

# DC500 People Counter Protocol

## LoRaWAN Version



V1.0

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## Changed

**V1.0** Initial version;

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## 1 Special Notes

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## 2 Terminal Uplink Data Format

Direction: from sensor to server.

Field	Packet head	Forced bit	Device type	Report data type	Packet size	Payload	Reserved	Packet tail
Instruction	Packet head	Forced bit	Device type	Active reporting or answering	Packet length	Data content	Reserved	Packet tail
Size	1byte	1byte	1byte	1byte	1byte	0-255byte	1byte	1byte

### 2.1 Field Definition

#### 2.1.1 Packet Head

Packet head:0x80; length:1byte.

#### 2.1.2 Forced Bit

Forced bit:0x00; length:1byte.

#### 2.1.3 Device Type

Device type:1byte.

Command	Device type
0X02	DC500

## 2.1.4 Report Data Type

Report data type:1byte.

Command	Type
0x01	Abnormal reporting type, such as alarm etc.
0x02	Heartbeat data or data by reset.
0x03	Confirmation reply for downlink commands
0x04	Re-transmit data

## 2.1.5 Packet Size

The size of the total packet, in hex.

## 2.1.6 Payload

The payload format of DC500 Sensor(data type:0x01,0x02,0x04):

S/N	1	2	3	4	5	6	7
Payload	People count	People Count status	Battery status	Reserved	Battery voltage	Reserved	Frame count
size	2bytes	0.5byte	0.5byte	1byte	2bytes	6bytes	2bytes

### Payload field definition:

**1 People count:** Accumulated number of people passing by; 2bytes, in hex. The max count is 65535.

**2 People count status:**Limited number of alarm status bits; 1byte; 0 means that the people count does not exceed the limited number of people alarm threshold; 1 means that the people count exceed the limited number of people alarm threshold.

**3 Battery status:** 1byte; 0 means the battery is normal, 1 means the lower battery alarm.

**4 Reserved:** 1byte; default 0x00.

5 **Battery voltage**:battery voltage value; 2bytes in hex; Unit:mV;For example, 016F means that the battery voltage is  $367 \times 10\text{mV} = 3.67\text{V}$ .

6 **Reserved**: 6byte; default 0x000000000000.

7 **Frame count**: 2bytes in hex, Max 65535.

**Example** :800002011500000000016F00000000000000010081

80: packet head

00: default00

02: device type

01: data type02

15: packet length

0000: people count

00: people count status,battery status,00 means

00: default 00

0165: battery voltage, 0165 means 3.67V

000000000000: default 0

0001: frame count, the first data

00: default00

81: packet tail

The payload format of DC500 Sensor(data type:0x03):

S/N	1	2	3	4
<b>Function</b>	Firmware version	Heartbeat interval	People count alarm threshold	Battery alarm threshold
<b>Size</b>	2bytes	1byte	2bytes	1byte

**Payload field definition:**

1 **Firmware version**: the Firmware version of device;2byte;The upper 8 bits are the main version number, and the lower 8 bits are the small version number.

2 **Heartbeat interval**: Heartbeat interval; 1byte in hex; For example,0A means the heartbeat interval is 10hours.

3 **People count alarm threshold**: 2byte in hex; For example, 01F4 means 500 people;

4 **Battery alarm threshold**: 2byte in hex; For example, 1E means 30%;

## 2.1.8 Packet Tail

Packet tail:0x81;1byte.

## 3 Terminal Downlink Command Format by server

Transmission direction: From server to DC500 People Counter sensor.

**Format:**

Field	Packet head	Command type	Payload			Packet tail
Instruction	Packet head	The function of commands	Header	Command code	Content	Packet tail
Size	1byte	1byte	2byte	1byte	n	1byte

### Packet head

Packet head: 0x80; 1byte.

### Command type

Command type	Instruction
0x02	Configure device parameters through the downlink

### Payload

Payload header: 9999 by default

Command code:

Command code	Function Description
0x01	Setting heartbeat interval
0x02	Setting people count alarm threshold
0x05	Setting battery alarm threshold
0x09	Count reset/OTAA、ABPmode setting

Content: please refer to detailed command description part3.1-3.9

## Packet head

Packet tail: 0x81,1byte.

### 3.1 0x01 Setting heartbeat interval

Function:Setting heartbeat interval

Default: 24hours

Range: 1-168hours

Command type: command should be sent in hex from server to sensor.

Format:

Field	Packet head	Command type	Payload			Packet tail
<b>Instruction</b>	80	02	9999	01	Content	81
<b>Size</b>	1byte	1byte	2byte	1byte	n	1byte

**Content:** 1byte, in hex; Unit:h(hour); Range:1-168h.

**For example1:** set the heartbeat interval to 10hours,

Command:80029999010A81

### 3.2 0x02 Setting people count alarm threshold

Function:Setting people count alarm threshold

Default:500 people

Range: 1-65535

Command type: command should be sent in hex from server to sensor.

Format:

Field	Packet head	Command type	Payload			Packet tail
<b>Instruction</b>	80	02	9999	02	Content	81
<b>Size</b>	1byte	1byte	2byte	1byte	n	1byte



**Content:** 2byte, in hex; Range:1-65535.

**For example1:** set the people count alarm threshold to 500,

Command:800299990201F481

### 3.3 0x05 Setting battery alarm threshold

Function:Setting battery alarm threshold

Default: 20%

Range: 5%-99%

Command type: command should be sent in hex from server to sensor.

Format:

Field	Packet head	Command type	Payload			Packet tail
<b>Instruction</b>	80	02	9999	05	Content	81
<b>Size</b>	1byte	1byte	2byte	1byte	n	1byte

**Content:** 1byte, in hex; Unit:%; Range:5-99%.

**For example1:** set the battery alarm threshold to 20%,

Command:80029999051481

### 3.4 0x09 Count reset/OTAA and ABP mode setting

Function: Count reset or exchange OTAA and ABP mode.

Command type: command should be sent in hex from server to sensor.

Format:

Field	Packet head	Command type	Payload			Packet tail
<b>Instruction</b>	80	02	9999	09	Content	81
<b>Size</b>	1byte	1byte	2byte	1byte	1byte	1byte

**Content:** 0F/03/04; 0F:count reset, 03/04 : setting ABP or OTAA mode. Default

OTAA mode.

Example1: Count reset  
Command: 80029999090F81

Example2: set OTAA mode  
80029999090481

Example3: set ABP mode  
80029999090381

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