

# 3M™ Dynatel™ 1420EZ Writer

## Operator's Manual

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Congratulations on your purchase of the 3M™ Dynatel™ Model 1420EZ Writer. The Dynatel™ 1420EZ Writer is designed to write up to ten 3M™ iD Ball Markers, ten iD Near Surface Markers or ten iD Disk Markers in one simple step. Information such as facility data, application data and other details can be read from and written to your PC with this fast and easy to use writing station. Thank you for your purchase of this state of the art iD- marker writing solution.

## Statement of Conformity

“Hereby, 3M Company declares that this iD Marker writing product is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.”

[www.3m.com/market/telecom/access/conformity/](http://www.3m.com/market/telecom/access/conformity/)

## Statement of Intended Use

The 3M™ Dynatel™ 1420EZ Writer is designed and tested for use in writing 3M™ EMS 1400 Series iD Ball Markers, iD Near Surface Markers or iD Disk Markers. These 3M markers are used to identify buried utilities and structures. The products have not been tested or proven safe for other uses. The use of these products may be subject to licensing restrictions.

### WARNING

It is unlawful to operate this unit in any country with a configuration setting that is not specific to that country. In order to prevent the user from operating this unit with a configuration setting that is not specific to the country where it is operated, this unit is equipped with configuration software for installing country specific configurations. Please refer to the Dynatel™ 1420EZ Writer – Country Set-up section in this manual.


# Safety Information

Please read, understand and follow all safety information contained in these instructions prior to the use of the 3M™ Dynatel™ 1420EZ Writer. Retain these instructions for future reference.

## Intended Use

The Dynatel™ 1420EZ Writer includes writer/reader and stand to write unique user information into a maximum of ten (10) 3M™ EMS 1400 Series iD Ball Markers, ten (10) iD Near Surface Markers or ten (10) iD Disk Markers at one time. The system must be installed as specified in the Dynatel™ 1420EZ Writer documentation. It has not been evaluated for other uses or locations.

Explanation of Signal Word Consequences	
<b>⚠ Caution:</b>	Indicates hazardous situation which if not avoided, could result in minor or moderate injury.
<b>Notice:</b>	Indicates a situation which if not avoided, could result in property damage only.

Explanation of Product Safety Label Symbols	
	Do not throw away in normal trash.

### ⚠ Caution

#### To reduce the risks associated with fire and explosion:

- Do not short, excessively heat or incinerate the batteries.

#### To reduce the risks associated with falling/impact due to table break down:

- Do not sit on or over load the table.

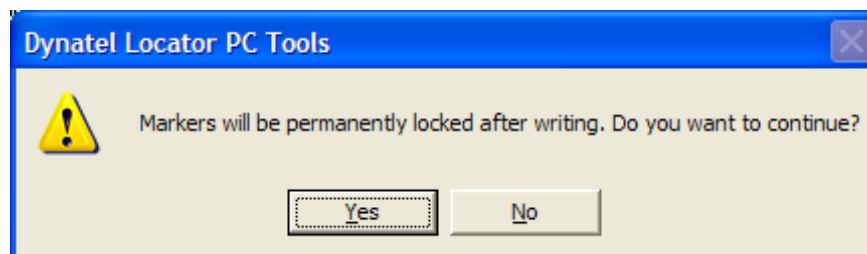
#### To reduce the risks associated with environmental contamination:

- Dispose of batteries and electronic components in accordance with all regulations.

### Notice

#### To reduce the risks associated with property damage:

- If the *Permanently Lock Marker Data* checkbox in the *Setup Options* section is selected the following warning dialog box is displayed:



- If Yes is selected, the iD-Markers will be permanently locked after being written.
- If No is selected, the selection will be removed and the iD-Markers will not be locked after being written.

# Introduction

The Dynatel™ 1420EZ Station consists of the following items;

1. Dynatel™ 1420EZ Stand: Writing stand that can hold up to ten Ball or ten Near Surface or ten Disk iD-Markers in pre-allocated slots.
2. Dynatel™ 1420EZ Writer: iD-Marker reading and writing unit
3. Dynatel™ PCTools: Software program that works with the 1420EZ Writer to provide an easy solution for writing up to ten iD-Markers (of the same type/frequency) at one time utilizing user data templates which are created using a PC, and the Dynatel™ PCTools software program.

## Initial Set-up

### Dynatel™ 1420EZ Stand Assembly

**NOTE:** Dynatel™ 1420EZ Stand Assembly Instructions are also included in the shipping box.

The Dynatel™ 1420EZ Stand consists of six (6) components (identified in illustration below);

- a. One (1) Upper level iD-Marker holding tray
- b. One (1) Lower level iD-Marker holding tray
- c. One (1) Stand stability holding tray
- d. Three (3) Stand legs

#### Assembly of components

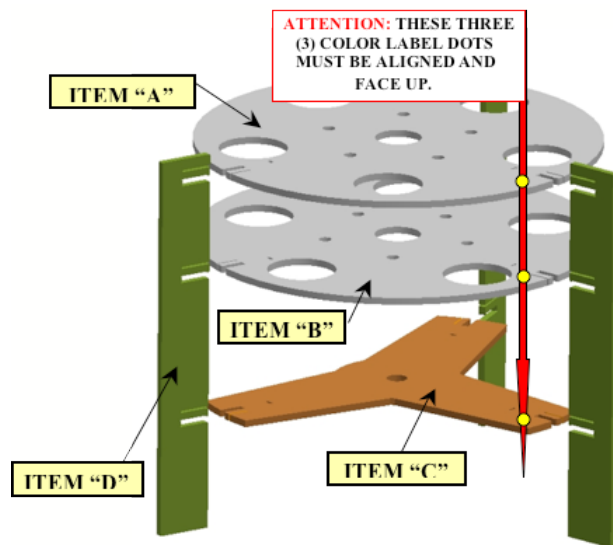
1. Slide “Item C” slot into the lower slot of one (1) “Item D” component.

