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Stand Alone Optical Module  
DFZ-2002S Specification



**Features特点**

- Low Price/High Quality低价格/高质量
- PCB is attached to the sensor for space saving PCD黏结，节省了空间
- Memory chip is capable to save fingerprints by itself 内存保证能本身够储存指纹
- CPU is able to save/authenticate/output fingerprints by our own algorithm通过我们的运算，CPU能够储存，鉴别，输出指纹。
- Our module supports diverse interfaces 适合不同的接口。

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## Appearance



Upper part  
上部



Front part  
前部



Reverse side  
反面

## Specifications

- CPU : 32Bit RISC CPU(66MHz)
- Interface : RS-232(TTL Level)
- Life : Semipermanent
- Capacity : 150
- FRR : 0.1%
- FAR : 0.00001%
- Resolution : 560DPI
- Size : 23mm X 28mm X 53mm
- Weight : 22g
- Operating Voltage : DC +3.3V
- Operating Current : 120mA
- Idle Current : < 70mA
- Operating Temperature : -20 < T < +60

## Improvement Particular

- Addition of AGD(Auto Gain Control) function : Auto optimum function by intensity of radiation(Sunlight, fire light etc)
- The operating is stable even under the sunlight outside
- AT89C51 MICOM is updated
- Addition of PROTOCOL COMMAND(Detection command of using ID)

