Zebra Enterprise Solutions

WhereCall IV User's Guide

WhereCall IV Part Number TFF-2220-00AA

WhereCall IV PLC Part Number TFF-2221-00AA

User Guide Special Notices

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.

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

FCC Requirements

Zebra Enterprise Solutions is a division of Zebra Technologies Corporation. The following regulatory agency information is for Model TFF-2220 devices, which includes part numbers TFF-2220-00AA and TFF-2221-00AA.

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
FCC ID: I28TFF-2000-00AA
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.
Radio Type Approval Number: 3798B-TFF2000

RF Notice

Any changes or modifications to Zebra Enterprise Solutions (ZES) equipment not expressly approved by ZES could void the user's authority to operate the equipment.

Document Revision History

Revision	Change	Change Description	Date	Author
A		Initial Release	2/3/09	DCB
B	C01769	Update mounting bracket photos and change WhereNet to ZES	6/10/09	DCB

Table of Contents

List of Figures

Page

1 OVERVIEW

The Zebra Enterprise Solutions (ZES) WhereCall System allows users in manufacturing and assembly operations to request service or specific parts without leaving their workstations. Specific parts or service requests may be assigned to individual WhereCall IV 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 WhereCall IV device located in the workstation. By pressing the green button on the WhereCall IV device, a radio signal is sent by the WhereCall System to the computer system in the supply area, indicating which workstation requires the specified part or service. The display will first blink CALL, and then alternate between CALL and the time since the button press. This message can be customized to site preferences.

The WhereCall IV also operates in an optional SWITCH mode. This mode can be used to indicate a status; the display will blink either -- ON -- or - OFF -- to indicate a functional status. The status will toggle each time the button is pressed. These messages can also be customized to site preferences. Each status can display a multi-word message on up to two different screen buffers.

To insure that the WhereCall 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 WhereCall IV 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 WhereCall IV may be mounted in a work area with removable fasteners, double-sided foam tape or with mounting brackets and screws (Refer to Section 2.1, Installation and Mounting).

