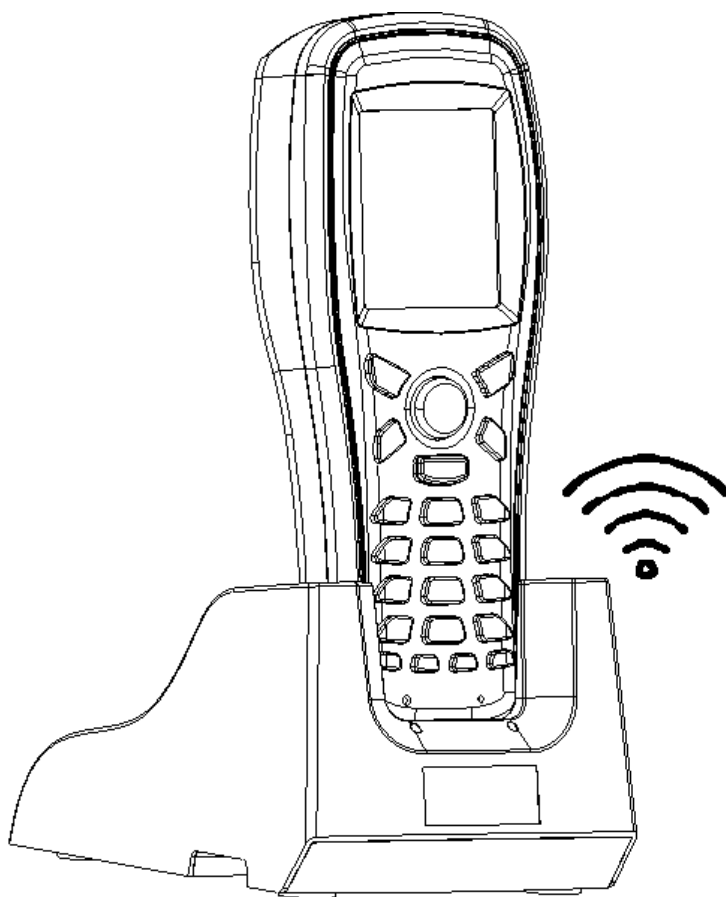


PDT 8B Data Terminal

User Manual



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I. Product Description

1. Function Characteristic

Welcome to use PDT data collection product, PDT-8B is a special barcode data collector in the market. Integrated with 32-bit ARM CPU, color TFT LCD, laser scan engine, USB interface and U-disk data exchange mode, the product is very easy to use and program. By supporting simulation development on PC, the compatibility degree of the simulation code is nearly 100%.



PDT 8B Wireless data acquisition using laser, red, 2D barcode scanning engine, it works at a high speed with large scan depth, which could meet the demands of most industries.

PDT 8B is saved in highly reliable NOR Flash that supports power loss data protection.

PDT 8B is embedded with Mptic-OS, very similar to DOS. It is a single task application system, which is convenient for users to write applications. Mptic-OS is specifically based on development

of the handsets, whose prominent characteristic is very low system resources is occupied, and it is easy to expand hardware and develop applications.

PDT8B adopted 433M wireless frequency, 2-way communication. It supports maximum 32 radio channels. In other words, 32 groups of PDT-8B devices can be used at the same time and will not interfere with each other simultaneously; each channel supports 255 devices, while in practice, the devices used in the same channel may conflict, no more than 5 devices is suggested. The transmission distance is generally 50-100m in the case of obstruction free. Strong environment interface would largely reduce the communication distance.

