A series of standalone product

Communication protocol manual

Zksoftware Inc

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1. the defines of data communication packet header structure

typedef struct _CmdHdr_{
        Unsigned short Command, CheckSum, SessionID, ReplyID;
}TCmdHeader, *PCmdHeader;

Explanation：

    Command: order word
    CheckSum: check sum and (including packet header and data)
    SessionID: session number
    ReplyID: Reply number:
    Data packet structure: packet header + the data want to be transmitted; the machine response data packet is same with this packet of structures. Also, the order character (2Bytes) + the check sum (2Bytes) + the session number (2Bytes) + the response number (2Bytes) + the data (certain length) compose a packet to Transmit and receive packet are symmetry.

the define of command character

Command	Value	Describe
CMD_CONNECT	1000	Connections requests
CMD_EXIT	1001	Disconnection requests
CMD_ENABLEDEVICE	1002	Ensure the machine to be at the normal work condition
CMD_DISABLEDEVICE	1003	Make the machine to be at the shut-down condition, generally demonstrates 'in the work ...'on LCD
CMD_RESTART	1004	Restart the machine.
CMD_POWEROFF	1005	Shut-down power source
CMD_SLEEP	1006	Ensure the machine to be at the idle state.
CMD_RESUME	1007	Awakens the sleep machine (temporarily not to support)

CMD_CAPTUREFINGER	1009	Captures fingerprints picture
CMD_TEST_TEMP	1011	Test some fingerprint exists or does not
CMD_CAPTUREIMAGE	1012	Capture the entire image
CMD_REFRESHDATA	1013	Refresh the machine interior data
CMD_REFRESHOPTION	1014	Refresh the configuration parameter
CMD_TESTVOICE	1017	Play voice
CMD_GET_VERSION	1100	Obtain the firmware edition
CMD_CHANGE_SPEED	1101	Change transmission speed
CMD_AUTH	1102	Connections authorizations
CMD_PREPARE_DATA	1500	Prepares to transmit the data
CMD_DATA	1501	Transmit a data packet
CMD_FREE_DATA	1502	Clear machines opened buffer
CMD_DB_RRQ	7	Read in some kind of data from the machine
CMD_USER_WRQ	8	Upload the user information (from PC to terminal).
CMD_USERTEMP_RRQ	9	Read some fingerprint template or some kind of data entirely
CMD_USERTEMP_WRQ	10	Upload some fingerprint template
CMD_OPTIONS_RRQ	11	Read in the machine some configuration parameter
CMD_OPTIONS_WRQ	12	Set machines configuration parameter
CMD_ATTLOG_RRQ	13	Read all attendance record
CMD_CLEAR_DATA	14	Clear data
CMD_CLEAR_ATTLOG	15	Clear attendance records

CMD_DELETE_USER	18	Delete some user
CMD_DELETE_USERTEMP	19	Delete some fingerprint template
CMD_CLEAR_ADMIN	20	Cancel the manager
CMD_USERGRP_RRQ	21	Read the user grouping.
CMD_USERGRP_WRQ	22	Set users grouping
CMD_USERTZ_RRQ	23	Read the user Time Zone set
CMD_USERTZ_WRQ	24	Write the user Time Zone set
CMD_GRPTZ_RRQ	25	Read the group Time Zone set
CMD_GRPTZ_WRQ	26	Write the group Time Zone set
CMD_TZ_RRQ	27	Read Time Zone set
CMD_TZ_WRQ	28	Write the Time Zone
CMD_ULG_RRQ	29	Read unlocks combination
CMD_ULG_WRQ	30	write unlocks combination
CMD_UNLOCK	31	unlock
CMD_CLEAR_ACC	32	Restores Access Control set to the default condition.
CMD_CLEAR_OPLOG	33	Delete attendance machines all attendance record.
CMD_OPLOG_RRQ	34	Read manages the record
CMD_GET_FREE_SIZES	50	Obtain machines condition, like user recording number and so on
CMD_ENABLE_CLOCK	57	Ensure the machine to be at the normal work condition.
CMD_STARTVERIFY	60	Ensure the machine to be at the authentication condition
CMD_STARTENROLL	61	Start to enroll some user, ensure the machine to be at

the registration user condition

CMD_CANCELCAPTURE 62 Make the machine to be at the waiting order status,

please refers to the CMD_STARTENROLL description.