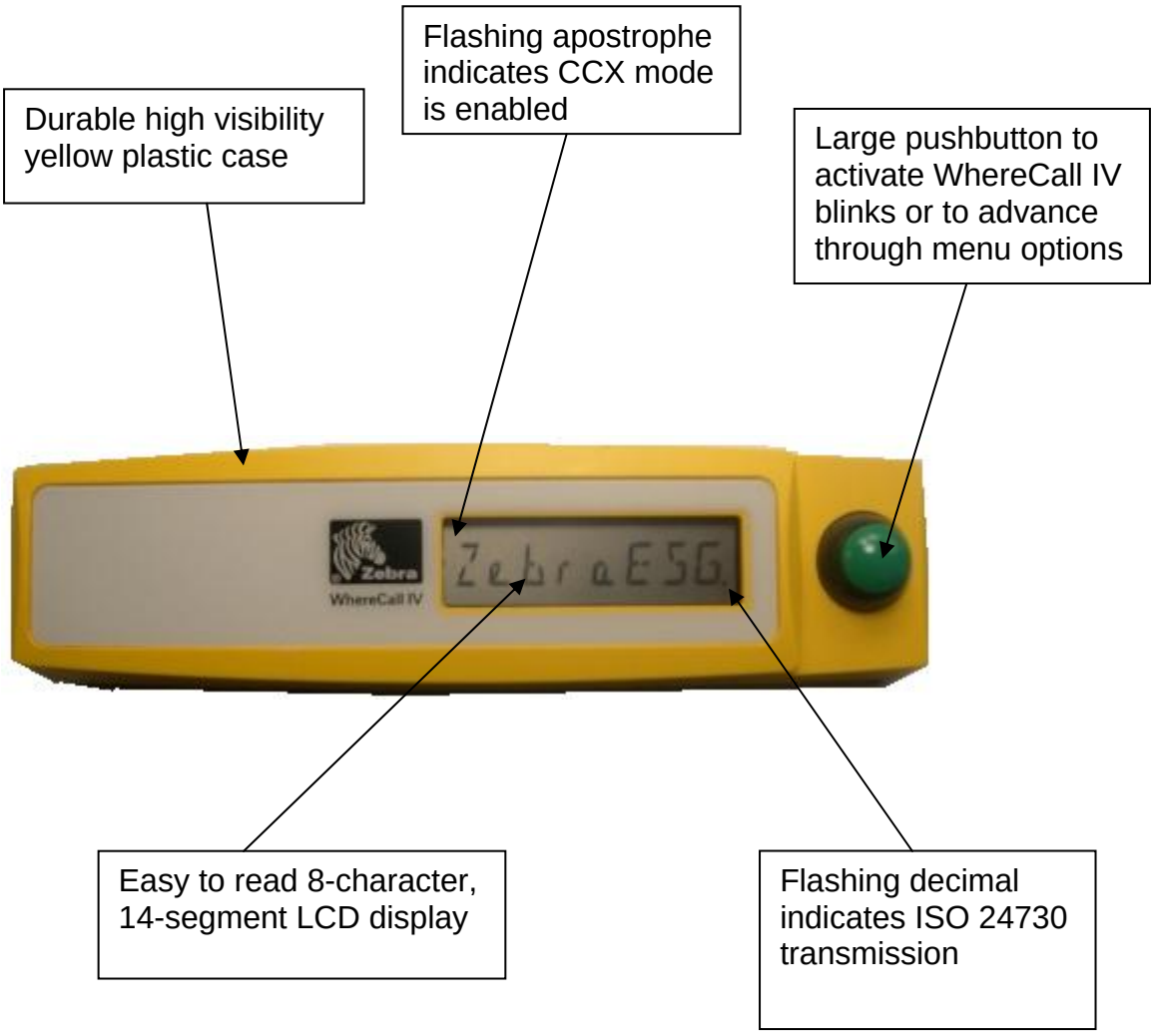


Figure 1: The WhereCall IV

2 COMPONENTS

2.1 ISO 24730 System

The **WhereCall ISO 24730 System** consists of four major components: the WhereCall IV device; a location antenna; a location processor and a ZES computer server. This document details only the WhereCall IV device.

The **WhereCall IV** is a palm-sized device approximately 6.3 inches by 1.7 inches, 1.2 inch thick, in a yellow case. A green colored actuator button is on the right side of the device. A liquid crystal display (LCD) screen is located next to the button, near the center of the device.

The ZES **Location Sensor** (LOS) or Locating Access Point (LAP) receives radio signals from the WhereCall IV device when the work station user sends a call requesting parts by pressing the green button on the WhereCall IV. These signals are transferred from the LOS/LAP by Ethernet or wireless backhaul to the VSS server. A message is generated by the server and sent to the user's computer system indicating that a part is needed at workstation initiating the replenishment request..

If necessary, a **WhereWand** hand-held programming device allows the ZES technician to configure the **WhereCall IV** device for custom applications. The **WhereWand** is not required for most applications.

2.1 CCX System

The **CCX System** consists of four major components: the WhereCall IV device; CCX access points; a wireless LAN controller and a location processor. This document details only the WhereCall IV device.

The **WhereCall IV** is a palm-sized device approximately 6.3 inches by 1.7 inches, 1.2 inch thick, in a yellow case. A green colored actuator button is on the right side of the device. A liquid crystal display (LCD) screen is located next to the button, near the center of the device.

The **CCX access points** receives radio signals from the WhereCall IV device when the work station user sends a call requesting parts by pressing the green button on the WhereCall IV. These signals are transferred by cable to the wireless LAN controller.

The **wireless LAN controller** converts signals from the antenna(s) and sends them to the **location processor.** The location processor passes the message through a VSS bridge to the VSS server which send an alert to the user's computer system indicating that a part is needed at the location of the WhereCall IV device.

If necessary, the **WhereWand** hand-held communicator allows the ZES technician to configure the **WhereCall IV** device. The WhereWand is not required for most applications.

3 INSTALLATION & MOUNTING

The WhereCall IV may be mounted in a work area with removable fasteners, double-coated foam tape, hanging brackets, or with mounting screws. . The WhereCall IV display is optimized for viewing at an angle perpendicular from the operator or from above. Mounting the WhereCall IV above an operator's eyelevel does not provide maximum contrast for the LCD display.

Each WhereCall IV must be mounted in a location to provide an unobstructed view in at least one direction. To maintain communication with the Location Antennas, do not install the WhereCall IV 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 WhereCall IV, but is available from ZES in precut squares. Contact your ZES account manager for information, reference part number TM-204-00.

