065 = 13.00$. This value will be added to \$200.00 to get \$213.00.

The total sale for the delivery is then calculated as:

| |
|---|
| Price/Unit total |
| + Tax/Unit total |
| + Percent Tax X Price/Unit total |
| \$Total Sale |

So, if **Price/Unit = 1.10**, **Tax/Unit = 0.25**, and **Percent Tax = 6.5** and **100** units was delivered, the total charge for the delivery would be:

| | |
|------------------------|-----------------|
| \$1.10 x 100 = | \$110.00 |
| \$0.25 x 100 = | \$ 25.00 |
| 0.065 x \$110 = | \$ 7.15 |
| Total | \$142.15 |

Press **Next (F1)** to advance to **Screen 19c** on page 56.

Press **Prev (F2)** to return to **Screen 19a** on page 54.

Preset and Delivery

Screen 19c: Preset and Delivery (3/7)

The third Preset and Delivery screen is used to set a few delivery options. **Product #** and **Units** will reflect values selected in the previous screens.

Product Type is the current product type associated with the selected **Product #** as defined in the Calibration screens.

Aux1 and **Aux2** are used to define the function of auxiliary outputs 1 and 2. If there are no external devices attached to these two outputs, there is no need set these values. Move the pointer to **Aux1** and press **ENTER** to open a list box window with the following options:

Monitor Flow Rate: This option causes auxiliary 1 to activate at the beginning of each delivery. If the flow rate during the delivery meets or exceeds 40 units per minute, auxiliary 1 will deactivate. This option is typically used to monitor the amount of restriction in a strainer basket or filter. The idea being, when the filter or strainer is getting clogged, the flow rate will decrease.

Off: This option deactivates auxiliary 1.

On: This option activates auxiliary 1. It remains activated even when a delivery is not taking place.

On During Delivery: This option activates auxiliary output only when the system is in an active delivery. This also causes header line 11 to print on the ticket.

Move the pointer to **Aux2** and press **ENTER** to open a list box windows with the following options:

Flow Direction: This option causes auxiliary 2 to indicate the flow direction through the flow meter.

Off, On, On During Delivery are all defined as in **Aux1** above. If set to **On During Delivery**, header line 12 will print on the ticket.

No-Flow Timer is used to set the no flow timer for the next delivery. Move the pointer to **No-Flow Timer** and press **ENTER** to open a field edit window. Enter a value between "0" and **3600** seconds. This timer will end an active delivery if there is no flow through the meter in the set amount of time. If this value is set to "0", then each delivery ticket will contain the text "**MULTIPLE DELIVERIES AT ONE SITE**". This value is typically set to **180** (3 minutes).

Press **Next (F1)** to advance to **Screen 19d** on page 57.

| | | | | |
|-----------------------------|----------------|--------|--------------------|----------|
| PRESET AND DELIVERY (3/7) 1 | | | | |
| ▶ | Product#: | 1 | Units: | Gallons |
| | Product Type: | | | Gasoline |
| | Aux1: | | On During Delivery | |
| | Aux2: | | Flow Direction | |
| | No-Flow Timer: | | | 180 |
| Next | Prev | Status | LCR# | Main |

| | | |
|---------------------|-------|--------|
| PRESET AND DELIVERY | (4/7) | 1 |
| Header Text | | |
| ▶ 1: | | |
| 2: | | |
| 3: | | |
| 4: | | |
| 5: | | |
| Next | Prev | Status |
| LCR# | Main | |

Screen 19d: Preset and Delivery (4/7)

These two screens allow the operator to customize the header text information that appears on a delivery ticket. For detailed information on entering header text information, refer to page 31.

| | | |
|---------------------|-------|--------|
| PRESET AND DELIVERY | (5/7) | 1 |
| Header Text | | |
| ▶ 6: | | |
| 7: | | |
| 8: | | |
| 9: | | |
| 10: | | |
| Next | Prev | Status |
| LCR# | Main | |

Screen 19e: Preset and Delivery (5/7)

Press **Next (F1)** to advance to **Screen 19f** on page 58.

Preset and Delivery

Screen 19f: Preset and Delivery (6/7)

This screen contains information relating to the operator's shift. Assuming that the shift information was reset after the last shift was completed, these values should all initially be "0".

NOTE: If an operator is beginning a shift and wants shift information available at the end, then the shift totals from a previous shift should be cleared. This is done on **Screen 19g** shown below.