CMD_STATE_RRQ 64 Gain the machine the condition

CMD_WRITE_LCD 66 Write LCD

CMD_CLEAR_LCD 67 Clear the LCD captions (clear screen).

CMD_GET_PINWIDTH 69 Obtain the length of user's serial number

CMD_SMS_WRQ 70 Upload the short message.

CMD_SMS_RRQ 71 Download the short message

CMD_DELETE_SMS 72 Delete the short message

CMD_UDATA_WRQ 73 Set user's short message

CMD_DELETE_UDATA 74 Delete user's short message

CMD_DOORSTATE_RRQ 75 Obtain the door condition

CMD_WRITE_MIFARE 76 Write the Mifare card

CMD_EMPTY_MIFARE 78 Clear the Mifare card

CMD_GET_TIME 201 Obtain the machine time

CMD_SET_TIME 202 Set machines time

CMD_REG_EVENT 500 Register the event

EF_ATTLOG 1 Be real-time to verify successfully

EF_FINGER (1<<1) be real–time to press fingerprint (be real time to
return data type sign)

EF_ENROLLUSER (1<<2) Be real-time to enroll user

EF_ENROLLFINGER (1<<3) be real-time to enroll fingerprint

EF_BUTTON (1<<4) be real-time to press button

EF_UNLOCK   (1<<5)   be real-time to unlock

EF_VERIFY   (1<<7)   be real-time to verify fingerprint

EF_FPFTR   (1<<8)   be real-time capture fingerprint minutia

EF_ALARM   (1<<9)   Alarm signal

//Follow is a machine return order

CMD_ACK_OK   2000   Return value for order perform successfully

CMD_ACK_ERROR   2001   Return value for order perform failed

CMD_ACK_DATA   2002   Return data

CMD_ACK_RETRY   2003   /* Regstered event occorred */

CMD_ACK_REPEAT   2004

CMD_ACK_UNAUTH   2005   Connection unauthorized

CMD_ACK_UNKNOWN   0xffff   Unknown order

CMD_ACK_ERROR_CMD   0xfffd   Order false

CMD_ACK_ERROR_INIT   0xfffc   /* Not Initializated */

CMD_ACK_ERROR_DATA   0xfffb

//Follow is data type sign (attendance record, fingerprint)

FCT_ATTLOG   (U8)1   Attendance record

FCT_WORKCODE   (U8)8   WorkCode。

FCT_FINGERTMP   (U8)2   Fingerprint data

FCT_OPLOG   (U8)4   Operation record

FCT_USER   (U8)5   User record

FCT_SMS   (U8)6   Short message

FCT_UDATA   (U8)7   User's short message

2. The description and detailed explanation to the order characters

CMD_CONNECT . this order is applied to connect the machine, if succeed, then follow the structure of the packet header from CMD_ACK_OK to return order , closed follow a packet of structure to transmit each data it, packet header detailed meaning description:

Verification and (CheckSum) algorithm: According to unsign short integer   accumulate the entire packet, till over 2147483648 (long 4 bytes), gains the low 2 byte values continue to add together again, depending on the position that the value is obtained to get ones complement, and transform it into the short integer (unsigned short 2 bytes), namely obtains the verification sum.

Session number (SessionID): Uniquely sign a time of connection, returns and assigned by the machine when machine execute connection

Order response number (ReplyID): The only mark current transmission order, is an accumulation value, uses in to differentiate the order, namely starts from the connection, each ReplyID order is different. If the machine has established the connection password, then carries out successfully after the connection, the machine return the authorized order that has not connected. Needs to transmit the connection password once more, can complete the connection process, please refer the authorized order to connect.

