

DLM125

User Guide

6/2010

Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the Users Guide, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to nprovide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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INTRODUCTION

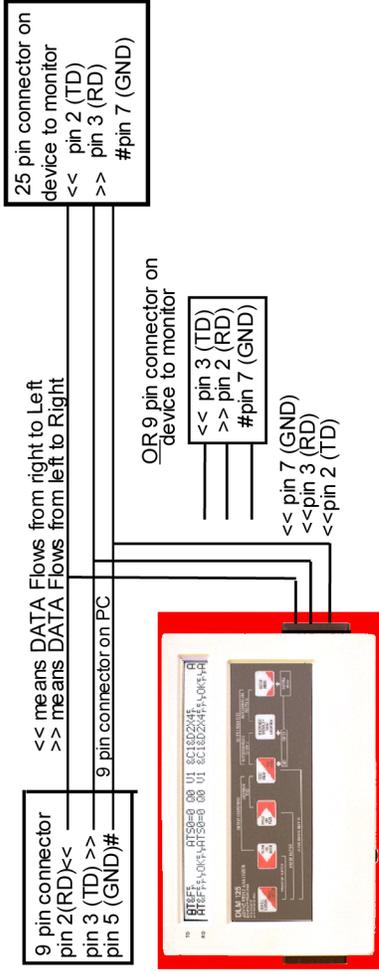
How to Use Your DLM125 in 2 Minutes!

- * Begin capturing data in one minute
 - * Quickly test terminals and printers.
 - * Eliminate serial handshaking problems.
- Turn to page 6.
- See Output option page 20.
- See “Serial Printer Troubleshooting” page 39 and “Additional Hints” on page 43.
 - See TOOLS (search for XOFF/XON) on page 23..
 - See “ *Historical Mode*” and description of how to monitor modem control signals on page 27 examine interface signals.
- * Quickly flag cables with broken wires.
- See  &  on page 29.

Quick Start Graphic

Tech Tip for hooking up a Benedict Computer DLM125

(Below graphic is the correct pin out configuration, you may have to use an adapter or null modem or break out box to make the circuit look like the drawing)



The easiest way that you may "T" into a serial circuit is at one end or the other. By inserting a combination Male/Female connector between the two existing connectors in line with the circuit. Please note that in this mode both lines, pin 2 and pin 3 of the DLM are in receive mode to enable the DLM to capture data from both sides of the conversation.

Figure 1 Configuring the DLM125.

1. If the OUTPUT switch (➔) is on, turn it off(➤)
2. Slide the DLM's main ON/OFF switch ① right—ON.
Transmitted data appears! If it doesn't, see hints that follow.

*Note: It is not necessary to attach 2 cables to the DLM as pictured above. You may use one "Y" cable with one connector on one end attached to the DLM and the other end of the cable with 2 (male/female) connectors inserted in the circuit that you wish to monitor. Benedict Computer can provide such a cable if you do not have one.

Quick Start Hints

Data not showing? Scroll through the options and check to make sure they match your devices' values. Appendix A shows all of the DLM125's options and all possible values. *Italicized values represent factory-set defaults.* Change the displayed values to match your devices' settings. To change an option's value:

1. Press  to get to the Menu Mode.
2. Press  or  to scroll through the options.
3. Press SET  to find the proper value. The displayed value will be stored when you press  or  or .

More Hints—Beyond Quick Start

The six buttons on the face of your DLM125 control over forty functions, therefore each button has to serve many purposes. Although this keeps the design compact, so much functionality may seem confusing at first, so here are a few hints for the novice:

- The DLM125 has two major operational modes. These two modes are described in separate sections in the manual:
 - Menu Mode—for changing options or their values, and outputting data.

View Mode—for viewing data or executing keyboard commands.

- Move between the Menu Mode and the View Mode by pressing .
- The names on the buttons themselves, and on the labels above and below the buttons help you to make distinctions between functions.
- Appendix A contains every option and all values for every option.

- Enter the Menu Mode; then scroll through options by pressing  or  and scroll through (and simultaneously set) values by pressing .
- Holding down any button makes the action repeat and repeat again.
- The DLM125 remembers settings, trigger string, and all **captured data**, even if you turn the power off.

Overview of This Users Guide

Following is a description of the other sections of the manual. When you first begin using your DLM125 it is a good idea to consult this Overview to see to which section you should turn to for specific information.

Menu Mode..... p 12

This section describes the options and their values. These options and values set the parameters of the DLM125. Toggle

between the Menu and View Modes by pressing



View Mode.....p 25

This section describes those functions of the DLM125 which allow you to view data. When you first turn on the DLM125 (or press



from the Menu Mode) you are in View Mode.

