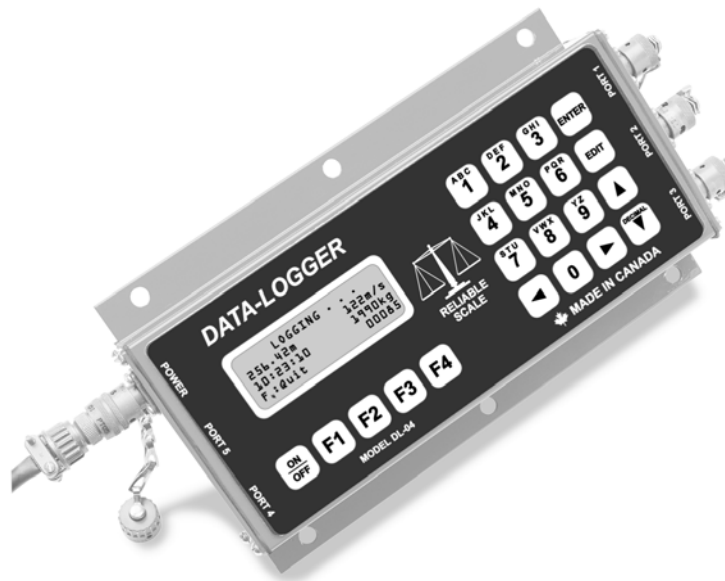




Serial Number: _____

Model DL-04
DATA-LOGGER
WIRELINE DATA-LOGGER

USER MANUAL



© 1996-2008, Reliable Scale Corporation

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2. Capabilities

The Model **DL-04 DATA-LOGGER** is a versatile tool designed to record line load, line speed and tool depth on Wireline trucks.

This new technology offers secure data recovery and reduces chances of operator error and improves record keeping. The result is an improved profit picture.

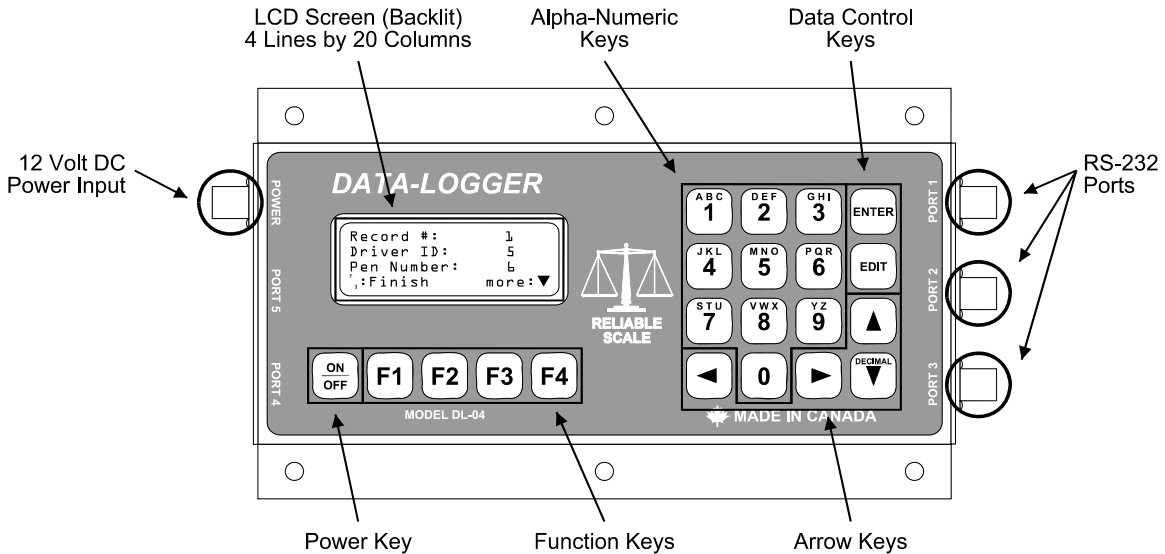
The **DL-04** stores data accurately without interfering with the operator's normal activities.

The **DL-04** monitors the truck's digital weight indicator, depth meter and line speed meter as often as every 2 seconds and stores the information securely in memory. This allows the manager to review very closely the details of each job.

2.1 Features

- Lists job description, operator ID, job date
- Each record includes record number, line load, line speed, depth, and time of day
- Stores up to 113,825 records (over 63 hours of continuous recording at 2 second log intervals)
- Reads data at 2 second to 99 second intervals
- Support for 115,200 bps serial transfers
- XON/XOFF flow control for serial transfers

3. Physical Layout



- 12 Volt DC Power Input - 4 pin male military style connector (P/N: PT02A8-4P).
- LCD Screen - displays instruction and status messages to the operator.
- Alphanumeric Keys - operator keys in information.
- Data Control Keys - for Entering and Editing data.
- RS-232 Ports - 4 pin female military style connectors (P/N: PT02A8-4S) to connect devices to the **DL-04**. *Example:* Digital Scale, Personal Computer, Line speed indicator.
- Arrow Keys - to scroll through menus and stored information.
- Function Keys - to issue commands; keys are assigned different functions as listed on the LCD screen.
- Power Key - to turn the **DL-04** on and off.

