

Terabee Follow-Me User Manual



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1. Introduction

The purpose of this document is to give guidelines for installation, use and integration of the Terabee Follow-Me system. The user manual includes an application case of this device which gives an idea of what this technology can do.

1.1. About Terabee Follow-Me

Terabee presents the new relative positioning system for mobile platforms. The system is based on a radiofrequency hardware kit consisting of two beacons (master and slave), to be installed on a mobile platform, and a remote control for the human operator.

The system outputs the distance and heading of the remote control with respect to the central point between the two beacons via USB (CDC) or RS485 (Modbus RTU). It is designed for industrial environments with CE, RoHS, IP65 (when back-panel mounted) and vibration & shock resistance (certifications on-going).

It takes a couple of minutes to set up the system and to obtain distance and heading output on a PC thanks to the graphical user interface developed by Terabee (see section [Graphical User Interface](#)).

1.2. Symbols explanation

The following symbols are used within the document:



This symbol indicates specific recommendations in order to run the device in the intended way.

1.3. Technical Specifications

Please refer to the Terabee Follow-Me Specification Sheet for details.

2. Package contents

- 1 master beacon
- 1 slave beacon
- 2 O-rings for back-panel mounting
- 1 rechargeable remote control
- 1 micro USB cable
- 1 cable to connect slave beacon to master beacon (Molex MicroFit 3.0, 5-pin)

3. Operation principle

When the user activates the system by pressing the button in the remote control (**R**), Two Way Ranging (**TWR**) is performed with the master (**M**) and slave beacons (**S**). The two measured distances together with span (**d**) between master and slave beacons are used to calculate distance (**D**) and heading (θ) of the remote control with respect to the central point between the two beacons. This information can be used by a control system of a mobile robot to follow a person holding the remote control.

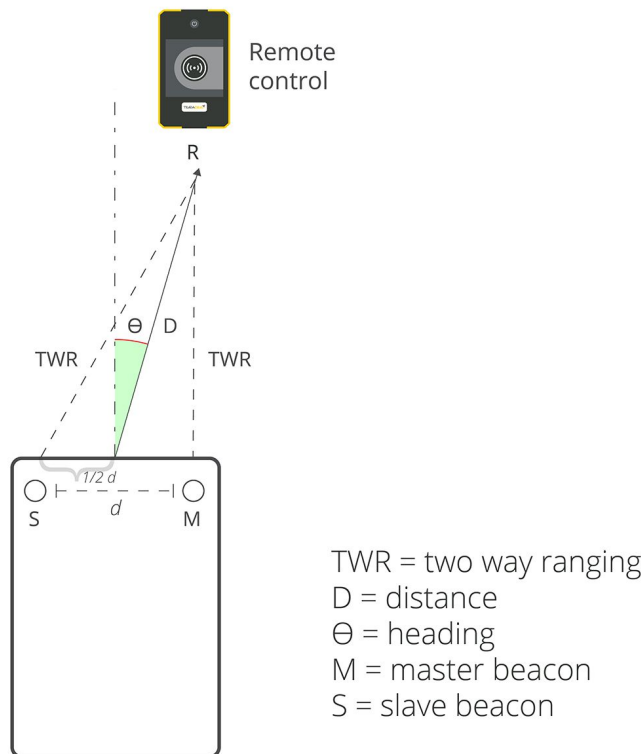


Figure 1 - Operation principle

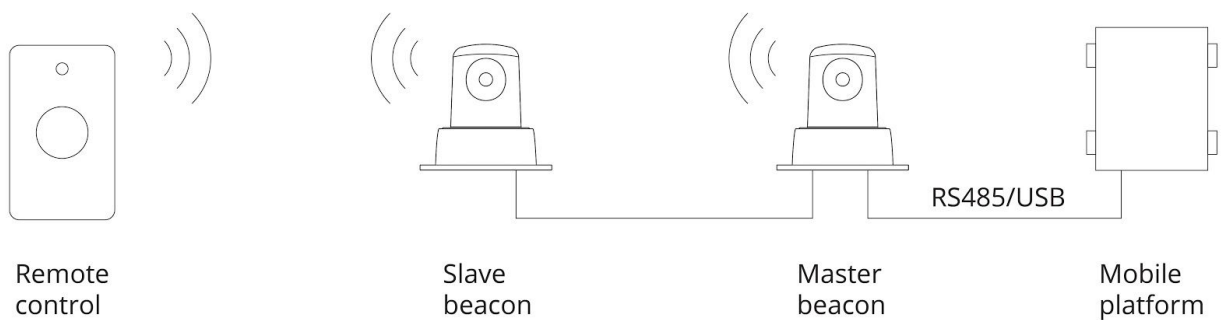


Figure 2 - Connections diagram

3.1. Parameters and output of the system

The system comes with several configuration parameters:

- *Span*
Determines distance between the two beacons (in millimeters).
- *Swap beacons*
Calculations are performed as if the master beacon was on the front right and the slave beacon on the front left side of the robot. If the application requires the opposite configuration, beacons can be swapped in software - this will adapt calculation accordingly.
- *EMA window size*
Parameter determines the number of samples used by the Exponential Moving Average filter. Increasing the window size will provide smoother output, but will also increase the reaction time of the system to changes.

Output of the system is in the form of distance (millimeters) and heading (degrees). In case the system is unable to calculate distance and heading or the remote control is beyond the maximum range, distance and heading will be set to 0 m, 0° respectively.

4. Mechanical integration

4.1. Mechanical design and mounting

The Terabee Follow-Me system uses ABS housings with aluminium lids in the bottom part of the beacons. Each lid has three curved slots for M4 screws. *Figure 3* and *Figure 4* illustrate external dimensions of the system.