*Note: the lower slot in the “Item D” component is farther from the end of “Item D” than the upper slot. (See illustration.)*

2. Slide “Item B” slot into the middle slot, and “Item A” slot into the top slot, of the “Item D” component.

*Note: It is imperative that the color dot labels on the top surfaces of “Item C”, “Item B” and “Item A” line up.*

3. Slide the second (2nd) and third (3rd) “Item D” components into the appropriate slots on “Item A”, “Item B” and “Item C”.

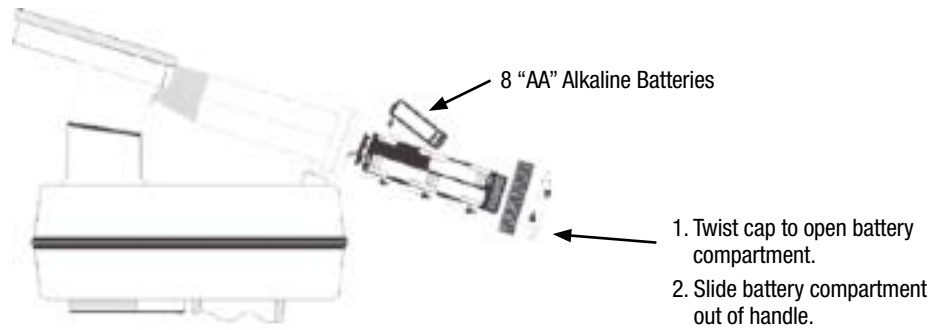


#### **⚠ Caution**

**To reduce the risks associated with falling/impact due to Stand Assembly break down:**

- DO NOT sit on, or over load, the Stand Assembly.

## Dynatel™ 1420EZ Writer - Battery Installation



*Note: The 1420EZ Writer is powered by alkaline batteries. At the end of their service life, dispose of alkaline batteries in accordance to federal, state and local requirements.*

## Dynatel™ 1420EZ Writer - Keypad, Icon and Port Definitions



1. POWER: Turns unit on and off
2. CONTRAST: Adjusts contrast of screen
3. BACKLIGHT: Toggles the backlight low, high and off
4. BATTERY ICON: Indicates battery level

1. SERIAL PORT: RS232 Port to connect 1420EZ Writer unit to a PC

# Dynatel™ 1420EZ Writer Operation

## Dynatel™ PCTools Download and Installation

The Dynatel™ PCTools software must be downloaded and installed on the laptop/desktop PC from the 3M website at [www.3M.com/dynatel](http://www.3M.com/dynatel).

## Dynatel™ 1420EZ Writer – Country Set-up

Following installation of Dynatel™ PCTools, the allowable iD-Marker types/frequencies must be activated, based on country of use. Some countries do not allow all iD-Marker operating frequencies to be used, therefore the country of use must be selected:

- Double click the *Dynatel PC Tool Kit* icon on the desktop.
- Connect the 1420EZ Writer to the PC via the provided RS232 serial cable or the USB-to-Serial Cable.
- Power On the 1420EZ Writer.
- From the Dynatel™ PCTools main screen, select the country in which the unit will be used. If country is not listed, select “All Other Countries”.
  - If the Initial Configuration button is grayed out after selecting the country, the following steps are not applicable and you can skip them.
- Click the *Initial Configuration* button.
- A communication window will appear:
  - Comport: Choose the Comport that the 1420EZ Writer cable is connected to.
  - Baud Rate: Leave this setting at 38400.
  - Click OK.
- Click Download.
- The prompt line will display: *Download Completed Successfully*
- Click *Exit*.

### WARNING

It is unlawful to operate this unit in any country with a configuration setting that is not specific to that country. In order to prevent the user from operating this unit with a configuration setting that is not specific to the country where it is operated, this unit is equipped with configuration software for installing country specific configurations.

## Creating iD-Marker Templates using Dynatel™ PCTools

A data template must be created in Dynatel™ PCTools for writing iD-Markers with the Dynatel™ 1420EZ Writer. The full User Guide for Dynatel™ PCTools is available for download at [www.3M.com/dynatel](http://www.3M.com/dynatel). It is also installed on a PC when “Full” is selected during the Dynatel™ PCTools installation process.

Following are the basic steps for creating and naming a data template;