Examples..... p 33

Here are two examples for those who learn by doing rather than reading. The first example demonstrates how to set a Trigger string. The second example is a case study troubleshooting a serial printer.

Appendix A

All Options and All Values..... p 46

Here is a handy reference table with all of the options and all possible values for those options.

Appendix B
ASCII HEX Printout..... p 48

Here is a sample of a typical ASCII HEX printout.

Appendix C
Batteries..... p 49

These are more than instructions on how to change the battery.
We have provided a few suggestions on how to avoid battery
trouble and how to extend battery life.

Section D p 50
Troubleshooting

Some problems and their solutions.

Index..... p 52

Menu Mode

1. Enter the Menu Mode by pressing .

In Menu Mode, the SET and ENTER labels come into play.

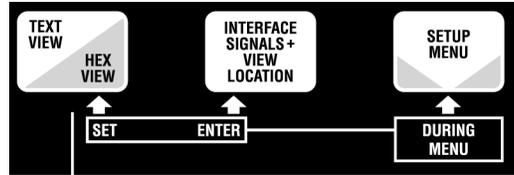


Figure 2 Look at the label of your DLM125. The  and  buttons take on the additional functionality of  (SET) and  (ENTER) in the Menu Mode.

2. Use  or  to scroll through the various options.
3. Once the option (an option is any one of the major functions of the DLM) is selected, use SET  to scroll through the values (a value is any of the settings available under an option) for the options. A value is set when it is displayed and then you leave that option, usually by pressing or  to scroll to the next option.
4. Press or to scroll to the next option, or press  to return

to the View Mode.

All of the DLM's options' values are set as described above in steps 1 through 4.

Baud Rate **38400** **19200** **9600** **4800** **2400**
 1200 **600** **300** **150**

The various speeds or baud rates the DLM125 can be set to accept.

Stop Bits **1** **2**

The number of stop bits the DLM can be set to read.

Data Bits **7** **8**

The number of data bits the DLM can be set to read.

Parity **Odd** **Even** **None**

The parity your DLM125 can be set to read. Choosing Odd or Even assumes an extra bit at the end of the data bit. If parity is wrong, View Mode displays parity error message.

Trigger Off **TD** **RD**

Use **Off** if you don't wish to use the Trigger. Use **RD** to trigger capture when the UserString appears on the RD channel. Use **TD** when you want to begin capturing data on the TD channel. If this option is chosen, the DLM will begin capturing data at the point it encounters the

String specified in the **Edit UserString** option.
(Note: After it has captured the data it will automatically return the Trigger to the Off position.)

Edit UserString->ENTER=GO:

No, Yes

Allows you to enter a Trigger String, as follows:

With YES showing, press . The following screen will appear.

BACK & FWD scroll values. SET moves the cursor. ENTER for next char. MENU exit

These instructions are describing how to use the next screen:

- Press  or  to increase or decrease the selected (underlined) nibble.
- Press SET  to select (underline) the desired nibble.
- Press ENTER  to go to next byte (character).
- Press  to store your string and return to the options Menu.

With the above screen showing, press any button and you will see the following screen.

Hex Char String (Current Size is:00)
00 #01 n

HEX	Char	String Current Size
View Mode		

is:nn

These options appear after you enter the Edit User String option. Descriptions follow.

HEX

Under this heading is the HEX value (from 00–FF) of the current character. One of the two nibbles will have a cursor under it. This is the nibble that will be affected by pressing certain buttons as follows:

1. Increase or decrease the nibble above the cursor by pressing  or .

2. Press SET  to move the cursor between high and low nibbles.

3. Press ENTER  to accept a byte and move on to the next byte.

4. Under “String” the DLM125 will display an ASCII representation of your string as it is built. It is updated as you press ENTER .

Note: Press  and  simultaneously to duplicate the previous byte

5. After you have ENTERed the last byte of your string, press . This will accept the entire string and bring you back to the Menu Mode.

See *EXAMPLES* for an example of how to create a HEX value string.

Char # **00 – FF**

Shows the current character location in the string.

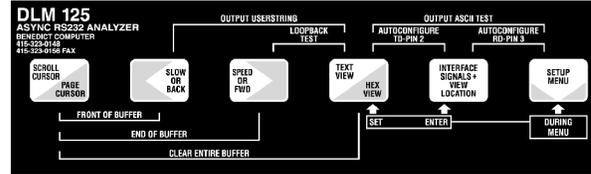
String

An ASCII representation of the string appears here as you build it character by character.

Current Size

Size of string in HEX. Check size before leaving this screen to make sure you have ENTERed all of the bytes.

