USER'S MANUAL
FOR
PDL-20
PORTABLE LASER
DATA TERMINAL

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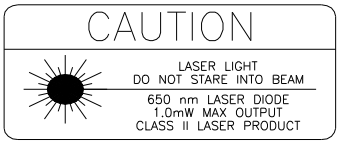
PART I

LASER SAFETY

The **PDL-20A** laser scanner complies with safety standard IEC 825-1(1993) for a Class 2 laser product. It also complies with U.S. 21CFR1040 as applicable to a Class IIa laser product. Avoid staring at direct laser light lest the laser beam hurts your eyes.



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FCC Notice

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, 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 provide reasonable protection against interference when operated in a commercial environment. Operation of this equipment in a residential area may 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.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
* Reorient the receiving antenna
* Relocate the computer with respect to the receiver
* Move the computer away from the receiver
* Plug the computer into a different outlet so that computer and receiver are on different branch circuits

If necessary, the user should consult the manufacturer, an authorized dealer or experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

" **How to Identify and Resolve Radio-TV Interference Problems**". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004000003454.

EMC Safety

According to EN 50081-1(1992) :EN 55022/EN61000-3-2
EN 50082-1(1992) :IEC 801-2/IEC 801-3/IEC 801-4

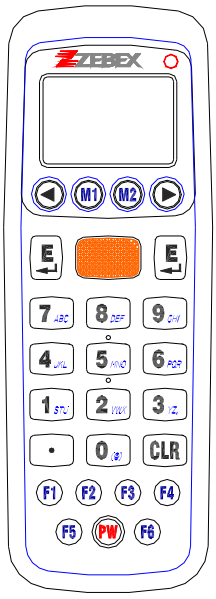
Preface

First of all, please accept our congratulations for owning one of the most compact- sized and high-performance portable terminals in the world. This book provides to first-time users information about the **ZEBEX PDL-20** as both a barcode scanner and a computerized terminal. By reading this manual, the users will obtain all necessary information about how to operate the **PDL-20** .

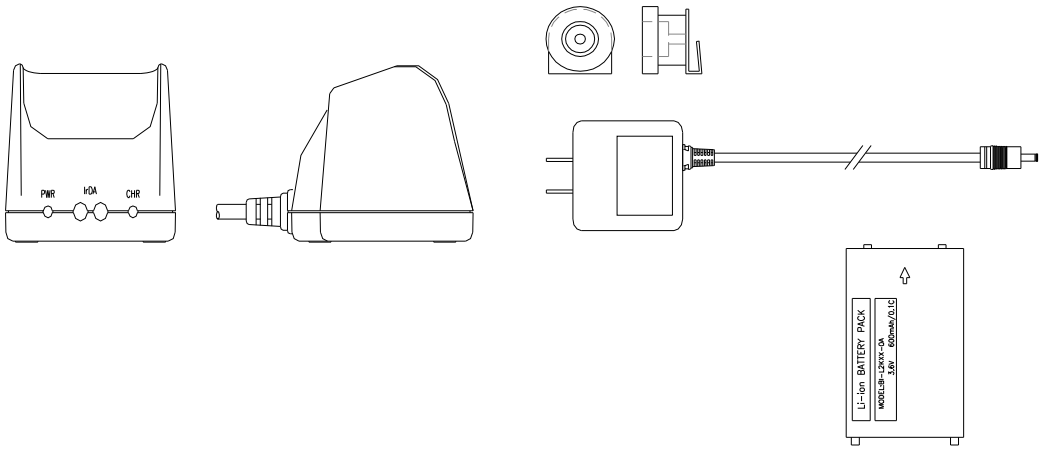
Contents of the Product Package

Each package of product may include:

1. The **PDL-20** Portable Data Terminal.
2. A power adapter
3. A cradle for communication and battery recharge
4. A set of Lithium ion rechargeable battery
5. A clip and a tab
6. **PDL-20** User's Manual



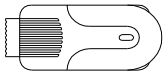
Please check that each package you have received includes the above items.
If there is anything missing or broken, please contact your local agent.



Precautions

1. Be careful with your PDL-20. Avoid dropping or banging it.
2. Keep the PDL-20 from dampness, water, corrosive liquids, etc.
3. Do not operate the PDL-20 under extreme temperatures.
   Refer to the Specifications for the temperature limitations.
4. Use only the specified charger for recharging.

Preparation



1. Mount the Battery in the PDL-20 Terminal

Take the **PDL-20** Portable Data Terminal out from the box;
place the accompanying battery in the battery compartment as shown in fig 1:

a. Press the catch, slide the back cover, and lift it in the sequence.
b. Place the battery in the compartment, and press it down.
c. Place the cover back as indicated.

2. Charge the battery

a. Put the **PDL-20** on the cradle as shown in figure 2.
b. Connect the power adapter to the DB-9 (female) connector
c. Insert the power adapter to the wall socket.

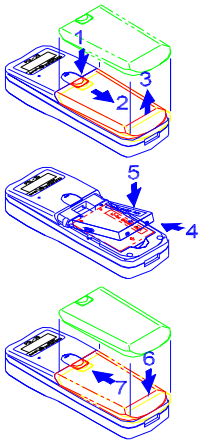


Fig 1

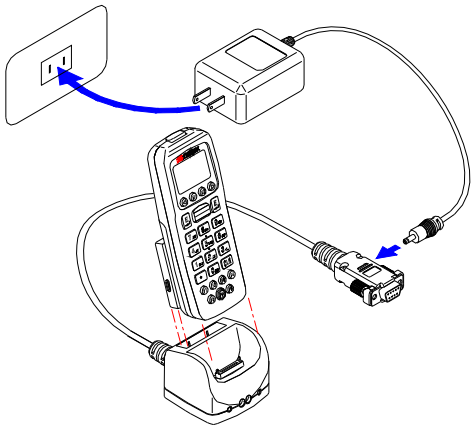


Fig 2

Note 1:

a. The cradle can be connected both to the power adaptor for battery charging and to the host computer for data uploading as well as downloading at the same time.
b. To charge the battery, connect the power plug of the power supply into the power jack on the **DB-9** female connector.
c. The **DB-9** (female) connector is used for battery charging and/or communication with the PC.

d. Battery charging and data exchange can be done at the same time or respectively. The **PDL-20** Laser Data Terminal, however, is unable to communicate with the host computer when placed on the cradle without the battery attached to it.

e. The battery is always charged via the cradle. There are two ways to charge the battery. First, take the battery out from the **PDL-20**, and insert it in the back slot of the cradle for fast charging, as shown in Fig 3, which takes about 3 hours before it is fully charged; second, put the battery in the **PDL-20**, and place it on the cradle, with the **PDL-20** either on or off, for slow charging, as shown in Fig 2. This will need approximately 6 hours. To maximize the battery's life span, it is recommended that slow charging be adopted unless there is a need for fast charging.

f. While the battery is being charged within the **PDL-20** on the cradle, data can still be exchanged between the PC and the **PDL-20** via the DB-9 connector and the RS-232 port.

g. The battery should stay on the cradle (either with the terminal or independently) for at least 12 hours before being used the first time or after months of idleness.

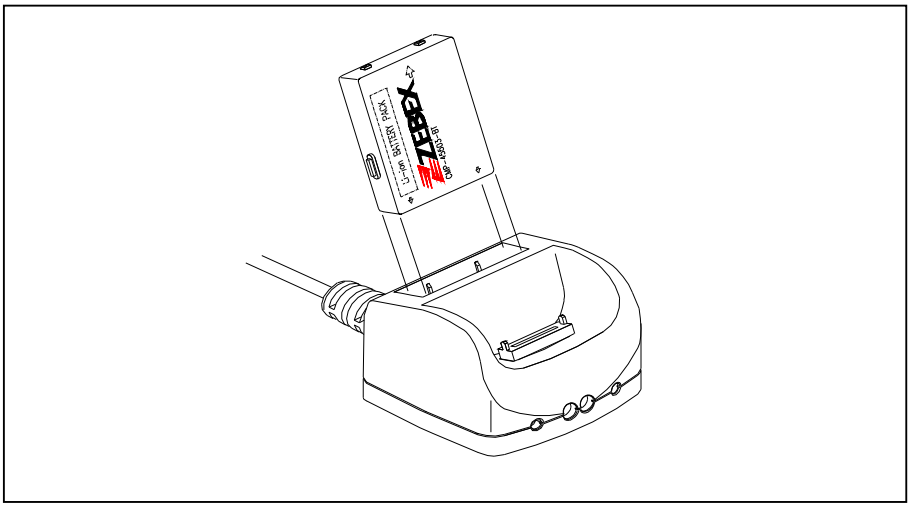


Fig 3

Note 2: How to remove the battery

a. Turn the power off.
b. Remove the back cover in a sequence similar to Fig 1.
c. Press the battery against the **PDL-20**, and lift it up and away from the compartment, as Fig 4 shows.
d. Place the cover back in place.

3. Mounting the tab

a. Remove the battery from the battery compartment as shown in Fig 4.
b. Push the tab into the thumb-like indentation as shown in Fig 5.
c. Place the battery and the back cover back in place.

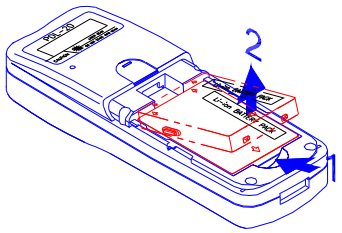


Fig 4

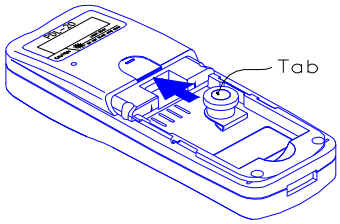


Fig 5

How to Start the Operation of the PDL-20 Terminal?

Take out the terminal, install in a set of fully charged battery.

a. Press the "**Power"** key. After the display appears, press "**M2**" key to enter the System Menu.
b. Then Press "**1**" to enter the "**Run Task**" menu. Then press "**1**" again to execute the "**FREETASK**".
c. Press "**SCAN**" to do barcode scanning and data collecting.

