

Model TFF-2245

WhereTag IV BT™

User Guide



Part Numbers:

TFF-2245-00AA

TFF-2246-00AA

Typographical Conventions



WARNING

Warnings call attention to a procedure or practice that could result in personal injury if not correctly performed. Do not proceed until you fully understand and meet the required conditions.



CAUTION

Cautions call attention to an operation procedure or practice that could damage the product if not correctly performed. Do not proceed until understanding and meeting these required conditions.

Note

Notes provide information that can be helpful in understanding the operation of the product.



REGULATORY AGENCY INFORMATION

Unless otherwise specified, the following regulatory agency information is for Model TFF-2245 devices, which include part numbers TFF-2245-00AA, and TFF-2246-00AA.

RF Notice

Any changes or modifications to Zebra Technologies Corporation (ZTC) equipment not expressly approved by ZTC could void the user's authority to operate the equipment.

FCC Compliance Statement

This device complies with Part 15 rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference
- (2) This device must accept any interference which may cause undesired operation

Contains FCC ID: XWX-TFF2005

This equipment has been tested and found to comply with the limits for both Class A and Class B devices, pursuant to Part 15 of the FCC Rules & Regulations.

Canadian DOC Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Contains IC: 8701A-TFF2005

Other Compliance Information

**TRA
REGISTERED No:
ER37069/15
DEALER No:
0071480/11**



EU Compliance Information

This Class I radio is approved for use in the following countries

| | | | | | | |
|----|----|----|----|----|----|----|
| AT | BE | BG | CY | CZ | DK | EE |
| FI | FR | DE | GR | HU | IE | IT |
| LV | LT | LU | MT | NL | PL | PT |
| RO | SK | SI | ES | SE | GB | |
| IS | LI | NO | CH | | | |

Cautions:

- No modifications to the tag allowed. This includes any type of modification to the case, such as adding metal foils, holes, disassembly or modifications to the PCB assembly, antenna, battery or modifications to the product labels, etc.
- Prior to installation, carefully inspect the tag, looking for crack, puncture or any other breach of the plastic case. Damaged tags must not be used. Properly dispose of any damaged tag.
- Never dispose of the tag in a fire.
- Deactivate the tag when not in use. It is mandatory to deactivate the tag prior to shipment by airplanes.
- Follow limitations of use as set forth by any applicable regulatory bodies.
- The tag contains replaceable primary Lithium Thionyl Chloride (Li-SOCl₂) batteries, which must be replaced only by trained service technicians. ZTC offers service to replace the batteries. Please contact your ZTC account manager for more information.



WARNING



- **Do not attempt to open the tag and modify the battery due to fire, explosion and severe burn hazard. Do not recharge, short circuit, crush, disassemble, heat above 100 °C (212 °F), incinerate, or expose contents of the battery to water.**
- Do not dispose the tag or its lithium batteries in unsorted municipal waste. In most countries, recycling programs are available through non-profit organization, mandated by local government or organized on a voluntary basis. Contact your local government for disposal practices in your area. ZTC offers recycling programs in certain geographic areas. To determine if a program is available for this product in your area, please refer to our web site at: <http://www.zebra.com/environment>.
- When not in use, the tag should be stored in dry and cool conditions at a temperature preferably not exceeding +30 °C (86 °F).



Document Revision History

| Revision | Change | Change Description | Date | Initials |
|----------|----------|------------------------------------|---------|----------|
| 01 | | Draft | 6/29/12 | HH |
| A | C03036 | Initial Release | 1/22/13 | HH |
| B | C03181 | Updated tag pictures | 5/22/13 | HH |
| C | LE000530 | Add UAE TRA compliance information | 2/16/15 | HH |



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1 OVERVIEW

The Zebra Technologies Corporation (ZTC) Call System allows users in manufacturing and assembly operations to request service for specific parts without leaving their workstations. Specific parts or service requests may be assigned to individual WhereTag IV BT devices so that users may indicate which item is needed. For example, an assembly worker using several parts: each part is associated with a separate WhereTag IV BT device located in the workstation. By pressing the green button on the WhereTag IV BT device, a radio signal is sent by the ZTC Call System to the computer system in the supply area, indicating which workstation requires the specified part or service. The LED on the front face of the device also flashes for a programmable duration to indicate that the button has been pushed.