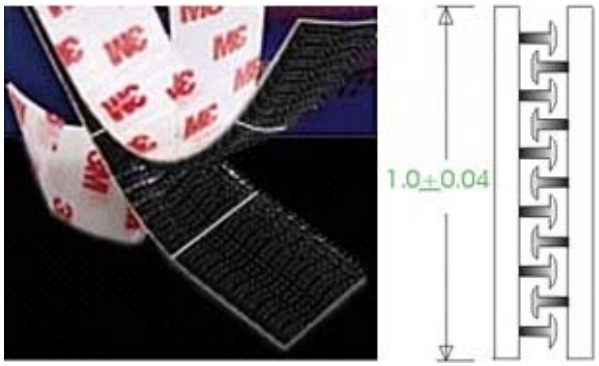


Figure 2: Poly-Lock fastener with adhesive backing

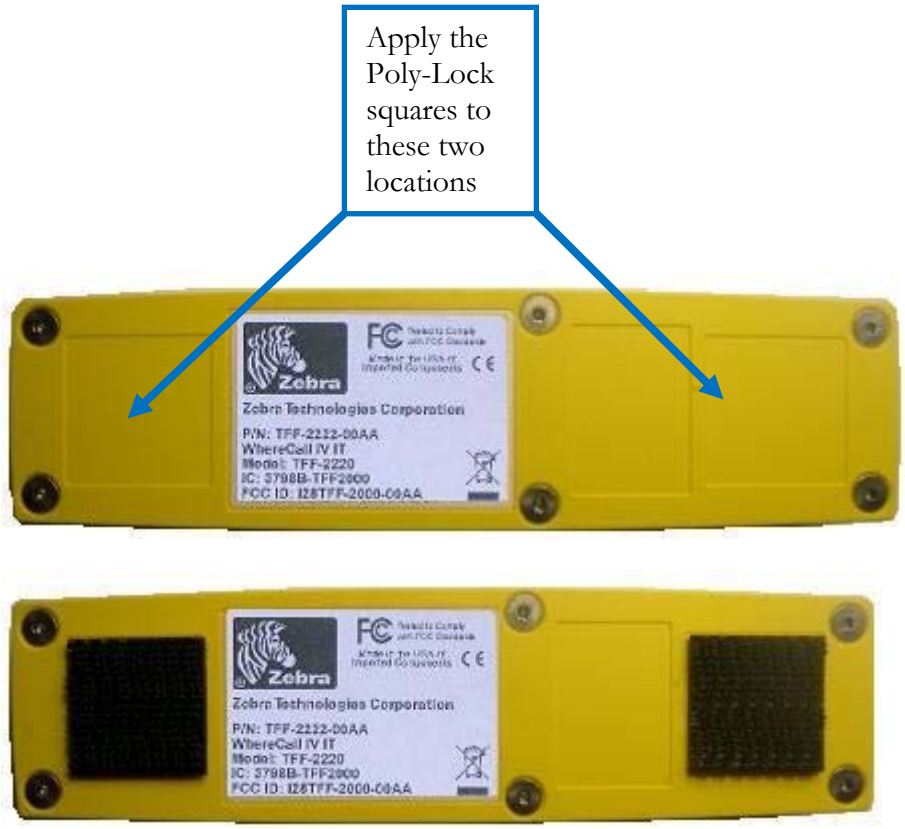


Figure 3: Poly-Lock positions

3.2 Mounting WhereCall IV with Poly-Lock

CAUTION

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 WhereCall IV.
2. Clean the mounting surface and the back cover of the WhereCall IV with isopropyl alcohol.

3. Select two pairs (they are shipped in attached pairs)of Poly-Lock squares, remove the adhesive backing on one side of each pair, and then press them to the tag case, sticky side down as shown in Figure 3.
4. You should now have two pairs of Poly-Lock attached to the back of the WhereCall IV. Remove the adhesive backing from both squares.
5. While holding the WhereCall IV, gently press the unit against the mounting surface to assure that the adhesive on the squares is bonded to the surface.

3.3 WhereTag Foam Tape Squares

WhereTag foam tape, both sides adhesive, provides a secure, semi-permanent mounting method for the WhereCall IV device. Foam tape is not included with the WhereCall IV. Contact your ZES Account Manager for information, reference part number TM-202-00.

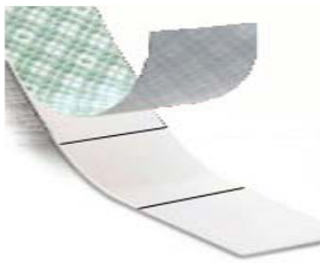


Figure 4: Foam tape squares

CAUTION

The foam tape applies a layer of permanent adhesive film to both surfaces. Care should be taken in the application of foam tape because once applied it is difficult to remove.

Figure 5: Foam tape squares

3.4 Mounting WhereCall IV with Foam Tape Squares

CAUTION

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 WhereCall IV.
2. Clean the mounting surface and the back plate of the WhereCall IV with isopropyl alcohol.
3. Select two foam tape squares, remove the adhesive backing from one side only and apply them to the back cover of the WhereCall IV as shown in Figure 5.

4. Remove the adhesive backing from the exposed surface of the tape squares.
5. While holding the WhereCall IV, aligned to the desired position. Gently press the unit onto the mounting surface.

3.5 Cable Hanging Mounting Bracket

The WhereCall IV may also be installed from an overhead cable for ease of use in a workstation where mounting on flat surfaces is unsafe or inconvenient. Hanging cable brackets are not included with the WhereCall IV but are available from ZES. Contact your ZES Account Manager for information, reference part number TM-241-00.

Figure 6: Cable Hanging Mounting Bracket

Figure 7: Attaching WhereCall IV to Mounting Bracket

3.6 Installing WhereCall IV with Cable Hanging Bracket

1. Using a 5/64 inch hex drive bit, remove 4 screws from the bottom cover as shown in Figure 7.
2. Align the mounting bracket so the 4 screw holes align with the 4 screw holes in the WhereCall IV bottom cover. Be sure the four counter sunk holes in the mounting bracket are visible and not against the WhereCall IV bottom cover. Reinsert the screws through the bracket and into the bottom cover of WhereCall IV, with torque set to 6.0 $\pm$ .6 inch-pounds [0.68 $\pm$ 0.07 Newton-meters]. See figure 8.
3. Hang the mounting bracket in the desired location by threading the cable into the slot on the end of the bracket.

Figure 8: Cable Hanging Bracket Installed

3.7 Screw Mounting Bracket

The WhereCall IV may be installed using screw by utilizing the screw mounting bracket. Screw mounting brackets are not included with the WhereCall IV but are available from ZES. Contact your ZES Account Manager for information, reference part number TM-240-00.