Features

1. Hardware features

a. Compact size, lightweight, elegant, and easy to carry on the waist strap by means of a tab mounted on the back of the unit and a clip attached to the user's waist strap.
b. Ergonomic design, operated with one hand, easy to capture data.
c. Low power consumption. Good for 48-hour operation after a full charge.
d. Auto shut-off function reduces power consumption and extends battery life.
e. Built-in **FREETASK** allows the **PDL-20** to be used for data collecting without outside supports.
f. Programmable functions supports Win Task Gen. for special data collection.
g. Built-in Laser scanner as input device.
h. Built-in Real Time Clock for time-stamp.
i. Tone controllable buzzer.
j. A lithium back-up battery for memory protection.
k. Low-battery detecting circuit and low-power warning device.
l. RS-232C communication port.

Note:

a. The **FREETASK** is a built-in simple Data Base system with which you can define your own storage structure for data collection operation.
b. Win Task Gen. is a Windows based utility program with which you can design the procedure for specified tasks and execute designed tasks on the data terminal.

2. Firmware features

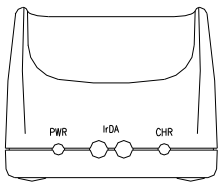
a. Supports most of the popular barcode symbols.
b. Ability to discriminate among barcodes
c. Programmable auto-power-off time
d. The uploading or downloading can be fully controlled by the computer.
e. Easy user-defined **FREETASK**, able to assign as many as 16 fields
f. Ability to execute as many as 8 TASK

3. Development Software features

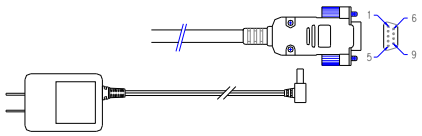
a. Windows 95/98/NT based Win Task Gen.
b. Able to remotely program all functions as long as the terminal (including the decoder) is connected to PC via the cradle.
c. Ability to upload data to PC
d. The **FREETASK** may be downloaded (from PC) to the terminal
e. In addition to the **FREETASK**, as many as 8 TASKs may be downloaded to the terminal
f. Ability to edit TASK to execute specified data collecting tasks

4. Cradle features

a. A special recharging circuit ensures recharging effects and security of the lithium Ion battery during recharging.
b. Able to communicate with PC using a widely used RS-232 interface as shown in Fig 6.
c. Able to do infrared communication using the built-in IrDA communication port.



CRD-20



DB-9 connector & power jack

Fig 6

Note:

There are 2 LEDs and 2 holes at the front bottom of the **CRD-20** as shown in Fig 6. The 2 LEDs are located on the left and right, whereas the two holes in the middle, each containing an IrDA element. The LED on the left is illuminated when power is on, and will not be illuminated if the power adaptor is not connected to the AC output, or the 9VDC jack is not inserted into the RS-232 connector. The LED on the right is illuminated when a battery is put in the back slot of the cradle for recharge. It will remain illuminated as long as recharging is going on until a full charge is achieved. It flashes intermittently, however, when the battery slot is empty, indicating that the cradle is detecting the presence of the battery. The LED at the upper-right corner of the terminal is illuminated when the terminal is placed on the cradle for a recharge, and will be off when a full recharge is achieved.

The two IrDA elements inside the front middle holes and those at the front-end of the **PDL-20** Terminal are designed for remote uploading and downloading of data and tasks between the terminal and the host computer. The communication will be hampered if the two sides cannot "see" each other.

How to Communicate via the IrDA

1. Aim the red IR elements at the top of the PDL-20 directly at those in the cradle.
2. Make sure that the **PDL-20's** IR function has been activated.
3. Make sure the distance between the cradle and the terminal is within 1.5m.

Specification

CPU/Memory

CPU	8 bit C-MOS microprocessor
SRAM	512/1024/2048K on board
ROM	Flash ROM 128K
Keypad	26 fine touch rubber key
Buzzer	Tone programmable
Real Time Clock	Year, Month, Date, Hour, Minute, second
LCD Display	STN, 96 x 49 Graphic LCD display, ASCII 16 characters x 6 lines

Power Supply

Main Battery	3.6V lithium-Ion 600mAH rechargeable battery
Backup Battery	3V 25mAH lithium rechargeable battery
Battery Life	48 HRS (8 scan/min.) after full charge

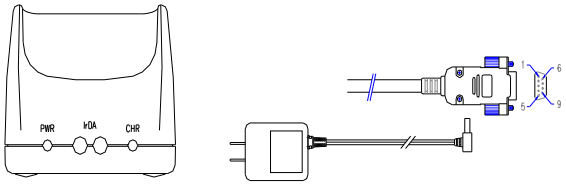
Integrated Optics

Optical System	Laser scanning technology
Resolution	(CODE 39, PCS=90%) 0.125 mm (5 mil)
PCS Value	30% or more
Scanning Speed	36 scans/sec
Depth of Field	(UPC x 1, PCS = 90%) 20 ~ 260 mm (0.8"~ 10.8")

Decoding Capability

Barcode Symbols	UPC-A/E, EAN-8/13, Codabar, Code 39, Code 39 full ASCII, Code 128, ITF 2 of 5, ISBN/ISSN, UPC-E to UPC-A, Code 93, China Post Code 25, IATA Code.

PIN-OUT CONFIGURATION



PIN-OUT CONFIGURATION	
DB-9(F)	
1.	CD (Carrier detect)
2.	TxD(Transmit data)
3.	RxD(Receive data)
4.	DSR(Data set ready)
5.	GND(sSingal ground)
6.	DTR(Data terminal ready)
7.	CTS(Clear to send)
8.	RTS(Request to send)
9.	RI(Ring indicator)
DC JACK	INNER +9V, 1A; OUTER: GND

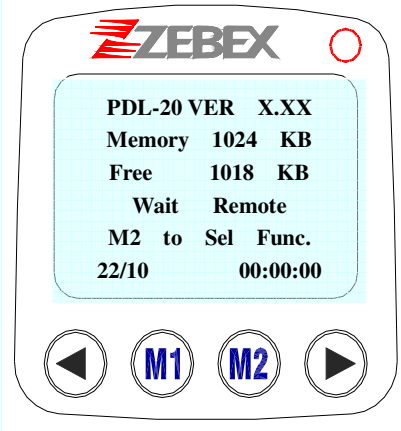
Part II

1. Two Initial Screens

1.1. Power-off Screen

With a **PDL-20** in hand, you will find its screen exactly as that shown above with no message on it before you turn it on,. We now define this screen the "**Power-off Screen**".

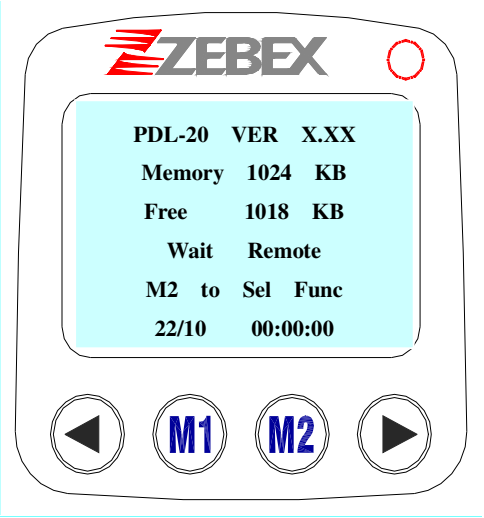
After power-on, the following screen will show as default, it's defined as "Power-on Screen."



When the "**Power-on screen**" is displayed, press **M2** to enter the "**System Menu screen**".

1.2. The Power-on Screen

Press and hold on the red **PW** key on the bottom of the keypad to turn the **PDL-20** on. The terminal will emit a "beep".



Once the Power-on screen as shown on the left is displayed, the **PDL-20** can be linked to a host computer for data to be either uploaded or downloaded. Press **M2** to enter the **System Menu.**

Notes:

a. The "**PDL-20"** at the upper left corner of the screen indicates the model of the terminal.

b. The "**X.XX"** at the upper right corner indicates the current version of the firmware.

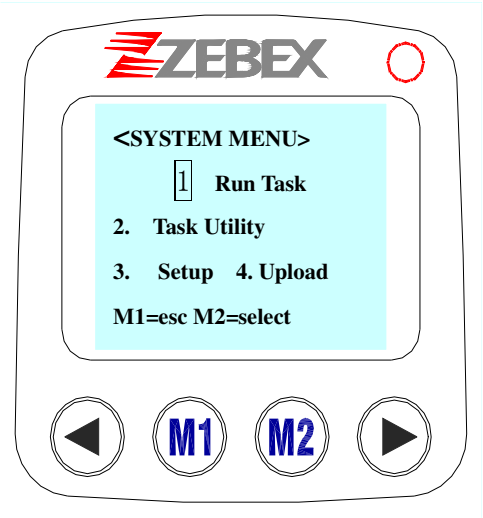
c. The "**Memory**" indicates the total memory built in the terminal.

d. The "**Free**" indicates the usable memory in the terminal. In this case, the system takes 6K, and leaves 1018K or 2043K(2M RAM PDL-20) for the "**free memory**".

e. The "**Wait Remote**" on line 4 indicates that during the transmission of the data, the terminal does nothing but "wait" on the cradle. In other words, uploading or downloading of the data is always done at the host computer.

2. Basic Operations and Settings of the PDL-20

When the "**Power-on Screen**" is displayed, pressing **M2** will lead it to the "**System Menu Screen**" as shown below. From this screen, the user can select all functions the **PDL-20** provides.



All the Select Sequences begin from the **System Menu Screen**

Item	Select Seq.	Function Descriptions
Run Task	1	To select and execute one of the tasks
File Status	2 1	To show the number of records in each file
Data Format	2 2	To set format in the Free Task for data storage
Delete Data	2 3	To delete data files
Delete Task	2 4	To delete downloaded Task
LCD Contrast	3 1 1	To set LCD contrast
Beep Volume	3 1 2	To set Beep Volume
Power up Scan	3 1 3	To set Power up Scan
Auto Power off	3 1 4	To set Auto Power off
Comm. Parameter	3 2 1 1	To set Baud Rate, Parity Check, Data Bits, Stop Bits
On Line Upload	3 2 1 2	To set Enable/Disable, Send Delimiter and Scan Data
SET DATE/TIME	3 2 2	To set DATE/TIME
Device ID	3 2 3 1	To set Device ID
Password	3 2 3 2	To set Password

Set Date Mode	3 2 3 3	To set Date Format: mm/dd/YY; dd/mm/YY; mm/dd/yyyy; dd/mm/yyyy
Basic Barcode	3 3 1	To set Basic Barcode decoder parameter
Advanced Barcode	3 3 2	To set Advanced Barcode decoder parameter
Get Barcode Type	3 3 3	To decide if the Barcode Type ID will be added to the barcode in each scan
Pre/Postamble	3 3 3	To decide if the Preamble or Postamble will be added to the barcode in each scan

Note: The information in the above table is only for reference.