◆ **CMD_EXIT**

Disconnect

◆ **CMD_ENABLEDEVICE**

Ensure the machine to be at in the normal work condition, generally when data communication shields the machine auxiliary equipment (keyboard, LCD, sensor), this order restores the auxiliary equipment to be at the normal work condition.

◆ **CMD_DISABLEDEVICE**

Shield machine periphery keyboard, LCD, sensor, if perform successfully, there are showing 'in the work …". on LCD.

◆ **CMD_CAPTUREFINGER\CMD_CAPTUREFINGER**

Capture image data from a machine sensor. ZEM200 (A5, F4+ and so on) series product do not support this function. Response data is bitmap originality ranks data, because the data to be transmitted is too big when capture bitmap, the terminal first transmits a special packet,

the first 4 bytes of this packet data part to save must accept the total length of the data, then the size of each packet will be saved as 4 bytes, certainly, last the packet is possibly smaller or equal to the size of the packet, also each packet cannot over 1Kbytes. When read in some bigger data, like all fingerprints template, attendance records, general add a sign in the packet of data part to indicate the data type that to be read. If capture the non- complete picture, the data part first 4 bytes of the packet is 500 (the capture partial image (small image)). If capture picture which size is defined by itself, then the data part start to fill in 4 bytes widths values from the first idle byte , because the proportion of the picture is defined, therefore high does not need to be transmitted. the order to transmit the big image has been send, the size to receive the data (no header) should be 640*480, otherwise, the data part 1-4 byte save bitmap the DPI,5-8 byte save bitmap width, 8-12 byte save bitmap altitude

◆ **CMD_TEST_TEMP**

Examine some fingerprint template exist or does not, the data part transmits some fingerprint template, if the fingerprint existence, returns the order character CMD_ACK_OK,
The data part returns to the user serial number. The byte count of the serial number is decided by the user serial number byte which the machine can support..

◆ **CMD_REFRESHDATA**

Refresh the data in the machine, mainly complete to synch the data, refresh the fingerprint

library and so on, and generally upload the mass datum after executing this order.

◆ **CMD_REFRESHOPTION**

Refresh the machine configuration, inform the firmware to reconfigure. Like as the machine

serial number, baud rate, time and so on.

◆ **CMD_TESTVOICE**

Play voice. May according to the pronunciation address and the length to play voice (only supports ZEM100, because ZEM100 uses pronunciation chip), the first two bytes of data part of the transmission packet separately transmit the address and the length. Also may use the index to play voice which is fixed pronunciation.

◆ **CMD_CHANGE_SPEED**

Change speed to the machine transmission data.   Transmit 0, indicated the slowdown, transmit 1, indicated the increasing speed.

◆ **CMD_AUTH**

Authorized connection If the machine has established the signal code, when go on connecting

◆ **CMD_PREPARE_DATA**

Inform the machine prepare for transmission data (for example PC-> Device), or machine prepare for to receive data (Device-> PC).   Fill the length of data which wan to be

transmitted in this packet of data part first 4 bytes. After the machine receives this order, can according to session number to create a buffer which use to receive the data which has been transmitted, after executing this order successfully, may use the CMD_DATA to transmit data, be sure to transmit data success, transmit the order CMD_FREE_DATA to tell the machine the data is complete, and release the buffer space to open. This process general apply to restore the firmware upgrade the data and so on in the big data communication, certainly, inform machine this data to play any role after the transmission finish, temporarily it is no in the nude

◆ **CMD_DB_RRQ**

read some saved data complete in the machine interior, the data is transmitted by the firmware definition structure, for more detail of the structure please refer to the firmware structure of data definition, the mode to transmit data follow the rule the mass data is to be transmitted , please refer to the order description for capturing fingerprint bitmap. The request to transmit data is decided by the first byte of the packet's data part. If the first byte is saved as the sign of the attendance data, then read all attendance record.
Note: always read the big data order all to follow above the way, like attendance record, user,

and fingerprint. Other read the big data order will be no longer to relate in detail.

