# UWD-3100 DartWand Software

**User Guide**

**Beta 1.0**


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# Contents

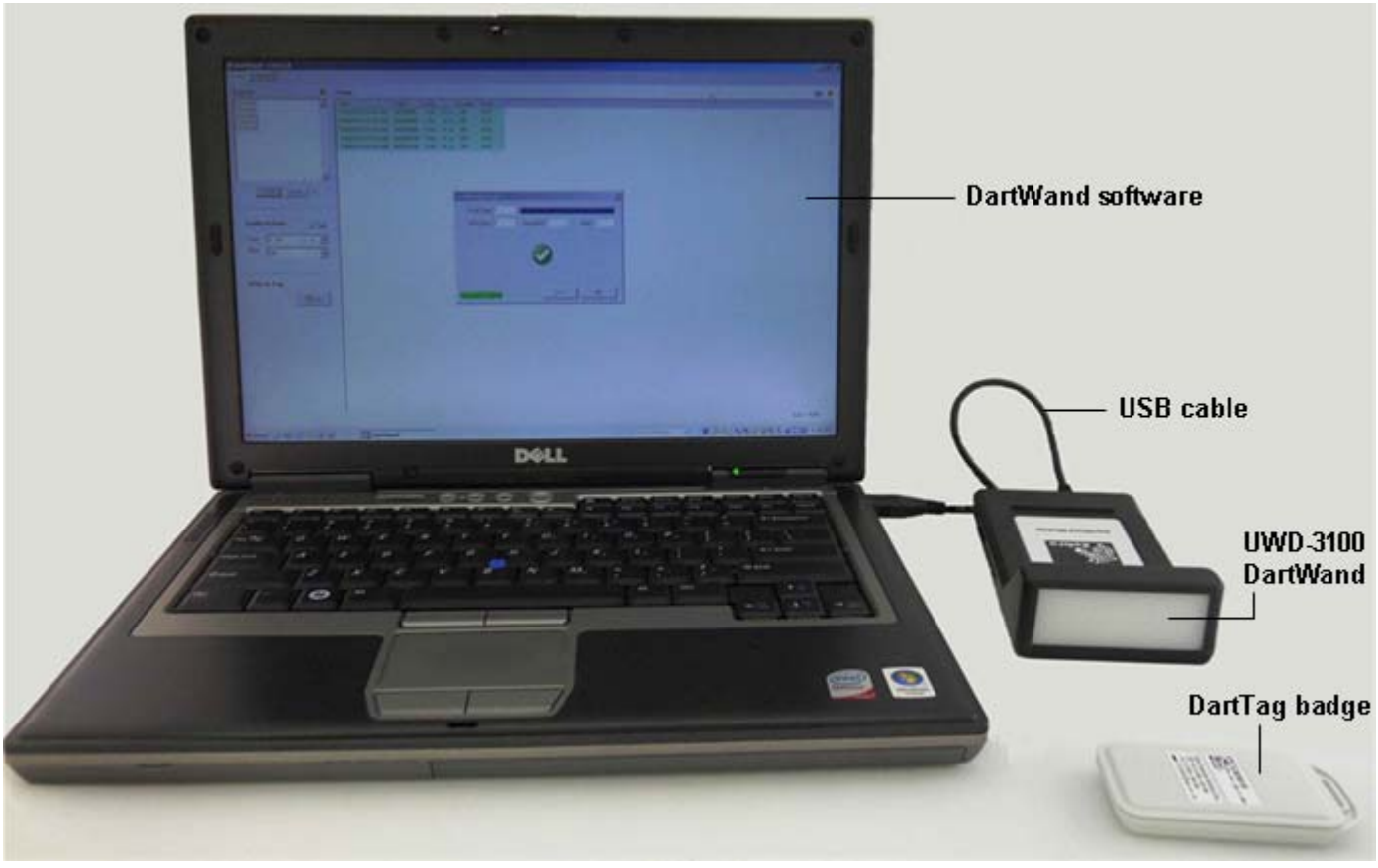
# 1 DartWand basics

Sapphire tags and DartTags are battery powered devices that periodically transmit their unique ID over Ultra Wide Band (UWB) radio frequencies. Sapphire tags support a single transmission rate that is set at the factory, whereas the rate of DartTags is user-configurable.