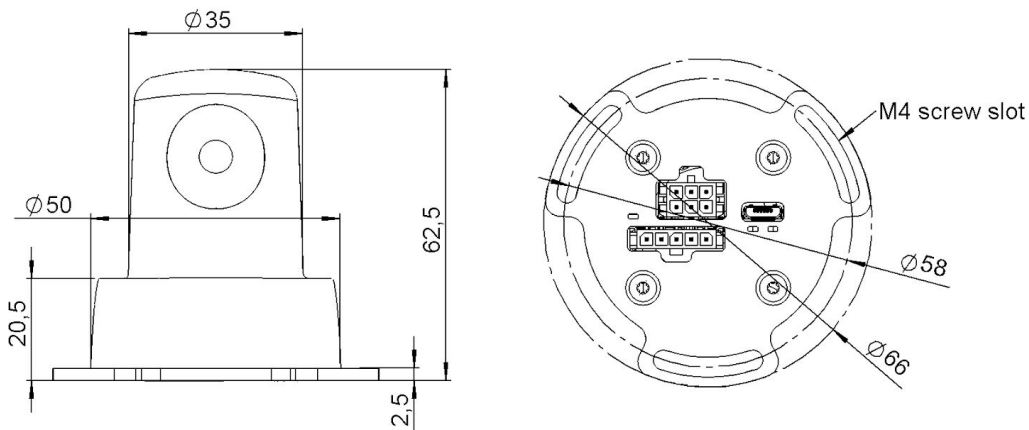


Figure 3 - Terabee Follow-Me overall dimensions - Beacon

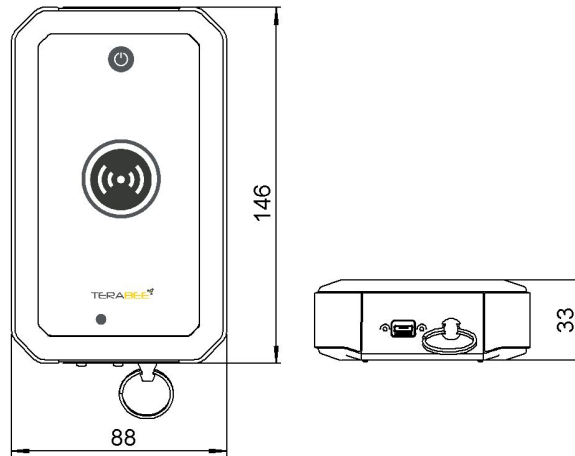


Figure 4 - Terabee Follow-Me overall dimensions - Remote Control

4.2. Mounting solutions

Two mounting options are available for the beacons:

1. Front-panel mounting - screwing the lid directly to the panel.



Figure 5 - Front-panel mounting

2. Back-panel mounting - with an O-ring providing a sealed connection between the panel and the beacon.

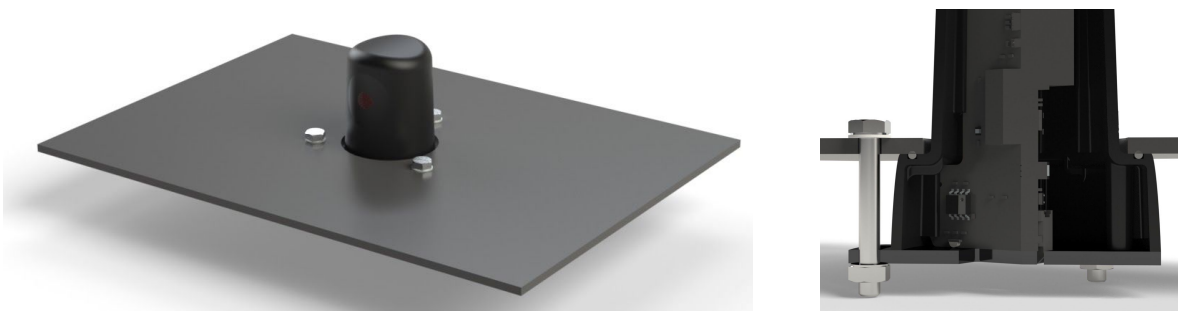




Figure 6 - Back-panel mounting

The first solution provides easy attachment and rapid evaluation of the system. The second solution provides a more discreet installation with a beacon behind a surface (e.g. panel) and thanks to the sealing, enables use in applications that require IP65 protection.

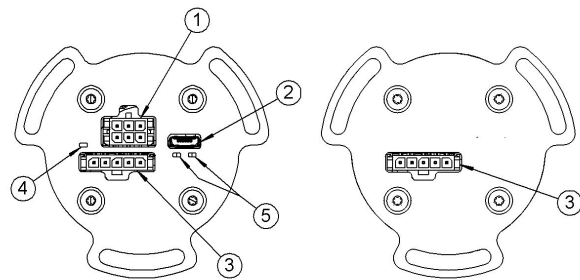
 During assembly and integration, please observe all common ESD precautions.

 For more recommendations concerning integration, refer to section [Applications with Terabee Follow-Me](#).

4.3. Connectors and indicators

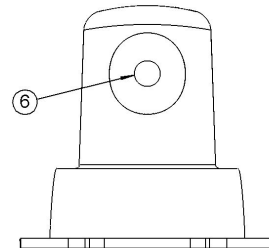
Master Beacon:

- 1. RS485 (Modbus RTU) Molex MicroFit 3.0 connector
- 2. USB 2.0 (CDC) micro USB connector
- 4. Device status LED
- 5. RS485 communication LED



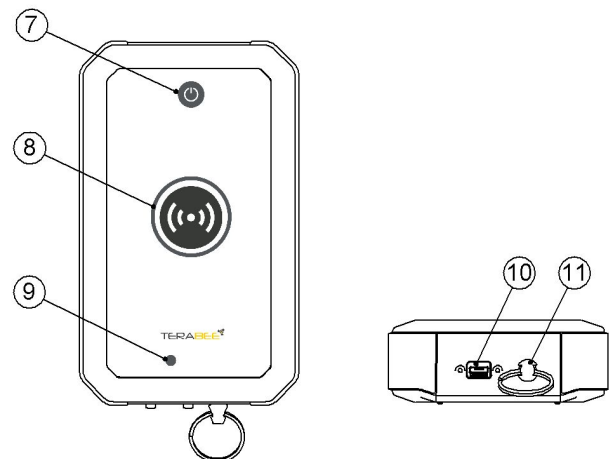
Master and Slave Beacons:

- 3. Connection between beacons Molex MicroFit 3.0 connector
- 6. Ranging indicator LED



Remote Control:

- 7. Power indicator LED
- 8. Ranging indicator LED
- 9. Charging indicator LED
- 10. USB 2.0 (CDC) micro USB connector
- 11. Strap ring



5. Visual notifications

Under the bottom lid of the master beacon, two indicators are available:

- 4 - Device status LED
- 5 - RS485 communication LED

In the top part of each beacon:

- 6 - Ranging indicator LED

5.1. Normal operation

Table 1 - LED indicators - normal operation

LED designator	Sequence	Description
4. Device status LED	<ul style="list-style-type: none">- Blinks GREEN 8 times- Blinking GREEN every 5 s	<ul style="list-style-type: none">- Device startup- Device working properly
5. RS485 communication LED	<ul style="list-style-type: none">- Blinking RED (TX) or GREEN (RX)	<ul style="list-style-type: none">- Data is transmitted or received respectively
6. Ranging indicator LED (beacons)	<ul style="list-style-type: none">- Blinks LIGHT BLUE 2 times- Blinking BLUE every 5 s- Continuous GREEN	<ul style="list-style-type: none">- Device power-up- Device working properly- Ranging active
7. Power indicator LED	<ul style="list-style-type: none">- Continuous GREEN	<ul style="list-style-type: none">- Device working properly
8. Ranging indicator LED (remote control)	<ul style="list-style-type: none">- Blinking BLUE every 5 s- Continuous BLUE light	<ul style="list-style-type: none">- Device working properly- Ranging active
9. Charging indicator LED	<ul style="list-style-type: none">- Continuous ORANGE- Continuous GREEN	<ul style="list-style-type: none">- Battery charging- Battery charged

5.2. Error messages and troubleshooting

Table 2 - LED indicators - error cases

LED designator	Sequence	Signification	Corrective actions
4. Device status LED	Alternating RED/GREEN	Device in error mode	Force a firmware upgrade, see section Firmware Upgrade Recovery for details

	Blinking GREEN every 1 s	Span calibration not performed	Set span or activate auto calibration
7. Power indicator LED	Blinking RED	Battery discharged	Charge the remote control
8. Ranging indicator LED (remote control)	Blinking RED	Unable to perform ranging	Signal strength insufficient for Two Way Ranging or beacons are not connected
		Button pressed while charging	Disconnect the remote from charging

6. Connecting Terabee Follow-Me to a host computer via USB

6.1. Connection parameters

These are the parameters to set up serial connection with the product on the host computer:

Baud rate : 115200 bit/s
 Data bits : 8
 Stop bits : 1
 Parity : None

6.2. Windows OS, Linux OS

In Windows and Linux it is possible to use terminal emulation software to display the data and configure the device. Terabee often works with and suggests using *HTerm* software. In order to download the software, please navigate to the following link: <http://www.der-hammer.info/terminal/> and select the file appropriate for your platform. *Tested with version 0.8.4 on Linux x64 and Windows 10 x64 platforms.*

When using Windows, extract the downloaded *zip* file to the selected folder, open it and double click on the "HTerm.exe" file.

When using Linux, extract the downloaded *tgz* file to the selected folder, make sure that you have execution permission for the file "hterm" (command: `chmod u+x hterm`), double click on the "hterm" file or run it from terminal while in its directory: `./hterm`.



On Linux, consider removing the *modemmanager* package if you are sure that it is not required by your system setup. This will shorten the initialization time of the serial devices in Linux system:

```
sudo apt purge modemmanager
```

Connect Terabee Follow-Me to the computer and select the corresponding port (click “R” button to refresh the port list) and connection parameters.

To improve data readability in text mode, select the “LF” option from the “Newline at” drop-down field. See *Figure 7* below for visual instructions.

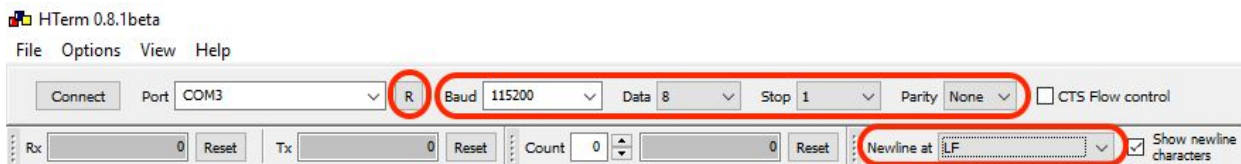


Figure 7 - HTerm parameters for Terabee FolloMe

Once the USB port is selected and the parameters correctly set, click on the “Connect” button. Now you can send commands and receive data from the system.

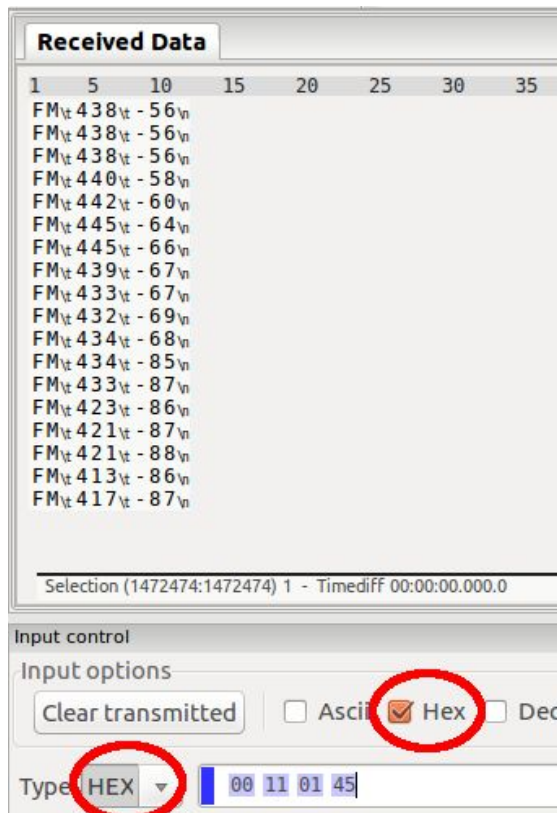


Figure 8 - Data stream on HTerm software:
Distance and heading data in text mode

The user needs to send a command in hexadecimal format to communicate with the device through terminal emulation software. One needs to make sure the "Hex" checkbox is selected (checked) and the "Type" field has "HEX" as an option selected. *Figure 8* shows an example of the command which configures data output in TEXT mode. Please refer to further sections: [USB operation - Master Beacon](#) and [USB operation - Remote Control](#) to see all the available commands.

6.3. Mac OS

When using a Mac OS it is also possible to use terminal emulation software to display the data and configure the device. Terabee often works with and suggests using the CoolTerm software. Please follow the provided link to download the software: <https://freeware.the-meiers.org/>.

Next, double click on the "CoolTermMac.dmg" file and then on the CoolTerm icon. Connect Terabee Follow-Me to a computer and click the "Options" button. Select the corresponding USB port (click "Re-Scan Serial Ports" button to refresh the port list).