The WhereTag IV BT also operates in an optional SWITCH mode. This mode can be used to indicate a status; the LED will blink either red or green to indicate a functional status. The status will toggle each time the button is pressed.

To insure that the ZTC Call system is in constant operation, real-time monitoring using an "I'm Still Alive" blinking transmission advises the system supervisor of the status of each WhereTag IV BT device. Battery status is also included in these "I'm still alive" messages as well as in the switch blinks, as well as in the button initiated blinks.

The WhereTag IV BT may be mounted in a work area with removable fasteners, double-sided foam tape or with mounting brackets and screws. (Refer to Section 3, Installation and Mounting).

2 ZTC CALL SYSTEM COMPONENTS

The **ZTC Call System** consists of four major components: the WhereTag IV BT device; a Zebra Location Sensor; Zebra Visibility Server Software (VSS) and a host application to act on Call requests. This document details only the WhereTag IV BT device.

The **WhereTag IV BT** is a palm-sized device approximately 1.5 inches by 2.5 inches, 1.3 inch thick, in a yellow and gray colored case. A green colored actuator button is in the center of the device. A light-emitting diode (LED) is located above the button.

The ZTC **Location Sensor** receives radio signals from the WhereTag IV BT device when the work station user sends a call requesting parts by pressing the green button on the WhereTag IV BT. These signals are transferred by cable or wireless to the VSS server software.

The VSS **server software** uses the BT tag “blink” signals from the sensors to calculate the location of the BT tag. A message is generated by VSS and sent to the user’s computer system indicating that a part is needed at the location of the WhereTag IV BT device.

If necessary, the **WhereWand** hand-held communicator can be used to configure the **WhereTag IV BT** device. The WhereWand is required to change operating mode or protocol of the **WhereTag IV BT** device.



In addition to the ISO 24730 **ZTC Call System**, the **WhereTag IV BT** device will support operation in a Cisco Certified Extensions (CCX) 802.11b system. The behavior is the same as in ISO 24730, except that the RF air protocol of the blinks is CCX. The WhereTag IV BT device also supports DUAL mode, with both ISO 24730 blinks and CCX blinks being transmitted.

A typical CCX system consists of Light Access Points (LAP), a Wireless LAN Controller (WLC), a Mobility Services Engine (MSE), and the Wireless Control System (WCS). A WhereWand allows the user to select the operating protocol of the **WhereTag IV BT**.

3 INSTALLATION & MOUNTING

The WhereTag IV BT may be mounted in a work area with removable fasteners, double-coated foam tape, hanging brackets, or with mounting screws. Overhead installation is also possible using cable mounting.

Each WhereTag IV BT must be mounted in a location to provide an unobstructed view in at least one direction. To maintain communication with the Location Sensors, do not install the WhereTag IV BT inside a metal enclosure such as a metal cabinet.

3.1 Poly-Lock

A plastic, adhesive-backed fastener, Poly-Lock uses mushroom-shaped contact points that overlap and snap together, forming a strong attachment that can be separated by a forceful pull. Poly-Lock is not included with the WhereTag IV BT, but is available from ZTC in precut squares. Contact your ZTC account manager for information, reference part number TM-204-00 (Poly-Lock Tape, 1" x 1", Set). Two sets of tape are required per tag.

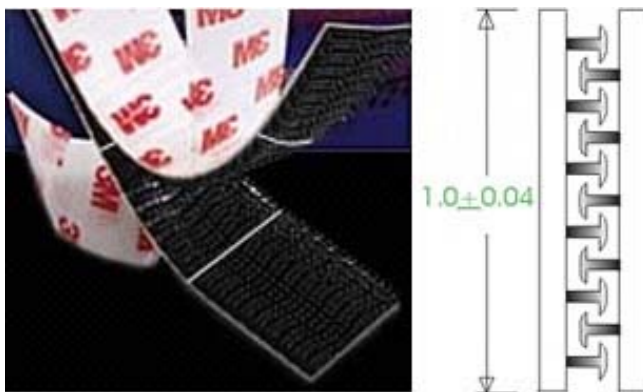


Figure 1: Poly-Lock fastener with adhesive backing



Figure 2: Poly-Lock & foam tape positions

3.2 Mounting WhereTag IV BT with Poly-Lock



Do not apply the Poly-Lock when the temperature is below 60°F (15°C) or above 90°F (32°C).