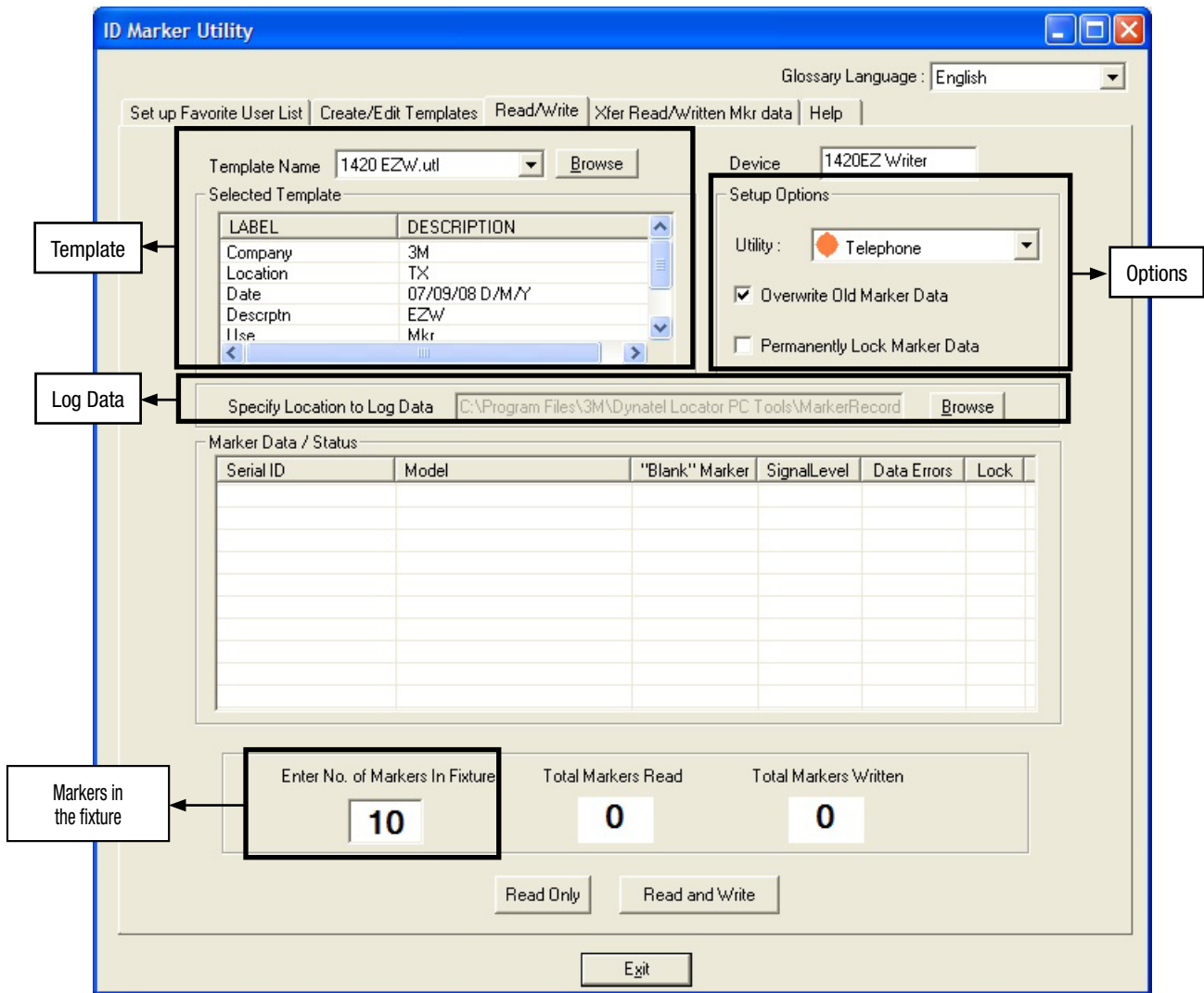
- Double click on the *Dynatel PC Tool Kit* icon on the PC desktop.
- Click on *GPS/iD Marker Utility* button. The *Create/Edit Templates* tab will open.
- Click the *iD Marker Templates* radio button near the top of the tab.
- Type the name of the template in the *Template Name* box, or select a previously saved template from the drop down menu.
- Select the *Labels* on the left side of the template, and the *Descriptions* on the right side of the template, from the drop down boxes in each of the six boxes. Selecting *Labels* and *Descriptions* from the drop down boxes saves available memory space. Not all six *Labels* or *Descriptions* need to be used.
- When the template is complete, click on the *Save As* button.

### **Read/Write Tab Set-up in Dynatel™ PCTools**

- Double click the *Dynatel PC Tool Kit* icon on the desktop.
- Connect the Dynatel™ 1420EZ Writer to the PC via the provided cable.
- Power On the Dynatel™ 1420EZ Writer.
- Click the *GPS/iD Marker Utility* button in Dynatel™ PCTools.
- Click the *Read/Write* tab near the top of the *GPS/iD Marker Utility* screen.
- A *Communication Options* window will appear:
  - Select the Comport that is connected.
  - Leave the Baud Rate at 38400.
- Click *OK*.

The *Read/Write* tab in Dynatel™ PCTools includes everything that is required to read, write and verify the iD-Markers.

Following is a Read/Write tab screen shot that highlights the different setups that can be configured by the user.



To write data to an iD-Marker, the following information must be provided by the user:

- **Template Section:**

- Select a Template Name from the Templates folder by using the Browse button.
- The Selected Template section displays the selected template data. This template data will be written into the iD-Marker when the Read and Write button is clicked.

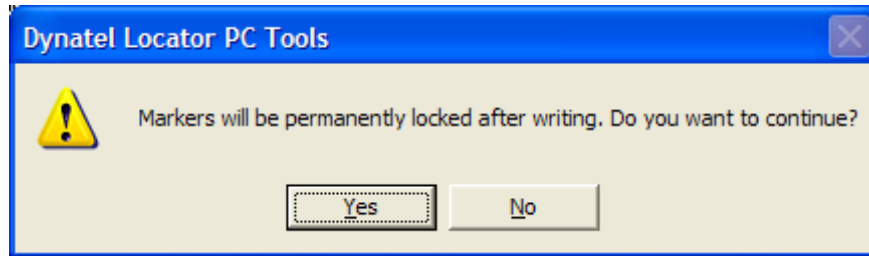
**NOTE:** The template cannot be edited from this tab. Template editing is accomplished through the “Create/Edit Templates” tab in Dynatel™ PCTools.

- **Options Section:** In Setup Options;

- Select the desired marker utility (Telephone, Power, Gas, Water, Waste Water, Communication and General Purpose) from the drop down menu.