HEX	Char	String	(Current Size is:01)
41	#2	A	



As in several DLM screens, pressing more than one key can expedite matters. Pressing:

 with  to the string's beginning.

 with  to the string's end.
 with  will erase the string completely.
 So if you want to quickly move from the 15th character to the fifth, just press 
 with  to get to HOME, the first character, then press ENTER  four times to get to the fifth character

Display

Mode **Compressed** **Expanded**

Each data line character in **Compressed** mode is displayed one after another

Each data line character in **Expanded** mode is followed by a blank to facilitate reading at high speeds—l i k e t h i s.

Buffer

Action

Stop when full **Discard oldest data**

If **Stop when full** is chosen, the DLM will stop collecting data when the buffer is full.

If **Discard oldest data** is chosen, the DLM will clear the buffer when it is full and then begin collecting data anew.

Status

Messages

Yes **No**

If **Yes**, the DLM will notify you of certain events e.g. END OF BUFFER.

If you find these messages annoying toggle them off by choosing **No**.

Error Messages

Fatal Warn Disable Autoconfig

The DLM will stop scrolling (receiveing continues)at certain hardware errors such as a change in line speed. When **Fatal** is showing, press any button and it will begin scrolling again.You may also enter the Options Menu and change a parameter before returning to View Mode.

Warn advises you of errors but continues scrolling after the message.

If **Autoconfig** (the default) is set, when the DLM125 gets a framing or break error, then it will attempt to do a software autoconfigure. It will change the speed, data, and parity until the errors stop. This works best with a constant flow of data. When **autoconfig** is enabled it has a standard sequence of tests which it performs and if it cannot determine the correct setings, it will inform you and stop. To **reset** this sequence, clear the buffer by pressing **scroll/page** and **text view/hex view** at the same time until "buffer clear" appears on the screen.

If you find the Error Messages annoying, say for example when watching a line which changes speed in normal operation, you may toggle them **Off** and they will not display.

In monitor mode (not output mode), the DLM will always pass data through itself, even if it cannot recognize the speed or other configuration parameters.

Suppress Capture

Off RD TD Both

Data will be captured when **Off** is chosen.

Data won't be captured on the RD line when **RD** is chosen.

Data won't be captured on the TD line when **TD** is chosen

Data will not be captured on either line when **BOTH** is set. This is used when COLLECTING MODEM CONTROL TRANSITIONS is active (



User String Xmit Count

(Enter=Change) 00

If you want to limit the number of times the User String is transmitted by the OUTPUT USERSTRING COMMAND on the keyboard, then hit ENTER at this option. You may then scroll the repeat count. If you enter a 0 then the string is output continuously when the Output USERSTRING command is issued. Hit ENTER to store value..

A word about how the DLM performs output and the "output user string" VIEW MODE command.

The DLM is set at the factory to transmit on pin 2 (like a DTE) out the right, male, connector. To attach it to another DTE device (i.e. to make it transmit on pin 3 of the female connector, left side) change the Output Connector option, documented below.

The DLM uses XON/XOFF, DTR or DSR flow control. To change see the FLOW CONTROL ON TRANSMIT Option following

Output **Off** **RD Buffer** **TD Buffer**

Rotating ASCII **Bert Test**
Capture Data Formatted Report

Off won't have any effect on the DLM.

RD Buffer and **TD Buffer** will output the contents of the RD or TD buffers respectively.

Rotating ASCII will output the ASCII character set, beginning with 0, over and over again. This turns your DLM into a pocket terminal test.

Bert Test will generate a binary pattern (hex 00-FF), count, and report errors. Please see Timeout option on page 19.

Capture Data Formatted Report will output a formatted report to a printer. This report includes each character received (in HEX and

ASCII or EBCDIC depending on the Code option) and its location relative to the beginning of the buffer.

See *sample HEX dump in Appendix B*.

1. Scroll through the output values and stop on what it is you want to output.
2. Press ENTER  and see the following screen:

Slide OUTPUT switch to ON.
Hit Page to START/STOP. MENU to End

5. Slide the output switch at the right-front of the DLM to ON.
6. Press  to start transmission.
7. Press  to pause and restart after pausing.
8. Press  to stop the output.

Load **Off**
Trigger From TD buffer
String From RD buffer

When **From TD buffer** or **From RD buffer** is showing, you can cause the current data in the named buffer (or its first 80 bytes) to be loaded

as the Trigger String. Using this option, you could enter a string via computer or terminal rather than entering it one byte at a time (using Select/View String on the DLM).

Here is how it works:

1. Capture the desired string in the appropriate buffer.
2. Choose "From TD buffer " or "From RD buffer."
3. Leave this option (Pressing  or any button) and the Trigger String will now be the contents from the respective buffer.
4. You may now check or edit this string through the **Edit UserString** option.

**Flow Control
on Transmit**

XON/XOFF DTR DSR

Xon/Xoff means only XON/XOFF flow control.

