

# Document of Common Protocol

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# 1. Communication of Scales

## 1.1 Network communication

### 1.1.1 TCP Server Mode

Devices is working in TCP Server mode(socket=33581), when the Spec43=0(default). Software (PC or mobiles) can connect to it by using TCP client socket.

If the device 's IP=192.168.1.100, software can connect it by create a TCP client whose remote port=192.168.1.100:33158.

If the software do not know the device's, using UDP search function. The device have an UDP socket pair(33583/33584). PC can broadcast at UDP port 33583 "UDP\t\r\n". Device will also broadcast at UDP port 33584, when device receive this broadcast or power-on or with 30 seconds interval (based on Spec). The content of device's broadcast is "UDP\t33581\tX\t\r\n", the X may different in different version. 33581 is the port of device, and software can get the IP of this broadcast package. **PS:** If the socket of device is already connected, UDP function will stop until this socket release.

## 2. Communication Format

### 2.1 Basic framework of communication

In communication, we use LINE mode(split by "\r\n" ). Each line have several segment, and each segment end to "\t"(PS: last segment also need a "\t").

For example,

**DWL TMS**

It contains one line with two sement "DWL" and "TMS", we send it as "DWL\tTMS\t\r\n"

**And we use a SPECIAL-FLOAT-TYPE. If we need to send a decimal=8.20, we should send "820,2".** In fact, "820,2"="82,1"="8200,3", and in most application it is also same(When the application have decimal fix function).

### 2.2 Data Segment of communication

Data Segment	Data Sub Segment	
DPT		Department
CLS		Class
PLU		Information of Items
BAR		Barcode
LAB	LAS,LAE	Print Format
NU1		Nutrition
SAL		Salesman
TIM		Current time of device
INF	INA,INM	Information of devices
SCP		Shortcut Keys
TMS		Global parameter: Spec
TMT		Global strings
REP	RES,REE	Logs communication

### 2.3 Command Segment of communication

#### 2.3.1 Send Data

We use Segment "DWL", when we need to send data (Both PC to device or device to PC). For example:

```

DWL TMS           //Declare to send TMS
TMS 0 1           //One TMS command
TMS 1 6           // One TMS command
...

```

---

END TMS //End of send TMS

Different DATA have different DATA command. In follow document we will introduce some common ones. If programer need more about these command, PLEASE generate TMS files from TM-xA software, and study on it. [TMS file is totally same as our protocol.](#)

### 2.3.2 Receive Data ( except REP )

We use Segment "UPL", when we need to ask device send data back. For example, PC send:

UPL TMS X //Declare to receive TMS, parameter=X

If X=0, this command means ask scale to send back all TMS. If X > 0, this command means ask scale to send back TMS whose number=X. (Some command do not have parameter, keep X=0)

When the device receive this command, device will send back data like

DWL TMS //Declare to send TMS

TMS 0 1 //One TMS command

TMS 1 6 // One TMS command

...

END TMS //End of send TMS

### 2.3.3 Delete Data ( except REP and PLU )

Delete command need two lines.

If we need to delete data(except REP and PLU)

CLR DPT X //Declare to delete DPT, parameter=X

CLR END //Delect is submit

If X=0, this command means ask scale to delete all PLUs. If X > 0, this command means ask scale to delete **DPT** whose number=X.

### 2.3.4 Delete Data ( PLU )

Delete command need two lines.

If we need to delete data(except REP)

CLR PLU X //Declare to delete PLU, parameter=X

CLR END //Delect is submit

If X=0, this command means ask scale to mark all PLUs deleted. (Not physical delete)

If X > 0, this command means ask scale to mark PLU whose number=X deleted. (Not physical delete)

If X=-1, this command means ask scale to physical delete all PLUs [and all logs/report.](#)

### 2.3.5 Receive REP (Ignore CLR flag)

UPL REP -X //Declare to receive all logs, whose FID>=X

[Note: There is a '-' before X](#)

### 2.3.6 Receive REP (Only REP without CLR flag)

UPL REP X //Declare to receive logs without CLR flag, whose FID>=X

### 2.3.7 Make REP with CLR flag

**CLR REP X** //Declare to make REP with CLR flag, whose FID<=X  
**CLR END** //Delect is submit

### 2.3.8 Device ASK Data(Complex function)

The device have two ASK function now:

1. REP event: ASK REP X

The device inform the PC, it have a new log, whose FID=X.