2.1. Quick Setup

a. When the **"Power-on Screen**" is displayed, press **M1** and **F1** in sequence (or **F2**, or **F3**, or **F4**) for a quick setup of the following functions:

   i. To set beep volume: **M1 + F1**
   The **PDL-20** provides 4 different volume levels: "**quiet**", "**low**", "**middle**", and "**loud**". Each time **M1** and **F1** are pressed in sequence, the beep volume goes from one level to the next. It eventually goes back to the first one upon the fifth pressing. Under this mode, however, no volume change is indicated on the screen. The user can only sense the change by listening to the beeps carefully.

   ii. Pressing **M1** and **F1** once will turn the volume off (**quiet**).
   iii. Pressing **M1** and **F1** twice will set the volume at **Low**.
   iv. Pressing **M1** and **F1** three times will set the volume at **Middle**.
   v. Pressing **M1** and **F1** four times will set the volume at **Loud**.
   vi. Pressing **M1** and **F1** five times will turn the volume off again.

b. Each time you press **M1** and **F2** in order, the "**Firmware Date**" at the upper right corner of the display will appear for about 0.5 sec.

c. Pressing **M1** and **F3**, the backlight is on, and press again to switch it off.

d. To enter the "**Multi Drop Mode**", press **M1** and then **F3**. To go back to the "Power-on Screen", press **M1**.

2.2. Remote Connection with the Host Computer

When the terminal is on the cradle, and the **Power-on Screen** is displayed, a command can be issued (by the user) from the host computer to the **PDL-20** terminal through the RS232 port, ordering the terminal to enter the connection mode. When the connection is made, the green LED at the upper right corner of the terminal will be illuminated; the connection command and the result will all be displayed on the terminal screen, as shown below:

```
< Host Remote>

Send data 2:-->
unit status
Finished
```

Line 2 : command function
Line 3 : command items
Line 4 : the result (*or* communication status)

2.3 Reset PDL-20

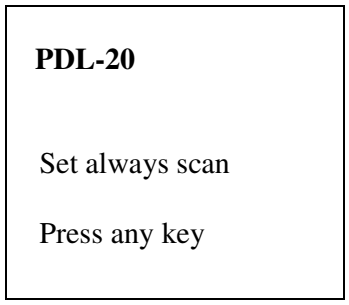
In Power-off state, press "<" + ">" + "**PW**", system is powered on and enters the Reset mode (see the figure below). Press "**M2**" to choose "**Y**" and press "**Enter**", then system will begin to reset.

```
User Reset!


Warning!
Clear All Data
M2 sel Y/N ? N
```

2.4 Set Always Scan

Before system finishes resetting, press "F5" + "F6" together until resetting is finished. The "Set always scan" screen is displayed for about 3 seconds (see the figure below), then **PDL-20** is set to the "Always Scan Mode".

To cancel "Always Scan Mode" setting, turn off PDL-20A then press "<" + ">" + "**PW**" to turn on and reset **PDL-20** again. The "Set Always Scan" mode is cancelled.



3. Display of the System Menu, Item Selection and Low Power

3.1. The System Menu Screen

When the **System Menu** is displayed as shown below, there are 4 items to choose from: 1. **Run Task**, 2. **Task Utility**, 3. **Setup**, and 4. **Upload**. To enter a desired item, press the corresponding number.

a. To select an item, press the item number or press ◁ or ▷ to move the cursor to the desired item, then press **M2** or **Enter**.

b. To return to the previous screen, press **M1** or **CLR**.

3.2. How to Select an Item

The method mentioned above for selecting an item applies to all menus. A cursor will appear in each menu display. Generally speaking, to enter an item:

a. Press the numerical key corresponding to the item; or
b. Press ◁ or ▷ to move the cursor to the item, then press **M2** or **Enter** to select it. To return to the previous screen, press **M1** or **CLR**.

3.3. Low Power Warning

A figure indicating "**Low Power**" will be displayed on the bottom line of the LCD display when the power appears insufficient to backup the **PDL-20A** for prolonged operation.

4. Run Task

4.1 Run Task Menu

There is a built-in **Free Task** in the **PDL-20**. In addition to it, as many as 8 tasks (*or* procedures) can be downloaded from a host computer to the **PDL-20**. Therefore, in total, there may be 9 different tasks as shown below. Press **Enter** to shift from one screen to the next.

< RUN TASK >	< RUN TASK >	< RUN TASK >
1. Free Task	4. Down load 3	7. Down load 6
2. Down load 1	5. Down load 4	8. Down load 7
3. Down load 2	6. Down load 5	9. Down load 8
M2=sel, ENT=Next	M2=sel, ENT=Next	M2=sel, ENT=Next

Executing the Free Task

The following display will appear when the **Free Task** is executed:
(**Note**: The **Free Task** is a task, which can be programmed on the **PDL-20** terminal without having to use a computer.)

Line 1: the record number and the field number.

Lines 2 and 3: a 32-byte space provided for data input.

Line 4: key promptings or message indicating improper operation.

Line 5: key promptings

Note:

a. In putting field prompting: When setting the "Data Format" under the "Task Utility" mode, the user can input field prompting. If the format is not specified (or nothing is input to specify the format), what is displayed on the screen are only the record number and the field number, for example: "Rec 1, field 1", as shown above. Refer to 5.3.5. for inputting procedure of field prompting data.

b. Lines 4 and 5 contain key prompting message: press M1 to exit the Free Task ; press F6 to enter the editing mode; press F3 to insert a blank character; and press F4 to delete a character.

c. Error message: A data verification function can be set by the user while setting the Data verification format. Refer to 4.5. for "Data verification Function Setting". When an error is found (by the terminal), the "Error Message" will be displayed in line 4, indicating that the input data is not correct (or the data is not correctly input), and the nature of the error. When this happens, the cursor will stay at the field (where the error occurred), waiting for new data to be input.

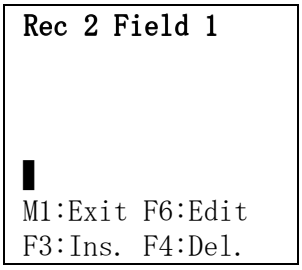
4.3. Scanning the Barcode Data

a. In the "**Free Task**" mode, press and hold the orange **SCAN** key. A laser beam will be activated and shoot out from the window at the lower front end of the **PDL-20**.

b. Aim the laser beam at the barcode to be scanned. A beep will be given and the beam will disappear if the data scanned has been successfully decoded by the **PDL-20**. The decoded message will then be displayed, as shown on the 2nd line in the following screen.

```
Rec 1 Field 1


0028200106605

M1:Exit F6:Edit
F3:Ins. F4:Del.
```

c. The following display appears as soon as the **SCAN** key is released, indicating that the scanned data has been stored, and the next field is ready to be filled.

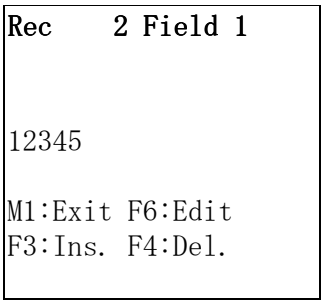


d. Usually, it takes less than 3 seconds for a barcode to be scanned and its data to be decoded. For the protection of the laser engine built in the **PDL-20**, any such procedure that has run for more than 3 seconds will cause the **PDL-20** terminal to give a warning beep, and, at the same time, deactivate the laser beam.

4.4. Keying in Data (via keypad)

4.4.1. Inputting Numerical Data

To input numerical data, press the corresponding keys. To save the input data, press **Enter** after the data is input. See the following display.



4.4.2. Modifying the Input Data

To modify the input data,

a. To move the cursor, press ◁ or ▷ .
b. To delete the data, press **CLR**.
c. To insert a blank where the cursor is located, press **F3**. For

example, if the data is "1234567," and you want to insert a blank between "3" and "4", move the cursor to "4", and press **F3** .

d. If you want to delete "4," move the cursor to "4," and press **F4** .
e. To change a character, move the cursor to the character to be changed, and input a new character.
f. A character can only be modified when the cursor stays at it.

4.4.3. Inputting Alphabetical Data

a. To input an alphabetical character, first find the appropriate key. The following table displays the numerical keys and their corresponding alphabetical characters.
b. Press the key, and the numerical character corresponding to the key will be displayed. Pressing **M2**, will turn the character into the first alphabetical one.
c. Pressing **M2** each time will turn the character into the next one. Eventually it turns back into the numerical character.
   For example,
   To input "M", press "5" and then **M2**.
   To input "N", press "5" and **M2** twice.
   To input "o", press "5" and **M2** six times.
   Pressing **M2** once more will turn "o" back into "5".
d. Keep pressing **M2** until the desired character is approached. Press the symbols are available for data inputting as shown below on the table:

7	A	B	C	a	b	c
8	D	E	F	d	e	f
9	G	H	I	g	h	i
4	J	K	L	j	k	l
5	M	N	0	m	n	o
6	P	Q	R	p	q	r
1	S	T	U	s	t	u
2	V	W	X	v	w	x
3	Y	Z	,	y	z	;
0	(	@	)			

e. To alternate between the upper case and the lower one of an English letter, press **F1**. For example, when "**A"** appears, pressing **F1** will change it into "**a",** and vice versa.