DTR means a high DTR signal enables transmission; low DTR inhibits transmission, PLUS XON/XOFF

DSR means a high DSR signal enables transmission; a low DSR inhibits transmission, PLUS XON/XOFF

**Gather
Modem
Signals**

Enable Disable

If **Enabled**, as DLM begins gathering data it will

simultaneously capture the modem control signal with each byte. See "View Mode" to learn how to display captured signals.

If **Disabled**, DLM won't capture signals with data. This frees 9K for more data.

Code **ASCII** **EBCDIC**

Choosing **ASCII** or **EBCDIC**, prepares the DLM to receive data in the respective code.

Output Connector **Male (DTE)** **Female (DCE)**

If **Male (DTE)**, DLM transmits on pin two and receives on pin three of the male connector on the right side of the DLM.

If **Female (DCE)**, DLM transmits on pin three and receives on pin two of the female connector on the left side of the DLM.

This option affects both Output and Output Trigger String options.

Timeout (Sec): **2** **4** **6** **8** **60**

The amount of time, in seconds, the DLM will wait, after a Bert Test pattern has been transmitted, before, lacking any response, displaying "Timeout Error."

TOOLS->Enter=GO **OFF Search TD BUF** **Search RD BUF**

When ENTER is hit then the DLM will search the Specified

Capture Buffer for the USERSTRING

The search will continue forward through the TD buffer from the current cursor location until it finds a match of the Trigger String. To find out how to set the Trigger String, see "Example 3-1 Setting a Trigger String" in .

Once the desired string is found, you may then wish to check its location in the buffer by using the INTERFACE/VIEW screen

VIEW MODE

You enter the View Mode when you first turn on the DLM. If you are in the Menu Mode, press  to exit the MENU mode and enter the View Mode. View Mode is used to view data as it is being captured, or after it has been captured, and to check the state of modem control signals in real time or historical modes. By using the buttons on the DLM, you have many view options. We'll explore these buttons one at a time.

Button Uses



Toggles between "Scroll" and "Page" modes in the View Mode. Page shows one full screen (40 characters on TD and 40 characters on RD lines) at a time. Scroll shows one character at a time.



Press once slowly (at least one second intervals) to scroll backwards through captured data one character at a time in Scroll Mode and one page at a time in Page mode.

Press twice quickly to initiate auto scrolling; then,

holding  down increases the rate of scrolling.

Press  to slow it down and finally reverse it.



(HOME) Press  with  for one second or more to move to the first character in the buffer.



Press once slowly (at least one second intervals) to scroll forward through captured data one character at a time in Scroll Mode and one page at a time in Page mode.

Press  twice quickly to initiate auto scrolling. Then, holding this button down increases the rate of scrolling. Press  to slow it down and finally reverse it.

(END) Press  with  for one second or more to move to the last character in the buffer.

Use this button to toggle between TEXT and HEX data display.

(CLEAR) Press  with  for one second or more to permanently delete all data in the buffer.

Press  to drop into the interface signal/location screen.

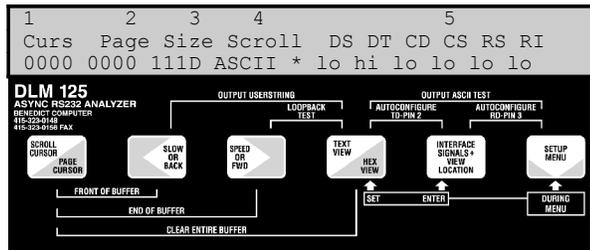


Figure 3 The **INTERFACE SIGNALS** screen

- | | | | |
|---|--------------------------|---|---|
| 1 | Current cursor position | 4 | Mode of display |
| 2 | Page number | 5 | Ready states—modem signals (see Note) following) |
| | Amount of data in buffer |  | shows the |

(see Note ① following) Historical Mode

Note ①: Data in buffer—If you plan to use the cursor location value (*Curs*) from the INTERFACE/VIEW screen as an *exact* count of characters received on either the TD or RD buffer, please be advised—the cursor value reflects the number of characters received from both the TD pin *and* the RD pin *less* any characters received at the same time (characters received at the same time on the DLM125 appear one above the other). If you need an exact count use only one buffer to receive data or use Suppress Capture to disable one buffer.

Note: Ready States—This portion of the screen displays the ready states (“hi” meaning high and “lo” meaning low) of the following signal lines:

DS	Data Set Ready	CS	Clear to Send
DT	Data Term Ready	RS	Request to Send
CD	Carrier Detect	RI	Ring Indicator

All information in the INTERFACE/VIEW screen is dynamically updated even as you watch the display.