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## Structure



← Sensor of fingerprint Enrollment

← Body of Module



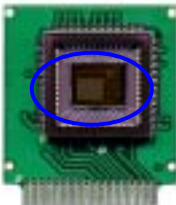
← Back light

← 32Bit RISC CPU



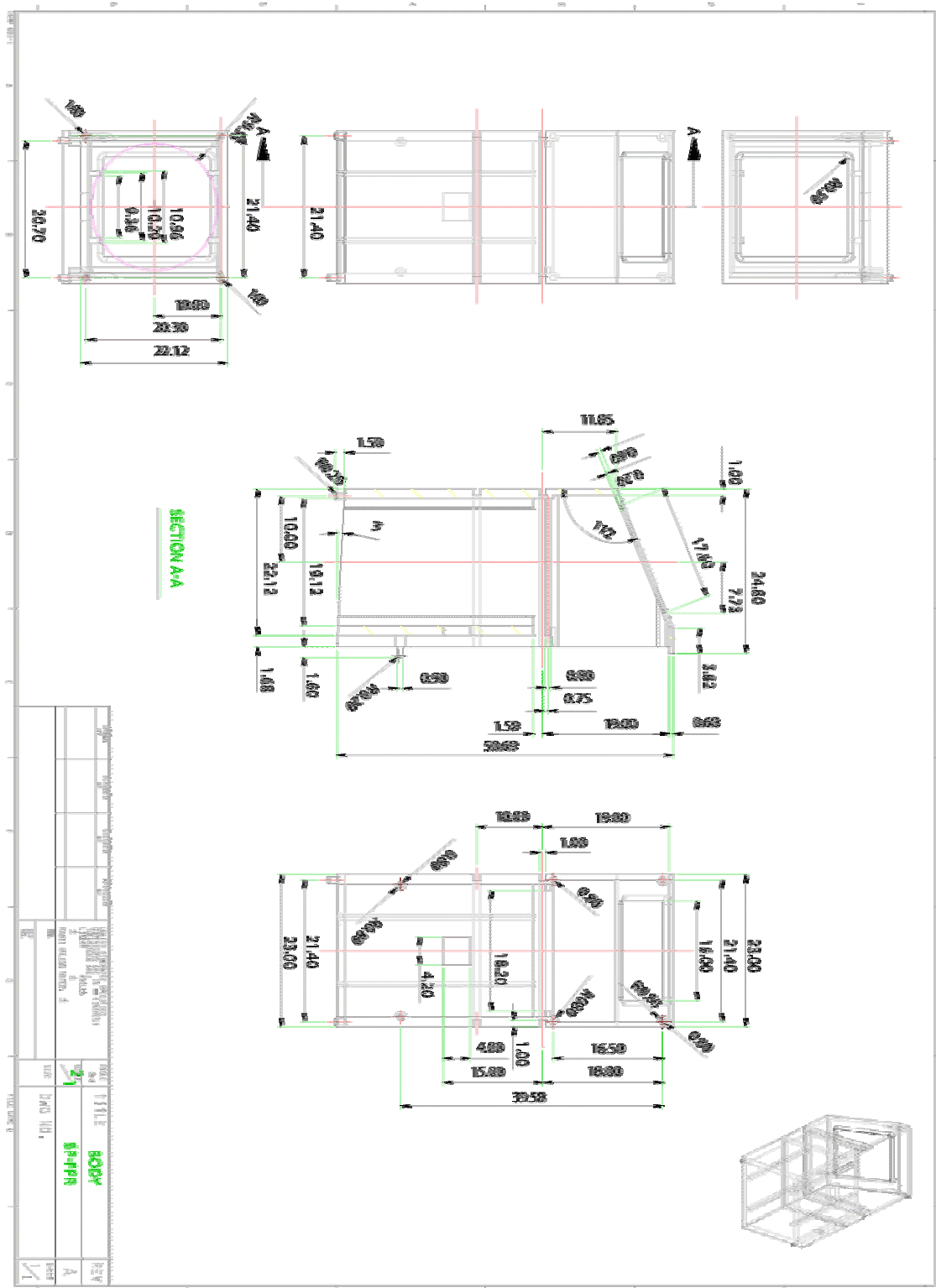
← Data Memory

← RS-232(TTL Level) Interface

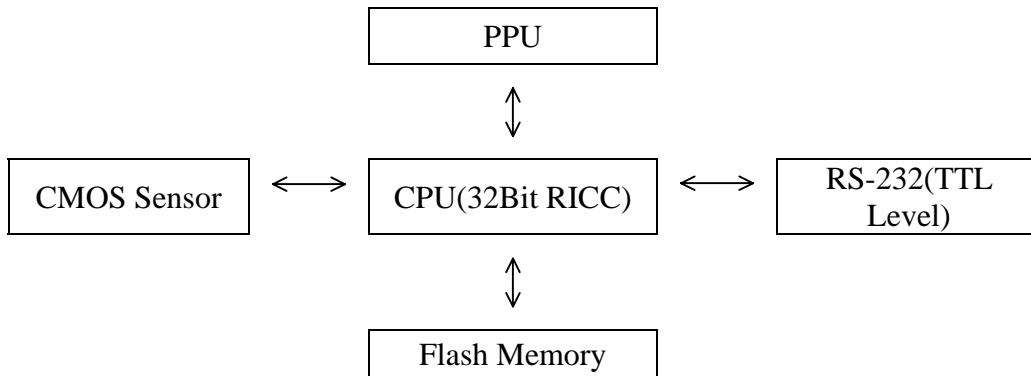


← CMOS Sensor

- Plan of Module body



|                       |                           |
|-----------------------|---------------------------|
| Model name名称          | DFZ-2002S                 |
| CPU                   | 32 Bit RISC CPU           |
| Interface接口           | RS-232(TTL Level)         |
| PCB Size尺寸            | DFZ_2002S : 23mm × 50mm   |
|                       | DFZ_2001F : 23mm × 26.8mm |
| Operating Voltage工作电压 | DC +3.3V ±0.3V            |
| Operating Current工作电流 | < 70 mA                   |
| Temperature Range温度范围 | -20 < T < +60             |