PDT 8B is equipped with a dedicated charging and wireless communication function of the cable, once it is placed on the cable ,it'll be automatically charged, and the cable is also a wireless base station. (When the device is placed on the base station charging, it is impossible to make wireless communication because of the distance between the base station and the equipment)

2. Technical Parameter

- 1)、32-bit high-speed ARM series CPU
 - 2)、FLASH memory: 16MB, including all of the English fonts. Support U-disk, with 14M memory.
 - 3)、Display: 2.2 inches TFT color LCD screen, support 22 rows 12 lines character display, with 262K colors at most.
 - 4)、Power supply: Standard BL-5C Lithium ion battery, support USB and cradle charging.
 - 5)、Standby time: Over 3 months (according to the remaining battery); with a lower consumption than most similar products in the market
 - 6)、Continuous work hours: 30-50hrs, at least 10,000 times barcode scan.
 - 7)、Support power-off protection, could be turn on & off at any time, as well as support automatic shutdown.
 - 8)、Embedded with high precision real-time clock
 - 9)、Unique FLASH FAT file system: Support FAT12/FAT16 compatible with WINDOWS, provide industrial standard class DBF database operation engine.
 - 10)、Support both USB1.1 and USB 2.0 full speed communication mode, could be switched to each other from the menu
- U-disk mode: Using the major and simplest data exchange mode, no programming by user is needed. The max read/write transmission speed is 250KB/s, 25 times faster than the fastest serial communication, completely eliminating the necessity of installing any driver and communication program. Currently in the field of the specific data collector handset, most products only support the serial port or USB simulation port.
 - USB-Scan gun mode: Simulate the USB scan gun, as usb keyboard, under which the PDT data collector can be used as a laser barcode

scanner, therefore achieving one machine for two usages

11)、Adopted 433M wireless data transmission chip, ensures the reliability of data transmission.

Wireless frequency:

- 433M, two-way communication
 - Maximum wireless Transmit Power: +10 dB
 - Wireless receiving sensitivity: -102dB
 - Wireless Channel: 32
 - Number of devices per channel: 255
 - Wireless signal strength indicator

CRC check for wireless communication, ensures the accuracy of data transmission.

12)、Wireless base station and terminal must in the same channel. A wireless base station is recommended to support five hand-held terminals. The base stations support USB port, USB emulation serial port, or USB keyboard, with which the drive is not needed. For special applications, wireless base stations can communicate with the non-PC communication device through RS232, to ensure communication safety and guard against illegal importation. The serial communication under RS232 is defaulted to be:

Baud rate 9600, 8 digit data, 1 stop bit, no verification.

13)、Size: 165 x 65x 35 mm, approx. 180 g

14)、Anti-Drop ability: Withstanding 1.2M free drop to concrete floor

Barcode scan parameter:

1D engine (default)

- 1) 、 Barcode scanning mode: 650nm laser
- 2) 、 Scan Depth :3-35cm (for 13mil EAN13 barcode)
- 3) 、 Barcode width: <20cm
- 4) 、 Decoding capability: EAN8, EAN13, CODE39, CODE93, CODE128, interleave 25 codes (IT25), Coda bar, UPCA, UPCE, MSI, etc.

CCD engine (optional)

- 1) 、 Barcode scanning mode: 632nm CCD
- 2) 、 Scan Depth :4-30cm (for 13mil EAN13 barcode)
- 3) 、 Barcode width: <20cm
- 4)、 Decoding capability: EAN13、 EAN8、 CODE39、 CODE128、 interleave 25 codes (IT25)、 CODE93、 Coda bar、 UPCA、 UPCE、 MSI、 etc.

2D engine (optional)

- 1)、 Light source: White light, red light
- 2)、 Scan Depth :2-20cm (for 13mil EAN13 barcode)
- 3)、 Barcode width: <20cm
- 4)、 Decoding capability: QR、 Data Matrix、 PDF417、 EAN13、 EAN8、 Code39、 Code128、 interleave 25 codes (IT25)、 Code93、 Coda bar、 UPCA、 UPCE、 MSI、 etc.

3、 Application Range

PDT 8B is a powerful data collector. Through secondary development, it can share the data of different product management

systems as follows:

- 1) Business industry: purchasing, shipment, inventory, etc.
- 2) Book, medicine, telemetry, terminal management, patrol, promotion sales of tobacco, etc.
- 3) Medical field: patient identification, specimen identification
- 4) Logistic field: goods tracking, eg. DHL, Fedex, etc.
- 5) Fixed assets management
- 6) Manufacturing execution

The user can save the data in a txt file, and input them into the management software or excel, and could transfer them by wireless function.