INTERFACE
SIGNALS +
VIEW
LOCATION

then

SETUP
MENU

Historical Mode As a character is being captured and stored, the state of the modem control signals at that instant is also being captured and stored when “Gather Modem Signals” is on. This historical information on the state of the modem control

signals is available using  as follows:

While in View Mode get to the Informational screen

by pressing  you are in “real time.” Press . “Historical Mode” will display briefly on the screen and you are in historical mode. Then the DLM125 will be displaying the historical information on the state of the modem control signals as received via the data line at a certain point in transmission. That point is relative to the Curs (the character number of the cursor position) display. To move through the characters captured and check on the state of the modem controls historically, press the buttons on the DLM125 as follows:

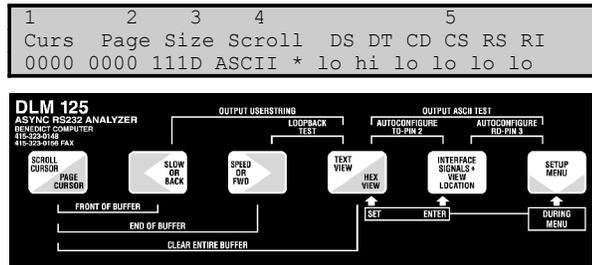


Figure 4 The INTERFACE/LOCATION screen in historical mode.

- 1 Press SET  to move the cursor to any one of the four positions of the Curs location display.

- 2  to increase value of selected position.
- 3  to decrease value of selected position.
- 4  simultaneously with () moves to character 0 (first one received)—HOME.
- 5  simultaneously with  to move to the last character (shows as one less than size because first character is zero)—END.
- 6 The asterisk indicates you are in Historical Mode.
- 7  re-enters INTERFACE/VIEW real time.

To check the modem control signals associated with a specific character received, use View Mode to help you easily scroll to the specific character as follows:

1. Press  to leave the INFORMATION screen and get back into View Mode. Then scroll until the cursor is positioned one character beyond the position you want to check.
2. Press  to return to INFORMATION screen, then  to see the state of the modem control signals at the desired point. Increasing or decreasing the cursor location number will show you the state of the modem control signals before and after the character was received.



Pressing  toggles you back and forth between View Mode and the Menu Mode.



Press



Press with for one second or more while



Press



with for one second or more to

collect modem control transitions. You will see the message “Collecting Modem Control Transitions.” Now, whenever a transition occurs on any of the six modem control signals, a marker (HEX FF) will be posted to the RD buffer. The signals are checked 60 times a second, so each time a transition occurs, it will be marked by HEX FF which shows as a 0.

To turn Collecting Modem Control Transitions off, press with again.

The way to use the Collecting Modem Control Transitions feature is as follows. Before you begin

collecting data, press and simultaneously. You’ll see the message “Collecting Modem Control Transitions.” When you begin capturing data you may notice the transitions being recorded. When viewing data as it is being captured, transitions are seen as the character 0. After your data is captured, if you want to check for any transitions in the modem control signals:

1. Load FF HEX into the Trigger String.
2. Get into the TOOLS in MENU MODE and search forward for FF.
4. After it finds the first transition FF, the page it appears on will appear with the cursor on the transition.
5. Press to get into the INTERFACE/LOCATION screen.

6. Press  to get into Historical Mode.
7. Now use  and  to scroll through the changing states and you can see where transitions (HEX FF) have taken place in your data.

EXAMPLES

The DLM125 is a powerful diagnostic tool. Many of its features aren't readily apparent just by thumbing through a reference manual. This section of the Users Guide shows an example of how to set a Trigger string (Example 3-1) and also describes a case study of how to use the DLM125 to troubleshoot a serial printer (Example 3-2).

Example 3-1

Setting a UserString (Creating a HEX String)

Purpose You need to create a UserString (a HEX string).

Method You may set a string with another device and download it, or you may set it with the DLM125 itself. The purpose of this example is to teach you how to create a HEX string using the DLM125 itself.

Procedure The quickest way to learn how to set a string with the DLM125 itself is to try this example. Please follow along on your DLM125 while we work through the following example.

1. Begin by entering the Menu Mode by pressing  then scrolling through the options  or  until you get to **Edit UserString.**

2. Use the **SET**  button once until your screen looks

like this:

FWD or BACK for Options. SET for Values.
Edit UserString->ENTER=GO: YES

Now you need to enter the Select/View String submenu.

3. Press the ENTER  button.

Now the DLM125 displays the instructions you will need to work the subsequent screen:

BACK & FWD scroll values. SET moves the cursor. ENTER for next char. MENU exits.

4. Press any button and you will see the following screen.

HEX Char String (Current Size is:00)
00 #01

Note: If your screen does not look like this, press and hold the



and  buttons simultaneously. This will CLEAR (see "CLEAR" on front panel) the string.