- Select Overwrite Old Marker Data, Permanently Lock Marker Data or both. If “Permanently Lock Marker Data” is selected, the following dialog box appears:



**NOTE: Choosing to Permanently Lock Marker Data is irreversible. Once the data is locked it can not be overwritten. Assure that the data that is being written is correct before proceeding.**

- **Log Data Section:**

- After all of the iD-Markers are successfully written and verified, the data is logged into a default file. The user can change the destination folder as follows;
  - Click the *Browse* button.
  - Choose a different destination file. This folder will become the future default destination file.
  - The logged data can be viewed through the *Xfer Read/Written Mkr Data* tab in Dynatel™ PCTools.

- **Markers in the Fixture Section:**

- Enter the number of iD-Markers to be written in the Enter No. of Markers in Fixture box.

## Writing iD-Markers

- Place up to ten iD-Markers (same type and frequency) in the Dynatel™ 1420EZ Stand.
- Insert the Dynatel™ 1420EZ Writer in the center of the Dynatel™ 1420EZ Stand.
- Connect the provided cable between the Dynatel™ 1420EZ Writer and the PC (if not already done in Read/Write Tab Set-Up in Dynatel™ PC Tools Section)
- Power On the Dynatel™ 1420EZ Writer (if not already done in Read/Write Tab Set-Up in Dynatel™ PC Tools Section)

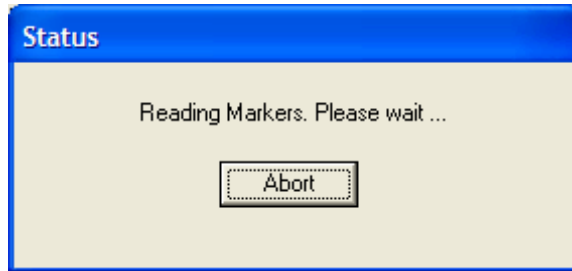
**NOTE: When writing iD-Markers, all of the iD-Markers MUST be the same type and frequency/color/utility (i.e., all yellow Gas Ball iD-Markers or all orange Telephone Near Surface iD-Markers).**

## Read or Read/Write iD-Markers

Once the *Read/Write* tab set-up is completed (previous section), two options are available;

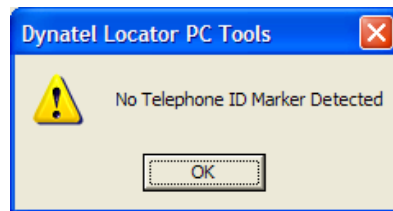
- *Read Only*: This option only reads the iD-Markers and then makes available any information that was previously programmed in the iD-Markers.
- *Read and Write*: This option reads all the iD-Markers and then writes or overwrites previous programmed data with the selected template data.

When the *Read Only* or *Read and Write* button is pressed, the following dialog box appears indicating that the read process is in progress;



The following dialog box appears if;

- No iD-Markers are present in the Dynatel™ 1420EZ Stand.
- The iD-Markers in the Dynatel™ 1420EZ Stand are of a different type and frequency (utility) from the iD-Marker type and frequency (utility) chosen in the *Setup Options* section of the *Read/Write* tab.



**NOTE:** The description “Telephone” will change to reflect the type of ID-Marker designated in the *Options (Utility)* section.

## Read Only Button

When the *Read Only* button is selected, the Dynatel™ 1420EZ Writer reads all of the iD-Markers that are in the Dynatel™ 1420EZ Stand and then sends the results back to Dynatel™ PCTools.



The written iD-Marker data, if any is present, is then displayed as shown in the following screen shot;

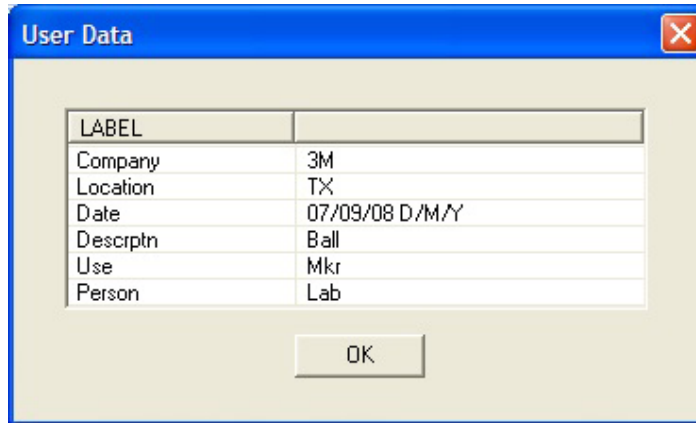
The screenshot displays the 'ID Marker Utility' window. At the top, there are menu options: 'Set up Favorite User List', 'Create/Edit Templates', 'Read/Write', 'Xfer Read/Written Mkr data', and 'Help'. The 'Glossary Language' is set to 'English'. Below this, the 'Template Name' is '1420 EZW.utl' and the 'Device' is '1420EZ Writer'. The 'Selected Template' section shows a table with columns 'LABEL' and 'DESCRIPTION'. The 'Setup Options' section includes 'Utility: Power' (indicated by a red dot), 'Overwrite Old Marker Data' (checked), and 'Permanently Lock Marker Data' (unchecked). The 'Specify Location to Log Data' field is 'C:\Program Files\3M\Dynatel Locator PC Tools\MarkerRecord'. The main 'Marker Data / Status' table is highlighted with a box and labeled 'Marker Data'. Below it, a summary section shows 'Enter No. of Markers In Fixture' as 10, 'Total Markers Read' as 10 (highlighted in green), and 'Total Markers Written' as 0. A 'Read Only' button is highlighted with a box and labeled 'Markers read without errors'. Other buttons include 'Read and Write' and 'Exit'.