A typical UWD-3100 DartWand system consists of a computer with DartWand software, DartWand USB cable, and an optional barcode scanner. The DartWand can configure the blink rate of DartTags. In addition, the DartWand can display inventory of nearby Sapphire or DartTags that are transmitting UWB.

The UWD-3100 DartWand hardware contains low frequency (LF) coils for transmitting configuration commands to DartTags. The range of this magnetic communication is 1 or 2 feet. The UWD-3100 DartWand also contains a UWB receiver that has a range from several inches up to 500 feet, depending on the software range setting and on environmental factors.

The DartWand software consists of USB device drivers plus an application for configuring tags and performing UWB inventories. An optional barcode scanner can be used to scan the barcode shipping label on the individual tags, or the barcode label on a box of tags.



# 2 Setting up DartWand

To use DartWand, you need:

- A computer with one available USB 2.0 port and one of the following operating systems: Microsoft® Windows® 2000, XP, 7, or Server 2003
- A minimum screen resolution of 800 x 600
- UWD-3100 DartWand hardware with a USB cable
- DartWand software installation files
- Optionally, a barcode scanner capable of decoding 1D and optionally 2D barcodes. The barcode scanner may require an additional USB 2.0 port.
- One or more DartTags

## In This Section



## Install the DartWand software

Installing the DartWand software is the first step in setting up DartWand.

**To install the DartWand software:**

1. Copy the folder containing the installation files to a temporary folder on your machine.
2. Run the `setup.exe` file.
3. Follow the prompts in the DartWand installer. This will also install USB drivers for communication with DartWand hardware.
4. Click **Finish**.

   The DartWand installer finalizes the installation and places a DartWand icon on your desktop.

# Install the barcode scanner

Installing a barcode scanner is optional.

### To install the barcode scanner:

1 Install the scanner per manufacturer's instructions. Many USB scanners do not require a driver and you can just plug them in to a USB port on your machine.

2 If needed, configure the barcode scanner to append a carriage return (CR suffix) after each scan.

# Connect the DartWand hardware

Before you connect the DartWand hardware, make sure you have installed the DartWand software.

### To connect to the DartWand hardware:

- Connect the DartWand hardware to the computer using the supplied USB cable.


Make sure to use a powered USB port. Do not connect to an unpowered USB hub.

# Start the DartWand software

When you have installed both DartWand software and hardware, you can run the software.

### To start the DartWand software:

- Double-click the DartWand shortcut on your desktop.

# 3 Viewing UWB tag inventory

The **Inventory** tab displays a table view that provides information on all tags transmitting UWB in range of the DartWand.

To receive an accurate list, you need to specify the range of the UWB receiver. The minimum setting (1) only shows tags within a few inches of the reader. The maximum setting (25) shows tags transmitting within maximum range; this can be over 500 feet, depending on the environment. For information on the estimated DartWand UWB range, see ***Appendix I*** (on page 25).

The following table describes the table columns available on the **Inventory** tab.

| Column Name | Description |
|---|---|
| **TagID** | The unique ID for the tag. This column is displayed in Hex, exactly as it appears on the printed tag label. |
| **USB Family** | Indicates if the tag is a Sapphire tag (1st generation UWB tag) or a DartTag |
| **LastSeen** | The time when the software last received this tag. |
| **battery** | The current battery level. This can be any value from 15 to 0, where 0 is the lowest battery level. |
| **Inferred Frequency (Hz)** | The computed tag blink rate, in Hz (blinks per second). This value is computed using approximately a two-second window.<br>This is an optional field. See also ***Working with tables*** (on page 17). |
| **Avg Rate (Hz)** | The computed tag blink rate, in Hz (blinks per second). This value is computed using the total number of blinks received divided by the total time.<br>To clear the tag inventory and restart this calculation, click the Clear button  . |

**To view a list of tags transmitting UWB in range of the DartWand:**

1 In DartWand, on the **Inventory** tab, from the **UWB Range** list, select the desired range according to the sensitivity of the UWB receiver.