Figure 9: Screw Mounting Bracket

3.8 Installing WhereCall IV with Screw Mounting Bracket

1. Using a 5/64 inch hex drive bit, remove 4 screws from the bottom cover as shown in Figure 7.
2. Align the mounting bracket so the 4 screw holes align with the 4 screw holes in the WhereCall IV bottom cover. Be sure the four counter sunk holes in the mounting bracket are visible and not against the WhereCall IV bottom cover. Reinsert the screws through the bracket and into the bottom cover of WhereCall IV, with torque set to 6.0 ± .6 inch-pounds [0.68 ± 0.07 Newton-meters]. See figure 10.
3. Attach mounting bracket in the desired location using two screws or rivets through the counter sunk holes at the ends of the mounting bracket. The 0.188 inch [4.78 mm] diameter holes are spaced 7.0 inches apart.

Figure 10: Screw Mounting Bracket Installed

4 OPERATION OF THE WHERECALL IV

The WhereCall IV is a wireless messaging device that is capable of transmitting simple messages to the ZES 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
- OFF Mode

The WhereCall IV is shipped in the "OFF" mode. There is also a battery change mode that is used to condition the tag to for installation of replacement batteries.

When the WhereCall IV is on the OFF mode, the display shows PWR OFF. To turn the WhereCall IV 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 WhereCall IV 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 WhereCall IV will transmit blinks with "Switch ID 0" which has status 2. The display on the WhereCall IV will flash CALL for one minute and then start to count up in minutes since the call was made. This lets the operator easily verify how long it has been since they made their request. The display is capable of counting up to 9 days, 23 hours, and 59 minutes shown as 9d23h59m after which it will continue to alternate between CALL and 9d23h59m but the elapsed time will not increment any further.

The displayed CALL can be replaced with any other 8-character custom message. The custom message will blink for one minute after each button push, and then the custom message will alternate with the elapsed time.

4.2 Switch Mode

In switch mode, the display toggles between -- ON -- and -- OFF --. The normal starting state is OFF. If the operator presses the button, then the WhereCall will send a message signaling the change in state and the display will change to -- ON --. 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 display will change back to -- OFF --. In the SWITCH mode the WhereCall IV 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 WhereCall IV then continue sending a set of blinks every 60 minutes.

The displayed -- ON -- and -- OFF -- messages can be replaced to show any one or a pair of 8-character custom messages. If the message is replaced with a pair of custom messages, then the display will not flash, but instead alternate between the pair of custom messages. When the button is pressed, the display will alternate between the other pair of messages

4.3 Turning WhereCall IV Off

The WhereCall IV 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 display shows ******** and then release the button. The display will show the tag firmware version TAG 2109 for a few seconds and then show the PIC Microcontroller firmware PIC 1017 version for a few seconds, the show PWR OFF. Note that the displayed version number may differ than those shown above. The WhereCall IV is now OFF and all transmissions are disabled. The magnetic receiver in the tag is also disabled.

4.4 Switching WhereTag IV Modes

To change modes between CALL mode and Switch mode or visa versa, press and hold the button. After about 5 seconds, the display will show ********. DO NOT release the button while the display shows ********, but continue to keep the button depressed until the display shows:

- CALL ? if the WhereCall IV is currently in SWITCH mode
- SWITCH ? if the WhereCall IV is currently is CALL mode.

When either of these is displayed, release the button , and then press and release the button again within five seconds. This will change the operational mode.

If the WhereCall IV has been changed from CALL mode to SWITCH mode, the tag will send SW ID 1 with status 4 and the display will show - OFF --.

If the WhereCall IV has been changed from SWITCH mode to CALL mode, the tag will send SW ID 0 with status 2 and the display will show CALL.

4.5 Changing System Protocols

To change the WhereCall IV mode between ISO 24730, CCX, and dual mode, the WhereCall IV must be in OFF mode and display PWR OFF. Press and hold the button for several seconds until the display starts to cycle between these options…ISO MODE, CCX MODE, DUALMODE, and CNG BATT.

To switch to ISO 24730 mode, keep the button pressed until the display is showing ISO MODE, then release the button, then click the button again to activate the mode. This mode will disable all CCX blinks and the WhereCall IV will only send ISO 24730 blinks. In ISO 24730 mode, the decimal point in the lower right most corner of the LCD will flash.

To switch to CCX mode, keep the button pressed until the display is showing CCX MODE, then release the button, then click the button again to activate the mode. This mode will disable all ISO 24730 blinks and the WhereCall IV will only send CCX blinks. In CCX mode, the apostrophe in the upper left most corner of the LCD will flash.

To switch to dual protocol mode, keep the button pressed until the display is showing DUALMODE, then release the button, then click the button again to activate the mode. In this mode, the WhereCall IV send both ISO 24730 and CCX blinks. In dual protocol mode, both the decimal in the lower right most corner and the apostrophe in the upper left most corner of the LCD will flash.

If the user has inadvertently released the button at the wrong time and the WhereCall IV is displaying the wrong mode, do not click the button again. The tag will timeout and return to OFF mode and the display will show PWR OFF. The user can now start the changing protocol sequence again.

4.6 WhereCall IV Soft Messages

The WhereCall IV supports soft messaging which allows the user to replace the displayed messages CALL, --—ON -- and/or —OFF -- with custom messages. Setting or changing the soft message will require a WhereWand to enter and program the messages to the WhereCall IV magnetically.