4. Basic Operation

1. Press the **ON/OFF** key until text appears.



Screen shows the serial number and the software version.

```

RELIABLE SCALE
DL-04 DATA-LOGGER
S/N: 9903148
Version 1.60
    
```

The next screen shows date & time for operator verification with local time zones.

```

RELIABLE SCALE
DL-04 DATA-LOGGER
1999-03-29 14:09:23
F1: Continue
    
```

2. Press **F1** to continue.

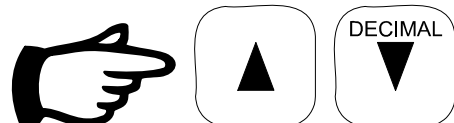


Screen shows the first two options available from the Main Menu.

```

MAIN MENU
1 Log Data
2 Resume Logging
Select #           more:▼
    
```

3. Use the **UP** and **DOWN** arrow keys to scroll through all the options.



```

MAIN MENU
3 Delete Data
4 View Data
Select #           more:▲
    
```

```

MAIN MENU
5 Plot Chart
6 Print Data
Select #           more:▲
    
```

4. Select the option you wish to use.

Example: 1 Log Data



5. When an process has been completed, the **DL-04** will return to the Main Menu.

```
MAIN MENU
1 Log Data
2 Resume Logging
Select #      more:▼
```

4.1 Log Data

The chief function of the **DL-04** is the Log Data process.

The screen prompts the operator through the necessary steps, issuing instructions as required. Once the operator initiates a job, each record is saved automatically for future transfer and analysis.

Once logging has begun, the screen is updated every log interval with the latest log information. This maintains a record of:

- Tool Depth with units
- Line Speed with units
- Entry Time
- Line Load with units
- Entry Number (max. 113,825)

1. From the Main Menu, select Log Data.

| | |
|-----------|----------------|
| MAIN MENU | |
| 1 | Log Data |
| 2 | Resume Logging |
| Select # | more: ▼ |



| |
|-----|
| ABC |
| 1 |

Operator is prompted for required information starting with Well Name

| |
|------------------------------------|
| Well Name: |
| ■ |
| F ₂ : Alpha |
| F ₄ : Quit ENTR: Accept |

2. Key in the Well name.
Example: K14 If letters are used press **F2** to enter alpha mode

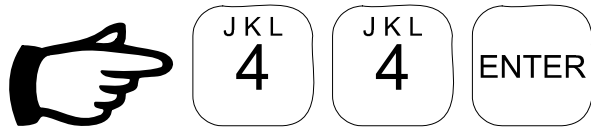


| |
|----|
| F2 |
|----|

The screen will change slightly

| |
|-------------------------------|
| Well Name: |
| ■ |
| F ₂ : Accept alpha |
| ▶: Next position |

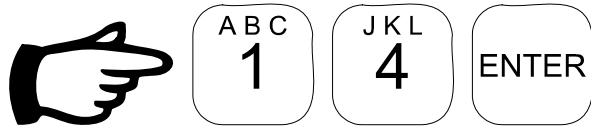
3. Press the number and arrow keys to scroll through the letters shown at the top of the keys.



4. Use **F2** to exit alpha mode and the screen will return to normal

| |
|------------------------------------|
| Well Name: |
| K■ |
| F ₂ : Alpha |
| F ₄ : Quit ENTR: Accept |

5. Input numbers normally



6. Well Number is next. Follow the same procedure as for Well Name.

| |
|------------------------------------|
| Well Number: |
| ■ |
| F ₂ : Alpha |
| F ₄ : Quit ENTR: Accept |

7. Key in Well Number.
Example: 45



| |
|------------------------------------|
| Well Number: |
| 45■ |
| F ₂ : Alpha |
| F ₄ : Quit ENTR: Accept |

8. Wireline Job Type is next. Follow the same procedure as for Well Name.

| |
|------------------------------------|
| Wireline Job Type: |
| ■ |
| F ₂ : Alpha |
| F ₄ : Quit ENTR: Accept |

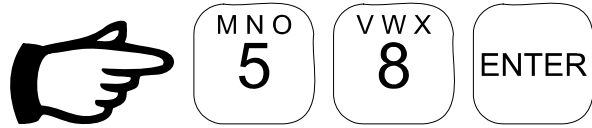
9. Key in Wireline Job Type.
Example: COMPLETION

| |
|------------------------------------|
| Wireline Job Type: |
| COMPLETION■ |
| F ₂ : Alpha |
| F ₄ : Quit ENTR: Accept |

10. Job Operator is next. Follow the same procedure as for Well Name.

| |
|------------------------------------|
| Job Operator: |
| ■ |
| F ₂ : Alpha |
| F ₄ : Quit ENTR: Accept |

11. Key in Job Operator.
Example: 58



| |
|------------------------------------|
| Job Operator: |
| 58■ |
| F ₂ : Alpha |
| F ₄ : Quit ENTR: Accept |

Log Interval is next. Intervals from 2 seconds to 99 seconds between records are available.

| |
|------------------------------------|
| Log Interval(s): ■ |
| Min: 2s Max: 99s |
| F ₄ : Quit ENTR: Accept |

12. Key in the Interval.
Example: 2



The **DL-04** begins reading data every 2 seconds.

| | |
|-----------------------|--------|
| LOGGING. . . | |
| 256.42m | 122m/m |
| 10:23:10 | 4990kg |
| F ₄ : Quit | 000085 |

13. Logging can be interrupted by pressing **F4**.



4.2 Resume Logging

If a job has been interrupted for some reason, it can be resumed using the Resume Logging process. Only the last job in memory can be resumed. If there are no jobs in memory, this process cannot be used.