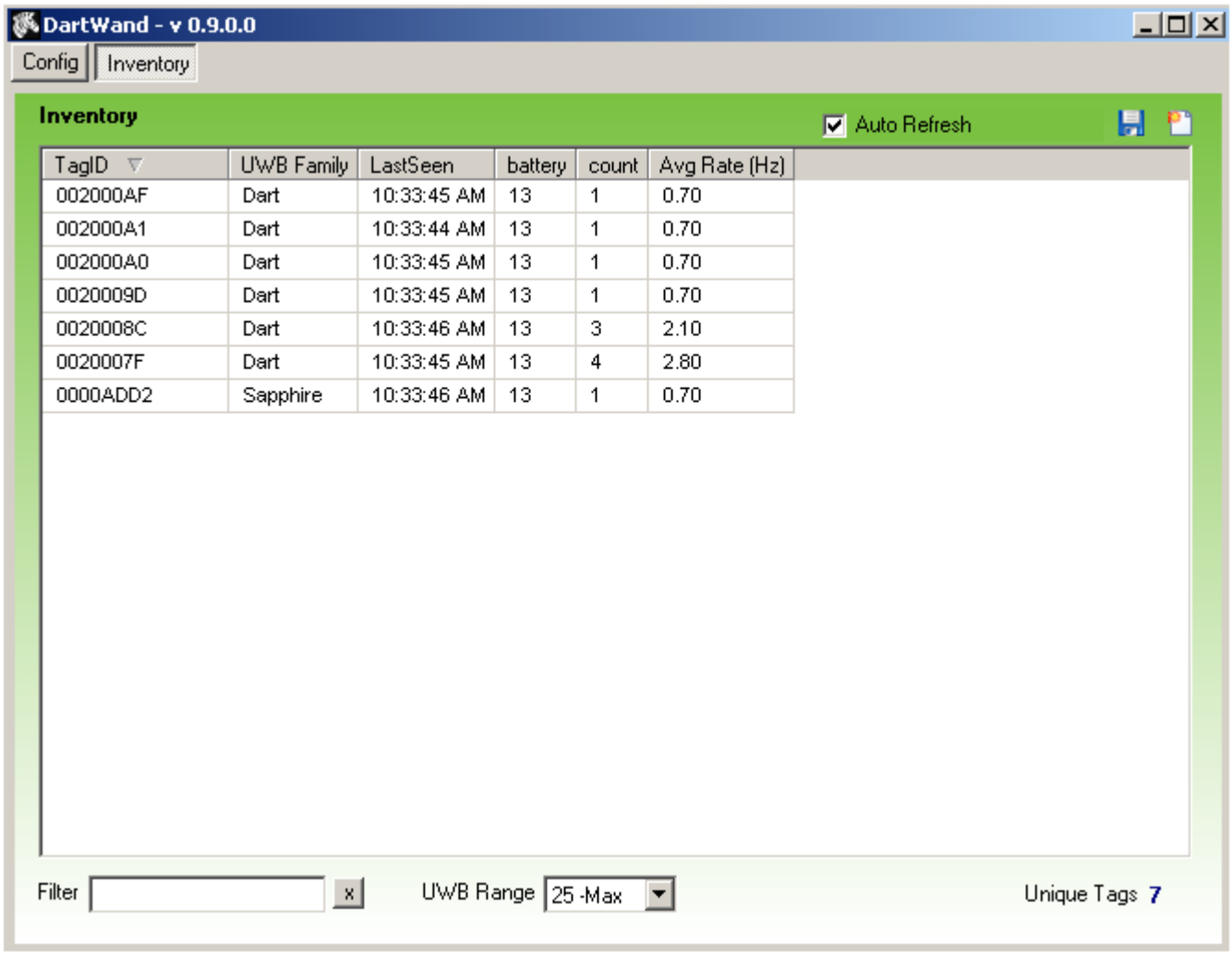
2 In the **Filter** field, type a TagID to display only a subset of the tags in the list. You may type part or all of the TagID.