4.4.4. Inputting Special Symbols

To input special symbols, press **F2**. The following screen will be displayed:

a. Keeping pressing **F2** will bring about different sets of special symbols in sequence on the bottom line.
   Press **F2**, the first set of symbols will be displayed.
   Press **F2** again, the second set of symbols will be displayed.
   Press **F2** the third time, the third set of symbols will be displayed.
   Press **F2** the fourth time, the symbols disappear.

b. When a set of symbols that includes the desired one is displayed, press the numerical key corresponding to the symbol to select it. For example, when the first set is displayed, press **5** to select **"&".**

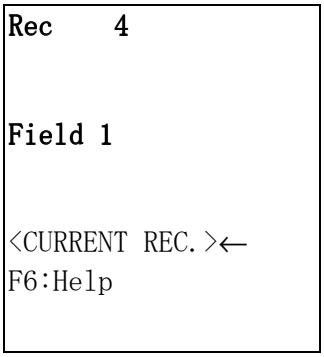
Numerical keys	1	2	3	4	5	6	7	8	9
1st set	!	#	$		%	&	*	/	+	-
2nd set	[	]	,		(	)	‘	:	;	“
3rd set	<	=	>		?	¥	_	|	`	@

c. All ASCII characters are available, with the exception of 4 characters, namely **{, }, ~, ^** .

Checking and Correcting the Input Field Data

4.5.1. Checking the Data

When running the **Free Task**, press **F6** to enter the editing mode. The following screen (which is defined "**Data Checking Screen**") will be displayed:



Line 1 : the current record number and field number

Line 2 : space provided for field data to be displayed

Line 4 : key promptings or description about the file currently used

Line 5 : key prompting

Note:

Why do you need to know where you are located in the file?

You want to know where you are (or where the data you are currently dealing with is) located in the file because without the knowledge of your current location, you **are not able to** edit the file. The **Free Task** is similar to a form in which data is recorded and arranged in lines and columns. Although the screen of the terminal is not big enough to display the overall form, by moving an "invisible" cursor, however, the user of the terminal can get an idea of where a certain data is located in the form, and where a new data should be input.

By pressing ◁ or ▷ , you can move (the invisible cursor) to a certain location in the **Free Task** file. When (the invisible cursor) is moved to the end of the file, where you can input new data, the **<CURRENT REC.>** will be displayed on line 4, indicating that here is a blank where new data is to be input. When "the invisible cursor" is moved to the beginning of the file, the **<TOP OF FILE>** appears in line 4. Each time ◁ or ▷ is pressed, either the record number or the field number (in line 1) or the data

displayed in line 2 will change, reflecting the movement of the "invisible cursor". For example, if there are 5 records in the **Free Task**, and each record has 2 fields, the **<TOP OF FILE>** will be displayed when "**Rec 1 Field 1"** is displayed on line 1. Pressing ⊵ key at this point will change the message shown on line 1(which is "**Rec 1 Field 1"**) into "**Rec 1 Field 2"**, which subsequently goes to "**Rec 2 Field 1"** if you press ⊵ again. Input new data when the "**CURRENT REC**" appears on line 4 and the data on line 2 disappears.

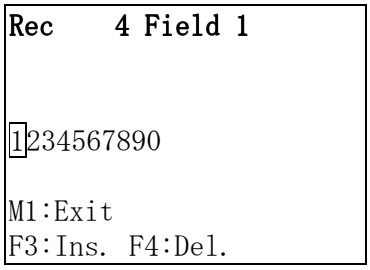
a. Whenever a field is reached, the data in the field will be displayed for the user to check it.
b. When the **<CURRENT DATA>** is displayed, new data cannot be input unless **M1** is pressed to exit the editing mode.
c. To modify the data as described in the next paragraph, press **M2**.
d. To obtain more key promptings as shown below, press **F6**.

```
F1: Last 10 Rec.


F2: Next 10 Rec.
F3: Insert Rec.
F4: Delete Rec.
F5: Jump to Rec.
```

1. If the current position is **Rec. 100**, pressing **F1** would move it back to **Rec. 90**; pressing **F2** would move it forward to **Rec. 110**.
2. To insert or edit a data at the current position, press **F3**.
3. To delete a data at the current location, press **F4**.
4. To move to a certain record, press **F5** and the number of the record to approach.

4.5.2. Modifying the Data

Under the data verification mode, press **M2** to modify the data. The following display will appear:



Line 1 : the current record and field numbers

Lines 2 & 3: provide a 32-byte zone where data is composed or edited.

a. Data can only be modified via the keypad. Refer to the above paragraphs for inputting method.
b. To move the cursor, press < or >.
c. To delete the data, press **CLR**.
d. To insert a blank character before a certain character, first move the cursor to the character, then press **F3**.
e. To delete a character, first move the cursor to the character, then press **F4**.
f. To replace a character, move the cursor to it and type a new character

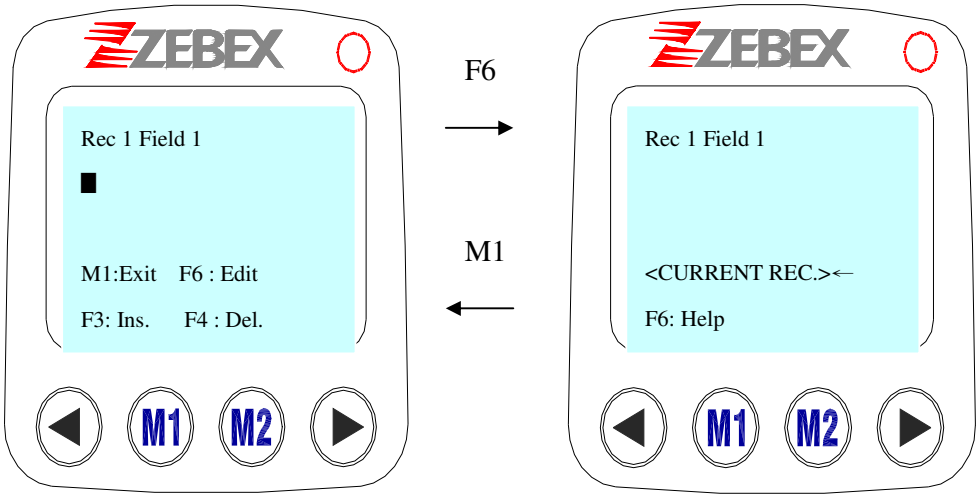
Note:

a. When a key is pressed, the numerical character corresponding to the key will be input to replace the character at which the cursor stays. The cursor will, in turn, move right to the next character.
b. For example, if the data is **"456"**, and the cursor stays at **"6"**, pressing **"7"** will replace the "**6"** with "**7"**, and the data will be changed into "**457"**, while the cursor moves to the right of **"7"**.
c. Pressing **M2** changes **"7"** into "**A"**. Pressing it again changes **"A"** into **"B"**.
d. Each time **M2** is pressed, the input character will change in order. The sequence of change is: **7–A-B-C-a-b-c-7.** Refer to **4.4.3** for further information.
e. To save the modified data, press **Enter. T**o quit modification and return to the previous data before the cursor appeared, press **M1**.

4.5.3. Exiting the Editing Mode

To exit the Editing Mode, press **M1** while the "**Data Checking**

Screen" is displayed to return to the "**Data Input Mode**" as shown below, ready for data to be input.

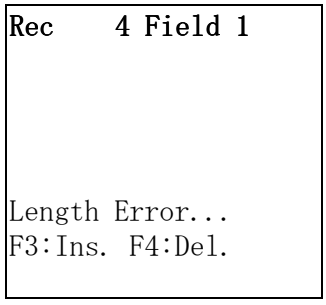


Data Inputting Mode **Data Checking Mode**

4.6. Error Messages:

4.6.1. Length Error

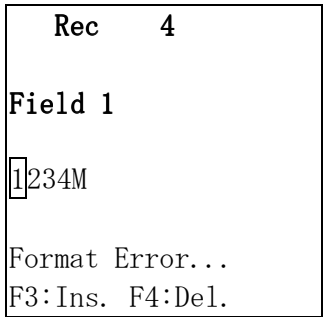
The **PDL-20**will automatically check the data length when the data is input. Any discrepancy between the input length and the preset value (*or* default value) will cause the terminal to give a beep, prompting that an error has occurred. In the meantime, the following display will appear, showing "length error" in the fourth line and requesting the data to be modified or corrected. Refer to the next paragraph for setup：



Take this screen as an example. An input data should include at least 1 character, yet there is no (or zero) character at all on line 2.

4.6.2. Format Error

When data is input or corrected, the **PDL-20** will automatically check its format. Any discrepancy between the input and the preset formats will cause the terminal to give a warning beep, prompting that an error has taken place. In the meantime, the following display will appear, showing "format error" and requesting the data or format to be modified or corrected. Refer to the next paragraph for formatting：



Suppose the input data on the screen on the left should contain all numerical characters, the "**Format Error**" shown on line 4 is caused by the "M" at the end of the data.

5. Task Utility

5.1. Task Utility Menu

The **Task Utility** is used to manage the Free Task's database of the **PDL-20** It provides the following functions:

```
< Task Utility >


1.Statu 2.Format
3.Delete Data
4.Delete Task
M1=esc,M2=select
```

1. Showing the status of the files
2. Setting the format in which the Free Task data is stored
3. Deleting files in the database
4. Deleting the downloaded Task

5.2. File Status

When 1. "**Status**" is selected, the following screen will be displayed.

```
< File Status  >


FREE TASK
Records:     5

M1 to exit
```

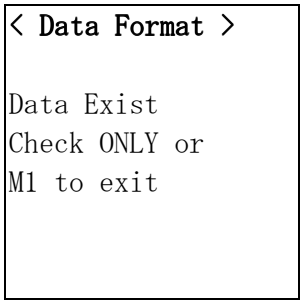
Line 2 : the file name
Line 3 : the number of the records in the file

Line 4 : key prompting

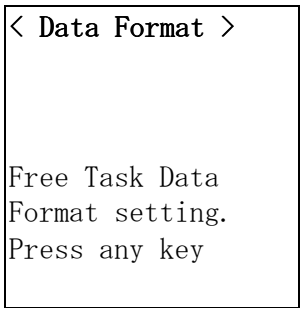
Note: Press any key to show the next file; or press **M1** to exit.