Assuming that the shift totals were cleared, this screen updates with shift information throughout the day.

Deliveries indicates the number of deliveries made.

Shift Net indicates the total temperature compensated volume delivered during the shift.

Shift Gross indicates the total non-temperature compensated volume delivered during the shift.

Press **Next (F1)** to advance to **Screen 19g** shown below.

| | | | | |
|-----------------------------|------|----------------|------|------|
| PRESET AND DELIVERY (6/7) 1 | | | | |
| ▶Product #: 1 | | Units: Gallons | | |
| Product Type: | | Gasoline | | |
| Deliveries: | | 8 | | |
| Shift Net: | | 403.5 | | |
| Shift Gross: | | 415.5 | | |
| Next | Prev | Status | LCR# | Main |

Screen 19g: Preset and Delivery (7/7)

This screen contains the date and time that a shift began. It also allows the operator to reset the shift totals.

Clear Shift? is used to reset the shift totals to "0". Move the pointer to **Clear Shift?** and press **ENTER** to open a list box window with the options **Yes** or **No**. Select "**Yes**" to clear the shift values. Select "**No**" to cancel the clear shift command.

Press **Stat (F3)** to advance to **Screen 21** on page 60.

| | | | | |
|--------------------------------|--|--------|------|------|
| PRESET AND DELIVERY (7/7) 1 | | | | |
| Shift Start: 01/13/05 15:40:59 | | | | |
| ▶Clear Shift? | | No | | |
| Prev | | Status | LCR# | Main |

LCR #xxx not found.
Check the LCR to ensure it
has power applied and that
its communications cable is
connected to the DMS i1000.
Press F1/Dlvy or F4/LCR# when
ready to attempt to reconnect.

| | | | |
|------|--|------|------|
| Dlvy | | LCR# | Main |
|------|--|------|------|

Screen 20: Device Not Found

Once the active LCRs are set up, **LCR# (F4)** can be used to switch between the active LCRs. Assuming that only one LCR has been set up, **LCR# (F4)** will open a list box window with only one item to select. If there are two LCRs configured, the list box window will contain two items to choose from.

If the operator opens the list box window for **LCR#**, selects an LCR, and the LCR is no longer communicating, then **Screen 20** will display, letting the operator know that there is a problem communicating with the **LCR#** selected. This may be a simple issue of a disconnected cable or power has been removed from the LCR.

This screen will also appear anytime communication with the active LCR is lost.

Machine Status

Screen 21: Machine Status

The Machine Status screens contain many indicators of current system conditions. From this screen the operator can access printer status, delivery status, and delivery code information.

State indicates the current state of the LCR. It will display one of the following indicators:

- Run
- Stop
- End Delivery
- Auxiliary
- Shift
- Calibrate
- Waiting for No-Flow
- Unknown

Printing? indicates whether or not the attached printer is currently printing text. This will either be **Yes** or **No**.

Other Errors indicates if there are any other errors being reported by the LCR. This will either be **Yes** or **No**.

Press **Diag (F1)** open a list box window with the options **Yes** and **No**. Select "**Yes**" to print a diagnostic ticket.

Move the pointer to:

Printer Status and press **ENTER** to advance to **Screen 22a** on page 61.

Delivery Status and press **ENTER** to advance to **Screen 23a** on page 62.

Delivery Code and press **ENTER** to advance to **Screen 24a** on page 63.

| | | | |
|-----------------------|---------------------|-------------|-------------------------|
| MACHINE STATUS | | (1/2) | 1 |
| Security: | Unlocked Idle | | |
| Switch: | Shift Print | | |
| State: | Waiting for No-Flow | | |
| Printing? | No | | |
| Other Errors? | Yes | | |
| Next | | Diag | LCR# Exit |

| | | | |
|-------------------------|-------------|-------------|-------------|
| MACHINE STATUS | | (2/2) | 1 |
| ▶ Printer Status | | | |
| Delivery Status | | | |
| Delivery Code | | | |
| | Prev | Diag | LCR# |

| | | |
|---------------------|--------|----|
| PRINTER STATUS | (1/2) | 1 |
| Delivery Ticket? | | No |
| Shift Ticket? | | No |
| Diagnostic Ticket? | | No |
| Pass-Through Print? | | No |
| Next | Status | |

Screen 22a: Printer Status (1/2)

The printer status screens display current status information for the printer. In all cases, the printer status fields will display either **Yes** or **No**. If **Yes** appears by a field, then the printer is currently executing that function. For instance, while a delivery ticket is being printed, **Delivery Ticket?** and **Printer Busy?** will change to **Yes**.