◆ **CMD_USER_WRQ**

Upload the user information; the uploading order not only the transmit oversized data but a also upload the user information, and the fingerprint template, Access Control privilege and so on,   fill the data part of packet depending on the structure of data   After the data transmitting finish, according to the performed result the machine return to the data

◆ **CMD_USERTEMP_RRQ**

this order may read some user's fingerprint data, assign the user serial number (2Bytes) and the fingerprint index (0-9)to the data part of the transmission packet; The data part assigns a

byte data type, then read in some kind of specific data.。

◆ **CMD_USERTEMP_WRQ**

Upload some user fingerprint template, the transmission packet of data part structure please refers to the firmware structure of data.
Note: the precondition to successfully upload the fingerprint template which is, the user must exist, the user, whose the fingerprint will be uploaded, must be empty.

◆ **CMD_OPTIONS_RRQ**

Read in some configuration parameter value in the machine. Need to fill a configuration name the data part of the data packet, carries out successfully, return to this configuration value.

◆ **CMD_OPTIONS_WRQ**

Set configuration parameter to the machine. The data packet data part needs to fill a configuration name.

◆ **CMD_ATTLOG_RRQ**

Read all attendance record (please refer to the relative description to read big data), this order function is alone; only apply to read the attendance record.

◆ **CMD_CLEAR_DATA**

Clear some kind of data, if do not assign the data type, then deletes all data, otherwise depending on the assigned type to delete data

◆ **CMD_CLEAR_ATTLOG**

Delete attendance record

◆ **CMD_DELETE_USER**

Delete some user. Fill data part of the transmission packet with user serial number (2Bytes).

◆ **CMD_DELETE_USERTEMP**

Delete user's some fingerprint template. Fill 1-2nd byte the data part of transmission packet with user serial number (2Bytes), fill 3rd byte with fingerprint serial number (0-9).

◆ **CMD_CLEAR_ADMIN**

Delete the manager

◆ **CMD_USERGRP_RRQ**

Read the user group. Apply to ZK Access Control machine (F4, F4+, A6 and so on) operation .fill the first two bytes of data part of the transmission packet with user serial number (2Bytes).

◆ **CMD_USERGRP_WRQ**

Set user group. Fill the 1-4 byte of data part of the transmission packet with user serial number (2Bytes), 5-8 byte with the group serial number.

◆ **CMD_USERTZ_RRQ**

Read the user employed Time Zone. Fill 2 bytes of the transmission packet data part with user's serial number (2Bytes). The returned 1-4 byte data is the user serial number; 12 bytes respectively indicate 3 Time Zone serial numbers which used by the user behind the date, each serial number takes 4 bytes.

◆ **CMD_USERTZ_WRQ**

Set user used Time Zone. Fill 1-4 byte of data part transmission packet with used the Time Zone quantity, at present only can set 3 Time Zone, and therefore fills in the value 3. Behind it 12 bytes separately fill 3 Time Zone serial numbers, each take 3 bytes.

◆ **CMD_GRPTZ_RRQ**

Read the group Time Zone. Please refer to read the user Time Zone, the function is same. The order to set group Time Zone and user Time Zone function is similar as, no longer describes it.

◆ **CMD_TZ_RRQ\ CMD_TZ_WRQ**

Read Time Zone setting. Fill the first 4 bytes of data part of the transmission packet with Time Zone serial number. Access Control machine support 50 time groups is available. Each Time Zone cycle is the week, in the week the setting form of the daily Time Zone is 24 hours formats, for example: 09.091616 is some day   Time Zone setting, meaning also, this day 08: 08 starts to 16:16 for this day effective Time Zone. The entire Time Zone take the week as a unit, which according to every day Time Zone to arrange. The Time Zone arrangement starts from Sunday.。

◆ **CMD_ULG_RRQ\CMD_ULG_WRQ**

Read the group unlocking combine. The return is the sequence numeral, namely group combination setting. Access Control machine can support 5 groups, 10 unlocking combination at present. The combination return is separated by ': '. The writhing combination also is separated by ': '.   fill data part of transmission or receiving packet with combination information.