**DFZ-2002S Stand Alone Module Block Diagram块图表**

**RS-232 Connector接口器**

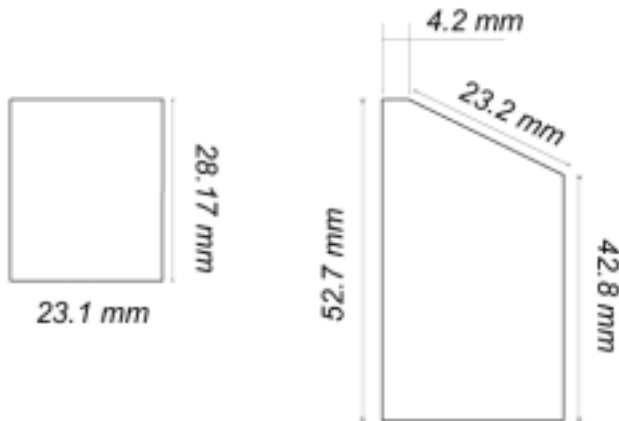
| Pin number | Symbol     | Remark |
|------------|------------|--------|
| 1          | VCC(+3.3V) |        |
| 2          | RXD        |        |
| 3          | TXD        |        |
| 4          | Reset      |        |
| 5          | GND        |        |

Serial Interface (TTL Level)

Baud Rate : 38,400 BPS

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## Size



## DFZ-2002S Command Protocol 命令模式

-Single Mode单一模式

### 1. Firmware Downloads(Compatible with Network Mode)

- Packet信息包

- DFP\_START\_DOWNLOAD开始下载

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0x10 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_END\_DOWNLOAD结束下载

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0x11 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_REQ\_DATA需要数据

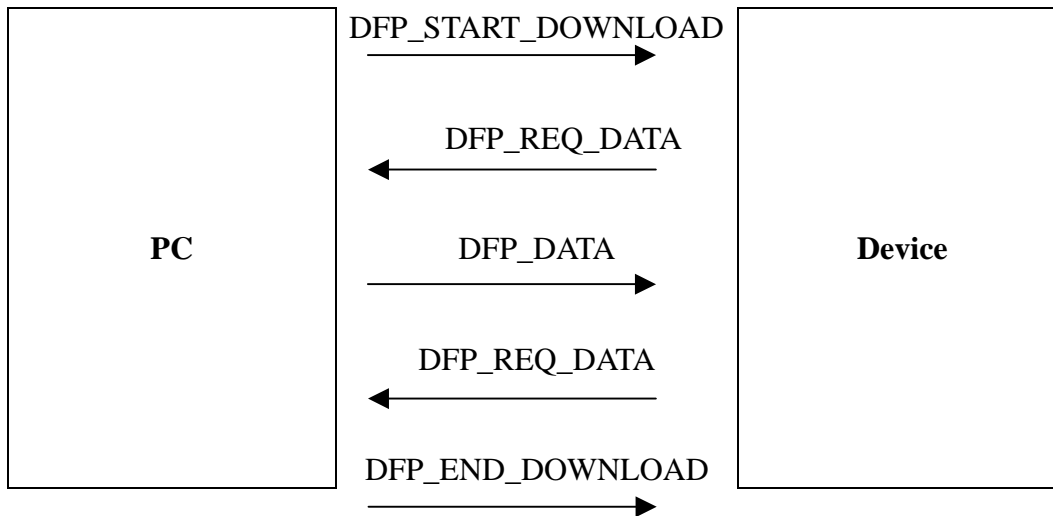
|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0x12 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_DATA

|      |      |      |       |       |               |
|------|------|------|-------|-------|---------------|
| 0x1b | 0x5e | 0x13 | Hsize | Lsize | Data(256Byte) |
|------|------|------|-------|-------|---------------|

Hsize : data size's superior Byte优质数据

Lsize : data size's inferior Byte低级数据



## 2. Information of User's Registration (USE\_Finger Check)使用者信息 (用手指确认)

- Packet数据包

-DFP\_USE\_FINGER\_CHECK\_ID使用手指确认ID

|      |      |      |      |           |
|------|------|------|------|-----------|
| 0x1b | 0x5e | 0xb6 | 0x00 | ID Number |
|------|------|------|------|-----------|

