



ZFind™ ZTEC Resource Manager

User's Manual: 0004-000066
Revision 4A

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Contact

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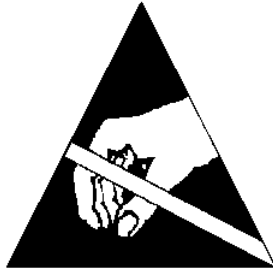
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Handling Precautions for Electronic Devices Subject to Damage by Static Electricity

This instrument is susceptible to Electronic Static Discharge (ESD) damage. When transporting, place the instrument or module in conductive (anti-static) envelopes or carriers. Open only at an ESD-approved work surface. An ESD safe work surface is defined as follows:

- The work surface must be conductive and reliably connected to an earth ground with a safety resistance of approximately 250 kilohms.
- The surface must NOT be metal. A resistance of 30–300 kilohms per square inch is suggested.

Ground the frame of any line-powered equipment, chassis, test instruments, lamps, soldering irons, etc., directly to the earth ground. To avoid shorting out the safety resistance, ensure that the grounded equipment has rubber feet or other means of insulation from the work surface.

Avoid placing tools or electrical parts on insulators. Do NOT use any hand tool that can generate a static charge, such as a non-conductive plunger-type solder sucker. Use a conductive strap or cable with a wrist cuff to reliably ground to the work surface. The cuff must make electrical contact directly with the skin; do NOT wear it over clothing.

Note: Resistance between the skin and the work surface is typically 250 kilohms to 1 megohm using a commercially-available personnel grounding device.

Avoid circumstances that are likely to produce static charges, such as wearing clothes of synthetic material, sitting on a plastic-covered stool (especially when wearing woolen material), combing the hair, or making extensive pencil erasures. These circumstances are most significant when the air is dry.

When testing static sensitive devices, ensure DC power is ON before, during, and after application of test signals. Ensure all pertinent voltages are switched OFF while circuit boards or components are removed or inserted.

Revision History

Rev	Date	Section	Description
1	1-4-08	All	Initial Release
1a	4-10-08	All	EPICS changes, instrument sharing
2	9-15-08	All	Abort, LAN and EPICS changes
2a	6-9-09	All	Updated
2b	9-25-09	All	Added SCPI scripting, PV file checking on upload
3	12-7-09	Finding Cards	Added VXI-11 Discovery Window
4	9-16-10	Adding an Instrument, LAN Settings	webLXI updates, shared instrument improvements
4A	11-24-10	All	Added ZT8440

Table of Contents

Introduction	6
Finding Cards	8
Menubar and Toolbar	8
Adding a LAN Instrument	11
<i>Known Address</i>	11
<i>Unknown Address</i>	12
Configuring LAN Settings	14
<i>WebLXI Interface</i>	14
Uploading an EPICS PV File	16
Instrument Calls	18
String Based Calls.....	18
Register Based Calls.....	21

List of Figures

Figure 1.1: SFP Layout	7
Figure 2.1: Menubar Controls	8
Figure 2.2: Toolbar Controls.....	9
Figure 2.3: Add Instrument Dialogue	12
Figure 2.4: VXI-11 Discovery Dialogue	13
Figure 2.5: webLXI Welcome Page.....	14
Figure 2.6: EPICS Settings Dialogue.....	16
Figure 2.7: PV File Upload Interface.....	17
Figure 3.1: String Communication Dialogue	18
Figure 3.2: Register Communication Dialogue.....	21

Introduction



The ZFind™ Resource Manager is designed for use with all ZTEC® M-Class and C-Class Instruments. ZFind™ automatically detects any instruments that are available on the local system for display and communication. It is also possible to add LXI or shared instruments through ZFind™ for use in this and other applications.

ZFind™'s primary function is to provide an easy-to-read list of all available instruments including their resource name and id information. ZFind™ also allows basic command line communication to the instruments for testing and debugging. LAN or EPICS settings may also be set up using ZFind™. Local instruments may also be shared as remote instruments using the sharing functionality

ZFind™ is currently available as an application for both Windows and Linux environments; see the ZTEC® website for currently supported Linux kernels.

The soft front panel (SFP) consists of three main areas:

1. Menubar
 - a. Menu access to all functionality.
2. Toolbar
 - a. Quick access to most advanced functionality.
3. Tree Display
 - a. A tree-style list of available instruments.