1. From the Main Menu, select Resume Logging.

| | |
|-----------|----------------|
| MAIN MENU | |
| 1 | Log Data |
| 2 | Resume Logging |
| Select # | more:▼ |



The operator is asked to confirm the resume operation.

| |
|--------------------------|
| LOGGING. . . |
| Resume Job # 3? |
| F ₂ : Confirm |
| F ₄ : Cancel |

2. Press **F2** to confirm resumption.



3. The **DL-04** Resumes logging

| |
|-------------------|
| Resuming Job #: 3 |
|-------------------|

| | |
|-----------------------|--------|
| LOGGING. . . | |
| 256.42m | 122m/m |
| 10:23:10 | 4990kg |
| F ₄ : Quit | 000085 |

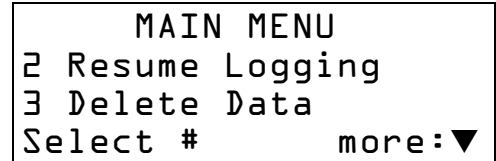
4. Logging can be interrupted by pressing **F4**.



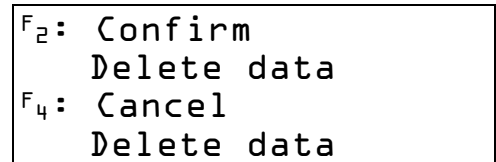
4.3 Delete Data

After the records have been plotted (see section 4.5 on page 14) or transferred to a computer (see section 4.6 on page 16), clear the **DL-04** memory using the Delete Records option. Jobs should be deleted after each day to make room for new ones and to eliminate confusion.

1. From the Main Menu, select Delete Data.



The operator is asked to confirm the delete operation.



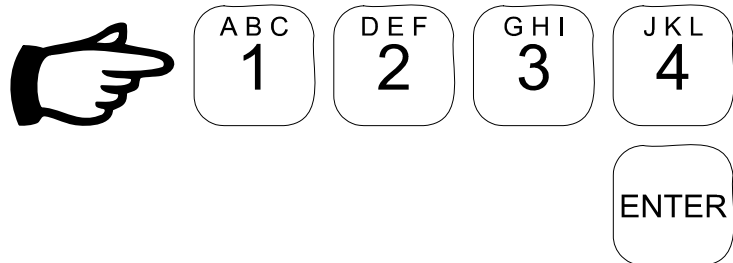
2. Press **F2** to Delete Records.



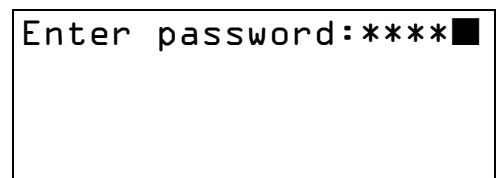
A password is required. The factory default password is 1234. See section 5.4 on page 31 to change password.



3. Enter the password.



When the password is entered, * 's are displayed for security.



If a valid password has been entered, the records are deleted and the status is displayed on the screen.

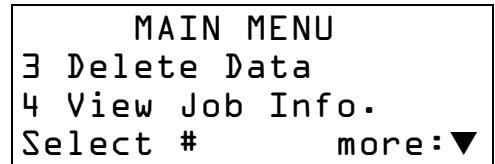
Deleting data

Data DELETED

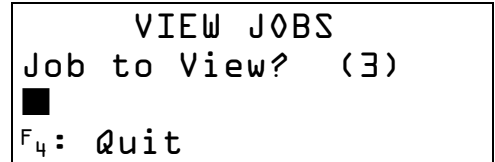
4.4 View Job Information

Job information in the **DL-04** memory can be viewed on screen without transferring or deleting it.

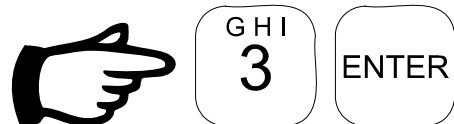
1. From the Main Menu, select View Job Info.



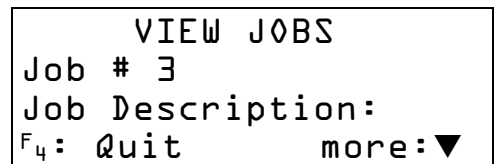
If there is more than one job in memory, the user will be prompted for the job number.



2. Enter job number to view.



3. The selected job information is displayed. Use the **UP** and **DOWN** arrow keys to scroll through the information.



4. To quit viewing, press **F4**.



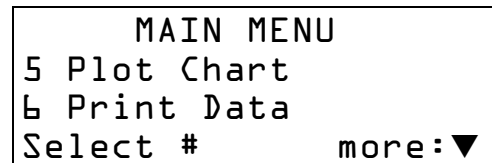
4.5 Plot Chart

Data saved in the **DL-04** can be transferred to a printer or computer in the form of a chart (Line Pull and Depth vs. Time). Connect the **DL-04** to the printer or computer with the proper cables & hardware. Be sure the printer/computer is ready to receive the data. The default serial port configuration for the **DL-04** is 9600 baud, 8 data bits, no parity, 1 stop bit.