4、 Appearance & keypad layout



- (1). top: laser scan engine (Default)
- (2). 2.2 inches color TFT LCD screen
- (3). Standard buttons, the yellow button is the scan key
- (4). USB port and power/communication port on the bottom, ensure connection reliability
- (5). Red indicator LED separately on the top, indicate scanning and charging status.

II. Use the PDT-8B

1. Power on and power off

After the batteries are put in, the handset, it can be switched on, to access the main menu. The red button on the right upside is the power key for turn on/off. The current status will be saved after the handset is switched off, and the status will be restored after restarting.

2. Using Keypad

There are 23 buttons on the handset consisting of 5 parts:

- 1)On the top row are system buttons **【M1 (left)】** **【yellow scan key】** and **【M2 (right)】** . The functions of M1 and M2 are defined according to different functions. Normally **【M1】** is set to be the OK button and **【M2】** as the Cancel button, similar to the mobile phones.
- 2)On the second row are **【↑】** **【↓】** arrow keys and **【ENT】** enter key. Row 3-6 are number keys and **【Ctrl】** key. After switching the input methods, they can also be used to input letters. **【Ctrl】** is used to switch input method.
- 3)The last row is function keys **【ESC】****【F1】****【F2】****【F3】**, functions of F1-F3 buttons are defined according to application program. **【ESC】** is used to exit from the program.

Power button is on the top right side.

3. Anomalies and Reset

If the handset device is not responding, it is partly caused by a crush due to uncertain reasons. There are two solutions:

1. Click the reset hole on the bottom of the shell with the reset pin, and the Handset device will be forced to reset.
2. Take out the batteries for over 10 seconds, and put them back in.

4. System kernel management and application program update

The PDT data collector supports USB data cable to update the application, for the first time may need to install the driver, the driver file is contained in the application update package.

Before entering application download interface, users need to enter the system kernel management in two ways as below:

1. Main menu → system management → update applications
2. Press and hold **【0】** key, reset the handset by reset hole with the reset pin

Before entering the system kernel management, users are required to input the password which is **13579** by default. The password can be modified in the system kernel management.

Enter the kernel Management:

<p><u>PDT-8B kernel Management V1.0</u></p> <ol style="list-style-type: none">1. Update Application2. System Information3. Password Management4. Exit
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1. Connect the USB cable and press **【1】** key, you'll get the following prompts:

Update Application

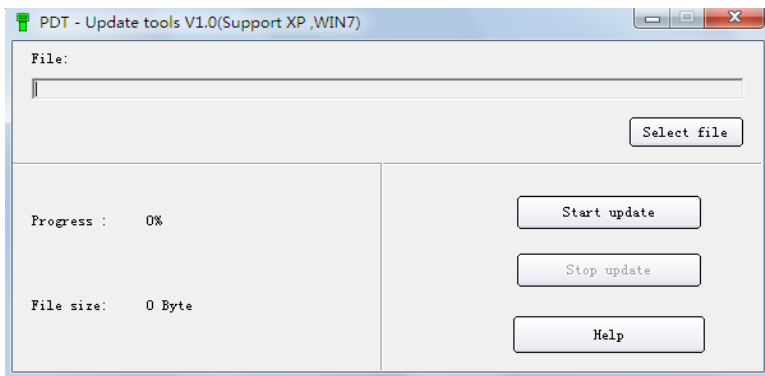
USB connection success

Down load by PC toolkits

Application Program (BIN)

File cannot excess 384K size

After installing the drive, start the PC side application update, the interface is as follows:



2) Check system information

Check the unique serial No. of the handset. The programmer can encrypt the software with the serial No.

3) Password management

Check and modify the password of system kernel management and U-disk communication. Whether to use the password of the application system is based on the specific program. If the password of U-disk communication is set to be '000000', no password will be needed again.

5. System management in applications

Different from system kernel management, the function of system management in applications is to update application programs and kernel, as well as manage the password. The system management in applications includes often-used general managements, for example, date& time, charging, access to U-disk communication, access to system kernel management, etc.