Serial ID	Model	"Blank" Marker	SignalLevel	Data Errors	Lock
000-034-0001	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒
000-034-0008	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒
000-034-0013	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒
000-034-0009	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒
000-034-0019	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒
000-034-0022	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒
000-034-0014	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒
000-034-0030	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒
000-034-0016	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒
000-034-0000	1422:XR/iD Power RFID Ball	⚠️ 🔍	✓ 🔍	✓	🔒

The information from each read marker is displayed in the *Marker Data / Status* section. The following information is displayed;

- The **Serial ID** column displays the unique serial number of each iD-Marker.
- The **Model** column displays the iD-Marker part number, utility type (frequency) and the iD-Marker type (i.e., Ball, Near Surface or Disk).

- The “**Blank**” **Marker** column displays;
  -  (check mark) if there is not any previously written data present in the iD-Markers.
  -  (warning symbol with a magnifying glass) if previously written data is present in the iD-Markers.
    - Clicking the magnifying glass opens a new dialog box (shown below) which displays the previously written template data.

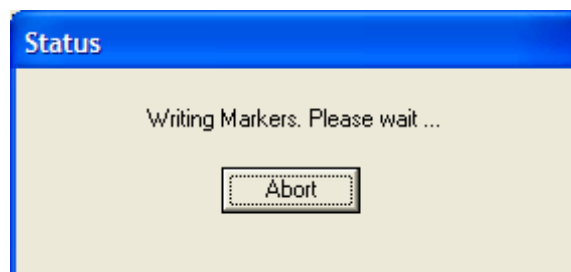


- The **Signal Level** column displays the signal level at which the iD-Marker was read.
- The **Data Errors** column displays;
  - A  icon is displayed when no reading errors have occurred.
  - An  icon is displayed if a read error has occurred.
    - Either perform the *Read Only* process again, or
    - Remove and replace the iD-Marker(s) that indicate an error.
- The **Lock** column indicates the lock status (open or closed lock icon) of the written data.
- The **Total Markers Read** box shows the total of all the iD-Markers that were read without any errors.
  - If this count matches the *Enter No. of Markers in Fixtures* box value, then it is highlighted in green.
  - If the count does not match, then it is highlighted in red.

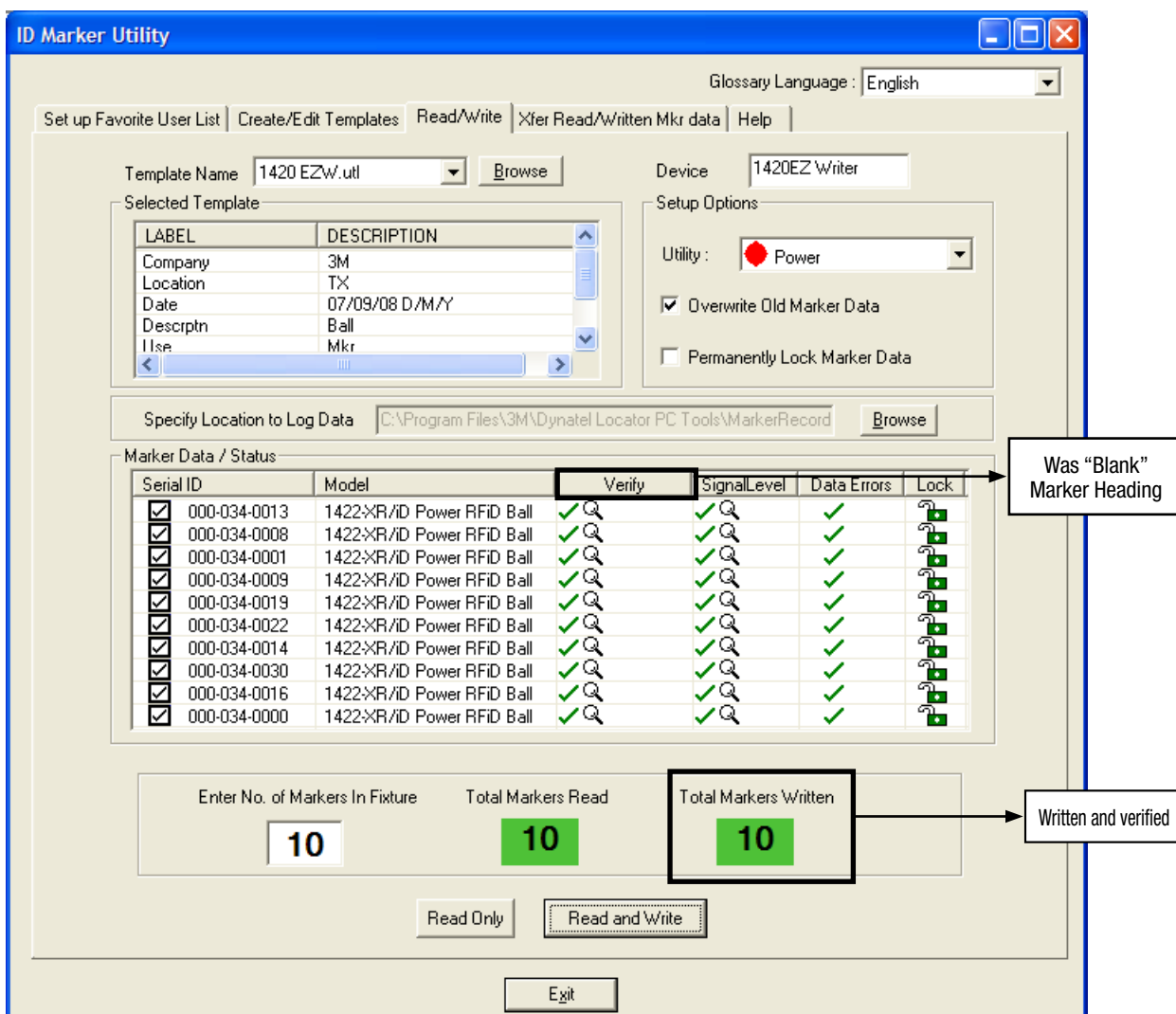
### Read and Write Button

When the *Read and Write* button is clicked, all the iD-Markers are first read. If the iD-Markers are read without any errors, then the Dynatel™ 1420EZ Writer proceeds to write to the iD-Markers with the selected template data.