- 1) Select the desired location in the workstation to mount the WhereTag IV BT.
- 2) Clean the mounting surface and the backside of the WhereTag IV BT with isopropyl alcohol.
- 3) Select a pair (they are shipped in attached pairs) of Poly-Lock squares, remove the adhesive backing and press them to the backside of the tag, sticky side down (see Figure 2).

- 4) Remove the adhesive backing from an additional pair of Poly-Lock and affix it adjacent to the first pair as shown in Figure 2.
- 5) You should now have two pairs of Poly-Lock attached to the backside of the WhereTag IV BT. Remove the adhesive backing from both squares.
- 6) Gently press the WhereTag IV BT against the mounting surface to assure that the adhesive on the squares is bonded to both surfaces.

3.3 Foam Tape Squares

Foam tape, both sides adhesive, provides a secure, semi-permanent mounting method for the WhereTag IV BT device. Foam tape is not included with the WhereTag IV BT. Contact your ZTC Account Manager for information, reference part number TM-202-00 (Tape, 1.0" x 1.0", VHB 4945). Two pieces are required per tag. See figure 2 for foam tape positions.

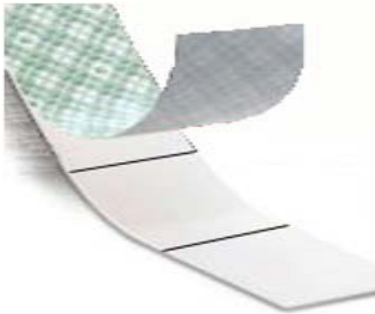


Figure 3: Foam tape squares

| | |
|-------|---|
| _____ | “Double sticky” tape applies a layer of permanent adhesive film to both surfaces. |
| Note | Care should be taken in the application of foam tape; once applied it is difficult to remove. |
| _____ | |

3.4 Mounting WhereTag IV BT with Foam Tape Squares



Do not apply the foam tape when the temperature is below 60°F (15°C) or above 90°F (32°C).

1. Select the desired location to mount the WhereTag IV BT.
2. Clean the mounting surface and the backside of the WhereTag IV BT with isopropyl alcohol.
3. Select two foam tape squares, remove the adhesive backing from one side only and apply them to the backside of the WhereTag IV BT as shown in Figure 2.
4. Remove the adhesive backing from the exposed surface of the tape squares.
5. While holding the WhereTag IV BT, aligned to the desired position. Gently press the unit onto the mounting surface.

3.5 Mounting WhereTag IV BT with Snap-on mount and screws

The WhereTag IV BT may be installed using screws by utilizing the snap-on mount (or ring). The snap-on mount is not included with the WhereTag IV BT. Contact your ZTC Account Manager for information, reference part number TM-400-00.

