



WTH301 User Manual

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International Telematics Solutions **Innovator**

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0. Revision History

Version	Date	Author	Description of Change
1.00	2023-05-29	Shoey Fu	Initial

1. Introduction

WTH301 is a standard beacon accessory based on 2.4GHz Bluetooth Low Energy (BLE5.1). It is mainly used for temperature and humidity collection when working with Queclink's tracker products.

1.1. WTH301 Technical Parameters

Name	Specifications
Carrier Frequency	2.4 GHz, Supports BLE 5.1 protocol
Operating Temperature	-40°C~+70°C
Waterproof Level	IP66
Transmission Distance	Max 150m in open area
Temperature Measurement	Range: -40°C~+70°C Measure accuracy: 5°C~60°C: ±0.5°C <5°C or >60°C: ±1.4°C
Humidity Measurement	Range: 0% - 100%RH Measure accuracy: 20 %~80%RH: ±2%RH >80%RH or <20%RH: ±3.5%RH
Sampling Period	10 seconds
Battery	Lithium iron battery (1200mAh), Over 3 years lifetime (+7dB transmit power, report every 10 seconds)
Current	Static Current <4.5uA (power consumption under power-off status) Peak Current <10mA Average Current <33uA (not including power consumption on data transmission)

2. User Guide

2.1. WTH301 Appearance



2.2. Key Description

1. Press and hold the switch button (white button). If the green indicator blinks for five times, WTH301 is powered on, broadcasts regularly, and can be scanned.
2. Press and hold the switch button (white button). If the green indicator is on for a while, it indicates that WTH301 is powered off, will not broadcast regularly, and cannot be scanned.

2.3. LED Description

There is a green LED underneath the front case. It works as follows:

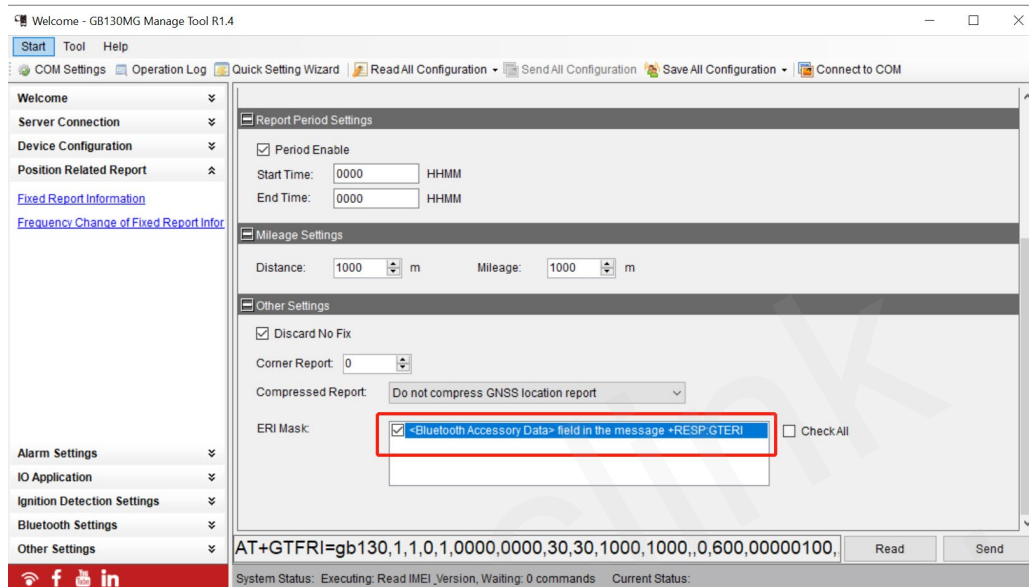
Power on	The LED will flash for 5 times.
Power off	The LED will be on for 1-2s.

The LED is off after the device is powered on and in working status.