Delivery Ticket indicates that a Delivery Ticket has been requested.

Shift Ticket indicates that a Shift Ticket has been requested.

Diagnostic Ticket indicates that a Diagnostic Ticket has been requested.

Pass-Through Print indicates that a line of text that will print has been given to the LectroCount from the host computer .

Press **Next (F1)** to advance to **Screen 22b** shown below.

| | | |
|----------------|--------|----|
| PRINTER STATUS | (2/2) | 1 |
| Printer Error? | | No |
| Printer Busy? | | No |
| Prev | Status | |

Screen 22b: Printer Status (2/2)

Printer Error indicates if there is an error detected with the printer.

Printer Busy indicates the print processor has begun to print a ticket.

Press **Stat (F3)** to return to **Screen 21** on page 60.

Delivery Status

Screen 23a, b, c, d: Delivery Status (1/4, 2/4, 3/4, 4/4)

The Delivery Status and Delivery Code screens contain information relative to the delivery.

ROM Check Sum indicates if a delivery could not be started due to the checksum of the LectroCount program code space failing.

Temperature indicates if the currently delivery was not started or was terminated due to an error detected with the temperature reading hardware.

Watchdog indicates if the processor was reset due to a LectroCount watchdog timeout error.

VCF Setup indicates if there was an error setting up the volume compensation factor for the current product.

VCF Domain indicates if the temperature of the product being delivered is outside the valid range for the compensation type of the product.

Meter Calibration indicates if an error occurred while setting up the meter calibration for the current delivery.

Pulser Failure indicates if the current delivery was terminated due to too many pulser faults.

Preset Stop indicates if a gross or net preset volume has been reached.

No-Flow Stop indicates if the current delivery was stopped due to no flow being detected through the meter for a specified amount of time.

Stop/Pause Request indicates if the STOP/PAUSE Key was pressed on the keypad during an active delivery.

Print/End Request indicates if the PRINT/END Key on the keypad was pressed during an active delivery.

Power Failure indicates a delivery ended due to a power fail condition for more than 15 seconds.

Preset Error indicates if a delivery ended due to an error condition while attempting to set up a gross or net preset.

RS-232 Lap Pad indicates if the RS-232 Lap Pad has been disconnected from the LectroCount during an active delivery.

Printer indicates if the current delivery requires a ticket to be printed and the printer is either off-line or busy.

Data Access indicates if a data access error occurred during a delivery which was critical to the delivery.

| | | | |
|------------------------|--|---------------|-----------|
| DELIVERY STATUS | | (1/4) | 1 |
| ROM Check Sum? | | | No |
| Temperature? | | | No |
| Watchdog? | | | No |
| VCF Setup? | | | No |
| Next | | Status | |

| | | | |
|---------------------------|-------------|---------------|-----------|
| DELIVERY STATUS | | (2/4) | 1 |
| VCF Domain? | | | No |
| Meter Calibration? | | | No |
| Pulser Failure? | | | No |
| Preset Stop? | | | No |
| Next | Prev | Status | |

| | | | |
|----------------------------|-------------|---------------|-----------|
| DELIVERY STATUS | | (3/4) | 1 |
| No-Flow Stop? | | | No |
| Stop/Pause Request? | | | No |
| Print/End Request? | | | No |
| Power Failure? | | | No |
| Next | Prev | Status | |

| | | | |
|------------------------|-------------|---------------|-----------|
| DELIVERY STATUS | | (4/4) | 1 |
| Preset Error? | | | No |
| RS-232 Lap Pad? | | | No |
| Printer? | | | No |
| Data Access? | | | No |
| | Prev | Status | |

| | | |
|------------------|--------|----|
| DELIVERY CODE | (1/4) | 1 |
| Delivery Ticket? | | No |
| Shift Ticket? | | No |
| Flow Active? | | No |
| Delivery Active? | | No |
| Next | Status | |

| | | |
|----------------------|-------|--------|
| DELIVERY CODE | (2/4) | 1 |
| Gross Preset Active? | | No |
| Net Preset Active? | | No |
| Stop/Gross Preset? | | No |
| Stop/Net Preset? | | No |
| Next | Prev | Status |

| | | |
|----------------------|-------|--------|
| DELIVERY CODE | (3/4) | 1 |
| VCF Active? | | Yes |
| S1 Closed? | | No |
| Delivery Beginning? | | No |
| New Delivery Queued? | | No |
| Next | Prev | Status |

Screen 24a, b, c: Delivery Code (1/4, 2/4, 3/4)

Delivery Ticket? indicates that a delivery ticket is pending. A new delivery cannot be started until this field is cleared by successfully printing the last delivery ticket.