This function enable when Spec=1 or 3

2. PLU event: ASK PLU X Y Z

The device inform the PC, it is calling a PLU, whose number=X(If X not 0) or ItemCode=Y(If Y not 0) or IndexBarcode=Z(If Z not 0). PC can download this PLU in 2 seconds, if PC want to update it. Then, the device will use new one not old one.

This function enable when Spec=2 or 3

## 2.4 Format of each data segment

### 2.4.1 TMS: Spec

No	Segment	Note
1	Fixed Text	TMS
2	Spec Number	Number type
3	Value Number	Number type

### 2.4.2 TMT: Global Text

No	Segment	Note
1	Fixed Text	TMT
2	Global Text Number	Number type
3	Text Value	String type

### 2.4.3 TIM: Time

No	Segment	Note
1	Fixed Text	TIM
2	Year	Number type
3	Month	Number type
4	Day	Number type
5	Hour	Number type
6	Minute	Number type
7	Second	Number type

### 2.4.4 PLU

No	Segment	Default	Note
----	---------	---------	------

1	Fixed Text	PLU	
2	Number (ID)		Number type
3	Item Code	0	Number type
4	Index Barcode		String type
5	Unit number of PLU.	3	Number : 1=weight,2=pcs, 3=kg, 4=g, 5=ton,6=lb,7=500g,8=100g, 9=1/4lb
6	Price	0,0	SPECIAL FLOAT
7	Cost	0,0	SPECIAL FLOAT
8	Tare	0,0	SPECIAL FLOAT
9	Label in bill 1	0	Number type
10	Barcode in bill 1	0	Number type
11	PLU Flag in Barcode in bill 1	0	Number type
12	Label in bill 2	0	Number type
13	Barcode in bill 2	0	Number type
14	PLU Flag in Barcode in bill 2	0	Number type
15	Class	9	Number type
16	PLU name		String type
17	Text 1		String type
18	Text 2		String type
19	Text 3		String type
20	Text 4		String type
21	Text 5		String type
22	Text 6		String type
23	Text 7		String type
24	Print Sale Data state	0	Number :0 for not print, 1 for print
25	Print Sale Time state	0	
26	Print Pack Data state	0	
27	Print Pack Time state	0	
28	Print Shelf Data state	0	
29	Print Sale Data data	0	Number type
30	Print Sale Time data	0	Number type
31	Print Pack Data data	0	Number type
32	Print Pack Time data	0	Number type
33	Print Shelf Data data	0	Number:number of shelf day
34	Lowwer of Discount Manual sort	0	Number type

35	Upper of Discount Manual sort	0	Number type
36	Lowwer of Discount Manual data	0,0	SPECIAL FLOAT
37	Upper of Discount Manual data	0,0	SPECIAL FLOAT
38	Auto Discount 1: Sort	0	Number type
39	Auto Discount 1: Weekdays	127	Number type
40	Auto Discount 1: Range Lowwer	0,0	Number type
41	Auto Discount 1: Range Upper	0,0	Number type
42	Auto Discount 1: Target Value	0,0	SPECIAL FLOAT
43	Auto Discount 2: Sort	0	Number type
44	Auto Discount 2: Weekdays	127	Number type
45	Auto Discount 2: Range Lowwer	0,0	Number type
46	Auto Discount 2: Range Upper	0,0	Number type
47	Auto Discount 2: Target Value	0,0	SPECIAL FLOAT
48	Auto Discount 3: Sort	0	Number type
49	Auto Discount 3: Weekdays	127	Number type
50	Auto Discount 3: Range Lowwer	0,0	Number type
51	Auto Discount 3: Range Upper	0,0	Number type
52	Auto Discount 3: Target Value	0,0	SPECIAL FLOAT
53	Auto Discount 4: Sort	0	Number type
54	Auto Discount 4: Weekdays	127	Number type
55	Auto Discount 4: Range Lowwer	0,0	Number type
56	Auto Discount 4: Range Upper	0,0	Number type
57	Auto Discount 4: Target Value	0,0	SPECIAL FLOAT
58	Tax sort	0	Number type
59	Tax rate	0	1=0.01%
60	SspValue 1	0	Number type
61	SspValue 2	0	Number type
62	SspValue 3	0	Number type
63	SspValue 4	0	Number type
64	PLU Type	0	0=Normal, 1=Tare only
65	Alfa function		Number type
66	PLU Flag	0	Number type
67	PLU Flag Value	0	Number type
68	Bitmap	0	Number type