5.3. Data Format

Go back to the "**Task Utility**" screen shown in 5.1. Select 2. "**Format**" to set data format for the **Free Task**. The screen on the left will be displayed if data has already existed in the file. Under this circumstance, no modification is allowed. What the user can do is only check the data. It is only when the **Free Task** file is cleared as the screen to the right shows can the **Free Task Data Format** be reset.



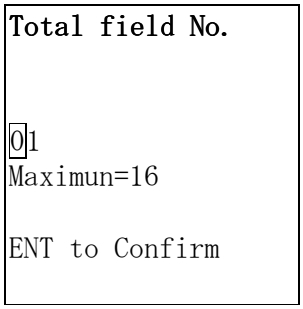
Data exists. Press **M1** to return to **Task Utility** or press any key to check the storage format.



Data does not exist.

5.3.1. Setting Total Number of Field

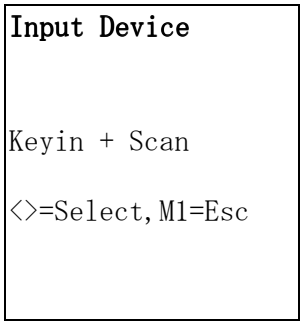
Each record in a database file can have as many as 16 fields. However, if you want to set total number of field for a file, first make sure that the file is empty. After the number is set, you can press **Enter** to confirm; or press **M1** to give up, if you want to.



Line 1: total field number
Line 2: input data
Line 3: prompting showing maximum field number

5.3.2. Selecting the Inputting Device

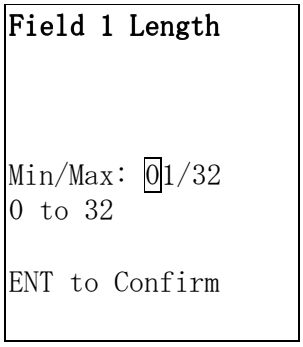
The user uses this screen to specify how he is to input the data for a (number of) field: by scanning or by keying in, or both. Press < or > to select, and press **Enter** to confirm.



Line 2 : data inputting method
Lines 4 and 5 : key promptings

5.3.3. Setting Data Length

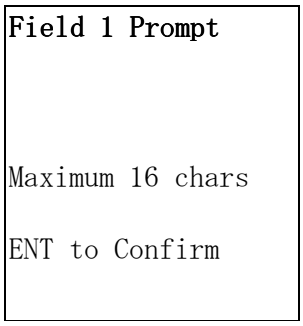
This screen is displayed for the user to set the length of data allowable in each field. You must specify both the minimum and maximum lengths. The maximum length should not exceed 32 bytes. However, regardless of the actual length, each data will take a full formatted memory size when stored. After setting the lengths, press **Enter** to confirm.



Line 2 : the length range to be set up
Line 3 : the min/max length allowable
Line 5 : key promptings

5.3.4. Setting Field Prompting

This screen is displayed for an accompanying prompting of a certain field to be input, such as "MATERIAL" or "ITEM", etc.. Such promptings will remind the user what the data to be input relates to. The message on line 3 indicates that the data to be input should not be more than 16 characters. After inputting the prompting on line 2, press **Enter** to confirm.

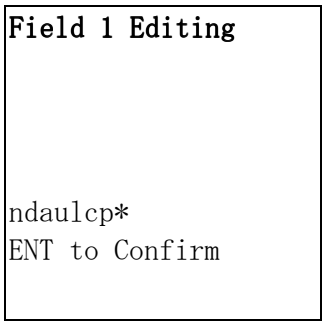


Line 2: providing a space for data to be input
Line 3: the maximum range

Line 5: key prompting

5.3.5. Setting Data Input Verification Format (Constraint)

This screen is used to set the data input verification (constraint) in each field. After entering this screen, you can choose not to set any " verification format", and skip it. But once you choose to do it for a certain field (such as "field 1" as presented on the following screen), the format you set (or input) on line 2 will decide how the data input in this field is constructed. For example, a verification format presented as "nnnnaaaa" defines that the first 4 characters of the input data should be numerical ones (represented by 4 "n's"), and the others alphabetical ones (represented by 4 "a's").



Line 2: where the format is input

Line 4: the verification prompting characters
Line 5: the key promptings

Note:

a. The Verification Character Promptings-"ndaulcp*" on the 4th line prompts how many kinds of character you can use, and what they are. For example, if the data you are going to input in a certain field contains 5 alphabetical characters, of which the first one is an upper case character and the others lower case ones, you input "ullll" on the second line.

Format character Prompting	Definition
n	Numeric characters 0~9 and +,-,.
d	digital characters 0~9
a	Alphabetic characters A~Z,a~z
u	upper case alphabetic characters A~Z
l	lower case alphabetic characters a~z
c	full ASCII characters
p	printable characters, ASCII code 32~127
*	Remove a character from a specified data entry

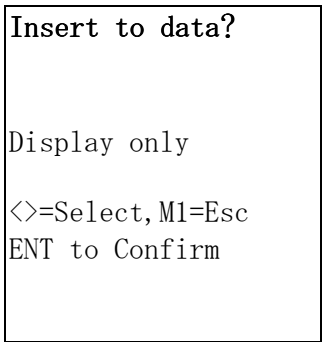
b. The characters represented by "*", such as the check character(s) in the barcodes, will (*or* may) be deleted when the data is stored. Characters other than the "Verification Promptings" mentioned above (namely n, d, a, u, l, c, p, and *) will be regarded as format symbols.

c. For example:

Format string	Input data	Display string
nnnn.nn	+12500	+125.00
DATE: dd/dd/dd	123199	Date: 12/31/99
aaa-uuu-lll-ppp	aBcDEFghi!@#	aBc-DEF-ghi-!@#

5.3.6. Storing Data Verification Prompting Characters

This screen is used to specify if the above-mentioned "format symbols" should be stored as a part of the data to be input in the field. For example, "123199" input as a "date" will be displayed as 12/31/99 if you select "Yes, Add it" (Add the "format symbol", which is "/"). Otherwise, it will be displayed "123199" if you select "Display only".



Line 2 : "**Display only**" or "**Yes, Add it**"
Lines 4 and 5 : key promptings

The "Field Format" defines the form of every character the input data contains.

5.3.7. Formatting All Fields

Repeat the processes described in **5.3.2.** to set up formats for all fields.

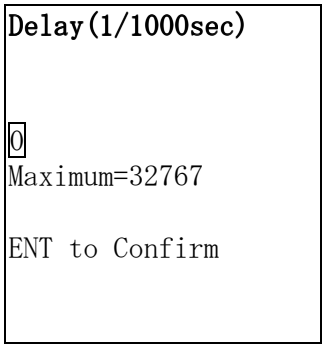
5.3.8. Setting the Delay Time

This is to decide the length of time a barcode message is displayed on the screen after the barcode is scanned.

.

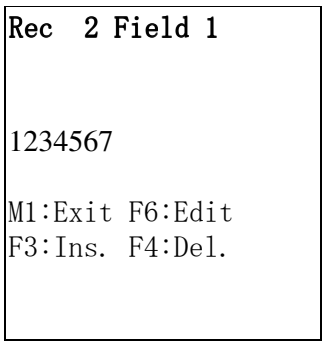
Note:

a. The following screen will not be displayed for "**Delay-time**" to be set up until all the set-ups mentioned before **5.3.8** have been completed.



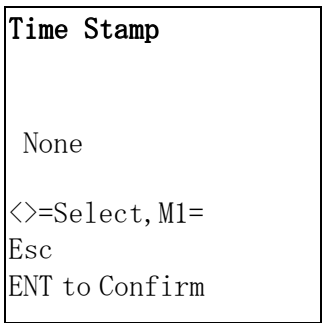
Line 2 : where the "length of time" is input
Line 3 : maximum range of time
Line 5: key prompting

b. When you have entered the screen mentioned in **4.3.**, and hold on the **SCAN** key to activate a scanning, the data being decoded from the scanned barcode will appear on the 2nd line of this screen. It will remain there as long as you hold the **SCAN** key. Even after you release it, it would still remain there for the length of time programmed under the "**Setting the Delay Time**" mode. For example, if the "time" you set up is "5,000", which means 5 seconds, and if the data obtained from scanning is "1234567", as shown on the following screen, this data will remain on display for 5 more seconds after you release the **SCAN** key. To change the length of time, enter the above-mentioned mode and reprogram the "delay-time" .



5.3.9. Setting Time Stamp

This is to set up a "Time Stamp Field" and its format to record and display the time when a record takes place.



Line 2: **None**, **Short** or **Long**
Lines 4 and 5: key promptings

a. PDL-20A has two Time-Stamp formats: a long one and a short one.
b. The short format is **DATE/ hhmm,** which indicates the **Month**, **Date**, **Hour**, and **Minute**.
c. The short format is **DATE/hhmmss,** which indicates the **Year**, **Month**, Date, Hour, Minute, and second.
d. Set up the format of DATE using the **Date Format**. Refer to the **Date Format** for detailed description.

Note:

a. Although the "Time Stamp" format is set from the **PDL-20**, it is only displayed on the screen of the host computer when the data is uploaded. On the host screen, each record will be followed by a distinct time stamp, indicating the exact time the record takes place. For example, when a barcode representing "217706" is scanned at 1 o'clock, 35 minute, 53 second PM, on June 30, in year 2000, it will be displayed in **Form 1** if the long "Time Stamp" is formatted; and in **Form 2** if the short one is formatted.

b. The "Time Stamp" following the data when displayed is actually marked by a timekeeping device built in the **PDL-20.**

Form 1. 21770606302000133553

Form 2. 21770606301353

c. The message in the 1st form includes the data (217706), the month (06), the date (30), the year (2000), the hour (13 or 1 PM), the minute (35), and the second (53).