The following dialog box appears indicating that the writing process is in progress;

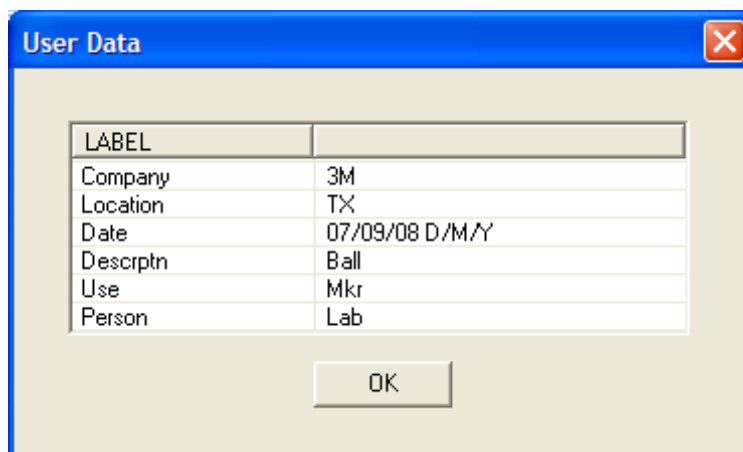


The written iD-Marker data is then displayed as shown in the following screen shot:



The information from each written marker is displayed in the *Marker Data / Status* section. The following information is displayed;

- The “Blank” Marker column gets modified to *Verify* which will now display the verification status of the iD-Marker after it has been written.
  - Clicking on the magnifying glass icon, , will open a new dialog box (shown below) that displays the written template data.

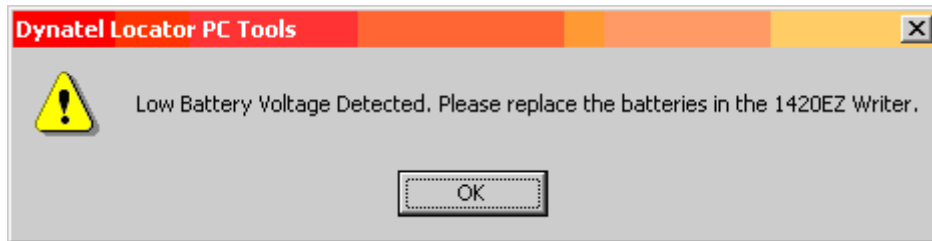


- The **Total Markers Written** box shows the total count of all the iD-Markers that were read, written and verified successfully.
  - If this count matches the Total Markers Read box value, then it is highlighted in green.
  - If the count does not match, then it is highlighted in red.

## Error and Warning Messages

### Low Battery


**ERROR:** If the battery level of the Dynatel™ 1420EZ Writer is too low to allow reading or writing of iD- Markers, a warning dialog box is displayed. The battery level verification occurs every time the *Read Only* or *Read and Write* button is clicked. The following dialog box is displayed prompting the user to change batteries;








**REMEDY:** Replace all eight (8) AA alkaline batteries in the Dynatel™ 1420EZ Writer.

### Read Failures


Three different read errors are possible:














**ERROR 1: Low Signal Level:** If the signal level is too low to write to a marker, then  is displayed in the *Signal Level* column. When the magnifying glass icon is clicked, the actual signal level at which the marker is read is displayed.

Marker Data / Status						
Serial ID	Model	"Blank" Marker	SignalLevel	Data Errors	Lock	
 000-000-4138	1421-XR/iD Tel RFID Ball					

**REMEDY 1:** Reread iD-Marker. If it fails again, remove it from the Dynatel™ 1420EZ Stand and replace with a different iD-Marker.






**REMEDY 2:** Relocate the Dynatel™ 1420 EZ Writer to another location and retry. Ambient noise in the room may be too high.

**ERROR 2: Data Errors:** If there are data errors,  is displayed in the *Data Errors* column.



Serial ID	Model	"Blank" Marker	SignalLevel	Data Errors	Lock	
<input checked="" type="checkbox"/> 000-017-6283	1422-XR/iD Power RFID Ball					
 000-017-6280	1422-XR/iD Power RFID Ball					
<input checked="" type="checkbox"/> 000-017-6300	1422-XR/iD Power RFID Ball					