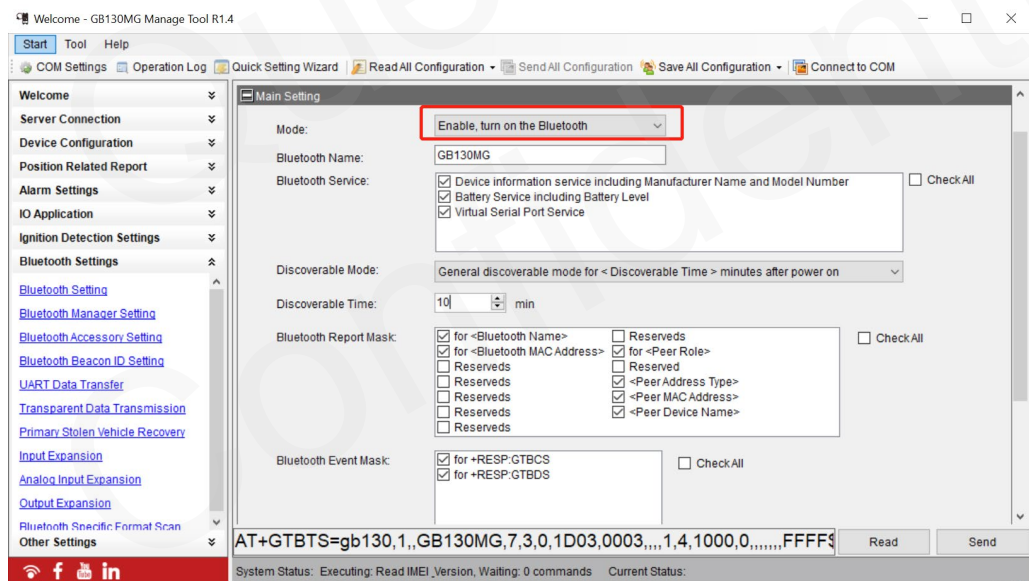
2.4. Configuration of Trackers

WTH301 is Queclink standard temperature and humidity sensor. Here by using the Manage Tool, GB130MG is taken as an example to explain how to pair Queclink trackers with the WTH301.

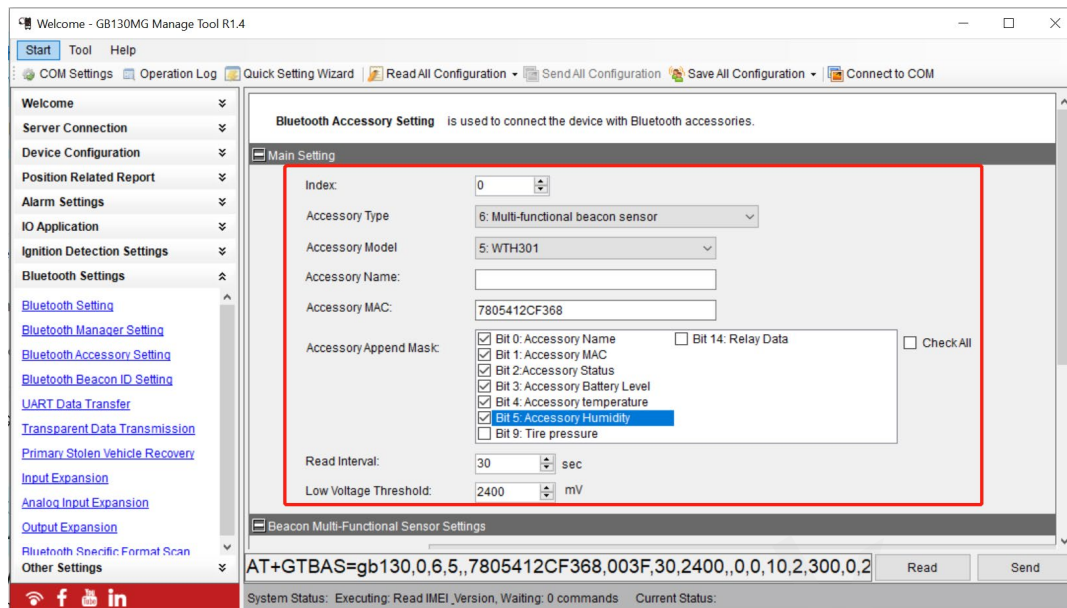
Step 1 Enable ERI mask *“Bluetooth accessory”* in **AT+GTFRI** so that the data read from WTH301 can be sent to server along with the periodic reports.



Step 2 Enable the Bluetooth function in **AT+GTBTS**.



Step 3 Properly set the parameters such as Accessory Type, Accessory MAC, Read Interval in **AT+GTBAS**.

**Note:**

- 1) Please refer to each model's respective @Track Air Interface Protocol for detailed explanation of the commands and parameters.
- 2) The commands and parameters used to connect WTH301 will be different dependent on the models. But the basic process shall be the same. Please refer to each model's respective @Track Air Interface Protocol for details.

2.5. Example message of WTH301

If the fixed report information is enabled by the command **AT+GTFR1** and the device is connected with the Bluetooth accessory, the device will report Bluetooth accessory data via the message **+RESP:GTERI** to the backend server when **<ERI Mask>** of the command **AT+GTFR1** is set to 1. **+RESP:GTERI** message is generated by schedule report.