◆ **CMD_UNLOCK**

Unlock order. Inform the Access Control machine to unlock, Set the first 4 bytes of data part the transmission packet as duration of delay unlocking。 。

◆ **CMD_GET_FREE_SIZES**

No

◆ **CMD_ENABLE_CLOCK**

Set the LCD dot (to glitter ': ') the packet data part transmit 0 to stop glittering, 1 start to glitter. After this order carries out successfully, the firmware will refresh LCD.

◆ **CMD_STARTVERIFY**

Ensure the machine to be at the verification state. If the transmission packet has been filled

with user serial number (2Bytes), then start to verify this user, machine prompt user to press fingerprint. If has not transmitted the user serial number, then machine auto-restore to normal verification condition.

◆ **CMD_STARTENROLL**

Causes the machine to be at the registration state, fill data part 1-2 byte of the transmission packet with user serial number (2Bytes),3-4 byte is applied to fill fingerprint serial number, after executing successful LCD prompt user to press fingerprint, start registration.
Note: in the setting before the starting registration, cannot enter the registration until transmit the CMD_CANCELCAPTURE order, after registers, may use the CMD_STARTVERIFY order to restore to the normal verification condition.

◆ **CMD_STATE_RRQ**

No

◆ **CMD_WRITE_LCD**

This order transmit character to demonstrate on LCD , the data part 1, 2 bytes of the packet transmit the rank value which start to demonstrate, the 3rd byte setting is 0 , follows close the filling character which want to be transmit. May work in CMD_CLEAR_LCD when use this function.

◆ **CMD_GET_PINWIDTH**

Obtain the length of user serial number, general the serial number is 5 or above.

◆ **CMD_SMS_WRQ**

Upload the short message. Depending on the short message structure the data packet will be

filled, please the reference data structure descriptions.

◆ **CMD_SMS_RRQ**

Download the short message. Fill the first 2 bytes of data part of transmission packet with download the short message serial number. The return part of the data packet is returned by the short message structure.
Note: The short message function only can support the machine which is allowed to support short message this order (for example A6).

◆ **CMD_DELETE_SMS**

Delete some short message. Fill the data part of transmission packet with 2 byte short

message serial number.

◆ **CMD_UDATA_WRQ**

Set user short message. Depending on the user short message structure fill data part of the

transmission packet.

◆ **CMD_DELETE_UDATA**

Delete user some short message. According to the short message structure the data part of transmission packet will be filled with the user short message data want to be deleted.

◆ **CMD_DOORSTATE_RRQ**

◆ **CMD_WRITE_MIFARE**

Inform machine to write Mifare card. Only the machine with Mifare card to reader is able to support this function. fill the data part 1-4 byte of the transmission packet with user serial number, and 12 bytes with templates information, the first 3 bytes of these 12 bytes, fill the 1-2nd byte with template length, and the 3rd byte with template index (corresponding user some fingerprint), for this 12 bytes, the fist 1-3 byte cannot be empty, there must be template in these bytes. May write 4 fingerprints templates, the following 9 bytes separately is filled with other three fingerprints length and the index, to fill every three bytes methods is same with before filling 3 bytes packing. May refer to the following structure.
 4th Bytes | [1-2bytes (fingerprint 1 template length), 3rd bytes (fingerprint index)], [4-6... ..] | The user numbers 4 bytes | fingerprints templates information 12 bytes | 1-4 fingerprint template data

◆ **CMD_GET_TIME**

Get the time of the machine. Fill the data part 4 bytes   of the return packet with the time setting, time value is customize code, its encoding method as follows: ((Year%100) *12*31+ ((mouth-1) *31) +day-1) * (24*60*60) + (hour*60+minutes) *60+second, according to this encoding method to decode

◆ **CMD_REG_EVENT**

Register the real-time event. If has registered this event, the machine meets transmit the real-time data to the connection, like when the user verification is successful , or keep hold the keyboard , the machine transmits these information to all connections (success

connection).