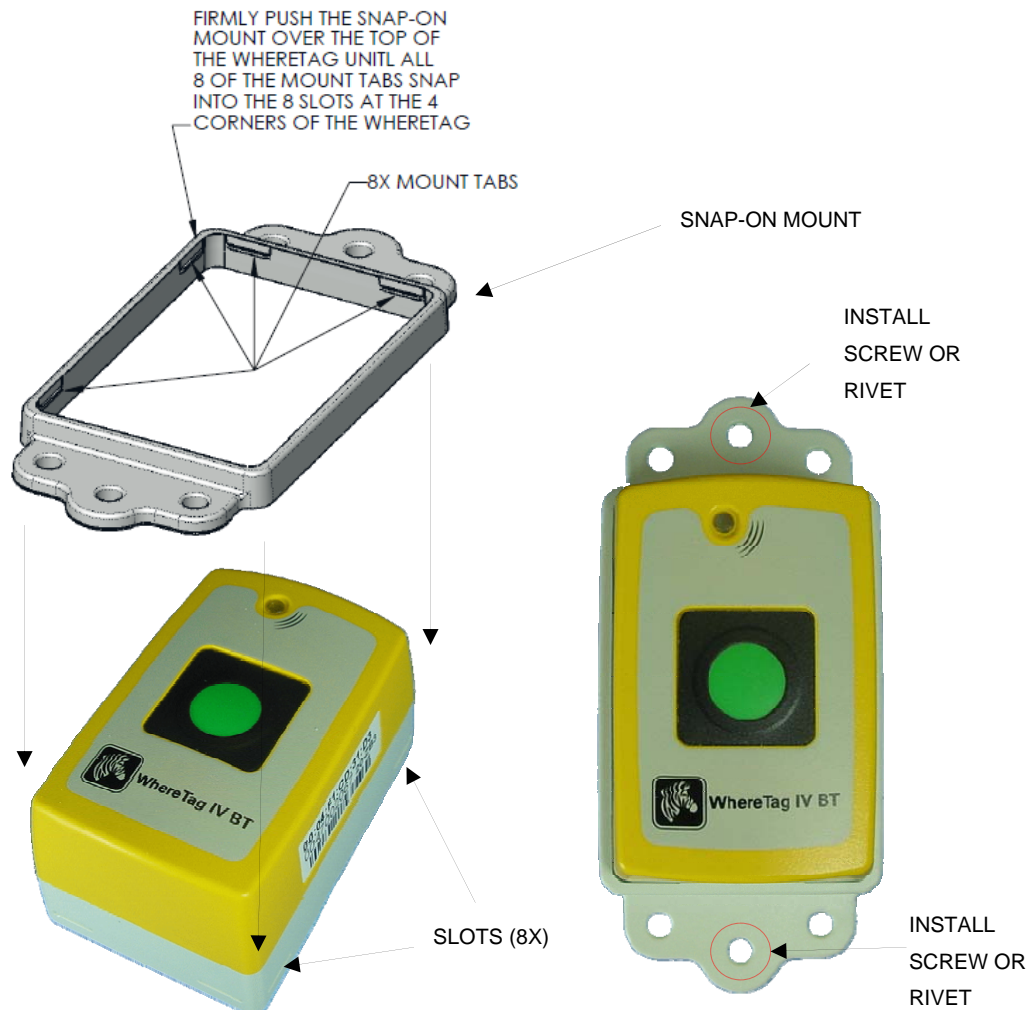


Figure 4: Snap-on mount

1. Firmly push the snap-on mount over the top of the WhereTag IV BT until all 8 of the mount tabs snap into the 8 slots at the 4 corners of the WhereTag IV BT.
2. Attach the snap-on mount to the desired location using two screws or rivets (see figure 4).

3.6 Mounting WhereTag IV BT with Vehicle Rearview Mirror Mount

The WhereTag IV BT may be installed using a vehicle rearview mirror mount. This mount is not included with the WhereTag IV BT. Contact your ZTC Account Manager for information, reference part number TM-206-02.



Figure 5: Vehicle Rearview Mirror Mount

1. Firmly push the vehicle rearview mirror mount over the top of the WhereTag IV BT until all 8 of the mount tabs snap into the 8 slots at the 4 corners of the WhereTag IV BT.
2. Attach the mount to the rearview mirror of the vehicle.

4 OPERATION OF THE WHERETAG IV BT

The WhereTag IV BT is a wireless messaging device that is capable of transmitting simple messages to the ZTC Infrastructure. These messages can range from a call for parts for line side material replenishment to a request for supervisor assistance. There are three modes of operation:

- Button or CALL Tag Mode
- Messaging or SWITCH Tag Mode
- PWR OFF Mode

The WhereTag IV BT is shipped in the “PWR OFF” mode. To turn the WhereTag IV BT on when it is in the OFF mode, press the button once and the tag will resume operation in either the CALL mode or the SWITCH mode depending on the mode it was in when the OFF mode was selected.

4.1 Call Mode

In CALL mode the WhereTag IV BT can be used for parts call and other operations that do not require an indication as to whether the request was fulfilled. In this mode, the operator presses the button to send the request message, and the WhereTag IV BT will transmit blinks with “Switch ID 0” which has status 2. The LED on the WhereTag IV BT will flash amber for 10 seconds. The color, interval, and duration of the LED flashing can be reconfigured with the WhereWand if desired by the user.