5.4. Delete Data

Select 3. **"Delete Data**" under the "**Task Utility**" mode, the following screen will be displayed.

```
< Delete data >


FREE TASK(Y/N)?N

M2  to Select
ENT to Confirm
```

Line 2 : the file name and enquiry
Lines 4 and 5 : key promptings

Note:

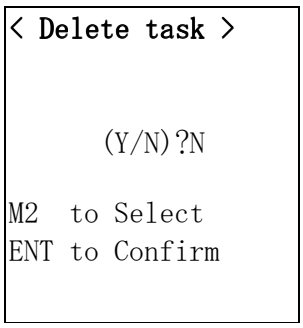
a. To choose between "**Y"** and "**N"**, Press **M2.**
b. To exit the "**Delete data**" mode, Press **M1.**
c. To confirm deletion of the file, Press **Enter**. The following screen will be displayed, indicating that the data has been deleted.

```
< Delete data >


FREE TASK(Y/N)?Y

Data Deleted
Press any key->
```

d. The next file will be displayed subsequently. Repeat the same procedure as mentioned above.
e.

5.5. Delete Task

Select 4. "**Delete Task**" under the "**Task Utility**" mode. The following screen will be displayed.



Line 2: the enquiry
Lines 4 and 5: key promptings

a. To choose between "**Y"** and "**N"**, Press **M2.**
b. To exit the "**Delete Task**", press **M1**. The task will remain unchanged.
c. To confirm deletion of the task, Press **Enter**. The following screen will be displayed, indicating that the file has been deleted.

6. Setup

6.1. Setup MENU

The **Setup Menu**, which includes 4 setup items, is used to set up parameters for the **PDL-20**.

```
<  Setup MENU  >
1.Basic Setup
2.System Setup
3.Barcode Setup

M1=esc,M2=select
```

6.2. Basic Setup

When 1. **Basic Setup** is selected, the following screen will be displayed:

```
1.BackLit &. LCD
2.Beep Volume
3.Power up Scan
4.Auto Power off

M1=esc,M2=select
```

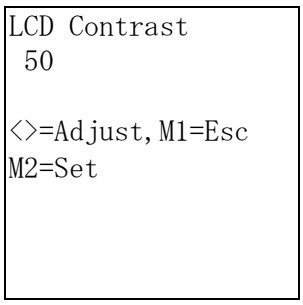
6.2.1. Back Light &. LCD

a. Under the **Basic Setup** mode, when 1. **"Back Light &. LCD"** is selected, the following screen will be displayed.

```
Back light
Off
<>=Select,M1=Esc
ENT=Set
```

Use "<" or ">" to turn on or turn off back light, then press "Enter". The following screen will display.

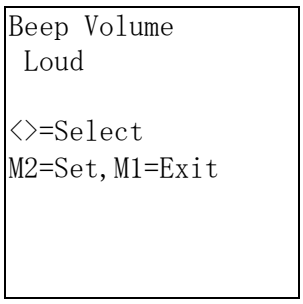
b. Whenever the **"LCD Contrast"** is selected, the value on line 2 always remains "50".
c. To select a status other than the default setting "50", press either ◁ or ▷.
d. Pressing either of the said two keys and holding it on will make the status change continuously between 40 and 60.
e. To increase the value and make the screen darker, press ▷. To decrease the value and make the screen lighter, press ◁.



Line 2 : the total range of contrast lies between 40 and 60; the default setting is 50
Lines 4 and 5: key promptings

6.2.2. Beep Volume

a. When 2. "**Beep Volume**" is selected, the following screen will be displayed.
b. There are four stages available: **"Quiet", "Low", "Medium"** and "**Loud"**. Each time you press ◁ or ▷, the beep volume goes accordingly from one stage to the next, and eventually back to the first stage.



Line 2 : where the volume set is shown
Lines 4 and 5 : key promptings

6.2.3. Power-up Scan

When 3. "**Power up Scan**" is selected, the following screen will be displayed. Two options are available: "**Enable**" and "**Disable**".

If choose "Enable", every times the **PDL-20** is turned off either under the "**Free Task**" mode or when any other task is executed, press **PW** to turn the **PDL-20** on again. It will automatically go to the former state that the **PDL-20** is turned off.

```
Power up Scan
  Enable

<>=Select
ENT=Set
```

Line 2 : the setting.
Lines 4 and 5 : key promptings.

6.2.4. Auto Power Off

```
Auto Power OFF
 10 mins

<>=select,M1=Esc
ENT=Set
```

Line 2: the settings
Lines 4 and 5: key prompings

There are 5 options to choose from: **"10 mins", "15 mins", "20 mins", "30 mins"** and **"Disable".** The default setting is **"10 mins"**, which means that the **PDL-20** will be automatically turned off 10 minutes since the moment it becomes idle.

6.3 System Setup

Press **M1** to go back to the "**Setup Menu**", and select 2. "**System Setup**", the following screen will be displayed.

```
< System Setup >
1.Communication
2.System Timer
3.ID/PW/DateMode

 M1=esc,M2=select
```

6.3.1. Communication

When 1. "**Communication**" is selected, the following screen will be displayed.

```
<COMM.  Setting>

1.Comm. paramter
2.On Line Upload


M1=esc,M2=select
```

6.3.1.1. Communication Parameter

a. Select 1. **"**Comm. Paramter**"** to setup the communication parameters, including: **Baud Rate, Parity Check, Data Bits, Stop Bits**, etc.

b. There are 6 Baud Rates available to choose from: **19200**, **9600**, **4800**, **2400**, **1200**, and **300**. The default setting is **9600**, as shown below.

```
Baud Rate
 9600

<>=Select,M1=Esc
ENT=Set
```

Line 2 : the default setting.
Lines 4 and 5 : the key promptings.

c. There are 5 **Parity Check** options available: **none, even, odd, mark**, and **space**. The default setting is **none**.

```
Parity Check
 none

<>=Select,M1=Esc
ENT=Set
```

Line 2 : the default setting.
Lines 4 and 5 : the key promptings.

d. Choose **7** or **8** bits for the **Data Bits**. The default setting is **8,** as shown below:

```
Data Bit
 8

<>=Select,M1=Esc
ENT=Set
```

Line 2 : the default setting.
Lines 4 and 5 : key promptings.

e. There are 2 kinds of **Stop Bits** available: **1** or **2** bytes. The default setting is **1**, as shown below:

```
Stop Bit
 1

<>=Select,M1=Esc
ENT=Set
```

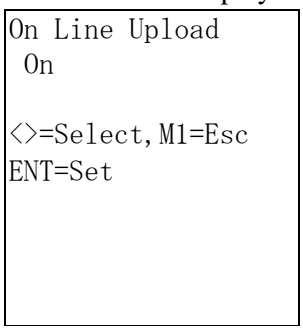
Line 2 : the default setting.
Lines 4 and 5 : the key promptings.

f. Press **M2** or **Enter** to confirm the set value after it is setup. The **PDL-20** will automatically enter the next setting mode.

g. Pressing **M1** during any setting procedure will bring the procedure to a halt, and return to the screen shown on 6.3.1.

6.3.1.2. Online Upload

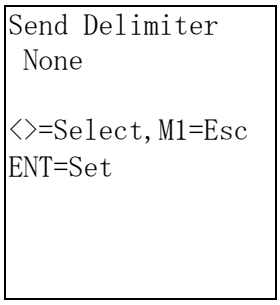
a. When 2. "**On Line Upload**" is selected from the "**COMM Setting**" screen, the following screen will be displayed.



Line 2 : the default setting.
Lines 4 and 5 : key promptings.

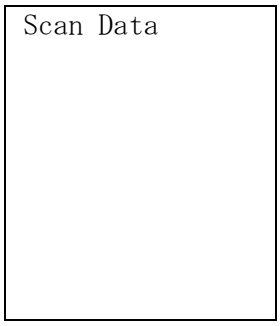
b. The **Online Upload** mode provides two functions when set "**On".** First, it allows the input data to be sent out via the RS 232 port immediately (Refer to the next section for detailed description); second, when the **Free Task** is executed, it allows the data to be sent out via the communication port at the moment the data occurs and is stored up in each field.

c. When the **Online Upload** mode is set **Off**, and the setting procedure is put to an end; the screen goes back to **COMM Setting**. When the mode is set **On**, the following screens is displayed for delimiters to be set. The delimiters, after being set up, will be transmitted out after each data is uploaded. There are 7 kinds of parity characters available: **None**, **,** , **;** , **Space**, **CRLF**, **CR**, and **LF**. The default setting is **None**.



Line 2 : the default setting.
Lines 4 and 5 : the key promptings.

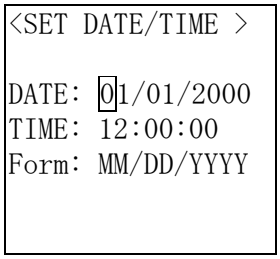
d. After the delimiter character is set, the following screen will be displayed to indicate that the **PDL-20** is ready for the above-mentioned operation to begin. The barcode data will appear on the screen right after the **SCAN** key is pressed to activate laser scanning. And as soon as the **SCAN** key is released, the data will immediately be uploaded via the communication port to the host. To exit this mode, press **M1**.



Line 2 : the scanned data containing no more than 32 bytes.

6.3.2. System Timer

When 2. "**System Timer"** is selected from the "**System Setup**" screen, the following screen will be displayed:



Line 2 : date and month
Line 3 : time
Line 4 : data format

a. When this mode is selected, the cursor appears on the 2nd line. Input the correct "date" as per the format provided on line 4. To confirm the input, press **Enter**. To go back to the original setting, press **M1**.

b. After "date" is set, the following display appears for "time" to be set up, too.

```
<SET DATE/TIME >

DATE: 01/01/2000
TIME: 12:00:00
Form: hh/mm/ss
```

Line 2 : Date
Line 3 : Time
Line 4 : data format

c. The cursor appears on line 3 when this mode is entered. Update the "time" data as per the format provided on line 4, and then press **Enter** to confirm the new setting; or, if needed, press **M1** to cancel the new setting and resume the original one. When **M1** is pressed, the time shown on the screen always reflects the real time, which kept running when the **System Timer Setup** was conducted. It is only when **Enter** is pressed to confirm the new time setting that the old timekeeping record will be made obsolete.