3. Data structures

Data organization has definition in the data structure to transmit and receive data packet, in the definition the data structure is quite same with the firmware's one, please refer as follows,
◆ **the user data structure**
Before the 5.04 edition firmware, have to use the following data structure, it uniform by 1 byte.

typedef struct _UserOld_{

U16 PIN;

U8 Privillege; //privilege，0，Common user，1，Enroller，2，Manager，3，Super administrator

char Password[5];

char Name[8];

}TUserOld, *PUserOld;

After the 5.04 edition firmware, the user data structure as follow, it uniform by 1 byte.

typedef struct _User_{

U16 PIN;   // user's serial number to the machine interior.

U8 Privillege;   //such as following illustrating, regard the 0-7bit, if the 3-1 bit   000, Common user; 001, Enroller; 110, manager, //,111, super manager. // the last bit of the Privilege is 0 which means   in effect, 1, invalid.

7	6	5	4	3	2	1	0
0	0	0	0	0	0	1	0

//

//。

char Password[5];   //Password

char Name[8];   // User Name

U8 Card[5];   //Card number, be apply to save the corresponding ID Card No.

U8 Group;   //user respective group

U16 TimeZones;   // user may use time Zone, bit sign.

U32 PIN2;   // 32 Bit user second identification number

}TUser, *PUser;

Note：Before 5.04 editions, the machine only supports 5 codes, in order to support the more Bit user code, after 5.04 editions has defined the new user data structure, which uses 4 bytes to indicate the user serial number. Namely afterwards 9 bit codes machine. When go on communication, before in the very many places there are prompt that user serial number transmits two bytes, which is U16 PIN. Other places stated U16 PIN is all same.

◆ **the data structure of fingerprint template**

typedef struct _Template_{

U16 Size; //the length of fingerprint template

U16 PIN; // corresponds with the user data structure PIN

char FingerID; // fingerprint

char Valid;   // fingerprint is valid or invalid

char *Template; // fingerprint template

}TTemplate, *PTemplate;

◆ **Attendance record structure**

The follow is the attendance record data structure of the non extension record ,namely the attendance record use the compression form to store up.

typedef struct _AttLog_{

Int PIN;   //U16 PIN, user serial number

char verified;//   matching way

time_t time_second; // time, time encoding is customized time encoding.。

char status; //   attendance condition

}TAttLog, *PAttLog;

Note：The read order only can be apply to the attendance record, read in all attendance records. the compression format of the attendance record is divided into the length or short mode, its compressing way are follow (for example presently read in char *Buffer, the pointer is in the first byte): The first 2 bytes are used to save user serial number (U16 PIN), third byte first three (Bit) saves the state to match, the 4-5th save the way to match , 6th bit is used to save the indicator which tell how long time is; If it is a short time form, then the time

value lastly two bit of the third byte and follow byte save the time excursion value, the attendance record time is the time excursion value to add the time datum value, the datum time value is recently a long time value (therefore long mode save integrity time, the short time form saved time excursion value add the time datum value), then, might according to the time encoding way (be possible to refer customize encoding method), to obtain the correct time. Follow is a extension attendance data record structure

```
typedef struct _ExtendAttLog_{

    U32 PIN;

    time_t time_second; // here is integrity time

    BYTE status;

    BYTE verified;

    BYTE reserved[2]; // temporarily is useless.

    U32 workcode;

}TExtendAttLog, *PExtendAttLog;
```

If the data storage form is the extension, then defers to this structure to read the attendance record.