Example:

```
+RESP:GTERI,770203,865284045844887,GB130MG,,10,1,1,0,0,0,58.5,121.409053,31.174847,20
200615073657,0460,0000,1877,8790,00,0,0,,,,100,410000,,1,0,2,0,0C051B80,001F,WTS300,780
54101E623,1,3077,27,20200615153702,92B6$
```

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' ', '\'	
ERI Mask	8	(HEX)	
External Power Supply	<=5	0 - 99999(mV)	
Report ID / Report Type	2	XY(X∈{1 - 5}, Y∈{0 - 6})	

Number		<=2	1 - 15	
GNSS Accuracy		<=2	0 - 50	
Speed		<=5	0.0 - 999.9(km/h)	
Azimuth		<=3	0 - 359	
Altitude		<=8	(-)XXXXX.X(m)	
Longitude		<=11	-180 - 180	
Latitude		<=10	-90 - 90	
GNSS UTC Time		14	YYYYMMDDHHMMSS	
MCC		4	0XXX	
MNC		4	0XXX	
LAC		4	(HEX)	
Cell ID		4 8	(HEX)	
Reserved		0		
Mileage		<=9	0.0 - 4294967.0(km)	
Hour Meter Count		11	HHHHH:MM:SS	
Reserved		0		
Reserved		0		
Backup Battery Percentage		<=3	0 - 100	
Device Status		6	(HEX)	
Reserved		0		
Bluetooth Accessory Data (Optional)	Bluetooth Accessory Number	<=2	0 - 10	
	Index	1	0 - 9	
	Accessory Type	<=2	0 3 6 8 12 13	
	Accessory Model	1	0 2 3 4 5	
	Raw Data	<=10	(HEX)	
	Accessory Append Mask	4	(HEX)	
	Accessory Name	<=20	(ASCII)	
	Accessory MAC	12	(HEX)	
	Accessory Status	1	0 1	

	Accessory Battery Level	<=4	0 - 5000(mV)	
	Accessory Temperature	<=3	-40 - 80(°C)	
	Accessory Humidity	<=3	0 - 100%(rh)	
	Tire Pressure	<=3	0 - 500(kpa)	
	Relay Configuration Result	1	0 - 4	
	Relay State	1	0 - 1	
Send Time		14	YYYYMMDDHHMMSS	
Count Number		4	(HEX)	
Tail Character		1	\$	\$

- ✧ <Bluetooth Accessory Number>: It indicates the number of Bluetooth accessories connected with the device.
- ✧ <Index>: The index of the Bluetooth accessory.
- ✧ <Accessory Type>: The type of the Bluetooth accessory.
- ✧ <Accessory Model>: The model of the Bluetooth accessory.
- ✧ <Raw Data>: The data is read from Bluetooth accessory. It varies according to <Accessory Type> and <Accessory Model>.
 - WTH300: It is a four-byte hexadecimal value. The 2 higher bytes of the hexadecimal value indicate temperature. And the 2 lower bytes of the hexadecimal value indicate humidity. The high byte is the integer part and the low byte is the fractional part. Temperature is equal to the low byte divided by 256 plus the high byte, and the unit is Celsius. Humidity is equal to the low byte divided by 256 plus the high byte, and the unit is RH.
- ✧ <Accessory Name>: The name of the Bluetooth accessory.
- ✧ <Accessory MAC>: The MAC address of the Bluetooth accessory.
- ✧ <Accessory Status>: A numeral to indicate whether the accessory is available.
 - 0: The accessory is not available.
 - 1: The accessory is available.
- ✧ <Accessory Battery Level>: The battery voltage of the Bluetooth accessory.
- ✧ <Accessory Temperature>: Temperature data of the Bluetooth accessory.
- ✧ <Accessory Humidity>: The real time humidity detected by the sensor. If <Accessory Type> is 6, <Accessory Humidity> will be present.

Note: The item denoted with “(Optional)” indicates the item is controlled by the parameter <ERI Mask>.

The event report of temperature alarm and humidity alarm from **WTH301** as **+RESP:GTBAA** message is uses the format below.

