

# MDC-6B data collector

## User guide



Laser barcode scanner + data collector

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# **I. Product Description**

## **1.Function Characteristic**

Welcome to use MDC data collection product, a special barcode data collector in the market. Integrated with 32-bit ARM CPU, 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%.

Adopting the laser scan engine, it works at a high speed with large scan depth, which could meet the demands of most industries. Nowadays most of the laser barcode scanner encodes are integrated with 8-bit ARM CPU, while PDT adopts 32-bit ARM CPU whose speed is over ten times faster and much more accurate.

The data of MDC is saved in highly reliable NOR Flash that supports power loss data protection. With a smaller storage space than NAND FLASH, the biggest advantage of NOR FLASH is it avoids the broken areas, which greatly increases the storage reliability.

The MDC data collector is embedded with JZOS, very similar to DOS. It is a single task application system, which is convenient for users to write applications. JZOS 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.

## 2. Technical parameter

- 1) 32-bit high-speed ARM series CPU, max. clock frequency 60MHZ
- 2) NOR FLASH: 8MB, 7.5M available for use.
- 3) Memory: SRAM 512KB
- 4) 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. 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.
  - Simulated scanner mode: Simulate the USB as keyboard, under which the MDC data collector can be used as a laser barcode scanner, therefore achieving one machine for two usages . Under this mode, the USB is used as power supply and no batteries are needed..
- 5) Power supply: two AA batteries (1600-2400mah NiMH rechargeable battery preferable), support USB charging.
- 6) Display: 128x128 FSTN LCD screen, support 10 row x10 line Chinese character display, with bright white or blue backlight.
- 7) Size:168 x 65 (55) x 35 (25) mm
- 8) 26-Key standard keypad
- 9) Standby time: Over a half year (according to the remaining battery); with a lower consumption than most similar products in the market
- 10) Continuous work hours: 50-100hrs, One times / per ten second averagely.
- 11) Support power-off protection, could be turn on& off at any time, as well as support automatic shutdown.
- 12) Embedded with high precision real-time clock
- 13) High safety data: All data in the handheld PC is saved in the flash. In case of sudden loosening or drop of the battery during operation, the temporary data can be protected fully.

- 14) Unique FLASH FAT file system: Support FAT12/FAT16 compatible with WINDOWS, provide industrial class DBF database operation engine.

***Barcode scan parameter:***

- 1) Barcode scanning mode: 650ns laser
- 2) Scan Depth :3-35cm ( for 13mil EAN13 barcode)
- 3) Barcode width: <30cm
- 4) Decoding capability: EAN8, EAN13, CODEBAR, CODE39, CODE93, CODE128, interleave 25 codes (IT25), Codabar, UPCA, UPCE, MSI, etc.
- 5) Anti-Drop ability: withstanding 1.2M free drop to concrete floor

### **3. Application**

The MDC 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: patients identification, sample identification
- 4) Logistic field: goods tracking, eg. EMS
- 5) Fixed assets management
- 6) Manufacturing execution
- 7) Fair information management, the user can save the data in a txt file, and input them into the management software or excel.

#### 4. Appearance & keypad layout



- (1) Frontal: laser scan engine
- (2) FSTN 128x128 LCD screen
- (3) Standard buttons, the yellow button is the scan key
- (4) Dual USB port on the bottom to ensure connection reliability
- (5) red and green indicator separately on the top, indicate scanning and charging status.

## II. Use the MDC-6B

### 1. Battery and charging

The MDC data collector uses two 5# (AA ) batteries for power supply. The user can use disposable battery or MiMH rechargeable battery. alkaline battery is suggested to use as disposable battery, because leakage from the normal dry battery that hasn't been used for a long time may erode the battery connector and even the internal main board. and MiMH battery is suggested as rechargeable battery, with the capacity from 1600-2400mAH, therefore ensure the handset to work for a long time.

The MDC data collector is integrated with charging function. The user can charge the MiMH battery via the USB port on the bottom of the handset. Powered from a 5V power supply, the battery can be charged through the USB port of a compatible PC or a normal charger whose output voltage is 5V. Charging a pair of 2000mAH NiMH batteries fully may take up to 12-15hrs.

**★Note:** Only the rechargeable battery can be charged. It is dangerous to charge a disposable battery. Please take out the battery if the handset will not be used for a long time. (Leakage may happen if the dry battery hasn't been used for a long time, which will result in rust of the battery connector and even the internal circuit board).

### 2. 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 middle bottom 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.

### 3. Using Keypad

There are 26 buttons on the handset consisting of 4 parts:

- (1) One 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 **【↑】** **【↓】** **【←】** and **【→】** arrow keys.
- (3) Row 3-6 are number keys and Enter key. After switching the input methods, they can also be used to input letters. **【ENT】** is enter key, also called OK button
- (4) The last two row are function keys **【F1】** - **【F4】** , **【ESC】** , **【Background-light】**(light-bubble symbol)and**【Power】**. The functions of **【F1】** - **【F4】** are defined according to prompts of the program. Similar to ESC key of PC, **【ESC】** is used to exit from the program.