Shift Ticket? indicates that a shift ticket has been requested and is waiting to be printed.

Flow Active? indicates flow is active during a delivery. The field is turned on and off with the **Delivery Active?** field but is also turned off when a delivery is paused and turned back on when it is resumed.

Delivery Active? indicates that a delivery is active. The field is turned on just before the **Delivery Beginning?** field is turned off and is turned off at the end of the delivery.

Gross Preset Active? indicates the current delivery is delivering a gross preset quantity. When this quantity is reached the delivery will either end or pause depending on the type of preset being run.

Net Preset Active? indicates the current delivery is delivering a net preset quantity. When this quantity is reached the delivery will either end or pause depending on the type of preset being run.

Stop/Gross Preset? indicates the current delivery has been stopped due to the gross preset value being reached. Depending on the type of preset being run, the delivery will either terminate or pause.

Stop/Net Preset? indicates the current delivery has been stopped due to the net preset value being reached. Depending on the type of preset being run, the delivery will either terminate or pause.

VCF Active? indicates that the current product will be temperature volume compensated during delivery.

S1 Closed? indicates the status of the S1 solenoid. This is **No** at the beginning of a delivery and **Yes** when solenoid 1 is closed due to the remaining gross or net preset value being less than or equal to the value in the **S1 Close** field. See page 32 for a discussion of the **S1 Close** field.

Delivery Beginning? indicates that a delivery is in the process of being started. Once the delivery has been started successfully, this field is turned off.

New Delivery Queued? indicates that a new delivery has been queued in the LCR. This condition occurs when a **Run** command is issued and the switch is in the **STOP**, **PRINT**, or **SHIFT PRINT** position.

Press **Next (F1)** to advance to **Screen 24d** on page 64.

Delivery Code

Screen 24d: Delivery Code (4/4)

Init Warning? indicates that a Flash data access error occurred during a delivery which was not critical to the delivery but that a default was used in place of the data that was attempting to be read.

Config Event? indicates that a configuration event has occurred. This field is set when one or more of the following fields are changed while in calibration mode:

- Auxiliary Multiplier
- Auxiliary Unit of Measure
- Base Temperature
- Compensation Parameter
- Compensation Type
- Decimal Setting
- Flow Direction
- Flow Rate Time Scale
- Gross Meter Totalizer
- Meter ID
- Net Meter Totalizer
- Print Gross Volume and Compensation Parameter Flag
- Print Volume Corrected Message Flag
- Printer Type
- Product Type
- Residual Processing
- S1 Close
- Sale Number
- Temperature Offset
- Temperature Scale
- Ticket Number
- Ticket Required Flag
- Unit of Measure

This field is cleared when a Calibration ticket is printed.

Calib Event? indicates that a calibration event has occurred. This field is **Yes** when one or more of the following fields are changed while in calibration mode:

- Enabling or Disabling the Multi-Point Linearization Algorithm
- Flow Rate for a Linearization Point
- Percent Error for a Linearization Point
- Pulses/Unit

This field is **No** when a Calibration ticket is printed.

Press **Stat (F3)** to return to **Screen 21** on page 60.

| | | |
|---------------|--------|-----|
| DELIVERY CODE | (4/4) | 1 |
| Init Warning? | | No |
| Config Event? | | Yes |
| Calib Event? | | No |
| Prev | Status | |

LCP File Server Application

LCP File Server

Screen 1: LCP File Server

The LCP File Server application provides access to the hard drivers in the DMS i1000 from the DMS i1000 Lap Pad or other computer systems.

When the application is initialized, a copyright notice will display for approximately two seconds. Depending on the contents of the DMS i1000 internal flash card, the display will remain on **Screen 1** shown to the right or advance to **Screen 5** on page 69.

To setup the LCP File Server, press **Init (F5)** to advance to **Screen 2** shown below. To exit from this application, press **ALT** and **ESC** together to return to **DMS i1000Menu** on page 16.

```
LCP File Server (DMS i1000)
v1.00

Welcome to LCP File Server!

To set up the file server, go
to the SETUP LCP FILE SERVER
```

Screen 2a: Setup LCP File Server (1/2)

Language is used to select the user interface language that will display on the DMS i1000 Lap Pad for the LCP File Server application. Press **ENTER** to open a list box window containing a list of languages available. Move the pointer to the desired language and press **ENTER** to accept.