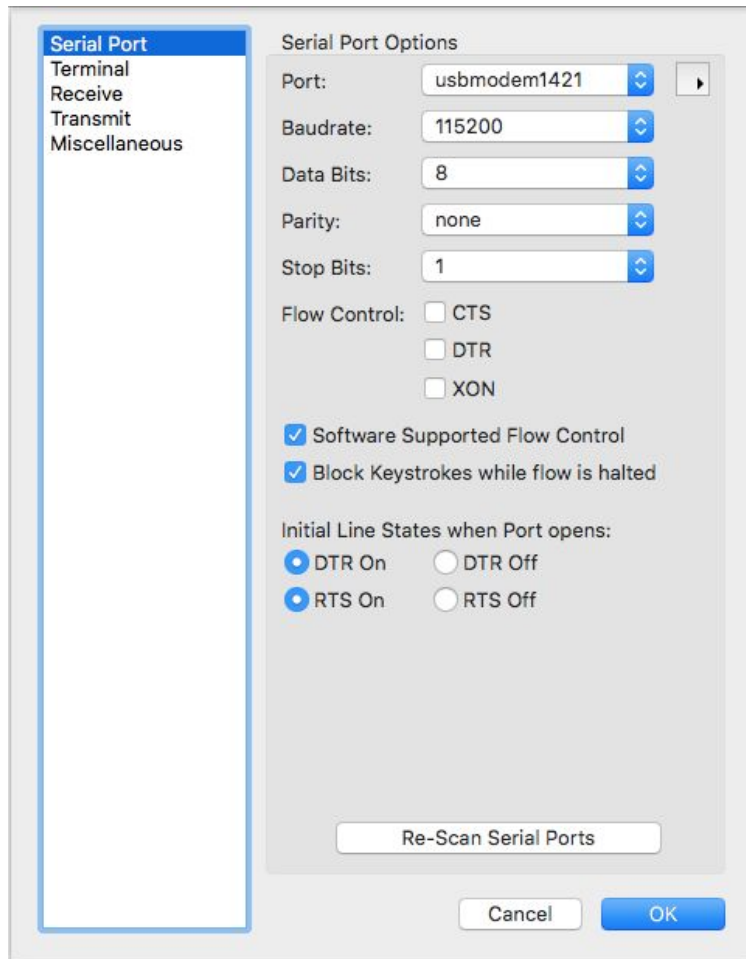


Figure 9 - CoolTerm parameters for Terabee Follow-Me

Once the USB port is selected and the parameters correctly set, click on the “Connect” button. Now you can send commands and receive data from the system.

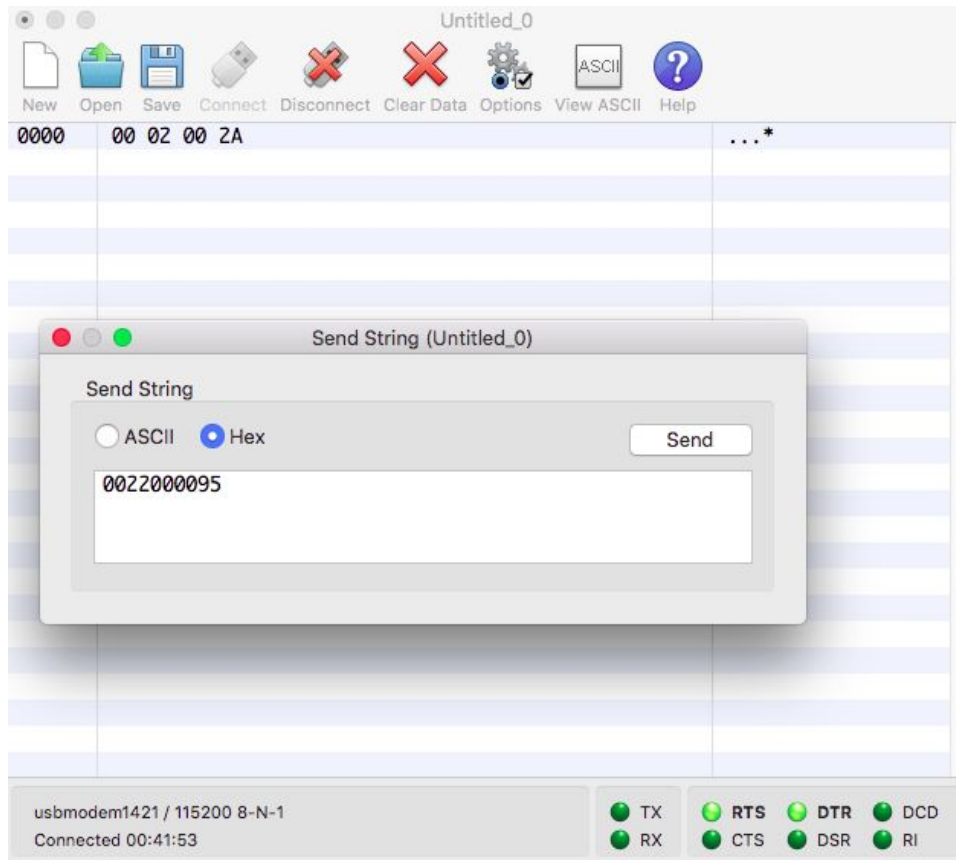


Figure 10 - Auto-calibration command in CoolTerm software

After connecting to the device, click Connection → Send String in order to communicate with the terminal emulation software. A new window will open, allowing you to send commands to the Terabee Follow-Me system. Make sure the “Hex” checkbox is checked as the command needs to be sent in hexadecimal, and then click the “Send” button.

7. USB operation - Master Beacon

Please refer to the section [Connecting Terabee Follow-Me to a host computer via USB](#) for instructions on how to send commands to Terabee Follow-Me system using a host computer and HTerm/CoolTerm emulation software.

7.1. List of commands

Table 3 - List of commands for Terabee Follow-Me

Command (HEX)	Command description
00 00 00 00	DEVICE INFORMATION
00 11 01 45	PRINT OUT MODE TEXT
00 11 02 4C	PRINT OUT MODE BINARY

00 22 00 00 95	<p>ACTIVATE SPAN AUTO CALIBRATION <i>After executing this command, span will be adjusted automatically, every time the device is powered-up</i></p> <p><i>Accuracy: ±25 cm; Repeatability: ±5 cm</i></p>
00 22 [UU] [LL] [CRC8]	<p>ACTIVATE SPAN MANUAL SETTING <i>UU LL contains a number in a range from 100 to 3000 mm, in HEX format</i> <i>Auto calibration is deactivated and value is stored in non-volatile memory</i></p>
00 31 [LL] [CRC8]	<p>SWAP MASTER AND SLAVE BEACONS <i>LL = 0 → no swap</i> <i>LL > 0 → beacons swapped</i></p>
00 52 01 [LL] [CRC8]	<p>EMA FILTER WINDOW SIZE <i>LL is a number in a range from 0 to 255, in HEX format</i> <i>LL = 0 → filtering disabled</i></p>
00 55 02 [OT] [UU] [LL] [OP] [CRC8]	<p>RS485 BAUD RATE AND PARITY <i>OT UU LL is the baud rate value, in HEX format</i></p> <p><i>P is parity:</i> <i>0 → None</i> <i>1 → Odd</i> <i>2 → Even</i></p>
00 52 03 [LL] [CRC8]	<p>SET MODBUS SLAVE ADDRESS <i>LL is a number in a range from 1 to 247, in HEX format</i></p>