PDT 8B requires under the main menu of the PDT data collector. The general 【system management】 consists of following items:

- Enter U-Disk mode
- Update Application
- System Information
- System Setup
- File List
- Charge Monitoring
- System Test

- **Transfer files (USB communication)**

Under this option, users can access U-disk mode, a 14MB U disk will appear. The files in the U-disk is the files in the handset, they could be treated as in a normal U-disk. Users will not be able to format the U-disk in PC. Password which is 13579 by default is required to input to access this option.

- **Update application**

This is described extensively in system kernel management and application update.

- **Display System Information:**

View machine serial number, version number and storage capacity, etc.

- **System configuration**

1. Set Decode Type
2. Set Auto-off Time
3. Set Volume
4. Set Date
5. Set Time
6. Set the Backlight Brightness
7. Restore Factory Settings

1) Set the Decode Type

Barcode parameter settings need to enter a password, the default is 13579

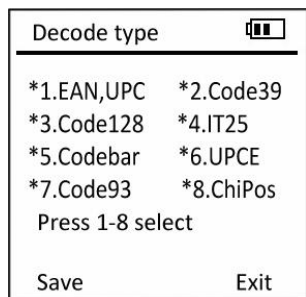
【1】 Decode type setting: Set collection allows the reading of bar code types

【2】 Decode option settings : Set the bar code parity type , whether added 0 before UPCA and whether to allow the full 39 decoding

【3】 Export format of scan-gun mode.

【4】 Export format of data collector mode.

【5】 Export format of direct inventory mode.



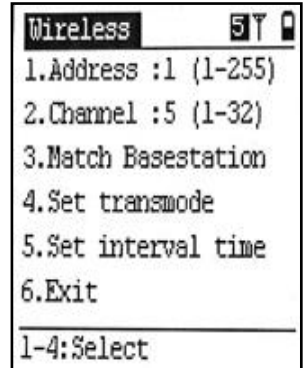
The default export format of USB barcode scanner is barcode+ Enter , you can set up complex export format via barcode export format. ‘B’ represent barcode , ‘A’ represents the local number (ie, the local address provided in the wireless settings) , number represent delimiter ,1 -127 is the character values of ASCII code, e.g. the default B.13 means output is barcode + Enter ; B.13.13 means barcode + 2 Enters; A.58.B.13 means that the output is the machine number : Barcode + Enter, 58 is the ASCII value of “:.”. Common used ASCII values can be found under fourth item of Help.

【6】Valid barcode length setting: Valid length of barcode means the valid output length of barcode, the default is 1-50; 8.13.15 means only 8,13 and 15 leng barcode output. 15-18 means 15, 16, 17, 18 barcode length out put; And

8.10.13-16 means 8,10,13,14,15,16 these 6 bar code length output.

Wireless setting: configuration includes setting address, channel and base station configuration.

The address range is 1-255, if many devices use in a same place and use the same channel setting, their addresses must be set as different values, otherwise it will result in receive and dispatch chaos. The channel value is 1-32, different wireless channels mean communication frequencies are different, so multiple wireless channel devices in the same place could be used meanwhile and non-interfering.



PDT-8B and wireless base station must be matched, the paired principle is: 1 wireless base station supports multiple PDT-8B at the same time, but address cannot be same for one base station, one base station uses one different channel value.

The paired method of PDT-8B and base station

- a、 switch off wireless base station (disconnect the USB cable)
- b、 Set the address and channel on PDT-8b.
- c、 Connect wireless base station (connect USB), normally, the screen will display a reminder of the base station was found. At this time press 'ENT' key and can pair to wireless base station, save configuration information to wireless base station, that you needn't pair them again in the future. Only when you change

wireless channel of PDT-8B, you need to pair again.

Set base station transmission mode

There are 3 transmission modes between the base station and computer.

- USB keyboard mode
- USB virtual com mode
- RS232 com (hardware serial port) mode

Default is USB keyboard mode, RS232 com is used for specific software and equipment, and also it's suitable for using in two-way data transmission.

