

Titan Bluetooth communication Protocol

1 Communication Protocol

1.1 Format

Desc	
Start bit	68H
Address	A0
	A1
	A2
	A3
	A4
	A5
Start bit	68H
Control bit	C
Data length	L
Data	DATA
Checksum	CS
End bit	16H

1. The frame start character 68H: identifies the beginning of a frame of information, one byte, the value 68H = 01101000B.
2. Address A0~A5: address consists of six bytes, each byte two BCD code. Address length is 12 decimal number indicating the device number, which is the device serial number.
 - (1) The broadcast address is 999999999999H.
 - (2) When the mobile app starts to communicate with the device, it will use broadcast address to send the device address acquisition command. It will use the actual device address for communication.
3. Control bit C: Control command type and transmission direction, a byte.
4. Data Length L: L is the number of bytes of the data field. Two bytes, L = 0 means no data fields.
5. Checksum CS: From the FSC began to die in all checksum bytes 256 before and that each byte binary arithmetic and, excluding the overflow value exceeding 256, one byte.
6. End bit 16H: identifies the end of a frame of information, one byte, the value 16H = 00010110B.

1.2 Transmission Control

1. Turn on the Bluetooth on the phone, Deimos will show a Bluetooth icon when connected. The phone will send a broadcast address to acquire the actual device address. After that, it will send the command 2.1.5, which means the phone is connected with Deimos. After the data communication icon shows on the main menu of Deimos, the mobile app can start to send command to the device
2. Modification of Device SN and Sensor module SN can only be done in factory mode.

2 Communication command

2.1 Command

2.1.1 Software version

Function: Read the current software version of the device, e.g. V1.00

Version number description: V1.00 , 1.00 is the software version

Date type: ASCII

Command: FF00H

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	00H	FFH	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	07H	00H	00H	FFH	N1	...	Nm	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----	----	----	-----

Data N1...Nm is the software version: V1.00

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00H	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	----	-----

2.1.2 Device Time

Function: Read and write device time

Data type: HEX

Command: FF01H

Read device time

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	01H	FFH	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	08H	00H	01H	FFH	N1	...	Nm	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----	----	----	-----

Data N1...Nm is the device time: YearMonthDayHourMinuteSecond

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00H	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	----	-----

Write device time

1. Mobile app send data format:

68H	A0	...	A5	68H	04H	08H	00H	01H	FFH	N1	...	Nm	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----	----	----	-----

Data N1...Nm is the device time: YearMonthDayHourMinuteSecond

2. Device response data format:

68H	A0	...	A5	68H	84H	00H	00H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	----	-----

3. Device abnormal response data format:

68H	A0	...	A5	68H	C4H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.1.3 Device Address

Function: Read and write the device serial number, which means the device address (The first 4 bit is ASCII code, the last 2 2 bit is BCD code)

Date type: BCD

Command: FF02H

Read Device Address

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	02H	FFH	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	08H	00H	02H	FFH	N1	...	Nm	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----	----	----	-----

Data N1...Nm is the device address: 12 digit device address A0~A5

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00H	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	----	-----

Write Device Address

1. Mobile app send data format

68H	A0	...	A5	68H	04H	08H	00H	02H	FFH	N1	...	Nm	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----	----	----	-----

Data N1...Nm is the device address, 12 digit device address A0~A5

2. Device response data format:

68H	A0	...	A5	68H	84H	00H	00H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	----	-----

3. Device abnormal response data format:

68H	A0	...	A5	68H	C4H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.1.4 Device Mode

Function: Set the device mode, there are two mode: operating mode and factory mode

Data type: HEX

Command: FF03H

Read device mode

1. Mobile app send data format

68H	A0	...	A5	68H	01H	02H	00H	03H	FFH	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	03H	00H	03H	FFH	mode	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	------	----	-----

mode=0: Factory Mode; mode=1: Operating Mode

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00H	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	----	-----

Write Device Mode

1. Mobile app send data format:

68H	A0	...	A5	68H	04H	03H	00H	03H	FFH	mode	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	------	----	-----

mode=0: Factory Mode; mode=1: Operating Mode

2. Device response data format:

68H	A0	...	A5	68H	84H	00H	00H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	----	-----

3. Device abnormal response data format:

68H	A0	...	A5	68H	C4H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.1.5 Connection Status

Function: Device will send the command to check the connection status between the phone and device

Command: FF04H

Write the connection status

1. Mobile app send data format:

68H	A0	...	A5	68H	04H	03H	00H	04H	FFH	Status	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	--------	----	-----

Status 1: connected; Status =0: disconnected

2. Device response data format:

68H	A0	...	A5	68H	84H	00H	00H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	----	-----