This is the screen you will use to build your String. Notice HEX 01 has no printable ASCII representation, hence the meaning none. Notice too that the 0 (the low nibble) is underlined. That means it is the currently selected nibble. We would like to increase the high nibble so we will now select the high nibble

5. Press SET  to move the cursor.

The leading zero (high nibble) is now underlined—selected.

Increase selected nibble by pressing  (decrease with ).

6. Press  four times to increase the high nibble to four.

Your screen should look like this:

```
HEX Char String (Current Size is:00)
41 #01 A
```

Now let's increase the low nibble.

7. Press SET  to move the cursor.
8. Press  once.

HEX '41' is ASCII 'A' and that should now be showing on your screen.

9. Press ENTER  to accept this first character and prepare to enter your second character.

Your screen now should look like this:

```
HEX Char String (Current Size is:01)
00 #02 A□
```

Notice that your string is now one byte long (Current Size is: 01) but you have already been put in position to work on the second byte Char #02. The first byte is HEX 41 and it has been ENTERed. The second byte is currently HEX 00.

Let's change the second byte from HEX '00' to HEX '42.'

10. First press SET  to select (move cursor to) the high nibble.

11. Then press  four times.

Your screen should look like this:

```
HEX Char String (Current Size is:01)
40 #02 A□
```

Now select the low nibble:

12. Press SET  to specify low half of HEX character.

13. Press  twice to increment low nibble from 0 to 2.

14. Press ENTER  to accept this byte and move to the next one.

Your screen should look like this:

```
HEX Char String (Current Size is:01)
00 #03 AB□
```

15. Press SET  to select high nibble.

16. Press  four times to change high nibble from 0 to 4.

17. Press SET  to select low nibble.

18. Press  three times to change low nibble to 3.

19. Press ENTER  to accept this byte and move on to the next.

Now you have set byte three to ASCII C and are positioned to define the fourth byte. Let's use a shortcut.

20. Press  and  simultaneously and hold down for at least one second.

You've learned the shortcut for copying the previous byte! By the way, the HOME, END and CLEAR labels offer shortcuts too. By

pressing  with  (HOME) you will go to the first character in your string.  with  (END) takes you to the last, and  with  erases the entire string (CLEAR).

```
HEX Char String (Current Size is:03)
43 #04 ABCC
```

21. Press  once to change the low nibble to 4.

Your screen should look like this:

```
HEX Char String (Current Size is:03)
44 #04 ABCD□
```

22. Press ENTER .

```
HEX Char String (Current Size is:04)
00 #05 ABCD□
```

Your screen should look like this: Now, your String is completed, so don't press ENTER or you will add HEX 00 again. Note the size of your string (Current Size is: 04).

23. Press 

That stored your Trigger string, and brought you out to the Menu Mode.

Example 3-2 Serial Printer Troubleshooting

Purpose You have just purchased, or been asked to repair, a serial printer that is attached to your computer through an asynchronous link. The printer won't print exactly what the computer sends.

Method The clues are that the printer prints some characters correctly and some incorrectly. Notably "a", "b", and "d" seem to be incorrect while "c", "e", and "f" print correctly. So, we will connect the DLM125 to the computer to see if it is sending the correct characters.

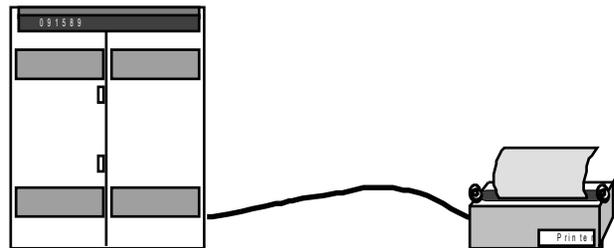


Figure 5 You have been asked to troubleshoot a printer.

Procedure What you will do is to connect the DLM125 between the computer and the printer to test what the computer outputs.

1. Disconnect the cable at the printer end from the printer.

Attach the DLM to the cable and then the other end of the cable to the printer. See figure 6.

2. Be sure the DLM's output switch is off.

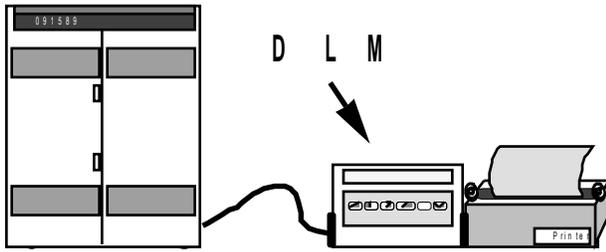


Figure 6 Either plug the DLM125 directly into the printer, or, if it is more convenient, use a cable.