Number of File Handles is the number of files that the LCP File Server will allow opened at one time on the DMS i1000 computer. The default value for this field is **3**, however, if the office computer needs access to more than three files simultaneously, this field can be changed to a larger value. Press **ENTER** to open a field edit window and enter a value from **3** to **255**.

LCP Node Address is the address of the DMS i1000 computer that the office computer will refer to when sending an LCP File Server request (using a wireless transmitter). This field can contain any value from **1** to **255**, and should match the value being used by the office computer that is accessing the files on the DMS i1000 computer. This value should be unique for each DMS i1000 system. For example, each vehicle with a DMS i1000 system would be assigned a unique **LCP Node Address** so the office computer can identify which vehicle it is communicating with.

Press **ENTER** to open a field edit window and enter the desired value.

Port shows the communications port assigned to the file server along with its baud rate.

Press **Next (F1)** to advance to **Screen 2b** on page 67.

Press **Port (F3)** to advance to **Screen 3** on page 68.

Press **Vers (F4)** to advance to the **DMS i1000 About Display** on page 12.

Press **Srvr (F5)** to advance to **Screen 5** on page 69.

```
SETUP LCP FILE SERVER (1/2)
▶Language: English

Number of File Handles: 3

LCP Node Address: 1
Port: COM1 at 115200 Baud
Next | Port | Vers | Srvr
```

Screen 2b: Setup LCP File Server (2/2)

This screen allows the operator to determine whether the LCP File Server application should boot up with **Caps Lock On** or **Off**, and whether LCP File Server should boot up with the system set with **Insert On** or **Off**.

Device displays the current LCP File Server device number. This is selected from a list box of available devices with which to communicate. If no **Device** numbers are available, the screen below will display prompting the operator to enter a **New Device** number.

Move the pointer to **Device** and press enter. If devices were configured by the office computer, they will be displayed in a list box that can contain one or multiple options. Move the pointer to the desired **Device** and press **ENTER** to accept. When the **Device** is selected, the **Name** field is populated with its name, if provided. The **Device** can refer to any device with which this DMS i1000 system can communicate. This can be the office computer, another truck, or some other defined component.

Name displays the name of current LCP File Server device. This field is editable. Move the pointer to **Name** and press **ENTER** to open a field edit window. Enter the desired **Name** and press **ENTER** to accept. This name is now associated with the **Device**.

To enter a new **Device**, press **New (F3)** to open a field edit window and enter a unique value between **1** and **255**. Press **ENTER** to accept the value. Move the pointer to **Name** and press **ENTER** to open a field edit window and type in a **Name** for the new **Device**.

To delete a device from the list, simply select the desired **Device** from the list box, then press **Del (F4)** to delete that device from the system.

NOTE: **Device** and **Name** are fields associated with communication through a wireless transmitter. These fields can be ignored when using a wired connection.

Press **Prev (F2)** to return to **Screen 2a** on page 66.

Press **New (F3)** to add a new device number.

Press **Del (F4)** to delete the current selected device number.

Press **Srvr (F5)** to advance to **Screen 5** on page 69.

From **Screen 2a** on page 66, press **Port (F3)** to advance to **Screen 3** on page 68.

```
SETUP LCP FILE SERVER      (2/2)
Startup Caps Lock:         Off
Startup Insert Flag:       Off

-----FILE SERVER DEVICES-----
Device:
Name:
Prev      New      Del      Srvr
```

```
SETUP LCP FILE SERVER      (2/2)
Startup Caps Lock:         Off
Startup Insert Flag:       Off

-----FILE SERVER DEVICES-----
Use F3/New to specify the node
addresses used in the network.
Prev      New      Srvr
```

Setup LCP File Server

Screen 3: Setup LCP File Server Port

Port is the communications port designation and interrupt request used by the LCP File Server to communicate with the host computer. Press **ENTER** to open a list box window with the options:

COM1
COM2
COM3
COM4

Use Base Address of UART

Select the desired option and press **ENTER**. This advances the display to a list box window with options for interrupt request (**IRQ**). Select a value for **IRQ** from the list between "2" and "15" and press **ENTER**.