The table content refreshes as you type.

 To clear the filter and display all tags, click the **X** button next to the **Filter** field.

3 Click  above the table to clear the tag inventory in memory.

4 Select **AutoRefresh** to have the screen update automatically.

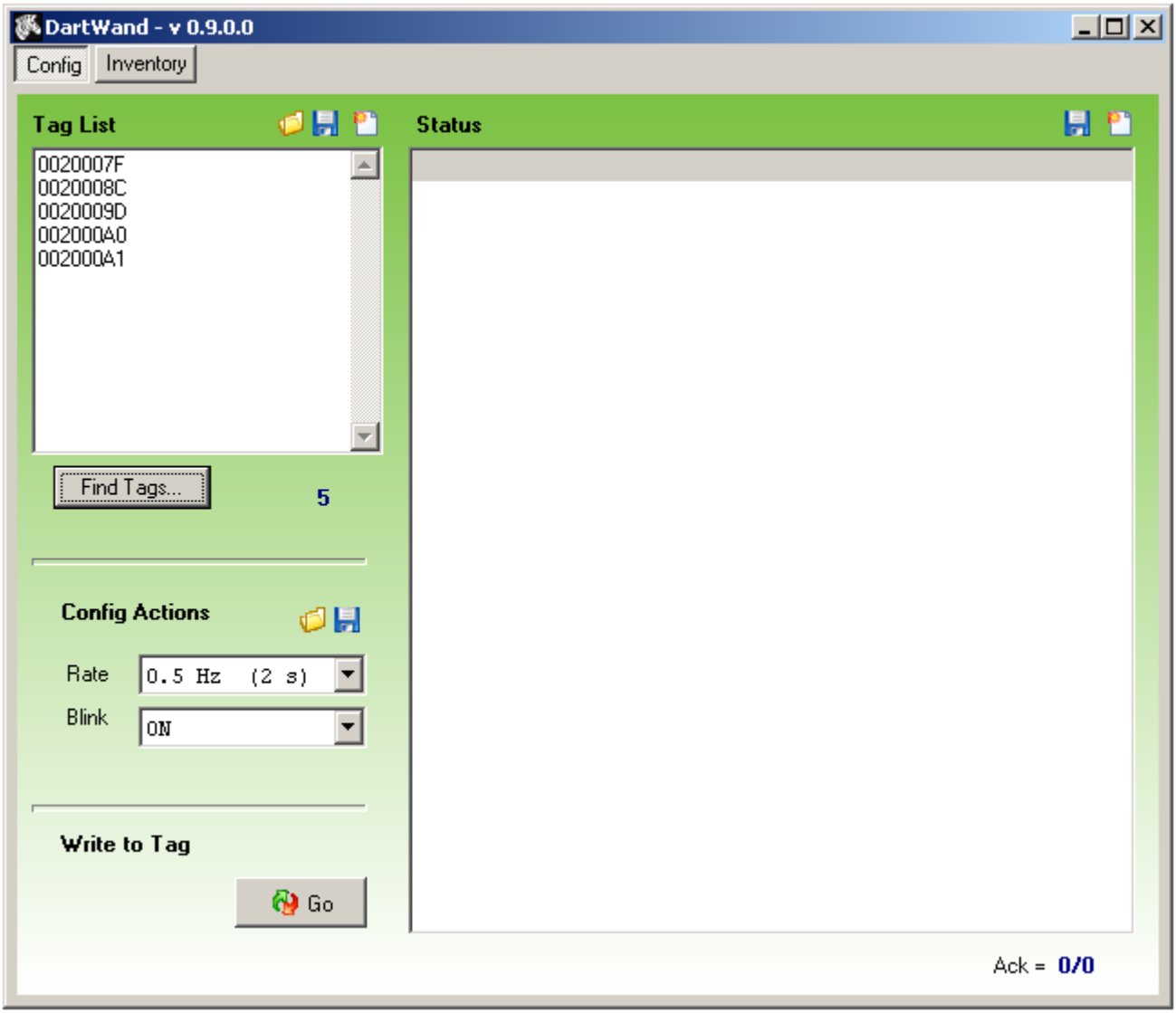


# 4 Configuring tags

When you have ***started the DartWand software*** (on page 8), you are ready to configure the tags.

**To configure a tag:**

1 On the **Config** tab, in the **Tag List** field, enter one tag per line. For different methods of adding tags to the list, see ***Create a tag list*** (on page 13).




2 Under **Config Actions**:

- From the **Rate** list, select a requested UWB blink rate for the tag, or accept the current setting.

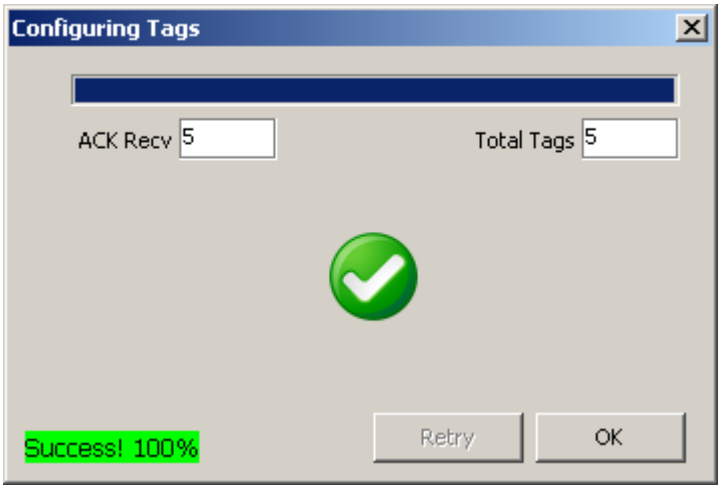
- From the **Blink** list, select **On** or **OFF** to enable or disable UWB blinks, or accept the current setting.