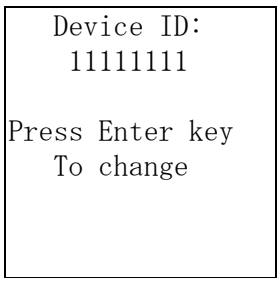
6.3.3. Setting up Device ID, Password, and Date Mode Setups

Select 3. **ID/PW/DateMod**e, the following screen will be displayed:

```
< ID/Password >

1.Device ID
2.Password
3.Date Mode

M1=esc,M2=select
```

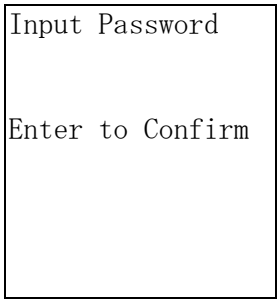
6.3.3.1. Device ID Setup

a. Select 1. **Device ID**, the following screen will be displayed. Press **Enter**, and reset the **Device ID**.



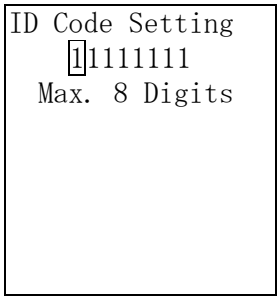
Line 2 : the current Device ID

b. If a password has been setup and input, the following screen will be displayed, requesting the original **Password** to be input.



Press **Enter** to confirm after the **Password** is input.

c. Re-set the **Device ID**. The following screen will be displayed:

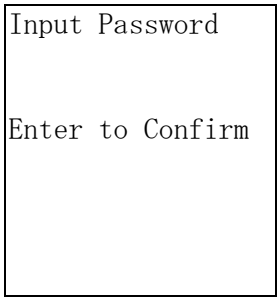


The Device ID is edited on line 2

d. Upon completion of editing, press **Enter** to confirm the setting or press **M1** to invalidate the setting.

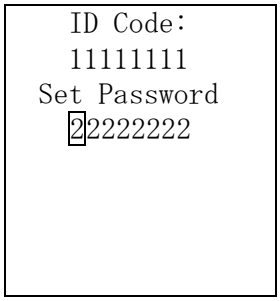
6.3.3.2. Password Setup

a. Select 2. **Password**, the following screen will be displayed, requesting the original password to be input, if a password has been setup with the **PDL-20**. Such a request will not be made if there has been no password at all.



Press **Ente**r after the password is input.

b. Set a new password, regardless of the original one. The following screen will be displayed:



The **Password** is edited on line 4.

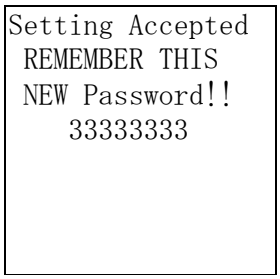
c. After the editing of the password is completed, press **Enter** to confirm the setting. If you want to abandon the setting, press **M1**.

d. If the original password remains unchanged, the following screen will be displayed.

e. If the password is changed, the following screen will be displayed:

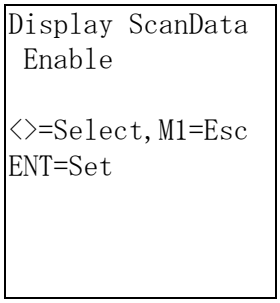
Re-input a password, and press **Enter** to confirm.

f. When a password is reconfirmed to be correct, the following screen will be displayed, reminding you to memorize it.



g. The following screen will be displayed if the setting is rejected due to the user's failure to recall the password that has been input.

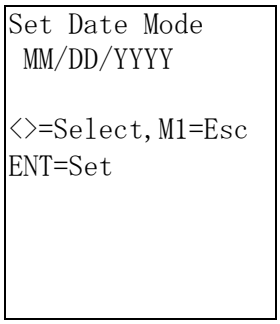
h. After the password is set, the following screen will be displayed, providing 2 options: "**Enable**" and "**Disable**". The barcode data will be displayed if "**Enable**" is selected, and would not if "**Disable**" is selected. The default setting is "**Enable"**.



Line 2 : the default setting.
Lines 4 and 5 : key promptings.

6.3.3.3. Date Mode Setup

When 3. "**Date Mode**" is entered, the following screen will be displayed:



Line 2 : the default setting.
Lines 4 and 5 : key promptings.

There are 4 options available: **MM/DD/YYYY**、**DD/MM/YYYY**、**MM/DD/YY**、**DD/MM/YY.** The default setting is: **MM/DD/YYYY**.

6.4. Barcode Setup

When 3. **Barcode Setup** is selected from the "**Setup MENU**", the following screen will be displayed:

```
< Barcode Setup>

1.Basic Set
2.Advance Set
3.Pre/Postamble

M1=esc,M2=select
```

There are a lot of barcodes available for different applications. With some parameters set up, the **PDL-20** series of lists provided in 6.4.1 demonstrate some widely-used barcodes and their parameters, options, defaults, and other remarks, etc.

6.4.1. Parameters and Options with Each Barcode

The parameters and options that can be set up with each barcode are as follows:

a. EAN/UPC

Parameters	Options	Default	Remarks
EAN/UPC	On, Off	On	Basic Setup
UPC-A Digits	11,12,13	13	Basic Setup
UPC-E Digits	6,7,8	8	Basic Setup
UPC-E to UPC-A	On, Off	Off	Basic Setup
UPC/EAN ADD 5	No Send, Send	No Send	Basic Setup
UPC/EAN ADD 2	No Send, Send	No Send	Basic Setup
EAN to ISBN/ISSN	On, Off	Off	Advance Setup
EAN-13 Digits	12,13	13	Advance Setup
EAN-8 Digits	7,8	8	Advance Setup

b. Code 39

Parameters	Options	Default	Remarks
Code 39	On, Off	On	Basic Setup
Code 39 CDV	On, Off	Off	Basic Setup
Code 39 ST/SP	Send, No Send	No Send	Basic Setup
Code 39 CKD	Send, No Send	No Send	Basic Setup

Italian Pharmac	On, Off	Off	Basic Setup
Pharmac. Add 'A'	No Add, Add	No Add	Basic Setup

c. Full ASC II Code 39

Parameters	Options	Default	Remarks
F ASCII Code 39	On, Off	Off	Basic Setup

d. Codebar

Parameters	Options	Default	Remarks
Codabar	On, Off	On	Basic Setup
Codebar CDV	On, Off	Off	Basic Setup
Codebar ST/SP	Send, No Send	No Send	Basic Setup
Codebar CKD	Send, No Send	No Send	Basic Setup
Codebar ST/SP	ABCD a/t, b/n, c/*, d/e DC1, DC2, DC3, DC4	ABCD	Advance Setup

e. ITF 25

Parameters	Options	Default	Remarks
ITF 25	On, Off	Off	Basic Setup
ITF 25 CDV	On, Off	Off	Basic Setup
ITF 25 CKD	Send, No Send	No Send	Basic Setup
ITF 25 Length	Minimum, Maximum 2 to 64	06 to 32	Basic Setup

f. Code 128

Parameters	Options	Default	Remarks
Code 128	On, Off	On	Basic Setup
Enable EAN 128	On, Off	Off	Basic Setup
Code 128 Length	Min/Max: 1 to 64	01/32	Basic Setup

g. Code 93

Parameters	Options	Default	Remarks
Code 93	On, Off	Off	Basic Setup

h. CPC 25

Parameters	Options	Default	Remarks
CPC 25	On, Off	Off	Advance Setup
CPC 25 CDV	On, Off	Off	Advance Setup
CPC 25 CKD	Send, No Send	No Send	Advance Setup

CPC 25 Length	Minimum, Maximum 1 to 64	10 to 12	Advance Setup

i. IATA Code

Parameters	Options	Default	Remarks
IATA Code	On, Off	Off	Advance Setup

6.4.2. Basic Barcode Setup

Enter 1. **Basic Set** screen and further enter the **EAN/UPC** screen, which is displayed on the left. Line 2 shows that the setting is **On**. The "**M2=more**" also shown on Line 2 indicates that pressing **M2** will lead to more parameters: the **UPC-A digits, UPC-E digits,** and **UPC-E to UPC-A**. When the decoding function is turned off, as shown on the right-hand side screen, no other parameters need to be set up.

EAN/UPC On M2=more <>=Select, M1=esc ENT=Set	UPC-A digits 13 <>=Select, M1=esc ENT, M2=Set/Next	EAN/UPC Off <>=Select, M1=esc ENT=Set

a. Basic barcode setups involve 7 barcode symbologies including: 1. **EAN/UPC**, 2. **Code 39,** 3. **Full ASCII Code 39,** 4. **Codabar,** 5. **ITF- 25,** 6. **Code 128, and** 7. **Code 93.** Refer to the X.X.X. for the procedure flow.

b. After parameters of one symbology have been setup, which is when **On** or **Off** appears on line 2 of the screen, press **Enter** to shift to the next barcode system for further setup. For example, When **EAN/UPC** is setup, and when "On/Off M2=more" appears on line 2, press **Enter** to enter the "**Code 39"** screen for subsequent setup.

c. Upon completion of all 7 basic barcode setups (that is when **Code 93** has been set either **On** or **Off**), press **Enter**

to go back to the **Barcode Setup** screen.

6.4.3. Advanced Barcode Setup

a. Select 2. "**Advance Set**" to enter **CPC 25**. Set up all parameters in a manner similar to that mentioned in **6.4.2.**

b. **Advanced barcode setups** involve 6 barcode symbologies including: 1. **CPC 25**, 2. **EAN to ISBN/ISSN**, 3. **EAN-13 Digits**, 4. **EAN-8 Digits**, 5. **IATA Code**, and 6. **Codabar ST/SP**.

c. After parameters of one barcode symbology have been setup, press **Enter** to shift to the next symbology for subsequent setup.

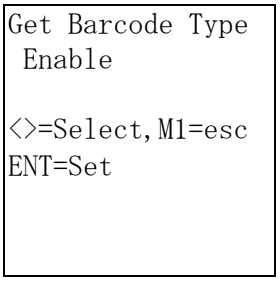
d. After all 6 advanced barcode setups (that is when under the **Codabar ST/SP** screen, either "**ABCD**" or "**a/t, b/n, c/*, d/e**" or "**DC1, DC2, DC3, DC4**" has been selected and confirmed) have been completed, press **Enter** to go back to the **Barcode Setup** screen.