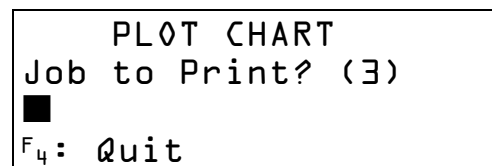
Plotting a job does not remove it from the **DL-04**'s memory. Records are stored permanently in memory and can only be removed by using the Delete Data option (see section 4.3, on page 11). Data transfer can be done as many times as desired before deletion.

Note: The DL-04 has been configured for use with an Epson FX-880 printer with an RS-232 serial interface. Other compatible printers should function, but proper operation is not guaranteed.

1. From the Main Menu, select Plot Chart.



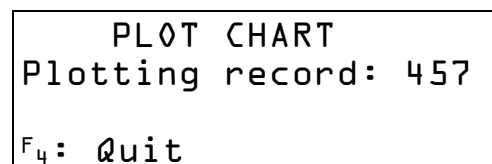
If there is more than one job in memory, the user will be prompted for the job number.



2. Enter job number to plot.



3. During data transfer, the number of the entry currently being plotted is displayed.



4. To quit printing, press **F4**.



4.6 Print Data

Data saved in the **DL-04** must be transferred to a host computer for historical storage and analysis. Connect the **DL-04** to the computer with the proper cables & hardware. Be sure your computer is ready to receive the records. The default serial port configuration for the **DL-04** is 9600 baud, 8 data bits, no parity, 1 stop bit. A standard terminal program such as Procomm or HyperTerminal can be used for this procedure (see your terminal program manual for details).

Transferring jobs to computer does not remove them from the **DL-04's** memory. Records are stored permanently in memory and can only be removed by using the Delete Data option (see section 4.3, on page 11). Data transfer can be done as many times as desired before deletion.

1. From the Main Menu, select Print Data.

```

MAIN MENU
↳ Plot Chart
5 Print Data
Select #           more:▼
    
```



If there is more than one job in memory, the user will be prompted for the job number.

```

PRINT DATA
Job T0 Print? (3)
■
F4: Quit
    
```

2. Enter job number to print.



3. During data transfer, the number of the entry currently being printed is displayed.

```

PRINT DATA
Printing record: 457
F4: Quit
    
```

4. To quit printing, press **F4**.



5. Configuration

Some operating features of the **DL-04** can be modified to suit the equipment being used. Other parameters such as the date and time need to be set in order to make accurate logs. All parameters are set from the Configuration Menu.

1. From the Main Menu, select Configuration.

```

MAIN MENU
┌ Pint Data
└ Configuration
Select #      more:▲
    
```



```

STU
 7
    
```

2. Screen shows first two items of the Configuration Menu. Use the **UP** and **DOWN** arrow keys to scroll through all the options.

```

CONFIGURATION MENU
┌ Set Date
└ Set Time
Select #      more:▲
    
```

```

CONFIGURATION MENU
3 Configure Ports
4 Set Depth Units
Select #      more:▲
    
```

3. To return to the Main Menu, select Exit Configuration.

```

CONFIGURATION MENU
┌ Set Password
└ Exit Configuration
Select #      more:▲
    
```



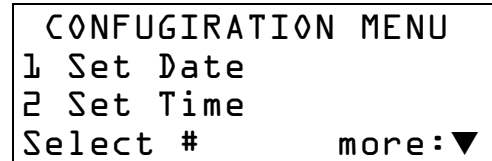
```

STU
 7
    
```

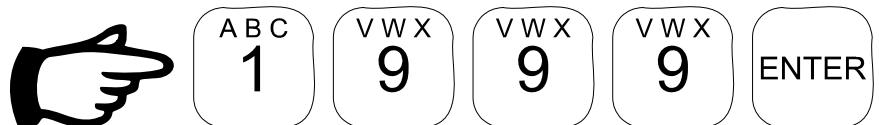
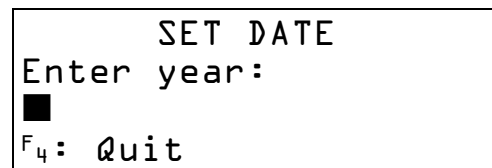
5.1 Set Date

The current date can be seen when the **DL-04** is turned on. It is important that this be set correctly in order to provide accurate log information. If the date needs to be changed, it is done using the Set Date process from the Configuration Menu.

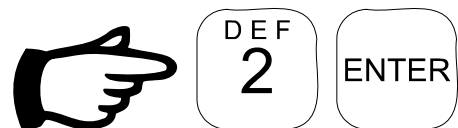
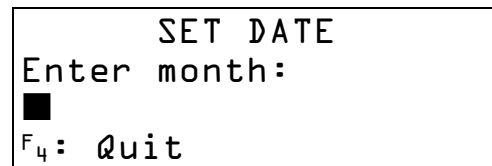
1. From the Configuration Menu, select Set Date.