3 Position the tag close to the UWD-3100 DartWand hardware and click **Go**.

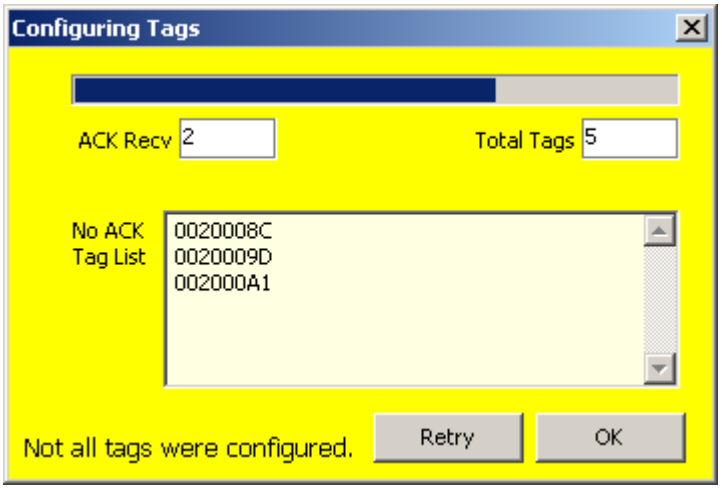
The status report adds a record for each tag. The **Config** tab displays the number of acknowledged tags at the bottom right. The **Configuring Tags** dialog box indicates the configuration progress.

4 In the **Configuring Tags** dialog box, do one of the following:

- If all tags were configured successfully, the dialog box displays a green check mark and the success rate, in percent. In this case, click **OK**.




- If one or more tags failed during the configuration, the dialog box turns yellow and displays a list of the tags that failed. In this case, reposition the tags or the DartWand, and then click **Retry**. When all tags were configured successfully, click **OK**.