3. Slide the DLM power switch (the big one) to the ON (RIGHT) position.

4. Press . The screen should look like this:

FWD or BACK for Options. SET for Values.
Baud Rate: 9600

5. If the baud rate shown is not the same as the computer's,

press SET  until the correct value for baud rate is displayed.

Remember how to do this, if the baud rate or other configuration parameters are incorrect you will have to go into Menu Mode again.

6. Press  to see Stop Bits. If the stop bits entry is incorrect press SET  again until the correct value is

showing. If you miss the correct value keep pushing SET



and it will come around again.

FWD or BACK for Options. SET for Values.
Stop Bits: 1

7. Press  to see Data Bits. Use SET  again to get the correct setting.

FWD or BACK for Options. SET for Values.
Data Bits: 8

8. Press  to exit the Menu Mode.

Note there are many more things you can do in Menu Mode, please refer to the Users Guide for a detailed description of each.

9. Check to see that the OUTPUT switch is in the OFF position.

In the ON position it can interrupt the flow of data. Now you are ready to start the test.

10. Press  and check to see that the DLM125 is in Scroll Mode. If it is not in Scroll Mode it will show the word "PAGE" next to the heading "Size"

11. Press  again to exit the INTERFACE/VIEW screen. If the DLM was not in Scroll Mode press . Now clear the buffer by hitting  and  simultaneously. Hold these buttons down until the display says "Buffer Clear."

12. Start the computer sending data to the printer. You should see data scrolling across the display of the DLM. Continue

printing until the printer makes mistakes.

13. Now put the printer off line which should stop transmission.
14. Examine the printout to find the last character that the printer printed correctly. Let us say that it was an "f".
15. Now scroll to that correct character, "f", on the DLM. Scroll the DLM as follows:

Each time you press the  button it will scroll faster and faster backward. If it goes too fast, hit the  button to slow backward scrolling. Repeated hitting of the  button will cause the cursor to slow and stop and finally scroll in the forward direction. Use this method to find the erroneous "d".

If scrolling one character at a time is too laborious, press



which puts you into Page mode. Now you will move through one page (screen) of data each time you press



or  .

16. Now manipulate the cursor one character back, to an erroneous character. Let's say it is a "d".
17. Press  (the ASCII/HEX button) and the DLM will change to HEX representation and automatically place the cursor on the "d".

In our test case the "d" appears as a "C4". An ASCII "d" is normally a 44 HEX. Since we are seeing a C4, then the high order (8th) bit is turned on. Examination will tell us that a 44 HEX has 2 bits high(1's). The fact that the high order bit has been set to a 1 tells us that the sending computer has set it to achieve

ODD parity. Odd parity means the total count of all high bits in any byte must be an odd number. That is why some letters, those which already have a odd number of bits hi, are not affected.

18. To correct this problem either set the computer to NO parity or SPACE parity. Alternatively, set the printer to ODD parity.
19. If you capture a lot of data and only have one or two errors, then a time saver is to let the DLM search for the bad character or string. To do this hit  and  simultaneously until you see the message "Buffer Home."
20. You can then do an RD or TD buffer search for the "Trigger." The DLM125 will find the character or string and place the cursor on it for evaluation.

To enter the trigger string please refer to the Menu Mode portion of the Users Guide.

21. To start the TD buffer search (search through only the TD buffer), position the cursor in front of where you want to start the search. Then depress . Then press BACK . The DLM will go into MENU mode and back to TOOLS. Select Search and hit ENTER. The DLM will then place the cursor on the string when it is found. You can then use the  (TEXT/HEX) to examine the character in HEX if you wish.

Additional Hints

Another common problem you might discover is improper handshaking. Handshaking, or back pressure, occurs when the printer, for some reason such as being off line or out of paper, cannot accept any more characters. When this happens it is the

printer's responsibility to do one of two things. It can drop a modem control interface signal or send a stop transmission signal to the computer. In the latter case usually the printer would send a X-off (13HEX). Within 1 to 9 characters the computer should stop.

If the DLM shows the X-off going from the printer to the computer, but the computer doesn't stop transmitting, then you might have a bad cable, or the computer may not be set up to look for X-off/X-on back pressure. When the printer again wants data it will send a X-on(11HEX). If the computer wasn't responding properly, then you would see the X-off from the printer to the computer with out a X-on from the printer later. The symptom would be garbled characters on the printer, or the printer simply going off line.

The second form of back pressure (flow control) is to drop a interface signal, usually DTR (Data Terminal Ready). The DLM125 collects the state of all 6 modem control (interface) signals with each byte captured.

To find the historical state of any modem control signal, place the cursor on the character which you want to know the signals for.

Press  and then . This puts the INTERFACE/VIEW mode screen into historical mode. The state of the modem control signals on the right hand side of the display is now what they were when the character number under the "Curs." heading was received.