If a custom message is configured in CALL mode, then the custom message will be displayed. , instead of CALL blinking or alternating with elapsed time, There is no change to the air protocol blink content .

In SWITCH mode, each of the two messages can be replaced with a single message or a pair of messages.

If custom messages are configured and the WhereCall IV is in the SWITCH mode ON state, instead of --—ON -- blinking, the display will either blink the custom ON mode single message or alternate between the pair of custom ON mode messages.

If custom messages are configured and the WhereCall IV is in the SWITCH mode OFF state, instead of —OFF -- blinking, the display will blink either the custom OFF mode single message or alternate between the pair of custom OFF mode messages.

4.7 Changing the WhereCall IV Batteries

CAUTION

Caution: Personnel changing batteries must use an ESD wrist strap to prevent damage of the tag circuit board due to static discharge. Follow the manufacturer's instructions for proper use of the static prevention device.

4.7.1 Description

WhereCall IV Tags have a nominal battery life of 5 years. After that nominal battery life, it is possible to replace the batteries to extend the life of the tag itself; however, ZES does not provide personnel or Services for this process.

To avoid damaging the WhereCall IV tags, the proper screwdrivers with the correct torque settings must be used. This procedure must be followed or the WhereCall IV may become non-operational. There is no field recovery method if this event occurs. Batteries should be replaced before they are completely dead.

ZES assumes no responsibility for damage to or failure of the WhereCall Tags resulting from this battery replacement procedure.

4.7.2 Materials

Qty. 2 per tag — 3.6V Lithium battery
(ZES P/N 20057, SAFT P/N LS 14500).
SAFT address - 12 rue Sadi Carnot 93170 BAGNOLET - France
Tel.: +33 (0)1 49 93 19 18 Fax: +33 (0)1 49 93 19 50

NOTE: Use only the exact battery and manufacturer specified above.

4.7.3 Tools

ZES does not provide the required materials and tools for changing batteries with the WhereCall IV Tags. The following tools will be required to change the WhereCall IV batteries.

- One, torque wrench with a 5/64 inch hex drive bit and the torque set to 6.0 ± .6 inch-pounds [0.68 ± 0.07 Newton-meters] for the six screws on the bottom cover of the tag.
- One, "small, pocket size" flat blade screw driver use to remove batteries from the battery holder.
- One, ESD wrist strap or equivalent static protection device.

4.7.4 Procedure

To change the WhereCall IV batteries, the WhereCall IV must be in OFF mode and display PWR OFF. See section 4.3 for instructions on turning the WhereCall IV off.

Step 1: Enter battery change mode as follows

Press and hold the button for several seconds until the display starts to cycle between these options…ISO MODE, CCX MODE, DUALMODE, and CNG BATT. Release the button when the display shows CNG BATT, then click the button again to activate the mode. The WhereCall IV is now in a mode that draws more current in bursts to ensure the circuitry fully discharges when the batteries are removed. This mode will expire in 5 minutes, so the batteries should be replaced within 5 minutes to ensure proper restart of the internal processors.

Step 2: Remove the 6 screws from the bottom cover of the WhereCall IV and remove the bottom cover and sealing gasket.

Step 3: Remove both of the old batteries and dispose of properly.

Step 4: Install two new batteries, being careful to orient the batteries correctly and not to install either battery backwards. Refer to figure 11 for proper battery orientation.

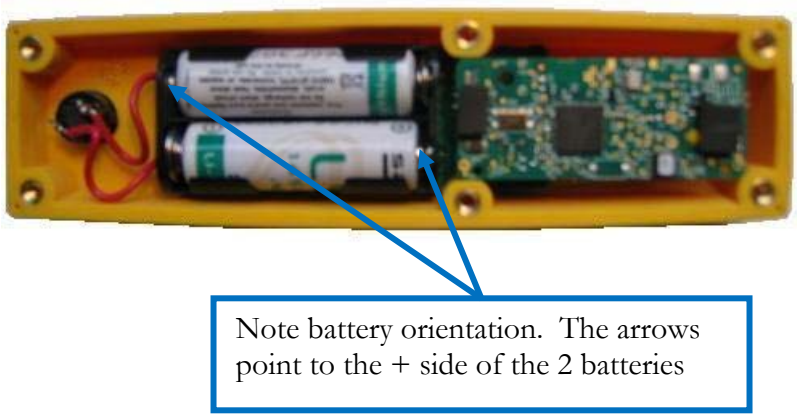


Figure 11: Battery Replacement

CAUTION

Caution: Inserting a battery with the wrong orientation may damage the tag. ZES assumes no responsibility for damage to or failure of the WhereCall Tags resulting from this battery replacement procedure.

Step 5: Reattach the sealing gasket and the bottom cover with the 6 screws, and torque screws to 6.0 ± .6 inch-pounds [0.68 ± 0.07 Newton-meters].