Bits/second (Baud) is the baud rate used by the LCP File Server to communicate with the host computer. Press **ENTER** to open a list box window with the options:

2400
4800
9600
19200
57600
115200

Select the desired baud rate and press **ENTER**.

Tx Enable Bit is the transfer enable bit used with the LCP File Server is used in an RS-485 network.

The LCP File Server allows a network of computers to be accessed by one office computer. To do this requires the use of an RS-485 communications device. Because an RS-485 device cannot transmit and receive data simultaneously, there is a mechanism used by the device that indicates whether it should be prepared to receive data, or to transmit data. This mechanism is called the Transmit Enable Bit.

Press **ENTER** to open a list box window with the following options:

IDTR
IRTS
!RTS!DTR
DTR
None
RTS
RTSDTR

If using an RS-232 link to the office computer, this field should be set to "None" Otherwise, set this field to the value used by the RS-485 device that is connected to the DMS i1000 computer. The literature that came with the RS-485 device should provide this information.

```
SETUP LCP FILE SERVER PORT
▶Port:          COM3 using IRQ 10
Bits/Second (Baud):  115200
Tx Enable Bit:      None
Maximum Retries:    1
Timeout (ms):      100
Exit
```

Maximum Retries is the number of retries that will automatically occur in the event that the host computer does not respond to a request message. The default value for this field is 1, but it can be increased if it is determined that the communications cable is in an electrically noisy environment. Press **ENTER** to open a field edit window and enter a value between 0 and 255.

Timeout is the amount of time, in milliseconds, that the LCP File Server will wait for a response from the office computer before it decides that no response is coming. At this time, it determines the office computer to be off-line. The default value for this field is 100 ms. Press **ENTER** to open a field edit window and enter a value between 100 and 9999.

NOTE: All of these fields are associated with communication through a wireless transmitter. These fields can be ignored when using a wired connection.

Press **Exit (F5)** to return to **Screen 2a** on page 66.

Press **Srvr (F5)** to advance to **Screen 5** on page 69.

Screen 4: File Management

This screen is used to manage the files located on the DMS i1000 Module internal flash memory or the USB flash memory. The quantity of files displayed depends on the number of files actually on the DMS i1000 Module internal flash memory or USB flash memory and the filtering set up under the command menu.

The first line displays the driver letter and node address, the total disk space, and the amount of free or unused memory on the drive. The second line displays the active directory on the left and the current file mask on the right.

Files with a diamond are “tagged” files. Files are tagged by moving the pointer to the file and pressing the **ENTER** key. If the file isn’t tagged, the diamond appears designating that the file is tagged. Pressing **ENTER** a second time toggles the diamond off and untags the file.

File Server Commands is accessed by pressing **Cmnds (F3)**. This opens a list box window with all available commands.

File Server Command List

B: Copy SLF Files by Record - This command copies all SLF format files by record. Once each record is copied, it is deleted from the source file. File format designation appears on page 70.

C: Copy Tagged Files - This command copies all tagged files, but leaves the source files intact.

D: Delete Tagged Files - This command deletes all the tagged files from the DMS i1000 Module internal flash memory.

E: Set the Directory - This command is used to set the directory.

I: Initialize LCPFS - This command is used to exit this **File Management** screen and open **Screen 2a** on page 66.

K: Set the Drive - This command is used to designate the active disk drive. For example: C:\, D:\.

L: List All Files by Mask - This command lists all files based on the current file mask.

M: Set the File Mask - This command sets the file mask. The mask is a file filter. For example: if the file mask is “*.trn”, then “L: List All Files by Mask” will show all files (and only those files) with the extension “.trn”.

R: Rename Selected File - This command sets the active directory. For example: C:\DMS i1000.

S: Show All Tagged Files - This command is used to display all tagged files.

| | | |
|---------------|-------------|-------------|
| C: | Size: 62.3M | Free: 59.1M |
| DMS i1000 | • | *.* |
| ◆C500L000.LNG | 09/23/05 | 12:45 |
| CASH.SLF | 09/23/05 | 12:45 |
| COMPTRAN.TRN | 09/23/05 | 12:45 |
| ▶◆CONFIG.SLF | 09/23/05 | 12:45 |
| CUSTACCT.SLF | 09/23/05 | 12:45 |
| Home | PgUp | Cmnds |
| | PgDn | End |

| | | | |
|-----------------------------|--------------------------|--|------|
| File Server Commands | | | |
| B: | Copy SLF Files by Record | | |
| C: | Copy Tagged Files | | |
| D: | Delete Tagged Files | | |
| E: | Set the Directory | | |
| I: | Initialize LCPFS | | |
| K: | Set the Drive | | |
| Home | PgUp | | PgDn |
| | | | End |

T: Tag All Files by Mask - This command tags all files that match the current file mask set by “M: Set the File Mask”.