## 2.4.5 SCP: Shortcut of Keys

No	Segment	Note
1	Fixed Text	SCP
2	Page number	Number :0-2
3	Key number	Number :1-63
4	PLU number or Function number	Number type

## 2.4.6 INF: Information

INF is multi line mode

DWL INF

INA UTF-8 UTF-8 0 8388608 8388608 8 8

INM 0023F01462E8 0023F01462E8 0

INF Factory Factory-Device 0 TM-xA UA100 V3.05E6

END INF

No	Segment	Note
INA-2	Firmware codepage	
INA-3	Font memory codepage	
INA-4	Reserved	
INA-5	Data memory	
INA-6	Font memory	
INA-7	Default font number	
INA-8	Current font number	
INM-2	Original MAC	
INM-3	Current MAC	
INM-4	Link Type	0=Default,1=Cable,2=WiFi
INF-2	Global string 0: Store Name	
INF-3	Global string 1: Device Name	
INF-4	Spec40: Device Number	
INF-5	Firmware version	

## 2.4.7 REP: Logs

REP is multi line mode

DWL REP

REP 17 8 11 11 39 7 1828 2 0

RES 1 414,2 1 1 1 0,2 69,2 3 0 0,2 600,2 0 Apple

REE

REP 17 8 11 11 39 10 1829 3 0

RES 1 1000,2 2 2 2 0,2 2,0 2 0 0,2 500,2 0 Water

RES 1 414,2 1 1 1 0,2 69,2 3 0 0,2 600,2 0 Apple

REE

END REP



No	Segment	Note
REP-2	Year	
REP-3	Month	
REP-4	Day	
REP-5	Hour	
REP-6	Minutes	
REP-7	Second	
REP-8	FID	
REP-9	SID	
REP-10	Salesman	
RES-2	SubID	SubID=0 means PLUS information
RES-3	Money	
RES-4	PLU	
RES-5	Class	
RES-6	Dept	
RES-7	Cost	
RES-8	Amount	
RES-9	Unit(2=pcs, 3=kg, 6=lb)	
RES-10	Type	0:Sale, 1:BuyBack, 2:Unconfirmed, 3:Deleted, 4:Hangup, 5:Auto Mode, 10:Inbound, 11:Outbound, 12:Stocktaking, 13:Order, 14:Spoilage
RES-11	Tax	
RES-12	Text1	Refer to Spec290
RES-13	Text2	Refer to Spec291
RES-14	Text3	Refer to Spec292
RES-15	Text4	Refer to Spec293
RES-16	UnitPrice	
RES-17	CoFID	
RES-18	PLU Name	

#### 2.4.8 BMP: Bitmap

No	Segment	Note
1	Fixed Text	BMP
2	ID number	Number :1-x Some important: Each ID reserves 4k storage space. If a Bitmap exceeds 4k and is less than 8k and is downloaded with

		ID=1, then his actual storage space is ID=1 and 2. You can not download ID=2 bitmap.
4	BinFile	<p>Bitmap Bin File: If Bin file is 4bytes: 0x12,0x34,0x56,0x78</p> <p>Then the BinFile data is: 0x41, 0x42, 0x43, 0x44,0x45, 0x46,0x47,0x48</p> <p>BinFile segment send 1byte with 2bytes</p>

Bitmap Bin file ruler:

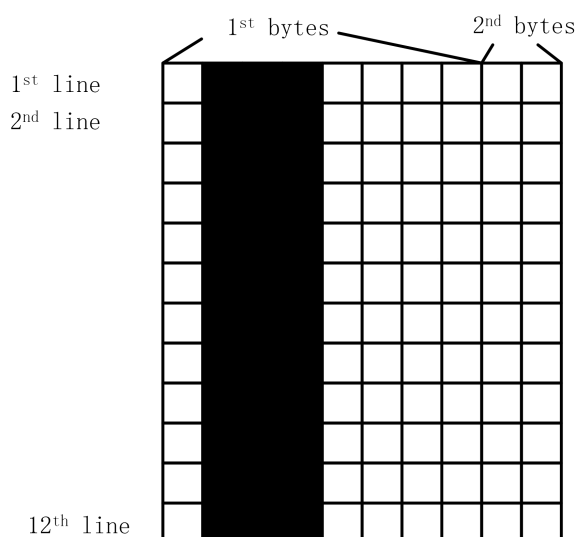
An example:

A 10\*12 Bitmap, then the BinFile of this bitmap is  $96+(2*12)=120$  bytes:

- 96bytes is the header of BinFile: First 4 Bytes of BinFile is the ID number of Bitmap(Little

Endian), then 2bytes of Width, then 2bytes of Height. 88 bytes 0x00

- 2\*12 is the Bit-Bytes of BinFile



This BinFile is in HEX

[illegible]

Send TMS in

DWL      BMP

[illegible]

END      BMP

#### 2.4.9 Label: LAB/LAS/LAE

Label download with multi-lines:

```
LAB 10 ..... //Start of a print format
```

```

LAS  0      .....      //one print format item

```

LAS 1 .....

LAS 2 .....

LAS //end of a print format

### LAB Item

No	Segment	Default	Note
LAB-1	Fixed Text	LAB	
LAB-2	Number (ID)	>=10	Number type
LAB-3	Name	0	String type
LAB-4	Label Sort		String type
LAB-5	Label Width in mm	1~56	Number type
LAB-6	Label Height in mm		Number type
LAB-7	Label Text 1		String type
LAB-8	Label Text 2		String type
LAB-9	Label Text 3		String type
LAB-10	Label Text 4		String type
LAB-11	Label Text 5		String type
LAB-12	Label Text 6		String type
LAB-13	Label Text 7		String type
LAB-14	Label Text 8		String type
LAB-15	Label Text 9		String type
LAB-16	Label Text 10		String type
LAB-17	Label Text 11		String type
LAB-18	Label Text 12		String type
LAB-19	Label Text 13		String type
LAB-20	Label Text 14		String type
LAB-21	Label Text 15		String type
LAB-22	Label Text 16		String type
LAB-23	Font Mode	Must Fix to 1	Number type
LAB-24	Label Text 17		String type
LAB-25	Label Text 18		String type
LAB-26	Label Text 19		String type
LAB-27	Label Text 20		String type
LAB-28	Label Text 21		String type
LAB-29	Label Text 22		String type
LAB-30	Label Text 23		String type

LAB-31	Label Text 24		String type
LAB-32	Label Text 25		String type
LAB-33	Label Text 26		String type
LAB-34	Label Text 27		String type
LAB-35	Label Text 28		String type
LAB-36	Label Text 29		String type
LAB-37	Label Text 30		String type
LAB-38	Label Text 31		String type
LAB-39	Label Text 32		String type