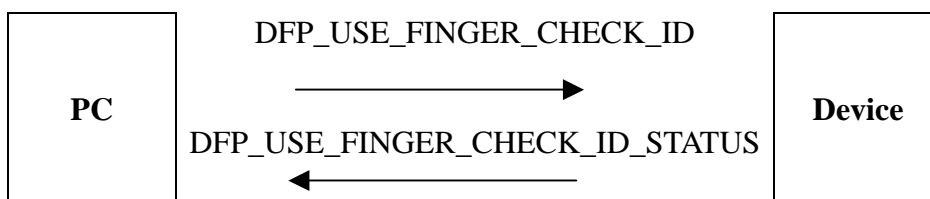
ID Number : User ID使用者ID

- DFP\_USE\_FINGER\_CHECK\_ID\_STATUS使用手指确认ID状况

|      |      |      |      |        |
|------|------|------|------|--------|
| 0x1b | 0x5e | 0xb6 | 0x00 | Status |
|------|------|------|------|--------|

Status : Memory Status内存状况

|      |                        |
|------|------------------------|
| 0x00 | Using area使用面积         |
| 0x01 | Extra area for use额外面积 |
| 0x03 | Memory over flow溢流内存   |



## 3. Number of Total User's Registration (Total\_USE\_Finger\_Cnt)所有注册者的人数

- Packet

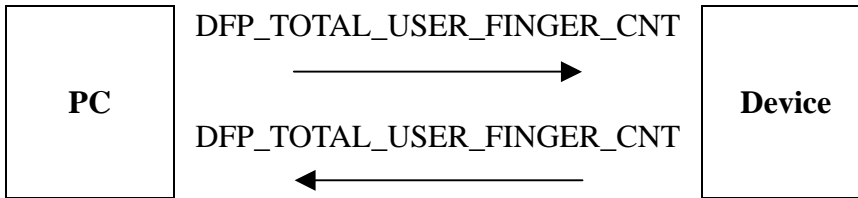
- DFP\_TOTAL\_USE\_FINGER\_CNT使用手指总数

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0xb7 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_TOTAL\_USE\_FINGER\_CNT手指总数

|      |      |      |      |          |
|------|------|------|------|----------|
| 0x1b | 0x5e | 0xb7 | 0x00 | User_CNT |
|------|------|------|------|----------|

User\_CNT : Number of Registered ID 注册的ID的数目



#### 4. User's Registration(Use Registration- ID)使用者注册 ( ID )

- Packet

- DFP\_USER\_REGISTRATION\_USE\_ID 注册ID

|      |      |      |      |              |
|------|------|------|------|--------------|
| 0x1b | 0x5e | 0x20 | 0x00 | ID<br>Number |
|------|------|------|------|--------------|

ID Number : User ID

- DFP\_USER\_REGISTRATION\_USE\_ID\_SUCCESS ID注册成功

|      |      |      |      |          |
|------|------|------|------|----------|
| 0x1b | 0x5e | 0x21 | 0x00 | NFeature |
|------|------|------|------|----------|