4.2 Switch Mode

In switch mode, the LED toggles between red flashes (OFF) and green flashes (ON). The normal starting state is OFF. If the operator presses the button, then the Tag will send a message signaling the change in state and the LED will flash green. The resulting transmission blink includes “Switch ID 0” which has status 2. The next button

press will cause a new message to be transmitted with “Switch ID 1” which has status 4. This signals the change of state, and the LED will change back to flashing red. The interval and duration of the LED flashing can be reconfigured with the WhereWand if desired by the user. In the SWITCH mode the WhereTag IV BT will send multiple transmissions at increasing intervals after each button press. The first set of blinks occurs as soon as the button is pressed, then repeats at 1 minute after the button press. The message is then repeated at the following periods after the initial button press: 5 minutes, 10 minutes, 15 minutes, and then 30 minutes.. After completing that sequences, the WhereTag IV BT then continue sending a set of blinks every 60 minutes.

4.3 Turning WhereTag IV BT Off

The WhereTag IV BT can be switched to the Power OFF mode from either CALL mode or SWITCH mode. In order to do this, press and hold the button until the LED flashes rapidly and then release the button. The WhereTag IV BT is now OFF and all transmissions are disabled. The magnetic receiver in the tag is not disabled.

5 SPECIFICATIONS: WHERE TAG IV BT DEVICE

Specifications are subject to change without notice.

Mechanical

| | |
|------------------------|--|
| Dimensions | 1.33 in x 2.6 in x 1.7 in (3.4 cm x 6.6 cm x 4.35 cm) |
| Weight | 3.1 oz (88 g) |
| Color | High Visibility Yellow and Gray |
| Attachments | Poly-lock, Adhesive Tape, Snap-on Mount, Vehicle Rearview Mirror Mount |
| Button Characteristics | A green, 0.5-inch diameter membrane switch |

Durability

| | |
|-------------|---|
| Drop | 4 feet (1.2 meter) to concrete |
| Temperature | -22°F to +158°F, (-30° to +70°C) |
| Humidity | 0% to 100% condensing |
| IP Rating | IP 54 (Unit to withstand windblown dust and rain) |
| Button | Functional after 1 million cycles |
| ESD | Functional per IEC-1000-4-2 Level 4 |

Battery

| | |
|--------------|--|
| Battery Type | Custom Battery Pack with two "AA" Lithium Thionyl Chloride Cells |
| Battery Life | Typical 7 years (batteries are customer replaceable) |

LED Characteristics

| | |
|-------|-----------------------|
| Color | Amber, Red, and Green |
|-------|-----------------------|

ISO 24730 System Operation

| | |
|-------------------|--|
| Keep Alive Blinks | WhereTag IV BT autonomously sends one DSSS blink at user's desired blink rate to allow system to verify that the tag is present and to monitor the tag's battery health. The interval can be set from 5 seconds to 5 days with a WhereWand. (Factory preset: 1 hour) |
| Switch Blinks | The WhereTag IV BT sends a series blinks in response to a button press. The number of blinks and the interval are user selectable. The status bits define the desired system action. (Factory preset: 3 blinks at 5 seconds). |
| Status Bit 0 | xxx0 indicates battery is OK xxx1 indicates low battery. The batteries should be replaced. |
| Status Bit 1 | xx0x indicates keep alive blink xx1x indicates CALL blinks in CALL mode indicate ON blinks in SWITCH mode |
| Status Bit 2 | x0xx indicates keep alive blink x1xx indicates OFF blinks in SWITCH mode |

CCX System Operation

| | |
|--------------------------|--|
| Beacon Blinks | WhereTag IV BT sends one CCX blink at user's desired blink rate to allow system to verify tag is present and to monitor battery health. The interval can be set from 5 seconds to 5 days with a WhereWand. (Factory preset: 1 hour) |
| Switch Blinks | The WhereTag IV BT sends a series of CCX blinks containing the Telemetry Group - Status Sub-group in response to a button press. The number of blinks, and the interval are user selectable. The group data content define the desired system action. (Factory preset: 3 blinks at 5 seconds). |
| Telemetry Group - Status | The telemetry – status group data content is 16-bit Unicode. '2' indicates CALL blinks in CALL mode indicate ON blinks in SWITCH mode '4' indicates OFF blinks in SWITCH mode |



Configurable Parameters

| | |
|--------------------------------|--|
| Mode | Call or SWITCH |
| Protocol | ISO 24730, CCX, or Dual (both ISO and CCX modes). |
| LED Flashing Rate and Duration | User defined: Flashing Interval from 1-30 seconds, Duration from 1 to 900 seconds. |