Admissible baud rate settings for the **RS485** interface:

1200	2400	4800	9600	14400	19200	28800
38400	56000	57600	115200	128000	256000	



Each command message frame must be transmitted in a continuous stream, ie. not byte by byte



It is advised to maintain a time interval of a few microseconds between two messages for proper command registration and checking ACK or response before sending the next command

7.1.1. Response to command (ACK/NACK)

In response to commands (except [Device information](#) which returns ASCII data), the system will send one of the acknowledgement responses listed below:

Table 4 - Acknowledgement responses

Response (HEX)	Description
00 [CMD] [ACK] [CRC8]	<p>CMD: <i>corresponds to 4 upper bits of command code, e.g. 0x03 for the command SWAP MASTER AND SLAVE BEACONS 0x05 for the command SET MODBUS SLAVE ADDRESS</i></p> <p>ACK: 0x00 corresponds to ACK (acknowledged) 0xFF corresponds to NACK (not acknowledged)</p>
FF FF FF FF	<p>CRC8 not acknowledged or span auto-calibration failed</p>

7.1.2. Device information

Device information response takes the following form:

```

\nID TB-FM serial_number FW a.b.c fw_tag RS485@ slave_addr baud_rate parity
UWB Master FW d.e.f Slave FW g.h.i
D:span_distance:ema_window_size:beacon_rev;print_out_mode \r\n
    
```

For example, a response:

```

\nID TB-FM 123 FW 1.0.0 STD RS485@ 1 19200 2 UWB Master FW 1.0.0 Slave FW
1.0.0 D:700:0:0:2 \r\n
    
```

corresponds to the following parameters of the system:

- Serial number: 123
- Main firmware version of master beacon: 1.0.0 STD
- RS485 slave address: 1
- RS485 baud rate: 19200 bit/s
- RS485 parity: 2 (even)
- Secondary firmware version of master and slave beacons: 1.0.0
- Span: 700 mm
- EMA window size: 0 (no filtering)
- Beacons swapped: 0 (not swapped)
- Print out mode: 2 (binary)

7.1.3. Printout mode - TEXT

This mode provides users with data transmission in human readable form. Data from the device is streamed in the following format: "FM\txxxx\tyyy\n"

```

Distance reading in mm           : xxxxx (0 to 60000)
Heading reading in degrees       : yyy (-90 to 90)
New line character               : \n (10 decimal / 0x0A hex)
Tab character                     : \t (9 decimal / 0x09 hex)
    
```




Please note that there is no zero-padding for leading zeros. Number of bytes is dependent on the number of digits in the reading.

7.1.4. Printout mode - BINARY (default)

This mode provides users with measured distance and heading in the form of binary messages of 6 bytes. Binary mode is the default print-out mode of the device.

Header	2B	: F (0x46 hex), M (0x4D hex)
Distance reading in mm (0 to 60000)	2B	: XX XX
Heading reading in degrees (-90 to 90)	1B	: YY
CRC8	1B	: CRC8



The system will output both distance and heading equal to 0 as an error message if the device is unable to calculate distance and heading or the remote control is beyond the maximum range.

8. USB operation - Remote Control

Please refer to [Connecting Terabee Follow-Me to a host computer via USB](#) for instructions on how to send commands to Terabee Follow-Me system using a host computer and HTerm/CoolTerm emulation software.

8.1. List of commands

Table 5 - List of commands for Terabee Follow-Me Remote Control

Command (HEX)	Command description
08 00 A8	Button Hold Mode (default)
08 01 AF	Button Toggle Mode
09 00 BD	Buzzer OFF (default)
09 01 BA	Buzzer ON
04 00 54	Remote Button & Buzzer Status Request
03 00 3F	Firmware Version Request

Table 6 - Response to Remote Button & Buzzer Status Request

Header	Data	Data description	CRC8
0x40	0xYY	0xYY : Remote Button & Buzzer Status ACK: 0x00 : button_hold & buzzer_silent 0x10 : button_toggle & buzzer_silent 0x01 : button_hold & buzzer_active 0x11 : button_toggle & buzzer_active	0xXX 0x5B 0x2B 0x5C 0x2C

Table 7 - Response to Firmware Version Request

Header	Data	Data description	CRC8
0x30	0xYYYYYYYY	4 bytes containing 4 digits related to the FW version e.g. 0001 => 0.0.0.1	0xXX

8.1.1. Response to command (ACK/NACK)

Table 8 - Acknowledgement responses to standard command

Header	Data	Data description	CRC8
0x00	0x00000000	ACK - command processed correctly	0x00
0x00	0xFFFFFFFF	NACK - command processing failed	0xDE



Each command message frame must be transmitted in a continuous stream, ie. not byte by byte.



It is advised to maintain a time interval of a few microseconds between two messages for proper command registration and checking ACK or response before sending the next command.

9. RS485 (Modbus RTU) - Master Beacon

9.1. RS485 interface settings

The RS485 interface is a half-duplex connection with the following default parameters:

Baud rate : 19200 (modifiable)
 Data bits : 8
 Stop bits : 1 (2 if selected parity is None)
 Parity : Even (modifiable)

On top of that, a Modbus RTU protocol is in place to handle the data transfer. This is a master-slave type of protocol, ideal for RS485 data communications. This protocol supports up to 247 devices on the bus. The Terabee Follow-Me system operates as a slave device.

9.2. Available registers

Table 9 - Registers, input and coils (Modbus RTU)

Address	Name	Value limits	Details
HOLDING REGISTERS			
0	Slave address	1 to 247	Default: 1
1	Span between two beacons	0 or 100 to 3000 [mm]	A value of 0 activates Auto Calibration A value different from 0 deactivates Auto Calibration and sets manual calibration with the specified value.
2	EMA window size	0-255	
3	RS485 parameters <i>Register value set to: [baud code] [parity], where is bitwise OR</i>	Hex - Baud 0x00 - 1200 0x04 - 2400 0x08 - 4800 0x0C - 9600 0x10 - 14400 0x14 - 19200 0x18 - 28800 0x1C - 38400 0x20 - 56000 0x24 - 57600 0x28 - 115200 0x2C - 128000 0x30 - 256000 Hex - Parity 0x00 - None, 0x01 - Odd, 0x02 - Even	From MSB to LSB: 10 bits - RFU 4 bits - baud rate 2 bits - parity
COILS			
0	Swap beacons	ON / OFF	OFF: Master on the right front ON: Master on the left front

DISCRETE INPUTS			
0	Is recent measurement	ON / OFF	ON: The measurement in buffer is the new one OFF: The measurement is not the new one (was already read by Modbus function) INPUT is reset when any of the two registers (distance or heading) is read
INPUT REGISTERS			
0	Distance to the remote	0 to 60000 [mm]	
1	Heading to the remote	-90 to 90 [deg]	

10. Graphical User Interface

A free Graphical User Interface (GUI) is available online for Windows, providing an easy way to visualize distance and heading data as well as modifying the configuration of the Follow-Me system. This can be done via USB, both for master beacon and remote control. It is useful for demonstration, testing purposes as well as setting parameters of the device before integration into the target platform. It also provides an upgrade feature for the main firmware running on the master beacon.