## LAS Item

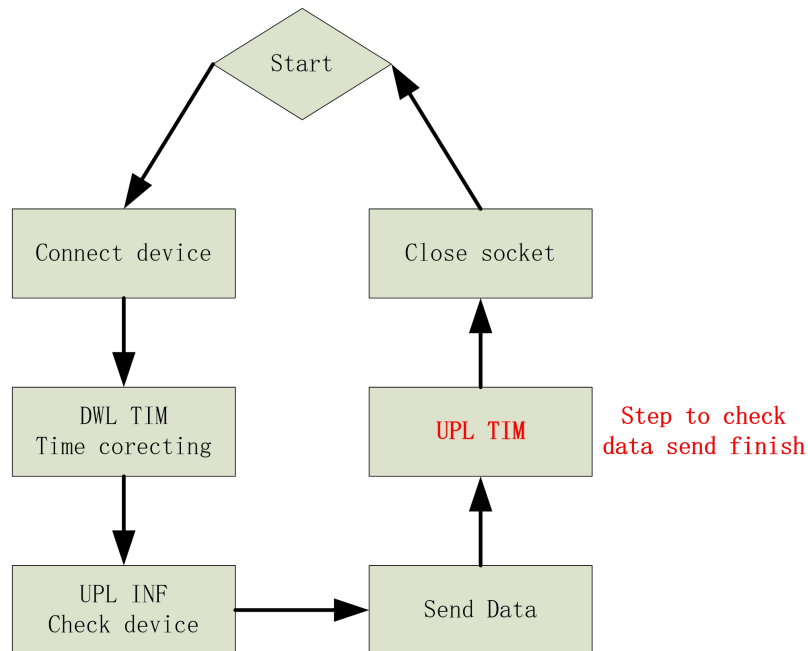
No	Segment	Default	Note
LAS-1	Fixed Text	LAS	
LAS-2	Number (ID)	0~99	Number type. Must be 0-99 If not reversed, run from 0 to 99 If reversed, run from 99 to 0.
LAS-3	Flag1	0~255	Number type. Refer to TM-xA or its LabelItem.xml for details
LAS-4	Flag2	0~255	
LAS-5	Flag3	0~255	
LAS-6	Print condition	0~255	Number type. 0: not print. 1: always print. 2~x: print in certain condition. Refer to TM-xA for details.
LAS-7	Angle	0~3	Number type. 0: 0° ;                      1:90° 2: 180° ;                    3:270°
LAS-8	Grid	0~255	Number type. 0: Default 1: Top Left;    2:Top Center;    3:Top Right; 4: Middle Left; 5:Middle Center; 6:Middle Right; 7: Bottom Left; 8:Bottom Center; 9:Bottom Right; +64: Print after item; +128: Print before item;
LAS-9	Font		Number type.
LAS-10	Start_X		Number type. 8 dots = 1mm.
LAS-11	Start_Y		Number type. 8 dots = 1mm.

LAS-12	Offset_X		Number type. 8 dots = 1mm.
LAS-13	Offset_Y		Number type. 8 dots = 1mm.

No	Segment	Note
REP-2	Year	
REP-3	Month	
REP-4	Day	
REP-5	Hour	
REP-6	Minutes	
REP-7	Second	
REP-8	FID	
REP-9	SID	
REP-10	Salesman	
RES-2	SubID	SubID=0 means PLUS information