Push  or  to change the cursor location and if the modem control signals changed that change will be reflected in the state display.

By holding  or  down you can scroll through the various locations until you see a modem control signal change.

We suggest that if you suspect that the printer is changing modem control signals, then you find the location in the capture buffer either visually by scrolling, or by using the search capabilities and then enter the INTERFACE/VIEW screen

(historical mode) and use  and  until you see if there was any change in the modem control signals.

▲ **Output Connector**

- *Male (DTE)*
- Female (DCE)

▲ **Timeout (Sec):**

- 2 • 4 • 8
- 60

▲ **TOOLS->ENTER=GO**

- Search TD Buf Search
RD Buf

★ Appendix B
Sample—ASCII HEXPrintout

```
Page number:01 code: ASCII
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
0000Td
Rd 54 68 69 73 20 69 73 20 61 6E 20 65 78 61 6D 70 This is an exat
0010Td
Rd 6C 65 20 6F 66 20 64 61 74 61 20 63 61 70 74 75 le of data capt
0020Td
Rd 72 65 64 20 6F 6E 20 74 68 65 20 52 44 20 6C 69 red on the RD :
0030Td
Rd 6E 65 20 61 6E 64 20 74 68 69 73 20 69 73 20 64 this is
0040Td
Rd 61 74 61 20 63 61 70 74 75 72 65 64 20 6F 6E 20 ata captured oi
0050Td
Rd 74 68 65 20 54 44 20 6C 69 6E 65 20 61 6E 64 20 the TD line an
0060Td
Rd 70 72 69 6E 74 65 64 20 77 69 74 68 20 74 68 65 printed with tl
0070Td
Rd 20 48 45 58 20 64 75 6D 70 20 6F 70 74 69 6F 6E HEX dump opti
0080Td
Rd 20 6F 6E 20 74 68 65 20 44 4C 4D 31 30 30 on the DLM100
```

★ Appendix C Batteries

Your DLM has 2 batteries in it. The primary battery is a 9-volt alkaline. Alkaline batteries provide the longest, most reliable service. Should you decide to use a rechargeable Nicad, we recommend you carry a charged spare as a Nicad can only deliver about 40% of the capacity of a fresh alkaline. When your battery is running low you'll receive a BATTERY LOW warning on your screen. You must then change your battery or plug in the AC adapter. You may plug in the external power supply even while the DLM125 is in use.

The second battery in the DLM125 is a lithium cell which is used to preserve memory and menu configuration. Should you notice that your unit "forgets" either of these, it is time to replace your lithium cell.

Replacing the Lithium Cell

Lay the DLM125 face down on a soft cloth and remove the five screws. Remove the back cover. Replace the 2 upper screws in their posts to secure the plastic spacers so they won't get lost. Carefully remove the circular lithium cell from its holder using the tip of a small screw driver to lift the battery up and out. Replace it with a DL-2325 or CR-2325 type lithium battery or any battery that fits in the coin cell older that is 3 volts.

Remove the two screws and gently refit the case. First insert the upper two screws, then find the smallest screw and insert it in the middle.

Damage will result if you try to insert a long screw in the

center post!

★ Appendix D Troubleshooting

Symptom

Data is scrolling by and you want it to stop scrolling (capture of incoming data will continue).

DLM doesn't show data or cursor, Screen looks the same as when power is off.

DLM shows a cursor but doesn't appear to capture data.

shows size is not changing. Nothing is happening on screen.

DLM shows only 9's and squares.

Resolution

Press the  button to put you into PAGE mode.

Install a new 9-volt battery or try the wall transformer.

Press  to see if the size value is changing. If it is, then you are probably in Page Mode. Press  to change to Scroll Mode.

Check to see that the trigger is not set to ON and that the SUPPRESS CAPTURE is set to off. Note that the DLM125 will tell you when you power up if either of these options is enabled.

Clear the screen by pushing  simultaneously with  for one second or more. If the symptom

persists, contact the supplier from whom you purchased the unit.

Cursor scrolls wildly.

Clear the buffer. Press  and

 until DLM says "Buffer Clear."

DLM won't scroll one character at a time.

When you slow scrolling by pushing forward or back (whichever is the opposite of the current scrolling direction) the cursor will eventually stop on a specific character. If you

then push  or , the cursor will move one character at a time

provided you do *not* hit  or

 more than once per second.

No data is being captured

Check to see that the output switch on the front of the DLM125 is switched off.

"Incorrect Capture Data" message is being displayed.

Two possible causes:

1) The AC adapter has been pulled from the socket before turning the DLM125 off. To avoid this condition, *always* turn DLM125 off before removing AC adapter from the wall socket.

2) Your lithium battery is low. Please read "Appendix C Batteries."

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