### 4. Abnomalies 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.  
Internal capacitor discharge of the handset is the reason for the 10+ seconds' waiting.

### 5. System kernel management and application program update

The MDC data collector supports the updating of new applications under U disk mode, which is a great innovation in the field. No software pre-installations are needed to update applications, which greatly facilitates users. Users need to input password to enter both system



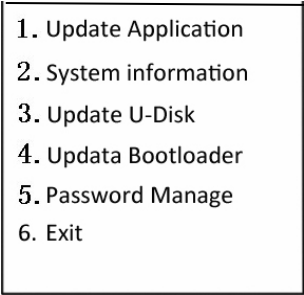
management and U-disk mode. The two passwords can be modified in the option of password management under system kernel management.

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.

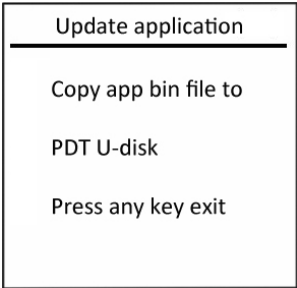
The interface of system kernel management is as follows:

- 
- A screenshot of a system kernel management menu. It is a rectangular box with a black border containing a numbered list of six options:
1. Update Application
  2. System information
  3. Update U-Disk
  4. Updata Bootloader
  5. Password Manage
  6. Exit

### ***System kernel management:***

#### **1. Update application program**

Connect the USB cable and press 【1】 key, you'll get the following prompts:



A screenshot of a prompt box titled 'Update application'. The box has a black border and contains the following text:

Update application

---

Copy app bin file to

PDT U-disk

Press any key exit

At this point a 382KB U-disk will appear. Please copy the application

program (a file in .BIN format) to it and press the left key (M1) to exit, then press M1 key to confirm, to complete the download of the application to the handset. Then please press **【6】**to exit and execute new applications.

## **2. Check system information**

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

## **3. Update U-disk communication;**

## **4. Update Bootloader.**

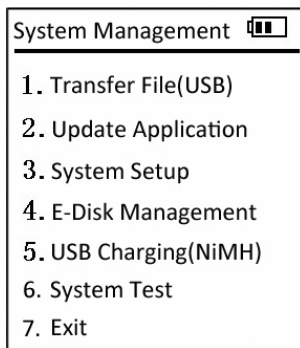
These two options are rarely used unless a serious problem occurs or they need to be updated.

**5. 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.

## **6. 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.

A submenu **【system management】**is required under the main menu of the MDC data collector. The general **【system management】** consists of following items:



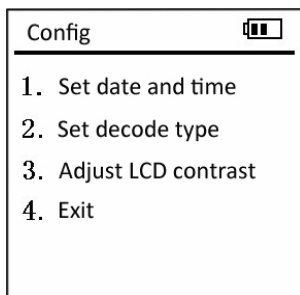
### **6.1. Transfer files (USB communication)**

Under this option, users can access U-disk mode, a 7.5MB 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.

### **6.2. Update application**

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

### **6.3. System configuration**



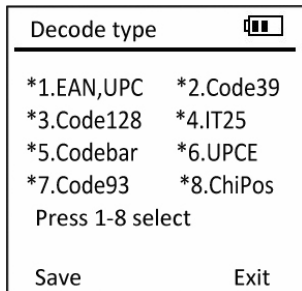
#### **(1) Set date& time**

Set the date& time of the handset. The date & time information will be lost and need to be reset if the battery is removed for more than 2minutes.

Please change the battery as quickly as possible to avoid this happening, also the handset should be switched off before changing the battery.

## (2) Set the encoding type

The options with the \*symbol mean the barcodes need to be encoded at the moment.



Press 1-8 to switch between encode / no encode.

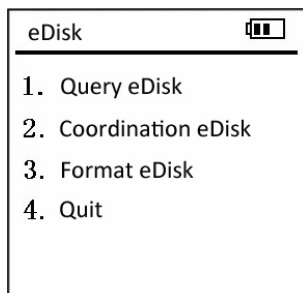
## (3) Adjust LCD display contrast

Press **【up】** and **【down】**key to adjust LCD display contrast. The screen will display the current contrast level promptly.

## (4) Display the serial No. of the handset.

The unique serial No. of each handset is used for user management.

## 6.5. Manage the flash disk



The flash disk contains the corresponding data inside the FLASH of the

handset. The flash disk of MDC 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.

#### **6.6. Charging**

If the rechargeable battery is used, users could start the charging process by this option. The charging status will be monitored by the data collector, and will automatically stop once the handset is fully charged.

#### **6.7. System test**

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

### **III. Application program development**

The MDC data collector adopts sequential programming instead of message mode on WINDOWS. The main reason being the small screen of MDC handset, multi-windows is not necessary to be supported. As the 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 MDC data collector whose functions can cover over 99% simulation tasks on WINDOWS. Users can simulate application programs of MDC 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 MDC 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 MDC 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 MDC 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.