2) Auto off time: Set auto power-off time, default is 180 seconds, this means auto shutdown in operation in 3 minutes, user can set the range within 10-600 seconds.

3) Volume set: Set buzzer volume, range is 1-5, none means mute.

4) Set LCD contrast: Set the LCD display contrast.

5) Factory settings Charge indicates the current state of charge of the battery. Reset means set the device back to the factory settings.

6) Manage the flash disk

Check electronic disk file information of the terminal, PDT currently only supports short file names in 8.3 format, not support long file names.

The flash disk contains the corresponding data inside the FLASH of the handset. The flash disk of PDT handset adopts FAT file management system in PC. After a period of usage, some waste fragments may be generated. To manage disk space is to recycle those waste fragments. The recycling begins at each communication as well as each power-on, no manual operation is needed by the users.

If the data is incomplete or destroyed on account of an



accident, users can format the flash disk to completely repair it. All data in the handset will be lost by formatting, so please backup the useful files to PC before formatting.

7) Charging

Connect USB cable or put on the cradle, PDT enter the charging mode. Charge information, e.g. battery voltage etc. Charge will automatically turn off after full power. It normally takes about 3-4 hours. Red light on the bottom side of PDT off indicates full power.

8) System test

It's mainly used for functions tests of all parts of the handset.

III. Application program development

The PDT data collector adopts sequential programming instead of message mode on WINDOWS. The main reason being the small screen of PDT handset, multi-windows is not necessary to be supported. Input events only contains keypad inputs, multi-task support is also not necessary. Sequential programming is the most suitable method for this kind of simple interactive mode and it is very similar to the old DOS, so the complexity of programming is vastly reduced.

1. Powerful simulation development greatly enhances programming efficiency.

The ANSI-C language is used in the development of the PDT data collector whose functions can cover over 99% simulation tasks on WINDOWS. Users can simulate application programs of PDT data collector with the most widely used development tool VISUAL C++. The VISUAL C++ supports the break, step and other debugging functions. It could also simulate the access to files

and barcode scanning.

2. Support standard FAT file system

The PDT data collector supports standard FAT file system, calling functions such as fopen(), fread(), fwrite() and many other standard C language function, which makes it extremely easy to access files in application programs.

3. Support industrial-standard DBF database

The PDT data collector provides industrial-standard DBF database access engine. Users can search, modify and browse the database with DBF calling functions from DBF database quickly. The DBF database can be generated by many different tools, such as EXCEL, FOXPRO, ACCESS, and so on.

4. Abundant graphic controls

The PDT data collector provides plenty of graphic controls to users, including edit box, scroll box, dialogue box, text box, scroll bar, icon menu, etc. Users can build high-level applications easily.

IV. Common faults and approach

	Symptom	Treatment
1	Does not boot	<ol style="list-style-type: none">1、 Replace the battery;2、 Connect the USB cable for power;3、 Hold the 0 key to reset, then enter into the system kernel to check whether it can be managed, if still no response, it is a hardware failure; otherwise updating an application to try again.

2	Laser jet failure prompts after boot	<ol style="list-style-type: none"> 1、 The laser jet failure, Depot Repair; 2、 Laser jet’s self-test failed due to power shortage. Connect to USB cable for power.
3	No display after boot but button operation can be a normal reaction	<ol style="list-style-type: none"> 1、 LCD screen failure, Depot Repair; 2、 The user may set the contrast of the LCD screen to unseen proportions, blind operation to re-set.
4	Initialization file system fail to pass after boot	<ol style="list-style-type: none"> 1、 FLASH file system may be damaged. Electronic disk must be reformatted to solve, methods of operation: press F2 reset or power-up, then go into the electronic disk formatting features, follow the prompts to re-format the electronic disk. This action will lose all the files inside the machine data; 2、 Hardware failure, Depot Repair.
5	Normal display but buttons are no response	<ol style="list-style-type: none"> 1、 Keyboard interface may be damaged by static electricity, Depot Repair; 2、 Check the application.