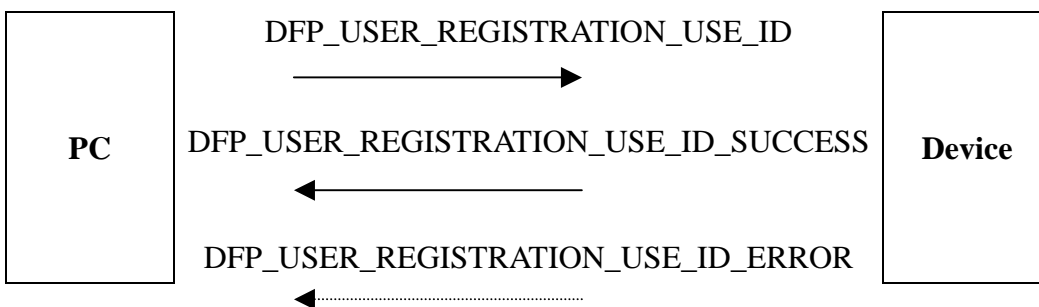
NFeature : Number of Feature 特征数

- DFP\_USER\_REGISTRATION\_USE\_ID\_ERROR 注册错误

|      |      |      |      |       |
|------|------|------|------|-------|
| 0x1b | 0x5e | 0x22 | 0x00 | Error |
|------|------|------|------|-------|

Error : Error Code 错误数据

|      |   |
|------|---|
| 0x01 | Number of feature is not enough to be standard 数据特征数不够      |
| 0x02 | Error of registered Fingerprint's information 注册者信息错误       |
| 0x03 | When use ID which user of the ID is existed already ID 已经存在 |



#### 5. User's Registration(Registration)注册

- Packet



- DFP\_USER\_REGISTRATION注册

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0x50 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_USER\_REGISTRATION\_SUCCESS注册成功

|      |      |      |      |           |
|------|------|------|------|-----------|
| 0x1b | 0x5e | 0x51 | 0x00 | ID Number |
|------|------|------|------|-----------|

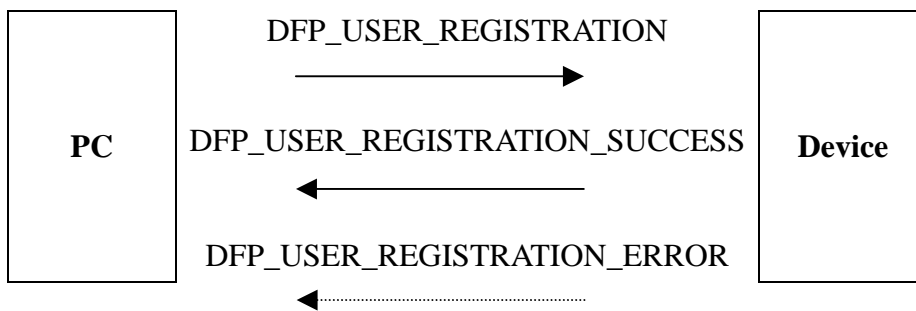
ID Number : Registered User ID

- DFP\_USER\_REGISTRATION\_ERROR注册错误

|      |      |      |      |        |
|------|------|------|------|--------|
| 0x1b | 0x5e | 0x52 | 0x00 | nError |
|------|------|------|------|--------|

nError

|      |  |
|------|--|
| 0x01 | Number of feature is not enough to be standard特征数不够      |
| 0x02 | Error of registered fingerprint's information信息错误        |
| 0x03 | When use ID that user of the ID is existed alreadyID已经存在 |



## 6. Erasing User(Deletion – ID use)删除ID

- Packet

- DFP\_USER\_DELETION\_USE\_ID删除ID

|      |      |      |      |           |
|------|------|------|------|-----------|
| 0x1b | 0x5e | 0x30 | 0x00 | ID Number |
|------|------|------|------|-----------|

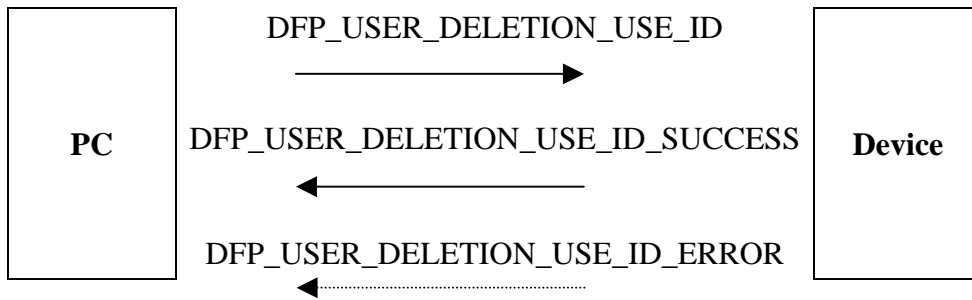
ID Number : User's ID that will be erased将要被删除的ID