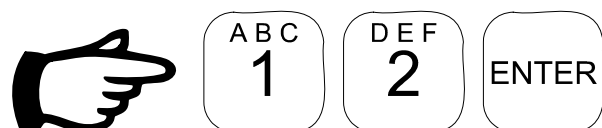
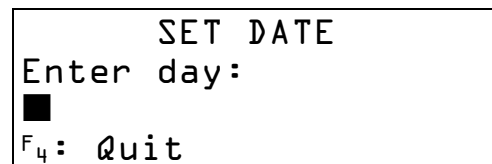
2. Key in the year. Use four digits.
Example: 1999



3. Key in the month. (1 to 12)
Example: 2



4. Key in the day. (1 to 31)
Example: 12



The new date is displayed before returning to the Configuration Menu.

```
SET DATE
Date set to:
1999-02-12
```

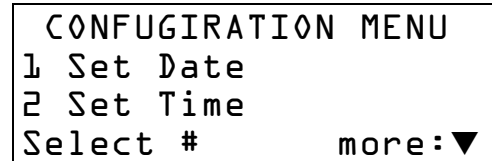
5. To quit, press **F4**.



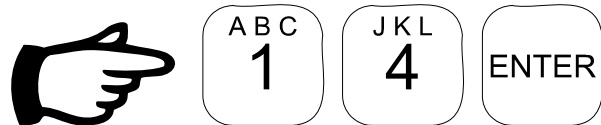
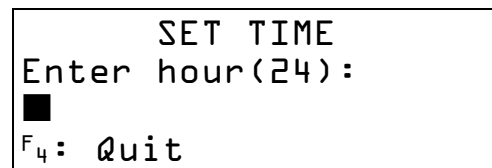
5.2 Set Time

The current time can be seen when the **DL-04** is turned on. It is important that this be set correctly in order to provide accurate log information. If the time needs to be changed, it is done using the Set Time process from the Configuration Menu.

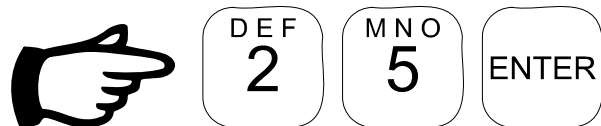
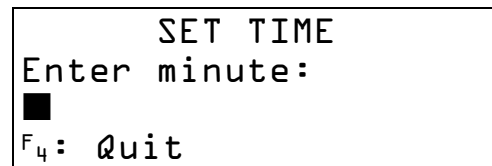
1. From the Configuration Menu, select Set Time.



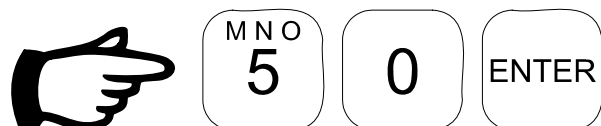
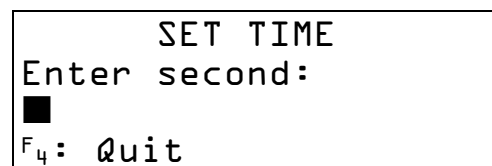
2. Key in the hour. (0 to 23)
Example: 14



3. Key in the minute. (0 to 59)
Example: 25



4. Key in the second. (0 to 59)
Example: 50



The new time is displayed before returning to the Configuration Menu.

```
SET TIME
Time set to:
14:25:50
```

5. To quit, press **F4**.

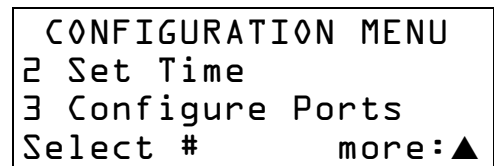


5.3 Configure Ports

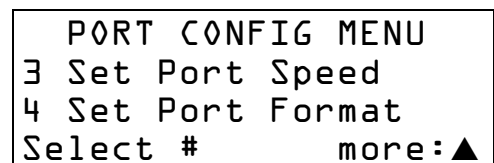
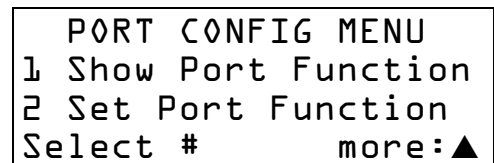
The ports on the **DL-04** can be assigned to different devices to suit individual applications. It is recommended however, that the default port settings be used. They are:

- Port 1 - Computer/Printer
- Port 2 - Counter
- Port 3 - Weight Indicator

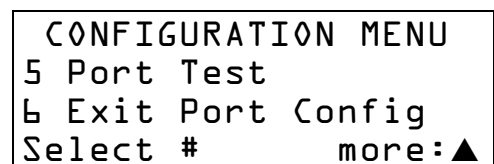
1. From the Configuration Menu, select Configure Ports.



2. Screen shows first items of the Port Config Menu. Use the **UP** and **DOWN** arrow keys to scroll through all the options.



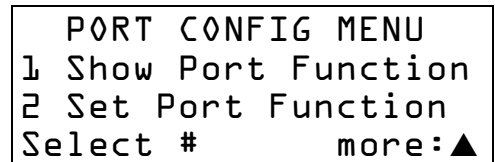
3. To return to the Configuration Menu, select Exit Port Config.



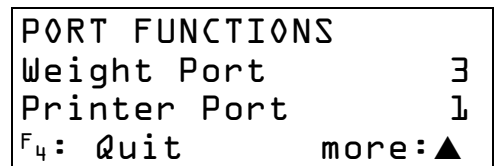
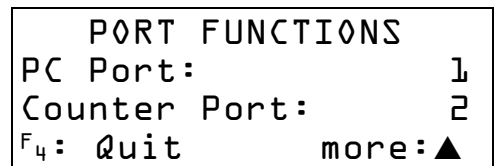
5.3.1 Show Port Function

The current port assignments can be seen by using the Show Port Function option in the Port Config Menu. This can be a useful troubleshooting tool if device communications problems arise.