5 WHERECALL IV LCD DISPLAY MESSAGES

Display Message	Display Meaning	Comments	Action required
"CALL " (flashing) CustCall (flashing)	CALL mode button blinks are being transmitted.	This mode will continue for 60 seconds following a button press.	None
"CALL " 10h 42m (alternating) CustCall 10h 42m (alternating)	This display follows the Call" display and indicates the elapsed time from the last button press.	The time advances from 1m until it reaches 9d23h59m then holds until the button is pressed again.	None
--"ON -- (flashing) Cust ON1 (flashing) Cust ON1 Cust ON2 (alternating)	SWITCH mode where the tag will transmit Switch ID 0 with tag status 2.	In SWITCH mode, each button press will toggle between -- ON -- and - OFF --.	None
- "OFF -- (flashing) CustOFF1 (flashing) CustOFF1 CustOFF2 (alternating)	SWITCH mode where the tag will transmit Switch ID 0 with tag status 4.	In SWITCH mode, each button press will toggle between -- ON -- and - OFF --.	None
********	Indicates that the user has held the button for several seconds and the unit will turn off when released	After the button is release, the unit will display its firmware versions before turning off.	Release the button to turn the WhereCall IV off.
PWR OFF	Indicates that the WhereCall IV is in PWR OFF mode	Pressing the button will turn the unit on again into the mode (CALL or SWITCH) that the unit was in prior to being turned off.	None

Display Message	Display Meaning	Comments	Action required
CALL ?	Indicates that the user has held the button for several seconds and can now change mode from SWITCH mode to CALL mode if desired.	To change modes release the button and then press the button again within 5 seconds. Pressing the button again will initiate CALL mode and issue Call blinks. Releasing the button without pressing it again will cause the WhereCall IV to enter OFF mode.	Release the button, then press the button again to initiate "CALL" operation.
SWITCH ?	Indicates that the user has held the button for several seconds and can now change mode from CALL mode to SWITCH mode if desired.	To change modes release the button and then press the button again within 5 seconds. Pressing the button again will initiate SWITCH mode and issue Switch ID 0 blinks. Releasing the button without pressing it again will cause the WhereCall IV to enter OFF mode.	Release the button, then press the button again to initiate "SWITCH" operation.
ISO MODE CCX MODE DUALMODE CNG BATT (cycling)	ISO MODE indicates the user has pressed and held the button for several seconds while in PWR OFF state and can now put the tag into ISO 24730 transmit mode	The display will cycle between the various protocol modes and the change battery mode. The user must release the button when the 24730 mode is shown then click the button again to activate the mode.	Release the button, then press the button again to turn the WhereCall IV on in ISO 24730 mode.
CCX MODE DUALMODE CNG BATT ISO MODE (cycling)	CCX MODE indicates the user has pressed and held the button for several seconds while in PWR OFF state and can now put the tag into an unsupported mode	The display will cycle between the various protocol modes and the change battery mode. The user must release the button when the desire mode is shown then click the button again to activate the mode.	Release the button, then wait until the WhereCall IV returns to POWER OFF mode

Display Message	Display Meaning	Comments	Action required
DUALMODE CNG BATT ISO MODE CCX MODE (cycling)	DUALMODE indicates the user has pressed and held the button for several seconds while in PWR OFF state and can now put the tag into an unsupported mode	The display will cycle between the various protocol modes and the change battery mode. The user must release the button when the desire mode is shown then click the button again to activate the mode.	Release the button, then wait until the WhereCall IV returns to POWER OFF mode.
CNG BATT ISO MODE CCX MODE DUALMODE (cycling)	CNG BATT indicates the user has pressed and held the button for several seconds while in PWR OFF state and can now put the tag into battery change mode	The display will cycle between the various protocol modes and the change battery mode. The user must release the button when CNG BATT is shown then click the button again to activate the mode.	Release the button, then press the button again to put the WhereCall IV into battery change mode.
CHANGE BATTERY (alternating)	Indicates that the WhereCall IV is in battery change mode.	The user should remove the bottom cover and replace the batteries within 5 minutes of starting the mode. To exit the mode, click the button again.	Replace batteries or click the button to exit the mode.
LOW BATT (alternating)	Indicates that the WhereCall IV has detected a low battery. The user should enter battery change mode and change the batteries.	This message will alternate or cycle with the existing messages in either CALL or SWITCH mode.	Enter battery change mode and replace the batteries.

6 SPECIFICATIONS: WHERECALL IV DEVICE

Specifications are subject to change without notice.

Mechanical

Dimensions	6.45 x 1.74 x 1.27 inches [163.8 x 44.2 x 32.3 mm] nominal
Weight	6.3 ounces [180 grams] nominal
Color	High Visibility Yellow and Light Gray
Attachments	Mounting Brackets, Poly-Lock, or Foam Tape
Form Factor	Wall Mounted-Rugged Aesthetics

Durability

Drop	4 feet [1.22 meters] to concrete
Temperature	+0°F to +130°F, [-20° to +55°C] Operating -10°F to +140°F, [-25° to +65°C] Storage
Humidity	0% to 95% condensing
Dust and Water Resistant	IP54 per IEC 60529 (dust and water spray tight)
Button	Functional for 1 million cycles
ESD	Functional per IEC-1000-4-2 Level 4 Operation not disrupted up to 8kV Unit not permanently damaged up to 15kV

Battery

Battery Type	Two "AA" Lithium Thionyl Chloride Cells
Battery Life	Typical 5 years (Batteries are customer replaceable)