Example:

+RESP:GTBAA,770203,865284045844887,GB130MG,0,2,0,03,001F,WTH301,78054101E623,1,3078,27,0,0,0,0,58.5,121.409053,31.174847,20200615073922,0460,0000,1877,8790,00,20200615153923,92DC\$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Index	<=2	(HEX)(0 - 9 FF)	
Accessory Type	<=2	0 3 6 8 12 13	
Accessory Model / Beacon ID Model	1	0 2 3 4 5	
Alarm Type	2	(HEX)	
Accessory Append Mask	4	(HEX)	
Accessory Name (Optional)	<=20	(ASCII)	
Accessory MAC (Optional)	12	(HEX)	
Accessory Status (Optional)	1	0 1	
Accessory Battery Level (Optional)	<=4	0 - 5000(mV)	
Accessory Temperature (Optional)	<=3	-40 - 80(°C)	
Accessory Humidity (Optional)	<=3	0 - 100%(rh)	
Accessory Signal Strength (Optional)	<=4	-120 - 0	
Tire pressure (Optional)	<=3	0 – 500(kpa)	
Relay Configuration Result (Optional)	1	0 - 4	
Relay State (Optional)	1	0 -1	
GPS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	

Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	4 8	(HEX)	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	\$	\$

✧ **<Index>**: The index of the Bluetooth accessory.

- The index of Bluetooth accessory defined in **AT+GTBAS** which triggers the **+RESP:GTBAA** message.

For BID Accessory, it is 0xFF.

✧ **<Accessory Type>**: The type of the Bluetooth accessory which is defined in the **<Index>**.

- 0: No Bluetooth accessory
- 3: Bluetooth beacon accessory
- 6: Multi-functional beacon sensor
- 8: External Input Output Bluetooth Accessory
- 12: BLE TPMS sensor
- 13: Relay Sensor

✧ **<Accessory Model / Beacon ID Model>**: The model of the Bluetooth accessory which is defined in **AT+GTBAS** or the model of the Bluetooth Beacon accessory which is defined in **AT+GTBID**.

✧ **<Alarm Type>**: The type of alarm which is generated by the Bluetooth accessory specified by **<Sensor Type>** and **<Sensor Model>** in the **AT+GTBAS** command.

- 0: The voltage of the Bluetooth accessory is low.
- 1: Temperature alarm: The current temperature value is lower than **<Low Temperature>** set in the **AT+GTBAS** command.
- 2: Temperature alarm: The current temperature value is higher than **<High Temperature>** set in the **AT+GTBAS** command.
- 3: The temperature alarm: The current temperature value is within the range defined by **<Low Temperature>** and **<High Temperature>** set in the **AT+GTBAS** command.
- 4: Pushbutton event for WKF300 is detected.

- 7: Humidity alarm: The current humidity value is lower than *<Low Humidity>* set in the **AT+GTBAS** command.
 - 8: Humidity alarm: The current humidity value is higher than *<High Humidity>* set in the **AT+GTBAS** command.
 - 9: Humidity alarm: The current temperature value is within the range defined by *<Low Humidity>* and *<High Humidity>* set in the **AT+GTBAS** command.
 - 0E: Tire pressure alarm: The current Tire pressure value is lower than *<Low Tire pressure>* set in the **AT+GTBAS** command.
 - 0F: Tire pressure alarm: The current Tire pressure value is higher than *<High Tire pressure>* set in the **AT+GTBAS** command.
 - 10: Tire pressure alarm: The current Tire pressure value is within the range defined by *<Low Tire pressure>* and *<High Tire pressure>* set in the **AT+GTBAS** command.
 - 13: Door opened.
 - 14: Door closed.
 - 15: Relay event notification.
- ✧ *<Accessory Append Mask>*: Bitwise mask defined in **AT+GTBAS** or **AT+GTBID** command to indicate the reported Bluetooth accessory data fields.
- Bit 0: *<Accessory Name>*
 - Bit 1: *<Accessory MAC>*
 - Bit 2: *<Accessory Status>*
 - Bit 3: *<Accessory Battery Level>*
 - Bit 4: *<Accessory Temperature>*
 - Bit 5: *<Accessory Humidity>*
 - Bit 6: *<Accessory Signal Strength>*
 - Bit 9: *<Tire pressure>*
 - Bit 14: *<Relay Data>*
- ✧ *<Accessory Name>*: The Bluetooth accessory name which ends with '\0'(0x00). If the accessory name is not found, this field will be filled with 0x00.
- ✧ *<Accessory MAC>*: Bluetooth accessory MAC address.
- ✧ *<Accessory Battery Level>*: The battery voltage of the Bluetooth accessory.
- ✧ *<Accessory Temperature>*: Temperature data of Bluetooth accessory.
- ✧ *<Accessory Humidity>*: Humidity data of the Bluetooth accessory.
- ✧ *<Relay Configuration Result>*: The number representing the response result of the relay, which is controlled and reported by Bit14 of the **AT+GTBAS** parameter *<Accessory Append Mask>*.
- 0: Configuration updated successfully.
 - 1: Error in connecting.
 - 2: The current password is incorrect.
 - 3: Password update error.
 - 4: Relay open or close error.
- ✧ *<Relay state>*: The current state of the WRL300 sensor.