# In This Section

# Create a tag list

You can add tags to the tag list by:

- ***Typing*** (on page 13)
- Sending an LF broadcast message by clicking the **Find Tags** button (on page 13)
- Scanning a ***tag barcode*** (on page 13) or ***box barcode*** (on page 13)

## Enter tag IDs manually

You can manually add tags to the tag list by entering the individual tag IDs.

### To enter tagIDs manually:

1 On **Config** tab, click  to clear the tag list.

2 Type one or more tag IDs exactly as shown on the tag label, including any leading zeros, putting each tag on a separate line.

## Use the Find Tag button to add tag IDs

You can use the Find Tag button to add tag IDs to the list. When you click this button, DartWand sends a low frequency (LF) broadcast message that detects which tags are in LF range.

### To add tag IDs by using the Find Tag button:

1 Position the tags close to the UWD-3100 hardware.

2 On the **Config** tab, click **Find Tags**.

The **UWB Tag Scan** dialog box opens. When the DartWand software has detected all tags in range, the **UWB Tag** dialog box closes and the tags appear in the **Tag List** field.

## Scan the tag barcode to add tag IDs

You can configure several tags at once by scanning their barcode.

### To add tagIDs by scanning the tag barcode:

1 Click the **Config** tab.

2 Use the barcode scanner to scan the 2D barcode on the tag.

The tag ID should appear in the **Tag List** field.

3 Repeat Step 2 for up to 100 tags.

## Scan the box barcode to add tag IDs

ZES typically ships boxes that contain 20 tags. Each box comes with a large 2D barcode shipping label that contains a list of every individual tag ID. Scanning this barcode quickly adds all 20 tags to the tag list.

### To add tag IDs by scanning the box barcode:

1 Click the **Config** tab.

2 Use the barcode scanner to scan the large 2D barcode on the box label.

# 5 Working with files

You can use the DartWand software to create ***tag list files*** (on page 15) and ***configuration files*** (on page 15) as a record of received and configured tags.

## In This Section



## Create and load tag list files

You can use the DartWand software to create and load tag list files. Each tag list file contains a list of tag IDs, with one tag ID per line. This is helpful if you have a group of tags you usually configure together. The file ensures consistency because it eliminates the need for scanning each individual tag ID.

**To create a tag list file:**

1 On the **Config** tab, click the Save icon  above the **Tag List** field.

2 In the **Save Tag List** dialog box, type a filename and click **Save**.

 ZES recommends using a descriptive name for Tag List files, such as `Forklift Tag List.txt`.

 Alternatively, you can use a text editor such as Notepad to create a Tag List file. To do so, enter one tag ID per line; then save the file with the extension .tl.

**To load a tag list file:**

1 On the **Config** tab, click the Open icon  above the **Tag List** field.

2 In the **Open** dialog box, browse to and select the file you want to open.

3 Click **Open**.

## Create and load config files

You can use the DartWand software to create new and load previously created config files. Each config file contains a pair of Blink Rate and Blink Enabled configuration settings for tag programing, such as a Blink Rate = 0.5 Hz and Blink = ON. Keeping all setting information in a config file reduces the risk of entering or maintaining incorrect settings.

## Working with files

*Create and load config files*

### To create a config file:

1 On the **Config** tab, in the **Config Actions** area, click the Save icon .

2 In the **Save** dialog box, type a file name and click **Save**.

ZES recommends using a descriptive name for this file, such as `Forklift Tag Config.cfg`.

### To load a config file:

1 On the **Config** tab, in the **Config Actions** area, click the Open icon .

2 In the **Open** dialog box, browse to and select the file you want to open.

3 Click **Open**.

# 6 Working with tables

Both tabs in the DartWand software user interface include a table:

- The **Inventory** table on the **Inventory** tab displays all tags in the UWB receive range.
- The **Status** table on the **Config** tab displays the status of the tags recently programmed.