3. Device abnormal response data format:

68H	A0	...	A5	68H	C4H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.1.6 Sensor module address

Function: Read and write the sensor module serial number, that is the sensor module address. (The first 4 bit is ASCII code, the last 2 bit is BCD code)

Data type: BCD

Command: FF05H

Read the sensor module address

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	05H	FFH	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	08H	00H	05H	FFH	N1	...	Nm	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----	----	----	-----

Data N1...Nm is the sensor module address, 12 digit, N1~N6

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00H	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	----	-----

Read the sensor module address

1. Mobile app send data format:

68H	A0	...	A5	68H	04H	08H	00H	05H	FFH	N1	...	Nm	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----	----	----	-----

Data N1...Nm is the sensor module address, 12 digit, N1~N6

2. Device response data format:

68H	A0	...	A5	68H	84H	00H	00H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	----	-----

3. Device abnormal response data format:

68H	A0	...	A5	68H	C4H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.2 Data command

2.2.1 Device Status

Function: Read the device current working status, when the mobile app start, it will check the Bluetooth connection status, if connected, it will get the current working status.

Data type: HEX

Command: 9001H

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	01H	90H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	03H	00H	01H	90H	00H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	-----	----	-----

Data 00H means the device is ready

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.2.2 Alcohol testing

Function: When the device is ready, send the alcohol testing command to start the alcohol testing

Data type: HEX

Command: 9002H

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	02H	90H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	03H	00H	02H	90H	STA	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	-----	----	-----

STA = 1 : start blowing

STA = 2 : finish blowing

STA = 3 : blowing discontinue

STA = 4 : refuse blowing

STA = 5 : measurement result calculation complete

STA = 6 : detect whether calibration date is expired or not.

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.2.3 Alcohol testing result

Function: when the device calculate the measurement, it will send the result to the mobile app

Data type: HEX

Command: 9003H

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	03H	90H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	04H	00H	03H	90H	Val_L	Val_H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	-------	-------	----	-----

Alcohol content : $(Val_H * 256 + Val_L)$ mg/100ml

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.2.4 Device battery

Function: Read the device current battery level

Data type: HEX

Command: 9004H

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	04H	90H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	04H	00H	04H	90H	Bat_L	Bat_H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	-------	-------	----	-----

Battery Level: $(Bat_H * 256 + Bat_L)$ %

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.2.5 Number of Record

Function: Read the device total number of record

Data type: HEX

Command: 9005H

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	05H	90H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	04H	00H	05H	90H	Time_L	Time_H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	--------	--------	----	-----

Number of record: (Time_H*256+Time_L)

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.2.6 Last Calibration Date

Function: Read last calibration date

Data type: HEX

Command: 9007H

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	07H	90H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	08H	00H	07H	90H	N1	...	Nm	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----	----	----	-----

Data N1...Nm is the last calibration date YearMonthDay

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.2.7 Temperature

Function: Read the device temperature

Function: 9008H

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	02H	00H	08H	90H	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----

2. Device response data format:

68H	A0	...	A5	68H	81H	03H	00H	08H	90H	Temp	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	------	----	-----

Temperature: Temp lower 7 bit is temperature, higher 1 bit is the sign (1 is negative temperature, 0 is positive temperature)

3. Device abnormal response data format:

68H	A0	...	A5	68H	C1H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

2.2.8 Test Record

Function: Read the device test record

Command: 900AH

1. Mobile app send data format:

68H	A0	...	A5	68H	01H	03H	00H	0AH	90H	Num	CS
-----	----	-----	----	-----	-----	-----	-----	-----	-----	-----	----

Record: Num is the record number (From 1 to 100, the device can only store 100 test records)

2. Device response data format:

68H	A0	...	A5	68H	81H	12H	00H	0AH	90H	N1	...	Nm	CS	16H
-----	----	-----	----	-----	-----	-----	-----	-----	-----	----	-----	----	----	-----

Data N1...Nm is the data of corresponding record

3. Device response data format:

68H	A0	...	A5	68H	C1H	01H	00	ERR	CS	16H
-----	----	-----	----	-----	-----	-----	----	-----	----	-----

Appendix A

Error message word ERR

bit7	bit 6	bit 5	bit 4	Bit3	bit 2	bit 1	bit 0
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- Desc:
- bit0: Illegal data, the data is not in a valid range
 - bit1: Data identification error, invalid data identification
 - bit2: Data check error
 - bit3: Illegal access
 - bit4: Device address error
 - bit5: Reserved
 - bit6: Reserved
 - bit7: Unknown error