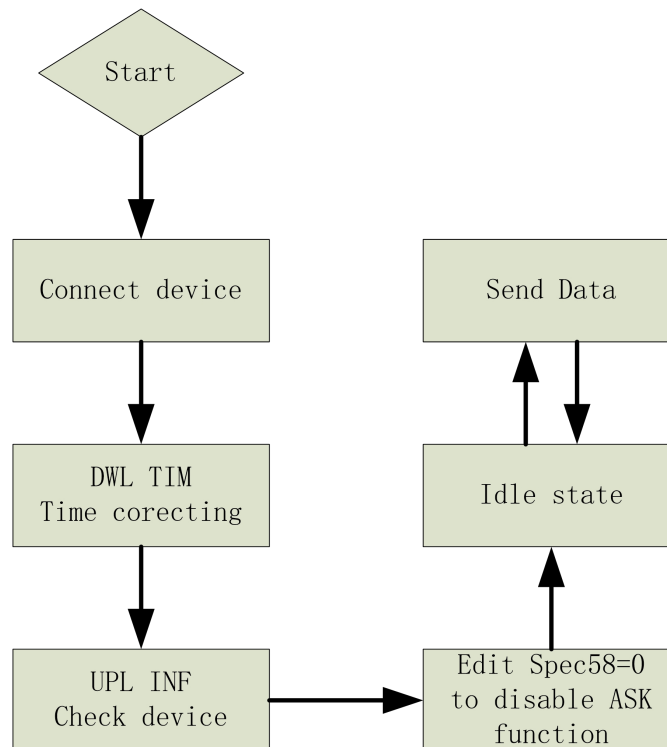
### 3. Suggest flow chart

#### 3.1 Download data only in short connection

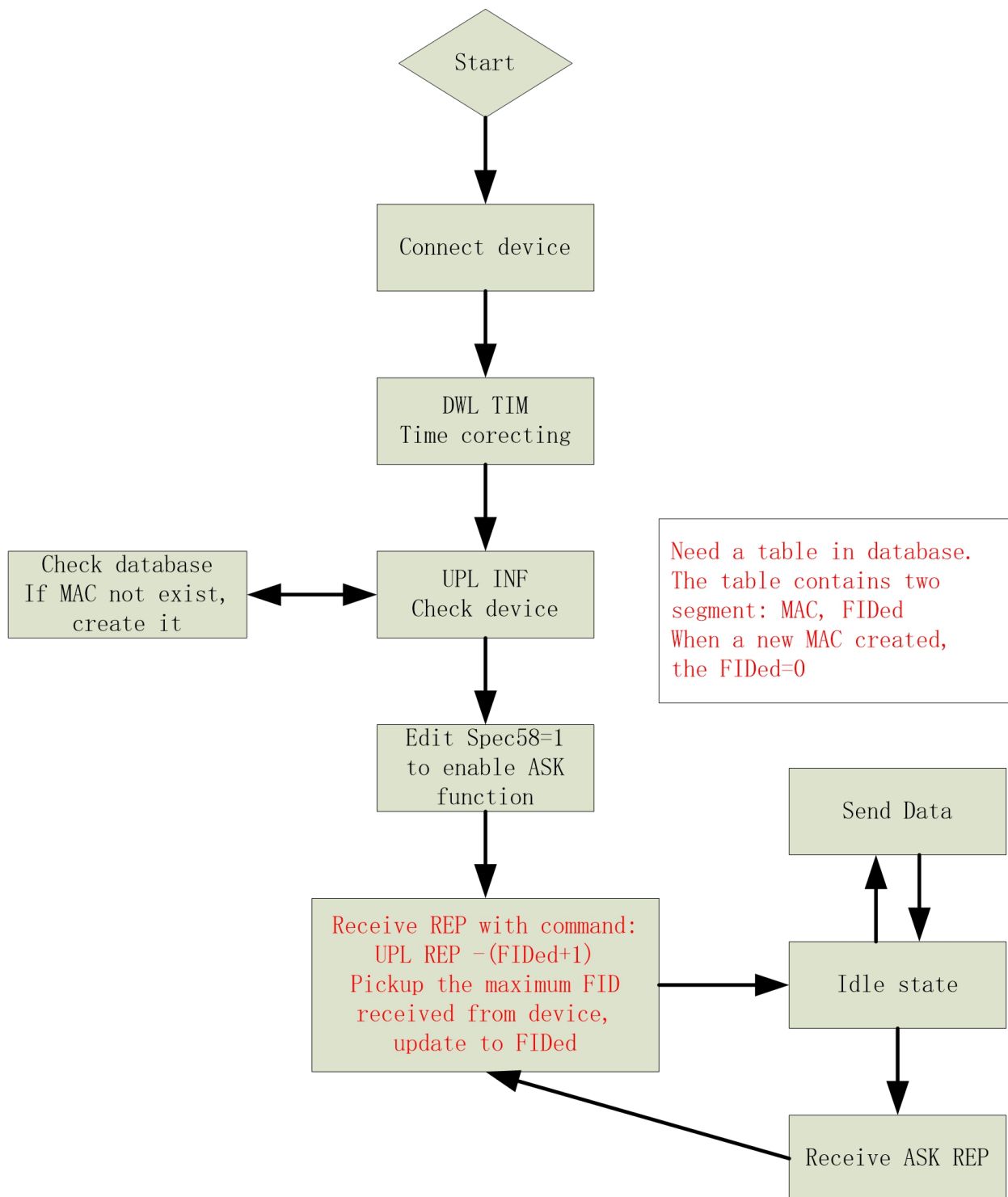


Never close socket Immediately after send data. The data may not accept by device. Do a UPL TIM command, and close socket after DWL TIM command from device.

#### 3.2 Download data only in long connection



### 3.3 Download data and receive logs in long connection ( have database )



### 3.4 Download data and receive logs in long connection ( no database )