The following table describes how you can use and configure these tables.

| Task | Instructions |
|---|---|
| Copy the table content to the clipboard | 1. Clear the **Auto Refresh** check box (Inventory tab only).<br>2. Right-click the table and select one of the following:<br>• **Copy Table**: Copies the entire table content to the clipboard<br>• **Copy Selection**: Copies the selected rows to the clipboard<br>• **Copy Cell**: Copies the value of the last cell clicked<br>3. Paste the copied data into any application, such as Microsoft Windows Excel. |
| Save the table content to file | 1. Clear the **Auto Refresh** check box (Inventory tab only).<br>2. Click the Save icon above the table.<br>3. In the Save Status Report dialog box, provide the following information:<br>• **File name**: The name of the report<br>• **Save as type**: The file type, which can be plain text with tab delimiter between values (.txt), rich text (.rtf), HTML, or comma separated values (.csv)<br>4. Click **Save**. |
| Hide a table column | Do one of the following:<br>• Right-click a column header and clear the check mark from the column name.<br>• Press Ctrl and click the header of the column to be hidden. |
| Show a table column | Right-click a column header and select the column to show. |
| Move a table column | Drag a column header to the new position. |
| Resize a table column | 1. Move the pointer over the border between two columns so it changes to .<br>2. Click and drag the border as required. |
| Sort by a table column | Click a column header to sort the table by this table. An arrow appears next to the column header.<br>To reverse the sort order, click the column header again. |

# 7 Troubleshooting

The following table suggests solutions to the most common problems.

| Problem | Suggested Solution |
|---|---|
| The DartWand Installer does not complete or displays an error message. | Make sure the USB driver is installed properly. To manually install the USB driver:<br>1. Open the folder containing the original DartWand software installer.<br>2. Open the Driver subfolder.<br>3. Double-click the CP210x_VCP_Win2K_XP_S2K3.exe file to run the driver installer. |
| The **Connect** dialog box opens, displaying the following message:<br>"The DartWand software is not communicating with the UWB Configurator. Please verify the device is connected via a USB port then click 'Connect'." | 1. Make sure a USB cable properly connects the DartWand hardware to the computer.<br>2. In the **Connect** dialog box, click **Connect**.<br>3. If this does not work, do the following:<br>• Click the Gear icon  .<br>• From the drop-down list, select the mapped COM port.<br>• Click **Connect** again.<br>  If this still does not work, try re-installing the DartWand drivers. |
| Retry errors occur during tag configuration. | On the **Inventory** tab, increase the UWB range. If the UWB range is set too low, DartWand does not detect UWB responses. See also ***Viewing UWB tag inventory*** (on page 9). |

# 8 Regulatory Information

This section provides the following regulatory information:

- ***US Regulatory Information*** (on page 21)
- ***Canada Regulatory Information*** (on page 22)
- ***RF Notice*** (on page 22)
- ***EU Regulatory Information*** (on page 22)

## In This Section



## US Regulatory Information

This device complies with FCC Part 15C.

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.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# Canada Regulatory Information

This device complies with ICES-003, RS-220, and RSS-GEN for indoor use only.

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

# 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.

# EU Regulatory Information

Model WND-3100 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 | | | |

CE2200

Important Notice:

This RF device is intended for indoor and outdoor use in all EU and EFTA countries.

# 9 Specifications

| | |
|---|---|
| Frequency Range: | 6.35 – 6.75 GHz |
| Antenna Gain: | 9.5dBi |

### USB

| | |
|---|---|
| Interface: | USB 2.0 |

### Environmental/Physical

| | |
|---|---|
| Operating Temperature: | -40°C to 70°C (-40°F to 158°F) |
| Environmental: | IP54 |
| Length: | 5.26 in. |
| Width: | 3.24 in. |
| Height: | 1.57 in. |
| Weight: | 0.36 Lbs |
| Power: | 5V @ 0.25A |

# Appendix I: Estimated UWB Range

The following figure shows the estimated DartWand UWB range based on the UWB Range setting.