- DFP\_USER\_DELETION\_USE\_ID\_SUCCESS删除成功

|      |      |      |      |        |
|------|------|------|------|--------|
| 0x1b | 0x5e | 0x32 | 0x00 | nError |
|------|------|------|------|--------|

nError

|      |   |
|------|---|
| 0x03 | ID for deletion is not existed要删除的ID不存在 |
|------|---|



## 7. Erasing User(Deletion)删除

- Packet
  - DFP\_USER\_DELETION使用者删除

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0x60 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_USER\_DELETION\_SUCCESS成功

|      |      |      |      |           |
|------|------|------|------|-----------|
| 0x1b | 0x5e | 0x61 | 0x00 | ID Number |
|------|------|------|------|-----------|

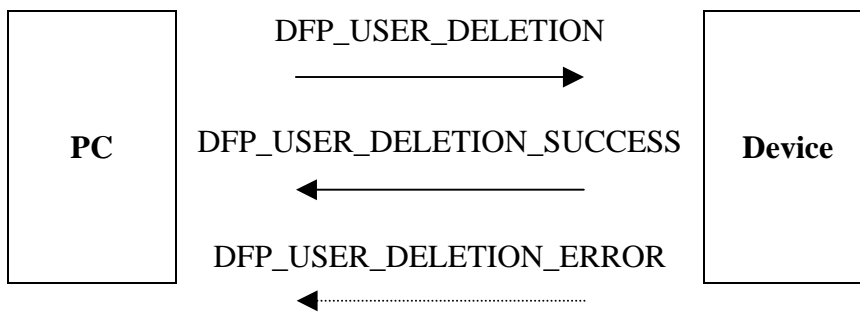
ID Number : Number of erased ID被删除的ID数

- DFP\_USER\_DELETION\_ERROR删除错误

|      |      |      |      |        |
|------|------|------|------|--------|
| 0x1b | 0x5e | 0x62 | 0x00 | nError |
|------|------|------|------|--------|

nError

|      |   |
|------|---|
| 0x01 | Number of feature is not enough to be standard特征数不够 |
| 0x02 | Coincident ID is not existed ID不存在                  |



## 8. User Authentication (Identification - ID 认证) 鉴定ID

- Packet
  - DFP\_USER\_IDENTIFICATION\_USE\_ID使用者鉴定ID

|      |      |      |      |           |
|------|------|------|------|-----------|
| 0x1b | 0x5e | 0x40 | 0x00 | ID Number |
|------|------|------|------|-----------|

ID Number : User's ID that will be authenticated将要被鉴定的ID号

- DFP\_USER\_IDENTIFICATION\_USE\_ID\_SUCCESS鉴别成功

|      |      |      |      |          |
|------|------|------|------|----------|
| 0x1b | 0x5e | 0x41 | 0x00 | nFeature |
|------|------|------|------|----------|

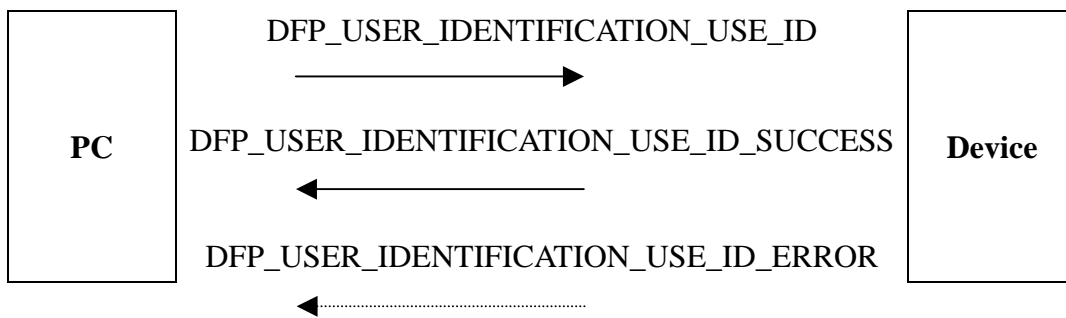
nFeature : Number of coincident feature 鉴别特征数