The Terabee Follow-Me GUI is available for download under the “Downloads” section of the Follow-Me product page.

10.1. Prerequisites

On Windows 7 and Windows 8, please download the Virtual COM Port driver from <http://www.st.com/en/development-tools/stsw-stm32102.html> and follow the ReadMe file instructions given by the installer. After successful installation, if the device (master beacon or remote control) was connected, unplug it for a few seconds and plug it in again. The Virtual COM port should now be available on your PC.



Users of Windows 10 do not need to download this driver as the built-in Windows driver is recommended.

10.2. Basic operation with the GUI



For the GUI to work properly, make sure **only one device** (either master beacon or remote control) is connected at the same time to your computer.

Please connect the master beacon (with slave connected) or remote control (turned on) to the computer via USB, the serial port will open automatically when starting the GUI. Each device can be connected/disconnected in the GUI by clicking on Connect/Disconnect in the File menu. You should immediately see feedback about a successful connection in the status bar of the main window. The available configuration options will differ depending on the connected device (Master Beacon or Remote Control), as shown in *Figure 11* and *Figure 12*.

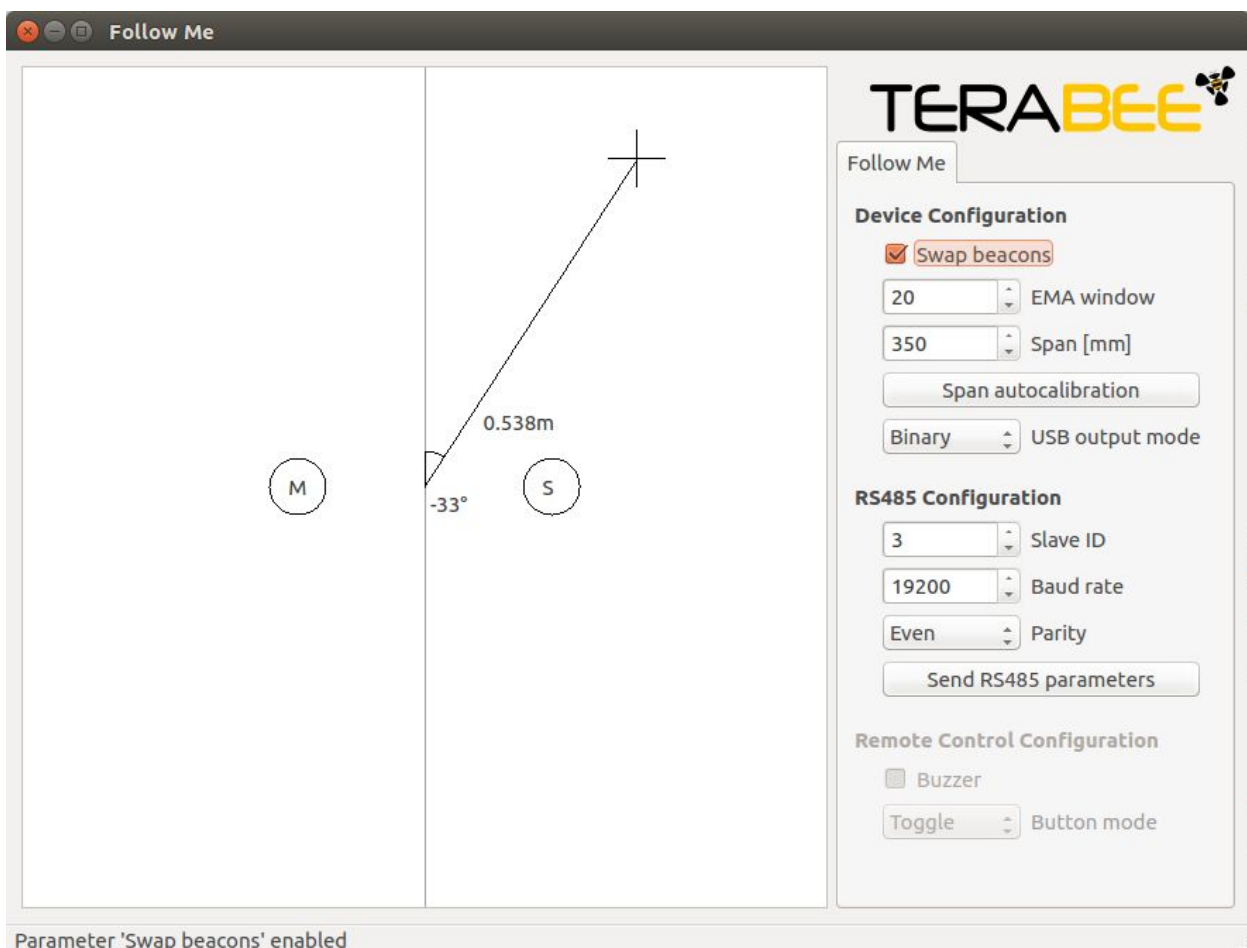


Figure 11 - Terabee Follow-Me GUI main window with Master beacon connected

When the master beacon is connected, the user can set the parameters of the system. Refer to the section [Parameters of the system and output](#) for details. Additionally, the user

can set parameters of the RS485 interface of the connected system: slave ID, baud rate and parity.

The graphics preview shows the representation of master and slave beacons and shows distance and heading to the remote control when ranging is active.