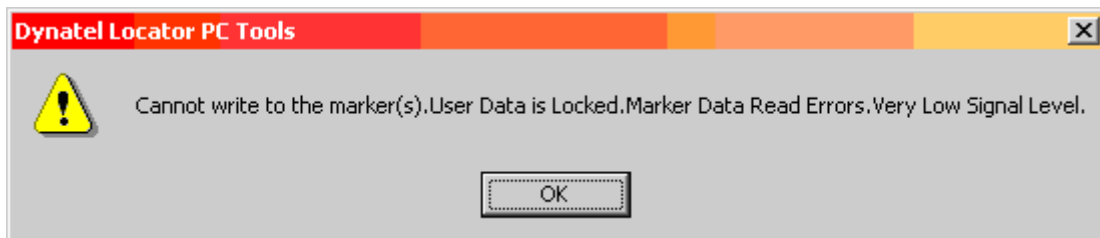
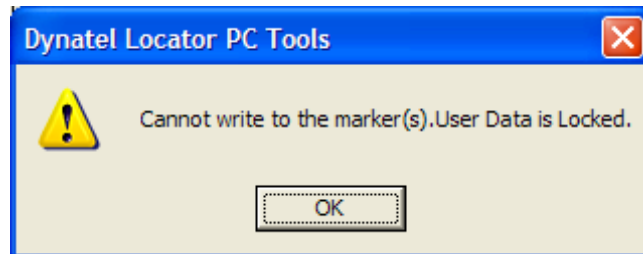
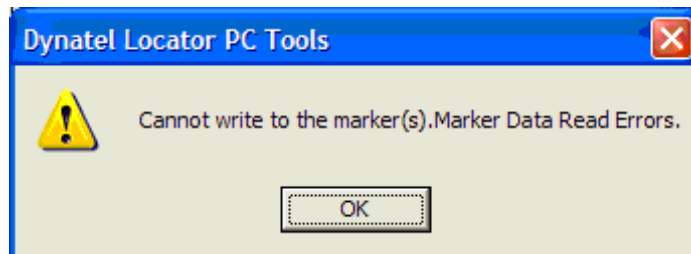
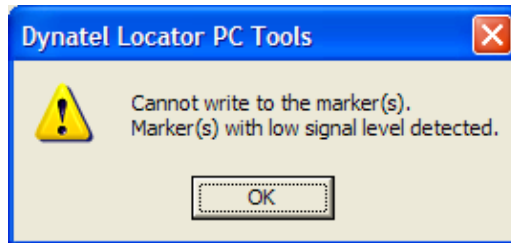
**REMEDY:** Reread iD-Marker. If it fails again, remove it from the Dynatel™ 1420EZ Stand and replace with a different iD-Marker.

**ERROR 3:** Lock Data: The iD-Marker data is locked.

Marker Data / Status						
Serial ID	Model	"Blank" Marker	SignalLevel	Data Errors	Lock	
 000-009-7665	1422-XR/iD Power RFID Ball					

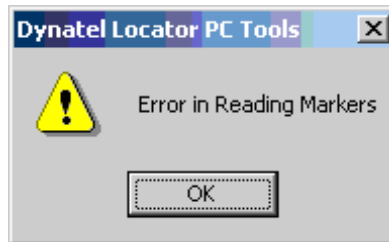
**REMEDY:** The iD-Marker data was previously locked, therefore it cannot be rewritten. Replace with a different iD-Marker.

In all of the above Read Error cases,  is displayed in the *Serial Number* column to indicate that the iD-Marker is prohibited from being written since this would result in an incorrect write process. When the  is clicked, one of the following dialog boxes pops up based on the failure condition(s);




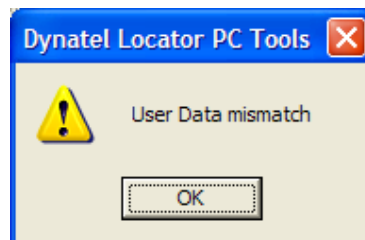
## Read and Write Failures

**ERROR:** When the *Read and Write* button is clicked, and iD-Markers are read with any of the above errors, the following error message may be displayed and the write process is stopped.



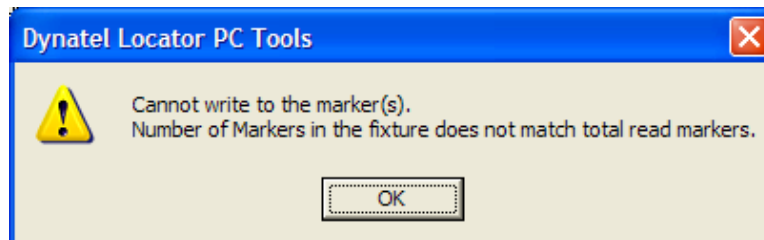
**REMEDY:** See appropriate remedy in *Read Failures* section above.


**ERROR:** If all the iD-Markers are read and written, but an iD-Marker failed in verification,  is displayed in the *Verify* column for that iD-Marker. Clicking on the magnifying glass icon, displays the following error message dialog box.



**REMEDY:** Rewrite iD-Marker. If it fails again, remove it from the Dynatel™ 1420EZ Stand and replace with a different iD-Marker.

**ERROR:** If the value of *Number of Markers in the Fixture* box is not the same as the value of *Markers Read* box, then the following dialog box is displayed.



**REMEDY:** Identify the iD-Marker with the error, indicated by the  , repeat the *Read and Write* operation. If it fails again, remove it from the Dynatel™ 1420EZ Stand and replace with a different iD-Marker and repeat operation.



## Total Number of Markers in Fixture Error

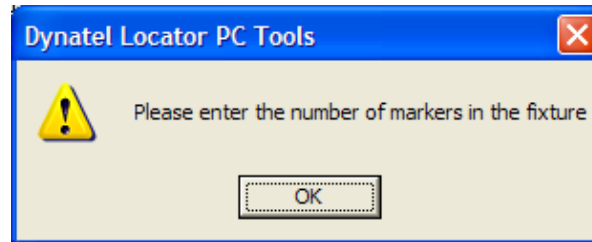
**ERROR:** If the *Read Only* button or *Read and Write* button is clicked, and there is no entry in the *Enter the No. of Markers in Fixture* box, as in the following screen shot,



Enter No. of Markers In Fixture	Total Markers Read	Total Markers Written
0	0	0

Read Only    Read and Write

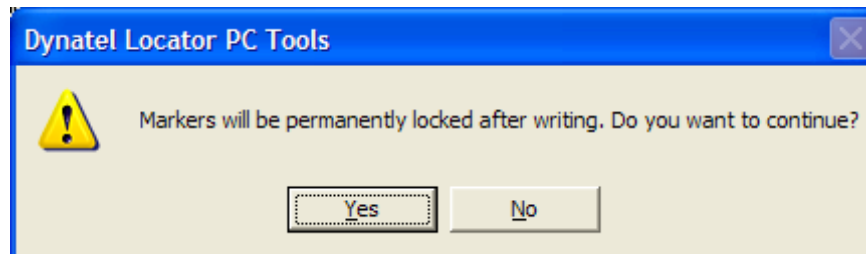
then the following dialog box is displayed;



**REMEDY:** Enter the total number of iD-Markers that are located in the Dynatel™ 1420EZ Stand into the Enter No. of Markers in Fixture box.