1. From the Port Config Menu, select Show Port Function



2. Screen shows first Port Functions. Use the **UP** and **DOWN** arrow keys to scroll through the list.



3. To quit, press **F4**.



5.3.2 Set Port Function

The current port assignments can be changed using the Set Port Function option in the Port Config Menu. It is recommended that the default port assignments be used.

1. From the Port Config Menu, select Set Port Function

```

PORT CONFIG MENU
1 Show Port Function
2 Set Port Function
Select #           more:▲
    
```



2. Key in the port to be changed.
Example: 1

```

SET PORT FUNCTION
Enter port number:
█
F4: Quit           more:▲
    
```



3. Select the function.
Example: 1:PC

```

Select Function:
1:PC           2:Printer
3:Scale       4:Counter
    
```



```

SET PORT FUNCTION

Port: 1
Function: PC
    
```

4. To quit, press **F4**.



5.3.3 Set Port Speed

Using the Set Port Speed option, the port baud rates can be set to accommodate the needs of the device connected to it. It is important that this setting is correct for proper device interfacing.

| Supported Baud Rates |
|----------------------|
| 1200 |
| 2400 |
| 4800 |
| 9600 |
| 19,200 |
| 38,400 |
| 115,200 |

1. From the Port Config Menu, select Set Port Speed.

```

PORT CONFIG MENU
3 Set Port Speed
4 Set Port Format
Select #      more:▲
    
```



2. Key in the port to be changed.
Example: 1

```

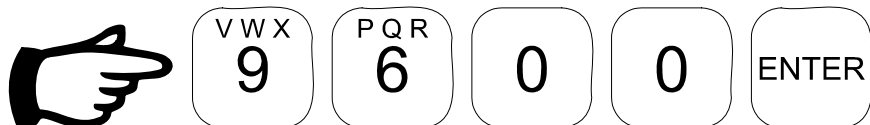
SET PORT SPEED
Enter port number:
█
F4: Quit      more:▲
    
```



3. Key in the baud rate.
Example: 9600

```

SET PORT SPEED
Enter port 1 speed:
█
F4: Quit      more:▲
    
```



SET PORT FUNCTION

Port: 1

Speed: 9600 baud

4. To quit, press **F4**.



5.3.4 Set Port Format

Using the Set Port Format option, the word length and parity parameters for a port can be set to accommodate the needs of the device connected to it. It is important that these settings are correct for proper device interfacing.

| Supported Word Lengths |
|------------------------|
| 7 |
| 8 |

1. From the Port Config Menu, select Show Port Function

```

PORT CONFIG MENU
3 Set Port Speed
4 Set Port Format
Select #      more:▲
    
```



JKL
4

2. Key in the port to be changed.
Example: 1

```

SET PORT FORMAT
Enter port number:
█
F4: Quit      more:▲
    
```



ABC
1

3. Key in the word length.
Example: 8

```

SET PORT FORMAT
Enter word length:
█
F4: Quit      more:▲
    
```



VWX
8

4. Choose the parity setting.

Example: 5:None

```
Select Parity:
1:Even      2:Odd
3:Mark      4:Space
5:None
```



MNO
5

```
SET PORT FORMAT

Port: 1
Format: 8,N,1
```

5. To quit, press **F4**.

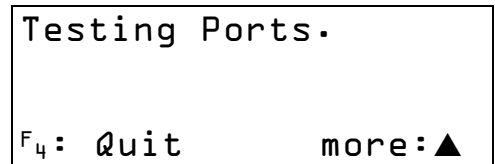
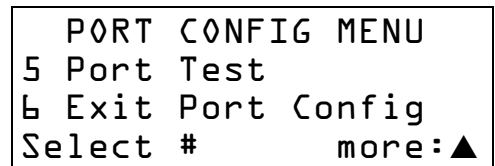


F4

5.3.5 Port Test

Proper port operation can be tested using the Test Port Function option in the Port Config Menu. This function should not be used when connected to the measurement devices as they can be damaged. This can be a useful troubleshooting tool if device communications problems arise and should only be used by trained personnel. A test string will be transmitted by each port using its current settings.

1. From the Port Config Menu, select Port Test



- 2 To quit, press **F4**.



5.4 Set Depth Units

As the Depth Counter does not provide unit information to the **DL-04**, the user must specify the depth and time units to used for logging.

1. From the Configuration Menu, select Set Depth Units.

```

Configuration MENU
3 Configure Ports
4 Set Depth Units
Select #           more:▼
    
```



```

JKL
4
    
```

2. Key in the depth units.
Example: 1:meters

```

SET UNITS
Select Depth Units:
1:meters  2:feet
    
```



```

ABC
1
    
```

5. Key in the depth units.
Example: 1:minutes

```

SET UNITS
Select Depth Units:
Depth Units: meters
    
```

```

SET UNITS
Select Time Units:
1:minutes 2:seconds
    
```



```

ABC
1
    
```

```

SET UNITS
Select Time Units:
Time Units: minutes
    
```

5.5 Plot Delay

In order to allow the printer to keep up with the data transfer, a time delay is used. After each line of the chart has been transferred, the **DL-04** waits for a specific amount of time. This length of time is determined by the Plot Delay setting and is measured in milliseconds.