U: Untag All Files - Untags all files.

ENTER: Tag/Untag File - The **ENTER** key is used to toggle a file between tagged and untagged.

Each one of these commands can be accessed without entering the **Cmnds (F3)** list box. The DMS i1000 Lap Pad has short cuts for each command. These short cuts are accessed by holding the **SHIFT** key and then pressing the letter associated with a command. For example, pressing **SHIFT** and “T” will tag all files that match the current mask. The only command that does not require the **SHIFT** key is the **ENTER: Tag/Untag File** command. When the pointer is next to a file, pressing **ENTER** will toggle between tagging and untagging that file.

As there are more commands than lines available on the display, use the function keys or arrow keys to access commands lower in the list, or use the short cuts.

File Management

File Extension Designation

File extensions are used to indicate the type of file. The list below provides a description of all types of file extensions used by LectroCount DMS i1000. Care should be taken not to delete any files that are critical to the LectroCount DMS i1000 operation or for making deliveries.

For example, the “.SLF” files contain information such as the customer data base, the logon data base, configuration files, ticket configuration files, application information, and others. These “.SLF” files are typically created by the office software and can be reinstalled on the DMS i1000 Module internal flash memory using the USB flash memory device.

NOTE: Files with extensions “.BAT”, “.COM”, “.EXE”, “.LNG”, and “.SYS” are critical to LectroCount DMS i1000 operation. Deletion of any files with these extensions could lead to complete system failure. These files are not created or configured by the office program, they are resident on the DMS i1000 Module internal flash memory.

To create a backup of the LectroCount DMS i1000 Module internal flash memory, follow the instructions for “**Create DMS i1000 Image**” on page 15.

| Extension | Description | Format |
|------------------|---|---------------|
| .BAT | DOS batch files | Text |
| .COM | Tiny memory model DOS application | Binary |
| .EXE | DOS application | Binary |
| .LCR | LCR configuration file generated by LCRHost | SLF* |
| .LNG | Language file | SLF |
| .SLF | Application specific database file | SLF |
| .SLS | SLF session file | Binary |
| .SLT | SLF transaction file | Binary |
| .SYS | DOS device driver loaded during system boot | Binary |
| .TRA | Archived transaction file | SLF |
| .TRN | Original transaction file | SLF |

*SLF is “Skip List File”.

Software Menu Maps

Software Menus - DMS i1000Menu

DMS i1000Menu

DMS i1000 Delivery
LCRHost
LCP File Server

Send Transactions to Office
Receive Database from Office

SYSTEM UTILITIES

Language
DMS i1000 Password
DMS i1000 Date Format
DMS i1000 Date
DMS i1000 Time

Startup Caps Lock
Startup Insert Flag
Office Node Address
Office Path
USB Path

Upgrade DMS i1000 Software
Create DMS i1000 Image

Software Menus - LCRHost

DMS i1000 About Display

Support SDKs
LCLCLCP
LCLCLCPF
LCLCLib
LCLCTIO
LCLCWIN

SETUP NETWORK PORT

Port
Bits/Second (Baud)
Tx Enable Bit
Maximum Retries
Timeout (ms)
Baud Synchronization

MAIN MENU

Setup Network
System Parameters
Configure LCR# xxx
Save Configuration
Load Configuration

SETUP NETWORK DEVICES

Network #
Device
Name
SEARCH FOR DEVICES
First Device
Last Device

SETUP NETWORK

Network #
Name
Port

Software Menus - LCRHost

SYSTEM PARAMETERS

Language
LCRHost Password
Host Date
Host Time
Date/Time Master

Startup Caps Lock
Startup Insert Flag

DMS i1000 About Display

Support SDKs
LCLCLCP
LCLCLCPF
LCLCLib
LCLCTIO
LCLCWIN
LCLCSLF
HSLCSLF

Software Menus - LCRHost

CONFIGURE LCR

General Setup
System Calibration
Product Calibration
Diagnostics
Security

GENERAL SETUP

Unit ID
Presets Allowed
Date Format
Date
Time

Sale #
Ticket #
Print Gross & Parameter?
Volume Corrected Message?
Pulse Output Edge