Connector (used with WhereCall IV PLC)

Mating Connector	Waterproof, 4 pin, mates with Turck RS-4.41T-X (where X is the cable length) or equivalent

Display Characteristics

Number of Characers	8
Format	14-Segment with apostrophe and decimal for each character
Function	Check previous page
Digit Size	.28 inch [7 mm] high
Back Lit	No

Status Word

Length	4 bits
Battery low bit	Bit 0 (---l) 0 = battery is OK l = low battery
CALL mode Button Push or SWITCH mode = "ON" state	Bit 1 (--1-) 0 = blink is not a switch blink, but a keep alive blink 1 = blink is CALL blink or SWITCH = ON blink
SWITCH mode = "OFF" state	Bit 2 (-1--) 0 = blink is not a switch blink, but a keep alive blink 1 = blink is SWITCH = OFF blink

7 CONFIGURABLE PARAMETERS

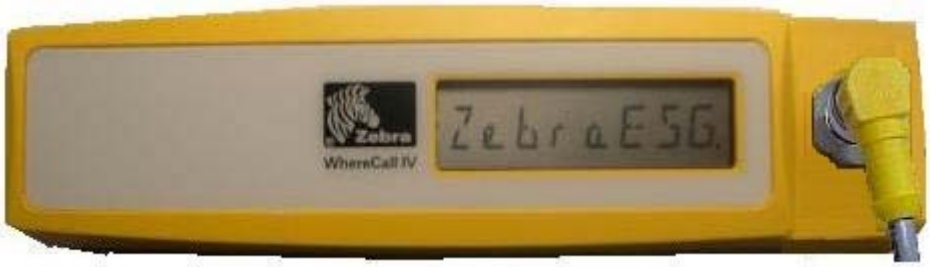
The WhereCall IV is configured with a default configuration suitable for most applications during the manufacturing process. If desired, the WhereCall IV can be reconfigured using a WhereWand. The following table identifies the configurable parameters. Valid ranges for each parameter are determined by the WhereWand.

Configurable ISO 24730 Parameters

Parameter Group	Parameter	Factory Defaults
Keep Alive Blinks	Interval	1 hour
	Alternate Interval	OFF
	Alternate Duration	OFF
	Sub-blinks	4
Long Message Blinks	Interval	OFF
	Alternate Interval	OFF
	Alternate Duration	OFF
	Message Mask	0001 (only message 1 enabled)
	Sub-blinks	4
WherePort Blinks	Number of Blinks	0 (no blinks)
	Interval	10 seconds
	Retrigger Time	10 seconds
	Retrigger Mode	sL
	Sub-blinks	4
Switch Blinks	Number of Blinks	3
	Interval	5 seconds
	Retrigger Time	1 second
	Sub-blinks	8
Misc	RF TX Power	12 dBm

8 WHERECALL IV PLC

WhereCall IV PLC User & Interface Guide



8.1 WhereCall IV PLC FCC Requirements

This device must operate in compliance with Federal Communications Commission (FCC) Rules and Regulations Parts 15. See FCC registration label, located on the bottom of the equipment, for the FCC registration.

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.

This device complies with FCC ID: Approval TBD

This ISM device complies with Canadian ICES-001
Cet appareil ISM est conforme à la norme pendant du Canada.

Radio Type Approval No……Approval TBD

RF Notice

Any changes or modifications to ZES equipment not expressly approved by ZES could void the user's authority to operate the equipment.

8.2 WhereCall IV PLC Overview

This document describes how to mount and interface the WhereCall IV PLC to your equipment via the external industrial connector.

The WhereCall IV PLC is a variation of the standard WhereCall IV. It allows the call tag to be used with a remote switch in external equipment. The external equipment can "press the button" to initiate a call. This enables the WhereCall IV PLC and the user equipment to operate unattended and to send a call message via the ZES system.

For more information regarding the operation and installation of the WhereCall IV PLC please refer to the WhereCall IV User Guide.

In this document the Terms WhereCall IV PLC and TFF-2221 are used interchangeably and will have the same meaning.

8.3 WhereCall IV PLC Installation & Mounting

The WhereCall IV PLC may be mounted in a work area with removable fasteners, double-coated foam tape, hanging brackets.

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

Note

In selecting the mounting location keep in mind that the cable from the equipment to the WhereCall IV PLC must not exceed 3 meters (10 feet).

8.4 Connecting the WhereCall IV PLC

The WhereCall IV PLC can be connected to a remotely mounted switch that is used to initiate a "button blink". This product works very much like the WhereCall IV except that "button" actuation is provided from another device.

8.4.1 WhereCall IV PLC Cable and Connector.

The TFF-2221 is to be connected using a Turck, RS 4.41T-X cord-set. The length of the cable is limited to 3.0M (10 feet). When this cord set is used the connection will be watertight.