1. From the Configuration Menu, select Plot Delay.

```

CONFIGURATION MENU
5 Plot Delay
6 Set Password
Select #      more:▲
    
```



2. The current Plot Delay setting is displayed and the user is prompted for the new setting.

```

SET DELAY
Current Delay: 1100
New Delay: ■
F4: Quit
    
```

3. Key in the new Port Delay setting.
Example: 1500mS

```

SET DELAY
Current Delay: 1100
New Delay: 1500■
F4: Quit
    
```



```

SET DELAY

Plot Delay: 1500mS
    
```

4. To quit, press **F4**.



5.6 Set Password

A password is required to delete data from the **DL-04**. If a password other than the factory default (1234) is desired, it can be changed using the Set Password process.

1. From the Configuration Menu, select Set Password.

```

Configuration MENU
3 Configure Ports
4 Set Password
Select #      more:▼
    
```



```

JKL
4
    
```

2. Key in the old password.

```

CHANGE PASSWORD
Old Password:
■
F4: Quit
    
```

When the password is entered, * 's are displayed for security.



4. Key in the new password.

```

CHANGE PASSWORD
New Password:
■
F4: Quit
    
```

When the password is entered, * 's are displayed for security.



5. Key in the new password again to confirm it.

```

CHANGE PASSWORD
Confirm Password:
■
F4: Quit
    
```

When the password is entered, * 's are displayed for security.



```

CHANGE PASSWORD
New Password Saved.
F4: Quit
    
```

6. To quit, press **F4**.



6. Troubleshooting

1. *The DL-04 won't turn on.*

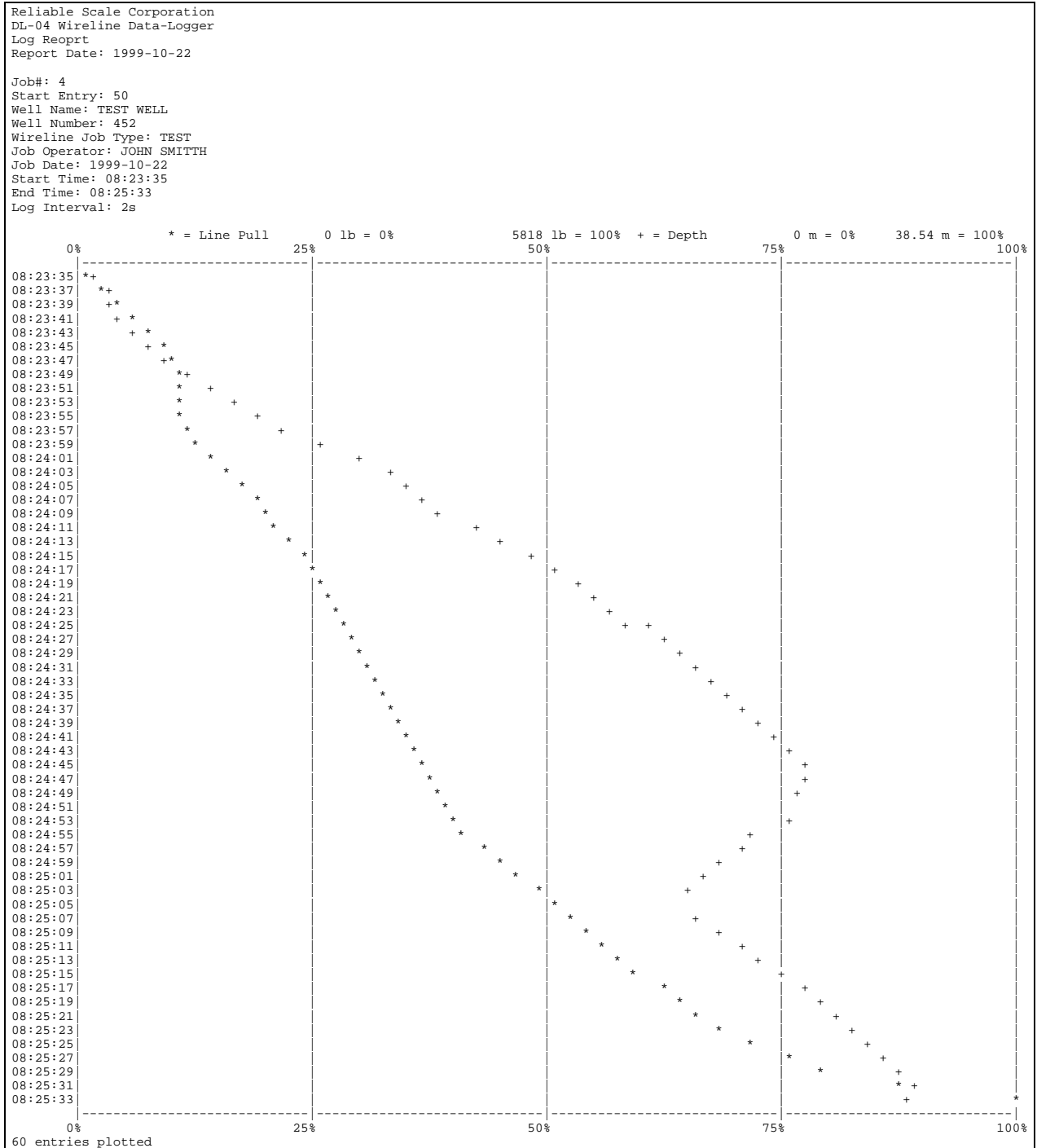
Ensure that the power connector is properly plugged in and is supplying 12VDC. Pin A of the power connector is positive, pin B is negative.