Header Text
1:
2:
3:
4:
5:

Header Text
6:
7:
8:
9:
10:

Header Text
11:
12:

Software Menus - LCRHost

SYSTEM CALIBRATION

Meter ID
Flow Direction
Ticket Required?
Printer
dP Shutdown Value

Units of Measure
Flow Rate Base
Decimals
Residual Processing

Pulses/Distance
Calibrated Distance
Odometer
Password Usage
Customer Usage

Temperature
Offset
Temperature Unit
RTD Slope
RTD Offset

Calib Date
Calib Number
Calib Event
Config Event

PRODUCT CALIBRATION

Product # Units
Product Code
Name
Product Type

Product # Units
Comp Type
Comp Parameter
Base Temperature
S1 Close

Product # Units
Linearization Mode
Pulses/Unit
Prover Quantity

Product # Units
Gross Quantity
Gross Preset
Temperature
Net Quantity

Product # Units
Aux Multiplier
Aux Quantity
Aux Units
Gross Totalizer
Net Totalizer

Product # Units
Linearization Mode
Point Number
Flow Rate
Percent Error
Prover Quantity

Software Menus - LCRHost

DIAGNOSTICS

Pulser Faults
Gross Count
Flow Rate
Unit of Measure
Flow Rate Base

Software Revision
Language Revision
Ticket Revision
Supply Voltage

SECURITY

User Key
Security
Factory Key

Software Menus - LCRHost

FACTORY SETUP

Serial ID
User Key
LCR Reset

R100.0
R128.6
Raw ADC
RTD Slope
RTD Offset

SAVE CONFIGURATION

Use the field below to specify the output file that will receive configuration data from the LCR

Output File

LOAD CONFIGURATION

Use the field below to select the input file that contains the configuration data that is to be sent to the LCR

Input File

PRESET AND DELIVERY

Product # Units
Preset Delivery
Price
Net
Gross
Preset Type

Product # Units
Product Type
Deliveries
Shift Net
Shift Gross

Product # Units
Product Code
Name
Price/Unit
Tax/Unit
Percent Tax

Product # Units
Shift Start
Clear Shift?

Product # Units
Product Type
Aux1
Aux2
No-Flow timer

Header Text
1:
2:
3:
4:
5:

Header Text
6:
7:
8:
9:
10:

Software Menus - LCRHost

MACHINE STATUS

State
Printing?
Other Errors?
Printer Status
Delivery Status
Delivery Code

PRINTER STATUS

Delivery Ticket?
Shift Ticket?
Diagnostic Ticket?
Pass-Through Ticket?

Printer Error?
Printer Busy?

Software Menus - LCRHost

DELIVERY STATUS

ROM Check Sum?
Temperature?
Watchdog?
VCF Setup?

VCF Domain?
Meter Calibration?
Pulser Failure?
Preset Stop?

No-Flow Stop?
Stop/Pause Request?
Print/End Request?
Power Failure?

Preset Error?
RS-232 DMS i1000 Lap Pad?
Printer?
Data Access?

DELIVERY CODE

Delivery Ticket?
Shift Ticket?
Flow Active?
Delivery Active?

Gross preset Active?
Net Preset Active?
Stop/Gross Preset?
Stop/Net Preset?

VCF Active?
S1 Closed?
Delivery Beginning?
New Delivery Queued?

Init Warning?
Config Event?
Calib Event?

Software Menus - LCP File Server

LCP File Server v1.00
Welcome to LCP File Server!
To set up the file server, go
to the **SETUP LCP FILE SERVER**
screen by pressing F5/Init.

SETUP LCP FILE SERVER PORT

Port
Bits/Second (Baud)
Tx Enable Bit
Maximum Retries
Timeout (ms)

SETUP LCP FILE SERVER

Language
Number of File Handles
LCP Node Address
Port

Startup Caps Lock
Startup Insert Flag
FILER SERVER DEVICES
Device
Name

Software Menus - LCP File Server

FILE MANAGEMENT

C: Size: Free:
DMS i1000
XXXXXXXXX.LCR
XXXXXXXXX.LNG
XXXXXXXXX.LCR
XXXXXXXXX.LNG

DMS i1000 About Display

Support SDKs
LCLCLCP
LCLCLCPF
LCLCLib
LCLCTIO
LCLCWIN
LCLCSLF
HSLCSLF

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Pub. No. 500342
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