This cord-set can be purchased from:

Turck USA
3000 Campus Drive
Minneapolis, MN 55441
1-800-588-8725

WWW.TURCK.COM

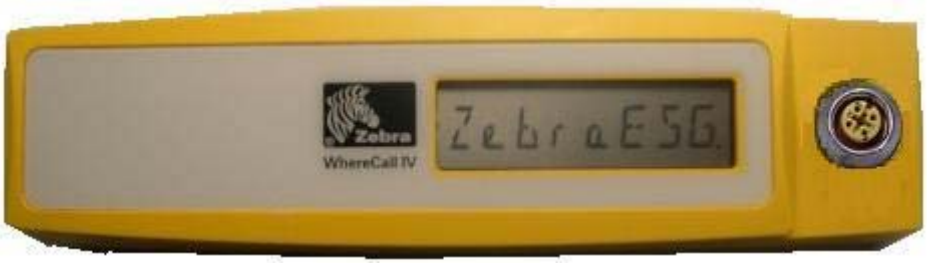
Other Turck locations are listed on the web site.

The cable length between the TFF-2221 and the remote device must not exceed 3.0 Meters (10 feet).

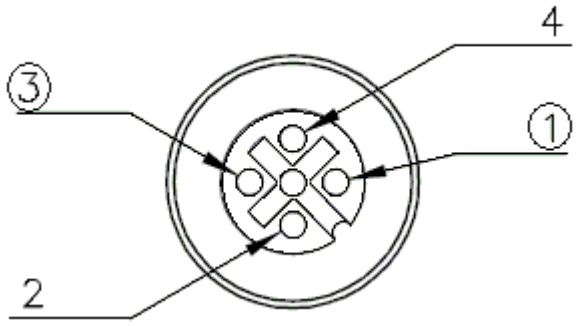
Note

ZES does not supply the cord sets and connectors for the WhereCall IV PLC.

8.4.2 WhereCall IV PLC Electrical Connection.



Pins one (1) and three (3) are to be connected to the remote switch.

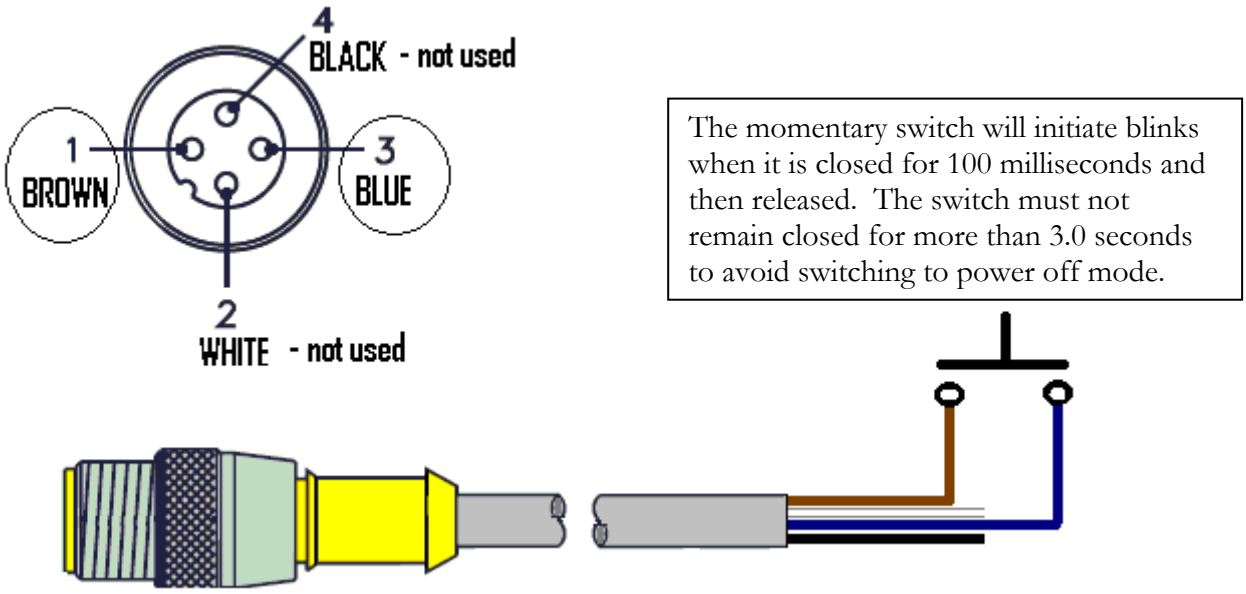


The external switch is connected across pins 1 and 3 as indicated

Figure 12: WhereCall IV PLC Connector

Note **Use the reference detail on the connector to identify the pin numbers. The connector may not be oriented the same on all units.**

WhereTag IV PLC Interface Cable Electrical Block Diagram



Turck RS 4.41T-X
(Connect to WhereCall IV PLC)

CAUTION

The cable should be connected and routed to prevent large voltage spikes and static discharges from being carried into the tag via the switch cable. This may result in false "Button Calls" being generated or in extreme cases the TFF-2221 could be damaged.

Figure 13: WhereCall IV PLC Electrical Interface

8.4.3 WhereCall IV PLC Switch Operation

The switch used to operate the TFF-2221 must be a momentary type. The TFF-2221 will initiate a "Button Blink" sequence when the switch breaks after having been closed for at least 100ms and less than 5 s. It the switch is closed for less than 100 ms the unit will not react. See Table 1 for more information.

Note **If the switch remains closed for three (3 seconds or more the unit will change to the "OFF" mode.**