2. *When transferring data to the computer, nothing happens or else the data looks like garbage.*

Check the cable connections to the computer and make sure the terminal program is properly configured. The default is 9600 baud, 8 data bits, no parity, 1 stop bit.

7. Sample Chart

The following is a sample chart produced by the **DL-04**.



8. Sample Log

The following is a sample log gathered by the **DL-04**. Each column has a fixed number of characters and is separated by a comma (,). The columns are organized as follows:

1. Log entry
2. Memory location
3. Log time
4. Line Load
5. Line depth
6. Line speed

```

Job#: 1
Job Date: 1999-02-25
Log Interval: 2s
Start Entry: 1
Job Description: WELL01
Job Operator: BILL

```

| | | | | | |
|-----|-----|-----------|---------|----------|-------|
| 1, | 1, | 15:28:46, | 5377kg, | 200.00m, | 0m/m |
| 2, | 2, | 15:28:48, | 5376kg, | 200.00m, | 0m/m |
| 3, | 3, | 15:28:50, | 5376kg, | 200.48m, | 33m/m |
| 4, | 4, | 15:28:52, | 5376kg, | 202.20m, | 49m/m |
| 5, | 5, | 15:28:54, | 5376kg, | 204.15m, | 68m/m |
| 6, | 6, | 15:28:56, | 5376kg, | 206.51m, | 65m/m |
| 7, | 7, | 15:28:58, | 5376kg, | 208.77m, | 61m/m |
| 8, | 8, | 15:29:00, | 5376kg, | 210.12m, | 65m/m |
| 9, | 9, | 15:29:02, | 5376kg, | 212.24m, | 54m/m |
| 10, | 10, | 15:29:04, | 5376kg, | 214.08m, | 50m/m |
| 11, | 11, | 15:29:06, | 5376kg, | 216.15m, | 48m/m |
| 12, | 12, | 15:29:08, | 5376kg, | 218.32m, | 56m/m |
| 13, | 13, | 15:29:10, | 5376kg, | 220.61m, | 71m/m |
| 14, | 14, | 15:29:12, | 5376kg, | 222.91m, | 71m/m |
| 15, | 15, | 15:29:14, | 5376kg, | 224.43m, | 66m/m |
| 16, | 16, | 15:29:16, | 5376kg, | 226.28m, | 37m/m |
| 17, | 17, | 15:29:18, | 5376kg, | 227.32m, | 37m/m |
| 18, | 18, | 15:29:20, | 5376kg, | 228.32m, | 25m/m |
| 19, | 19, | 15:29:22, | 5322kg, | 229.02m, | 26m/m |
| 20, | 20, | 15:29:24, | 5322kg, | 230.07m, | 26m/m |
| 21, | 21, | 15:29:26, | 5447kg, | 230.69m, | 41m/m |
| 22, | 22, | 15:29:28, | 5449kg, | 232.78m, | 53m/m |
| 23, | 23, | 15:29:30, | 5449kg, | 234.64m, | 71m/m |
| 24, | 24, | 15:29:32, | 5449kg, | 237.06m, | 68m/m |
| 25, | 25, | 15:29:34, | 5449kg, | 238.57m, | 22m/m |
| 26, | 26, | 15:29:36, | 5449kg, | 238.82m, | 6m/m |
| 27, | 27, | 15:29:38, | 5449kg, | 238.87m, | 1m/m |
| 28, | 28, | 15:29:40, | 5449kg, | 238.87m, | 0m/m |

28 records printed

9. Limited Warranty

This warranty applies to all new equipment manufactured by RELIABLE SCALE CORPORATION except when otherwise specified in the Terms of Sale. Warranty is subject to the following terms and conditions:

- All new products are warranted for a period of twelve (12) months from the date of final sale to the end user (maximum 24 months from date of manufacture).
- RELIABLE SCALE CORPORATION shall at its option, repair or replace or refund the purchase price, within a reasonable period of time, after being notified of the alleged defect and after acknowledging that a defect does in fact exist.
- Warranty claims must be submitted in writing by mail, fax or email to RELIABLE SCALE CORPORATION within the warranty period.
- This warranty does not extend to any consequential damage of other equipment, loss of use, commercial or economic loss or inconvenience prior to or during the repair period.
- RELIABLE SCALE CORPORATION is not responsible for any damage or defects caused by misuse, negligence, neglect, modification, improper operation, improper maintenance, or repairs by any unauthorized persons.
- This is the sole warranty applicable to RELIABLE SCALE CORPORATION'S products, and no RELIABLE SCALE CORPORATION employee, agent or dealer has any authority to add to this warranty whatsoever.
- Products for warranty repair must be returned to the factory freight prepaid by the customer. RELIABLE SCALE CORPORATION is not liable for any cost related to removal, replacement, or shipping of the products or any other associated equipment.

Batteries supplied in or with RELIABLE SCALE CORPORATION products are NOT covered by this warranty.