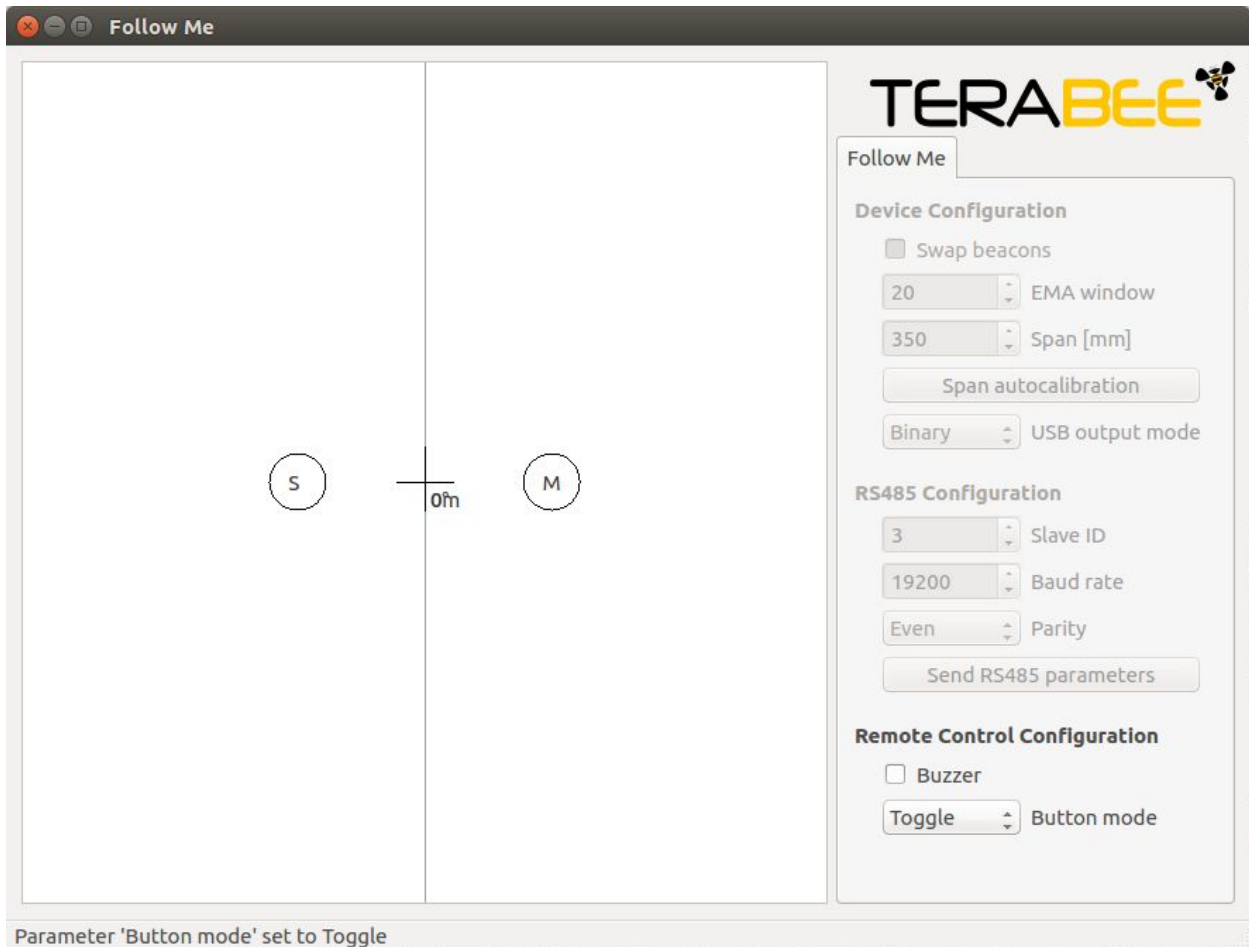




Figure 12 - Terabee Follow-Me GUI main window with remote control connected

When the remote control is connected to the application, you can set the following parameters:

- Buzzer enabled/disabled
If enabled, will beep within approximately 1 second intervals during ranging.
- Button toggle/hold mode
In hold mode, ranging is active as long as the button is pushed. Ranging stops as soon as the button is released.
In toggle mode, every time the button is pushed, ranging is activated or deactivated respectively.


Parameters are written to the device on-the-fly when changed in the GUI, except RS485 parameters - those need to be confirmed by pushing a button "Send RS485 parameters". All parameters visible in the GUI are stored in non-volatile memory on the device. If auto-calibration is activated, the span will be measured every time the device is powered up. If setting a parameter was not successful, appropriate information will be visible in the status bar in the bottom of the application window.

 In cases where the GUI is not streaming distance data, after successful physical connection to a personal computer, please reconnect the device to the computer by disconnecting and connecting it again. Should the issue persist, please contact the Terabee team at support@terabee.com for further guidance.

 Make sure the device is not streaming data before you connect, and during parameter changes.

10.3. Firmware Upgrade

The following section summarizes the steps to upgrade the firmware running on your device. This can be helpful upon a new product firmware release (as and when communicated by Terabee) or should there be a necessity to re-flash your existing device firmware. The firmware upgrade procedure enables the possibility to upgrade only the main firmware running on the master beacon.

 The current firmware version on your Terabee Follow-Me can be found by clicking *Device information* in the *File* menu of the application or by sending the DEVICE INFORMATION command via HTerm (see section [Device information](#)).

Please carefully follow the steps outlined below to upgrade the firmware and to avoid permanently disabling your device.


 Please be advised that wrongful execution of the upgrade instructions can result in disabling the device permanently.

Table 10 - Firmware upgrade instructions

Step	Action	Description
1	Download and install the GUI	Download and install the latest version of the Terabee Follow-Me GUI on your computer. The GUI is available on the Terabee Follow-Me product page.
2	Download the firmware file	Download the latest Follow-Me firmware file from the Terabee Follow-Me product page, or provided by the Terabee technical support team.

3	Load firmware file from hard drive	From the File menu select Connect. If the connection was successful, select Upgrade firmware. The application will ask to load the firmware file previously downloaded to your hard drive.
4	Initiate firmware upgrade procedure	Once the firmware file is selected, click 'Yes' in the Firmware upgrade dialog window to confirm the firmware upgrade procedure.
5	Firmware upgrade	You can observe the current status of the upgrade procedure in the progress bar and additional information about progress in the status bar of the main window.
6	Close upgrade procedure final message	Once the upgrade is finished, the pop-up message will be shown with information about a successful or failed upgrade. Close the pop-up message. The Device status LED will blink green 8 times if the upgrade was successful and alternating green/red if the device switched to error mode.



Once initiated, the upgrade firmware procedure must follow all the steps. If the procedure is interrupted before finishing, the device will switch to error mode. Please refer to the [Firmware Upgrade Recovery](#) section for more details.