- DFP\_USER\_IDENTIFICATION\_USE\_ID\_ERROR 鉴别错误

|      |      |      |      |        |
|------|------|------|------|--------|
| 0x1b | 0x5e | 0x41 | 0x00 | NError |
|------|------|------|------|--------|

nError

|      |  |
|------|--|
| 0x01 | Number of feature is not enough to be standard 特征数不够 |
| 0x02 | Fingerprint doesn't not match 指纹没有对比                 |
| 0x03 | Appointed ID is not existed 指定的ID不存在                 |



## 9. User Authentication(Identification)鉴别

- Packet

- DFP\_USER\_IDENTIFICATION 鉴别

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0x70 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_USER\_IDENTIFICATION\_SUCCESS 鉴别成功

|      |      |      |      |           |
|------|------|------|------|-----------|
| 0x1b | 0x5e | 0x71 | 0x00 | ID Number |
|------|------|------|------|-----------|

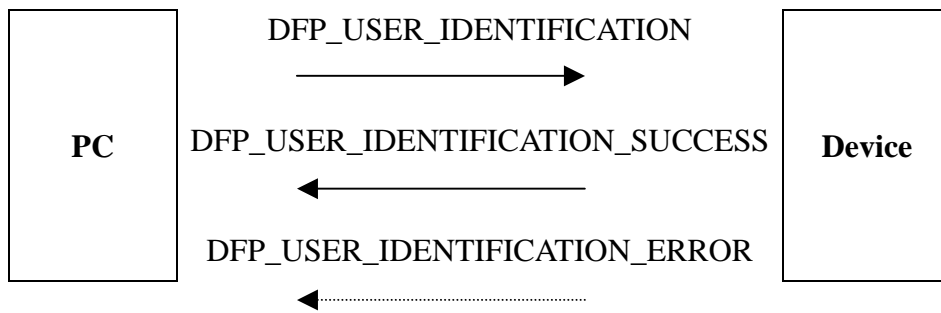
ID Number : Authenticated User's ID 鉴别的ID

- DFP\_USER\_IDENTIFICATION\_ERROR 鉴别错误

|      |      |      |      |        |
|------|------|------|------|--------|
| 0x1b | 0x5e | 0x72 | 0x00 | nError |
|------|------|------|------|--------|

nError

|      |  |
|------|--|
| 0x01 | Number of feature is not enough to be standard 特征数不够 |
| 0x02 | Coincident fingerprint is not existed 指纹不存在          |



**Network Mode网络模式**

**1. User Registration(Registration)注册**

- DFPNET\_USER\_REGISTRATION注册

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0x80 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFPNET\_USER\_REGISTRATION\_SUCCESS注册成功

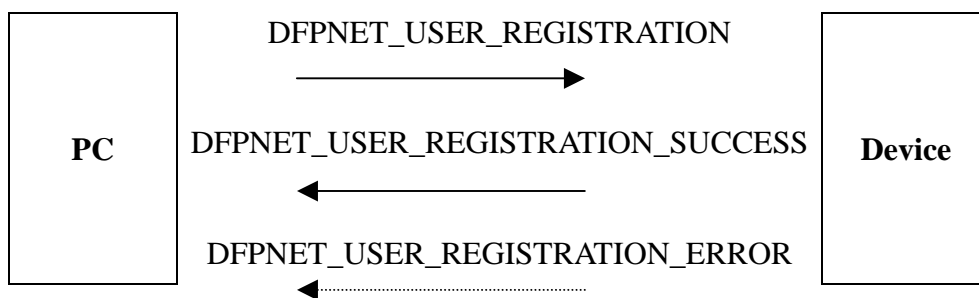
|      |      |      |      |      |                       |
|------|------|------|------|------|-----------------------|
| 0x1b | 0x5e | 0x81 | 0x00 | 0x00 | Feature Data(256Byte) |
|------|------|------|------|------|-----------------------|