◆ **short meassage data structure**

```
typedef struct _SMS_{

    U8 Tag;        // category, public short message, non- public short message.。

    U16 ID;        // data content marked 0 to express the record already invalid

    U16 ValidMinutes;   // effective minute  ,  0 = permanent。

    U16 Reserved;

    U32 StartTime;        // Start time

    U8 Content[MAX_SMS_CONTENT_SIZE+1];    // short message content ,

MAX_SMS_CONTENT_SIZE=60
```

}TSms, *PSms;

User short message data structure

typedef struct _UData_{

      U16 PIN;   //0 express invalid records.

      U16 SMSID;   //short message serial number.

}TUData, *PUData;

◆ **management data record structure**

typedef struct _OPLog_{

      U16 Admin; //manager NUMBERS

      BYTE OP; //operation type

      time_t time_second; //time, complete time. May according to customized the

definition method to decode

      U16 Users[4]; //User[0],   the user serial number which is operated

           //. Users [1], the operating result, the success is 1, the defeat is 0.

//Users [2], Users [3] is useless

}TOPLog, *POPLog;

Operation type description as follows :

The value	Describes
0	Turn on machine
1	Turn off machine
2	Failed to authentication warn
3	Anti- dismantle warn
4	Enter menu
5	Change Option
6	Backup to enroll fingerprint
7	Add Password
8	To register the HID card
9	Delete User
10	Delete fingerprint
11	Delete Password
12	Delete RF Card

13	Clean data
14	Create MF Card
15	Enroll MF Card
16	Register MF Card
17	Delete MF card registerd
18	Clean MF Card content
19	Transfer the registration data into the card
20	Capy data in the card to the standardalone fingerprint machine
21	Set the time of the Standalone fingerprint machine
22	restore the leaving- factory option
23	Clean attendance (check-in ,out) record
24	Clean administrator privilege
25	Revise Access Control option
26	Revise User Access Control option
27	Revise Time Zone of Access Control option
28	Revise Unlock Combin
29	Unlock
30	Enroll User

4. Real-time events

After registers the event in the machine, the machine is able to transmit the relative real-time information to the connection, when receive the CMD_REG_EVENT order which the machine transmits, namely receives the real-time data, may   according to the different data type to take analysis of the related information. In this packet this SessionID indicate event type, please refer as follows, fill and save in data part of the received packet with relative information, and after receives the real-time message, the session ID will change. Needs to reply the successful order。

◆   **EF_ATTLOG**

Data part of the excursion meaning as follows: 1-2nd byte: User serial number; 4th byte high 4bit: Whether effective, low 4bit: attendance state; 3rd byte: matching way; The following 6 bytes are: When year, month and day minutes and seconds. Its middle-value is based on 2000

◆   **EF_ENROLLUSER**

After register some user successfully, the machine returns this real-time data. The data part of the receive packet may obtain two bytes of the users serial number

◆   **EF_ENROLLFINGER**

◆   **EF_BUTTON**

Data part returns value of the keyboard that is pressed.

◆ **EF_VERIFY**

Data part returns the user serial number

◆ **EF_FPFTR**

Data part returns score when perform the matching fingerprint
EF_ALARM
The length of the data part to be returned is 4, the first byte is 55: anti-dismantle alarm; The first byte is 53: release button.
Length of the data part to be returned is 8, the first byte is 54: close door;
Length the data part to be returned is 12, the first two bytes are 0xFFFF:duress alarm 7, 8 bytes is the alarm type. 5, 6 bytes is the duress fingerprint serial number. 9-12 byte is the matching way.

5. Communication Way

◆ UDP

There is a UDP Server to monitor4,370 ports in the machine, ability to transmit or receive the data via UDP protocol, the data in the machine is comparatively few, read in the greatest information content is the fingerprint template, the fingerprint template generally is more than 600 bytes

◆ RS232\485

Passable RS232\485 communication
◆ **other**
in some machines, there is a built-in WebServer, may through the Http request to communicate. Next, some machines may support the SOAP communication interface, may use the SOAP protocol to communicate. The different machine possibly support the different function t, only

supplies the reference.