6.4.4. Pre/Post Amble Setup

a. The **Pre/Post Amble Setup** consists of set-ups of 3 different codes: the Barcode type ID code, the preamble, and the Post Amble. Once a piece of data is collected and stored in the database of the **PDL-20** terminal, it will automatically be stored with the 3 said codes attached to it. Take **EAN-13** for example: the Barcode type ID code is "->10", the Preamble "123", and the Post Amble "999". Suppose a barcode representing "0028200106605" is scanned and decoded, and the data gets stored and uploaded, what is going to be displayed on the host screen will be "->1012300282001066059999".

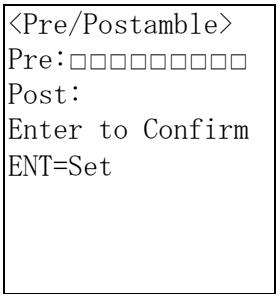
b. Select 3. Pre/Post Amble from the **Barcode Setup** screen, the

following screen will come up first:



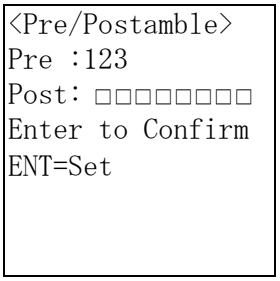
Line 2 : the default setting.
Lines 4 and 5 : the key promptings.

c. After the Barcode Type is setup, press **Enter** to shift to the next screen:



Line 2 provides blanks for the Pre Amble to be set up.

d. Fill up the blanks provided on line 2 with the Preamble characters. Press **Enter** to shift to the next line as shown below, and input the Postamble characters in the blanks provided therewith.



Line 3 provides blanks for the Post Amble to be set up.

7. Upload

Upload MENU

The **PDL-20** is built with an uploading function, that allows collected raw data to be sent out via its RS232 series port without the need of any computer software.

Note:

You can receive data, however, by using any PC host computer with standard Terminal Communication software (For example, Telix, Vetrm, and Hyper Terminal, etc.)

```
< Upload MENU  >
1.Upload Data
2.Delimiter Set
3.Upload Device
M1=esc,M2=select
```

File Uploading Format

a. Data Uploading Format

The selected files will be uploaded from the **PDL-20** to the host in sequence. The header goes first, and each record follows in order.

b. The File Header Format

The header format consists of file name and upload time. Take "**FREETASK010120001200**" for example, "**FREETASK**" is the file name; **010120001200** the upload time, which is similar to the **Date Mode**. Please refer to **6.3.3.3**. for detail.

c. The Delimiter Character

The record delimiter will be attached to the end of the header and every record. The field delimiter is inserted between two adjacent fields.

d. End-of-file Character

The End-of-file character (ASCII Code 1AH) will be attached to the end of each file.

Upload Data

Select 1.**Upload Data**, the following screen will be displayed:

```
< Upload data >
FREETASK(Y/N)?Y

M2  to Select
ENT to Confirm
```

Line 2 shows the file name and enquiry

a. The name of the file (in this case, **Free Task**) will be displayed on line 2. Also, the user is requested to make a choice between **Y**(yes) and **N**(no).

b. Press **M2** to choose **Y** or **N**, and press **Enter** to confirm.

c. If there is another file to be uploaded, its name will then be displayed on the screen. Repeat the above procedure to choose and confirm.

d. The following screen will be displayed after all files to be uploaded are picked up, indicating that the **PDL-20** is ready to upload the file(s).

```
< Upload data >

Ready to Upload

ENT to Confirm
```

Line 2 : the filename and promptings for selection.

e. If you want to upload the file, press **Enter** to confirm. The files will thus be uploaded.

f. If you want to cancel the uploading, press **M1** to exit the mode and return to the **Upload MENU** screen.

g. After the uploading is finished, the following screen will be displayed. Press any key to return to the **Upload MENU** screen.

```
< Upload data >
FREETASK
Record :    30
Finished
Press any key->
```

Line 2: the name of the last file being uploaded.
Line 3: total number of the file records.
Line 4: the result of uploading.

Delimiter Setup

From the **Upload Menu**, select 2. **Delimiter Set** to setup the delimiter characters between fields and between records as well as to select whether the header is going to be uploaded.

7.4.1. Setting up the Field Delimiter

Select 2. **Delimiter Set** from the "**Upload MENU**" screen to first set up the field delimiter. The following screen will be displayed:

```
Field Delimiter
 None

<>=Select,M1=Esc
ENT=Set
```

Line 2 : the default setting.
Lines 4 and 5 : key promptings.

a. There are 4 field delimiters available: "**None**", " , ", " ; " and "**Space**". The default is "**None**".
b. Press **Enter** to confirm the setup and shift to the "**Record Delimiter"** screen after the desired field delimiter is selected; or press **M1** to go back to the **Upload MENU** if you want to cancel the setup.

Note:

"**None**" means "Nothing".
"**,**" means "ASCII 2CH",
"**;**" means "ASCII 3BH",
"**Space**" means "ASCII 20H".

7.4.2. Record Delimiter Setup

```
Record Delimiter
 None

<>=Select,M1=Esc
ENT=Set
```

Line 2 : the default setting.
Lines 4 and 5 : key promptings.

a. There are 4 record delimiters available: **None**, **CRLF**, **CR**, and **LF**.
b. Press **Enter** to confirm the setup and moves forward to the **Upload Header** screen, or press **M1** to go back to the **Upload MENU** if you want to cancel the setup.

7.4.3. The Upload Header Setup

```
Upload Header
 Off

<>=Select,M1=Esc
ENT=Set
```

Line 2 : the default setting.
Lines 4 and 5 : key promptings.

a. To decide whether the Upload Header is to be uploaded, press either < or > to choose between **On** and **Off**. The default setting is **Off**.
b. Press **Enter** to confirm the setup and move to the **Field Delimiter** screen mentioned in **7.4.1**, and then press **M1** to put an end to the setup procedure and go back to the **Upload Menu** screen.

Upload Device

Select 3. "**Upload Device**" to enter the following screen to decide whether the Protocol is to be used or not:

```
RS232/IR Select
 RS232

<>=Select,M1=Esc
ENT=Set
```

Line 2 : the default setting.
Lines 4 and 5 : key promptings.

a. To choose to use RS232 or IR, press < or >.
b. Press **Enter** to confirm the setup, or press **M1** to go back to the **Upload MENU** if you want to abandon the setup.
c. If RS232 is chose, it will go to "Protocol Set" automatically as

follow.

```
Protocol
 Off

<>=Select,M1=Esc
ENT=Set
```

Line 2 : the default setting.
Lines 4 and 5 : key promptings.

d. To choose to use the Protocol or not, press ◁ or ▷ to set the Protocol **On** or **Off.**

e. Press **Enter** to confirm the setup, or press **M1** to go back to the **Upload MENU** if you want to abandon the setup.

7.5.1. The Protocol

During the communication between a **PDL-20** and a host computer, protocols are used to make notification, inspection, and confirmation.

7.5.2. Communication Protocol Control Code

VALUE	CTRL	CHARACTER	DESCRIPTION
1	A	SOH	START OF HEADING
2	B	STX	START OF TEXT
3	C	ETX	END OF TEXT
4	D	EOT	END OF TRANSMISSION
5	E	ENQ	ENQUIRY
6	F	ACK	ACKNOWLEDGE
21	U	NAK	NEGATIVE ACKNOWLEDGE

7.5.3. Control Codes for Data Transmission

a. **SOH** is transmitted from the **PDL-20** prior to the header.

b. The **PDL-20** will send the **STX** out prior to the data of all the records.

c. After the data is sent out, the **PDL-20** will send out **ETX**.

7.5.4. Handshake Control Code

a. Before a file is transmitted, the **PDL-20** usually performs handshaking with the host computer.

b. Before sending out the file, the **PDL-20** would send **ENQ**.
c. Upon receipt of **ENQ**, the host can send back **ACK** to acknowledge acceptance of the **ENQ**; or it can send back **NAK** to reject the file to be sent by the **PDL-20**.

7.5.5. 1 byte unsigned character

a. **BCC** is the sum of the byte values of the header, data and control code put together. The **BCC** will be sent out by the **PDL-20** after the data and **ETX** have all been sent out.
b. Upon receipt of **BBC**, the computer will first check if it is correct. If it is, the computer will then send **ACK** back to confirm. The **PDL-20** will then send the next file.
c. Or, upon receipt of the **BBC**, the host, after checking and confirming that the **BCC** it receives from the **PDL-20** is incorrect, can send back **NAK** to inform that the **BBC** is incorrect, and stopping the **PDL-20** from sending files.

7.5.6. Communication Sequence

a. The communication between a **PDL-20** and a computer goes in such sequence: 1, handshaking; 2, data transmission; 3, confirmation of correct **BBC**.
b. All files are transmitted in the same sequence as mentioned above till the transmission is completed.

Appendix—the PDL-20A's Database

1. The Data Storage Format

The **PDL-20** keeps the data it has collected. The data, which is stored in a simple form of database and presented as records, is composed of visible **ASCII** characters. Every record contains all its fields.

FORM 1	Field 1	Field 2	. . . . .	Field n
Record 1	data R1,F1	data R1,F2	. . . . .	data R1,Fn
Record 2	data R2,F1	data R2,F2	. . . . .	data R2,Fn
. . .	. . .	. . .	. . .	. . .
Record m	data Rm,F1	data Rm,F2	. . . . .	data Rm,Fn

2. Specifications of the PDL-20's Database

a. The **PDL-20** database can incorporate as many as 9 files. Each file can have its own format.
b. Each file can store as many as 65,536 records.
c. Each record can have as many as 16 fields.
d. As many as 32 characters can be stored in each field.

3. Applications of the Files in the PDL-20 Database

a. Each **PDL-20** database has one built-in **FreeTask** file, and could have as many as 8 downloaded files.
b. The PDL-20A has an inherent function that allows the **Free Task**'s format to be configured on the terminal itself without exerting an auxiliary computer.
c. The **PDL-20** is able to store the collected data and distribute the data sequentially in each **Free Task** field.
d. The **PDL-20** provides a Macro-command function that allows data to be collected, searched, transformed, compared, calculated, and stored.
e. The **PDL-20** also has an operation-programming function that allows the Macro-command to be executed according to the preset downloading procedure.