- DFPNET\_USER\_REGISTRATION\_ERROR注册失败

|      |      |      |      |        |
|------|------|------|------|--------|
| 0x1b | 0x5e | 0x82 | 0x00 | nError |
|------|------|------|------|--------|

nError

|      |   |
|------|---|
| 0x01 | Number of feature is not enough to be standard<br>特征数不够 |
|------|---|



**2. User Authentication(Registration)鉴别**

- DFPNET\_USER\_IDENTIFICATION用户注册

|      |      |      |      |      |                       |
|------|------|------|------|------|-----------------------|
| 0x1b | 0x5e | 0x90 | 0x00 | 0x00 | Feature Data(256Byte) |
|------|------|------|------|------|-----------------------|

- DFPNET\_USER\_IDENTIFICATION\_SUCCESS注册成功

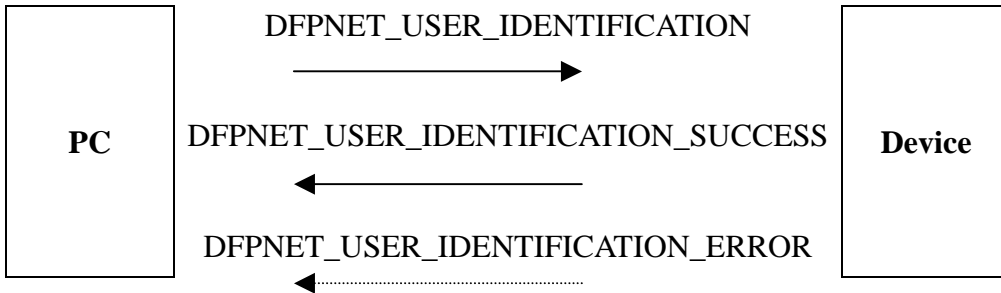
|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0x91 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFPNET\_USER\_IDENTIFICATION\_ERROR注册失败

|      |      |      |      |        |
|------|------|------|------|--------|
| 0x1b | 0x5e | 0x92 | 0x00 | nError |
|------|------|------|------|--------|

nError

|      |   |
|------|---|
| 0x01 | Number of feature is not enough to be standard特征数不够 |
| 0x02 | Coincident fingerprint is not existed指纹不存在          |



• Other Packet

- DFP\_RESET\_OUT重新开始

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0xa0 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_RESET\_IN

|      |      |      |    |    |
|------|------|------|----|----|
| 0x1b | 0x5e | 0xa1 | n1 | n2 |
|------|------|------|----|----|

n1 : Firmware version's first position

n2 : Firmware version's second position

ex> Firmware Version : n1.n2

- DFP\_DEVICE\_FAULT驱动错误

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0xa2 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_DELETE\_ALL\_USER删除所有用户

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0xa3 | 0x00 | 0x00 |
|------|------|------|------|------|

- DFP\_SET\_FEATURE\_COUNT设置特征数

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0xb0 | CntH | cntL |
|------|------|------|------|------|

cntH : feature count's superior byte优质数

cntL : feature count's inferior byte低质数

- DFP\_SET\_MATCH\_COUNT设置比较数

|      |      |      |      |      |
|------|------|------|------|------|
| 0x1b | 0x5e | 0xb1 | CntH | cntL |
|------|------|------|------|------|

cntH : match count's superior byte优质数

cntL : match count's inferior byte低质数

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