10.4. Firmware Upgrade Recovery

If the device stays in error mode (e.g. due to an interrupted firmware upgrade procedure), you can recover it by forcing a firmware upgrade. To do that, follow the steps below:

Table 11 - Firmware upgrade recovery instructions

Step	Action	Description
1	Download and install the GUI	Download and install the latest version of the Terabee Follow-Me GUI on your computer. The GUI is available on the Terabee Follow-Me product page.
2	Download the firmware file	Download the latest Follow-Me firmware file from the Terabee Follow-Me product page, or provided by the Terabee technical support team.
3	Start the GUI	Start Terabee Follow-Me GUI without plugging in the system.

4	Connect	<p>Plug in the Follow-Me master beacon to your computer, Press and hold <i>Ctrl + Shift</i> on the keyboard, then go to <i>File</i> menu and click <i>Connect</i>. The GUI will enter Upgrade Recovery Mode.</p> <p>The application will ask to load the firmware file previously downloaded to your hard drive.</p>
5	Initiate firmware upgrade procedure	Once the firmware file is selected, click 'Yes' in the Firmware upgrade dialog window to confirm the firmware upgrade procedure.
8	Firmware upgrade	You can observe the current status of the upgrade procedure in the progress bar and additional information about progress in the status bar of the main window.
9	Close upgrade FW procedure	<p>Once the upgrade is finished, the pop-up message will be shown with information about a successful or failed upgrade. Close the pop-up message.</p> <p>The Device status LED will blink green 8 times if the upgrade was successful and alternating green/red if the device switched to error mode.</p>

11. ROS package

ROS package available at: https://github.com/Terabee/follow_me_driver_ros

Features:

- Distance and heading streaming from the system
- Configuration of the system's parameters

12. Applications with Terabee Follow-Me

Our relative positioning Follow-Me system, combined with development of a control system for the specific platform, can transform electric pallet trucks into smarter mobile platforms, improving productivity when transporting items from one place to another. Instead of the human interacting with the platform using a handle, the operator can be positioned at a distance and guide it via the hand-held remote to navigate from one place to another. Designing a follow-me system with our kit will lead to an intuitive solution for the end user.

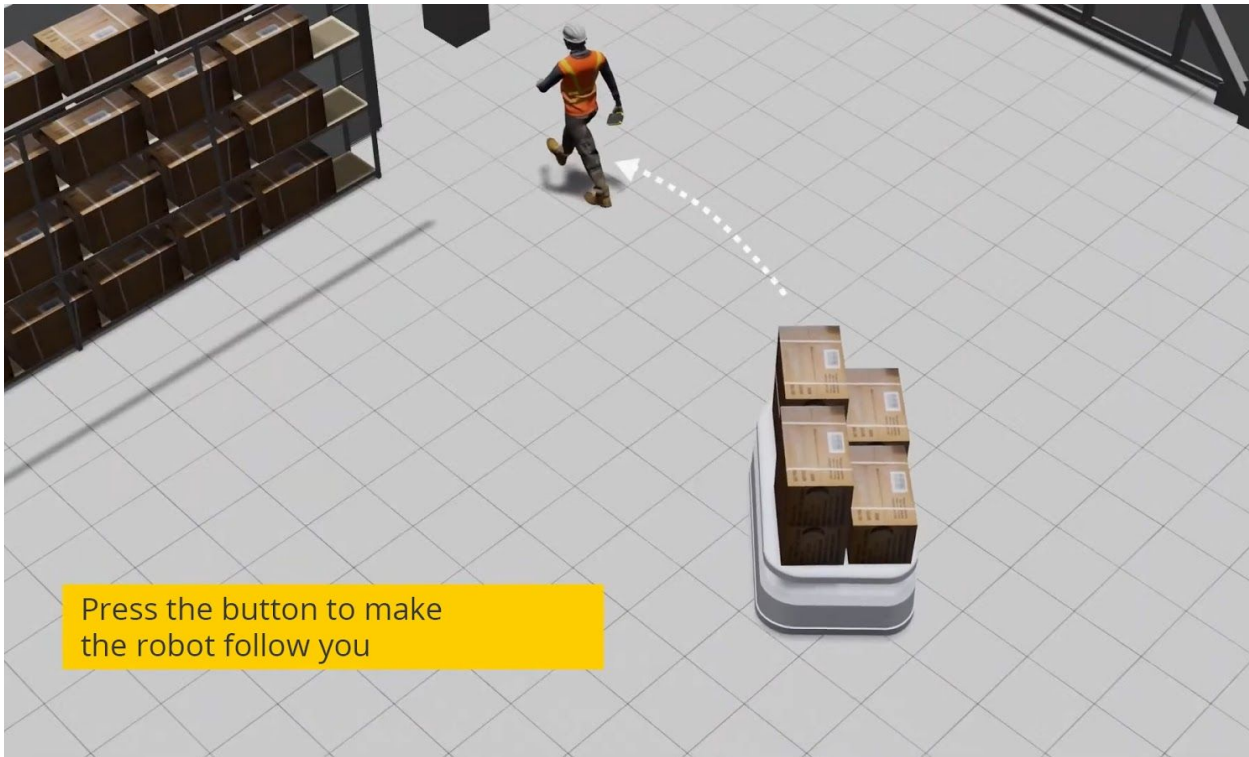


Figure 13 - Example of application with Terabee Follow-Me

Please consider the following recommendations to achieve the best performance:

- Mount beacons symmetrically on the mobile robot.
- Mounting close to sources of heat or strong electromagnetic fields can decrease the performance.
- To ensure accurate auto calibration of span, the area between master and slave beacons should be clear of obstacles.
- For proper operation, there should be no obstacles in the line of sight between the remote control and each of the beacons (e.g. beacons mounted internally in the machine, parts of the machine occluding the line of sight or shelves, pallets, big objects, human body, etc.).
- Avoid having other sources of Ultra-Wide Band Channel 5 (6.49 GHz) radio frequency within the same vicinity.
- Due to interference, it is not currently possible to run multiple Follow-Me systems in the same environment. (This will be remedied in a later release.)
- It is not advised to put an additional cover on the beacons or remote control.
- For best performance while operating the system, hold the remote control with its longest side vertically oriented.
- Be aware of the potential for decreased accuracy if the remote control and beacons are not on the same horizontal plane.
- Before integrating Follow-Me in your system, make sure that a suitable risk assessment is carried out and that appropriate safety measures are implemented (e.g. anti-collision system, personnel training, etc.).



With only two beacons, the system cannot self-identify which is the front or rear of the robot it is installed on. Please take this into consideration in your application.

13. Compliance

Certifications: CE, FCC, IP65, RoHS, vibration & shock resistance - PENDING

IMPORTANT: Contains FCC ID: 2AQ33-DWM1001