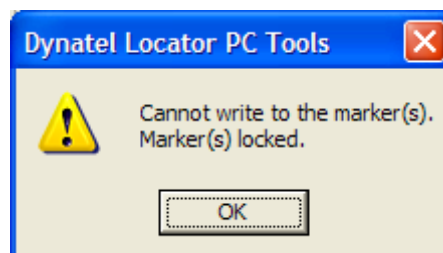
## Permanently Lock Marker Data and Locked iD-Marker Errors and Warnings

**ERROR:** If the *Permanently Lock Marker Data* checkbox in the *Setup Options* section is selected the following warning dialog box is displayed;



- If Yes is selected, the iD-Markers will be permanently locked after being written.
- If No is selected, the selection will be removed and the iD-Markers will not be locked after being written.

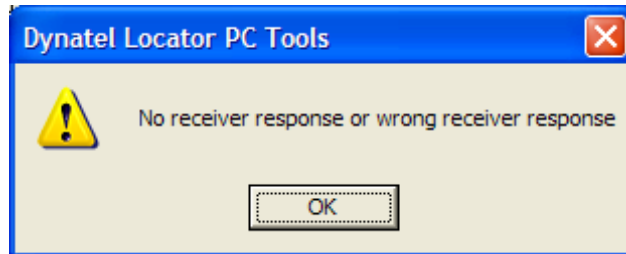
**ERROR:** If an attempt is made to write to a locked iD-Marker, the following error dialog box is displayed:



**REMEDY:** The iD-Marker data was previously locked, therefore it cannot be rewritten. Replace with a different iD-Marker.

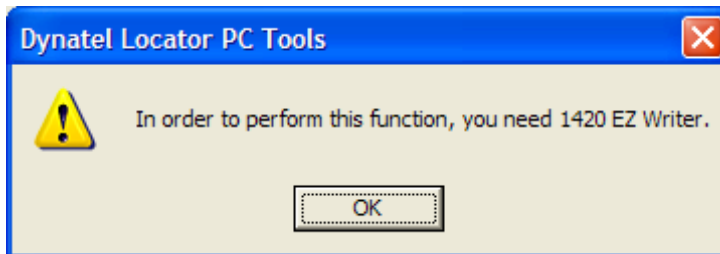
## Miscellaneous Errors

**ERROR:** If an attempt is made to read or write to iD-Markers and the Dynatel™ 1420EZ Writer is not powered on or the incorrect comport is selected, one or both of the following dialog boxes will appear:



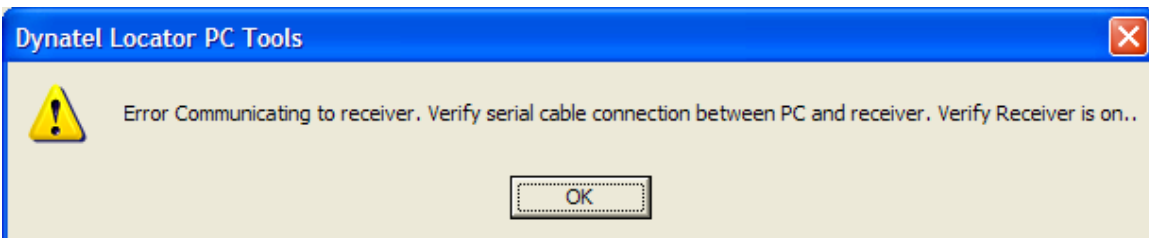
**REMEDY:** Power On the Dynatel™ 1420EZ Writer or verify that the correct comport is selected.

**ERROR:** If a unit other than the Dynatel™ 1420EZ Writer is connected to the PC, the following error dialog box appears when the *Read/Write* tab is clicked in Dynatel™ PCTools;



**REMEDY:** Connect the Dynatel™ 1420EZ Writer unit to the PC.

**ERROR:** If the Dynatel™ 1420EZ Writer is connected to the PC and the following error dialog box appears;



**REMEDY 1:** Verify serial cable connection between PC and Dynatel™ 1420EZ Writer unit.

**REMEDY 2:** Verify Dynatel™ 1420EZ Writer unit is powered on.

**REMEDY 3:** Verify correct comport has been selected.

**REMEDY 4:** Verify baud rate of 38,400 is selected.

# Specifications

## Dynatel™ 1420EZ Writer

Frequencies / iD-Markers	Power, Telephone, Gas, Water, Waste Water, Communication (CATV), General Purpose
Weight with Batteries	4 lbs (1.814 kg)
Average Battery Life	Approximately 1500 Read and Write Cycles *

\* Based on the assumption that ten (10) iD-Markers are read and written per Read and Write cycle.

## Dynatel™ 1420EZ Stand

Height	21 in (53.34 cm)
Width	22 in ( 55.88 cm)
Weight	12 lbs (5.443 kg)
Material	HDPE
Number of Parts in Assembly	6

## Standards and Regulatory

Regulatory	FCC
Regulatory	CE
Environmental Standard	IP54

CE 0678 !

CE This product is in accordance with the requirements of the European directive 99/5/EC

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