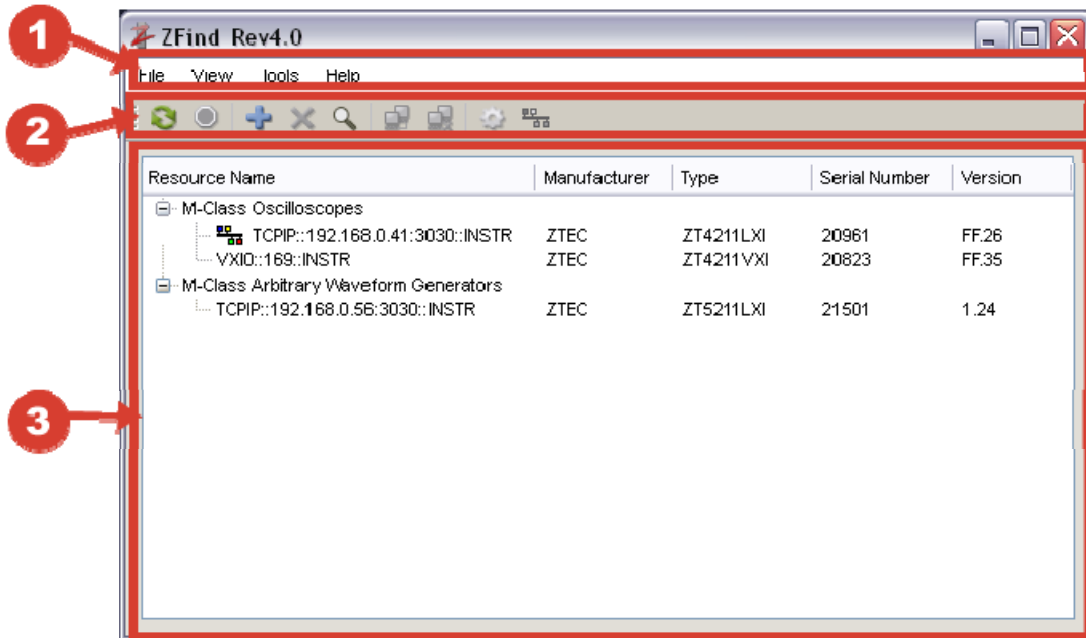


Figure 1.1: SFP Layout

Finding Cards



Menubar and Toolbar

The menubar and toolbar provide access to application functionality. The menubar is fixed at the top of the application, while the toolbar may be undocked, moved or hidden entirely. Some ZFind™ menubar and toolbar options require specific instruments and are grayed out unless an appropriate instrument is selected. Select an instrument by clicking on the resource in the Tree Display.

All functionality that is available in the menubar or toolbar has associated keyboard shortcut commands, as shown in the menus.

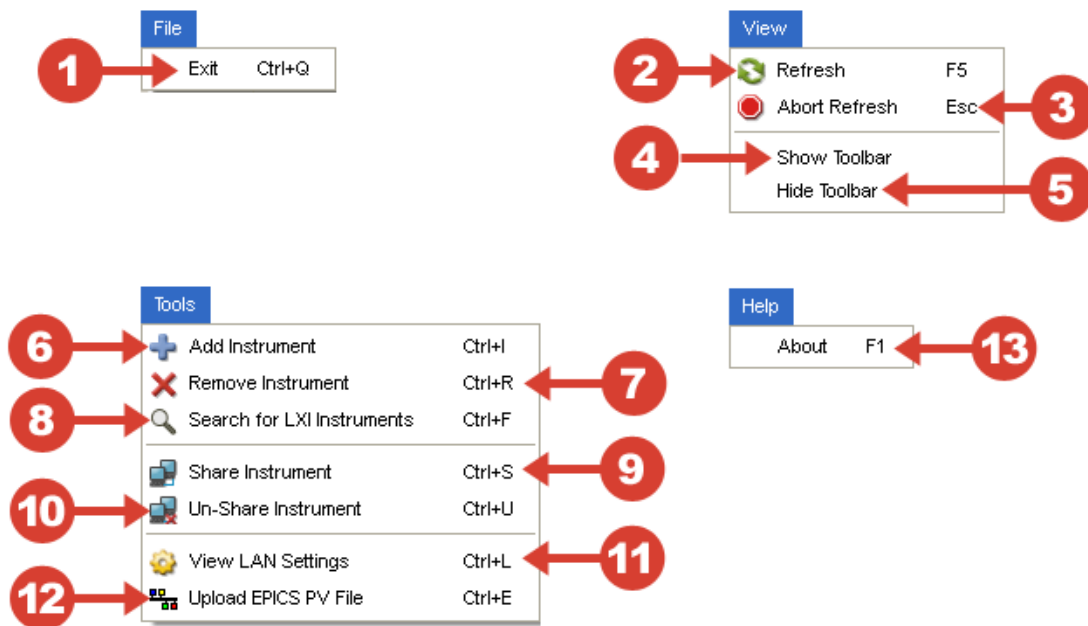


Figure 2.1: Menubar Controls

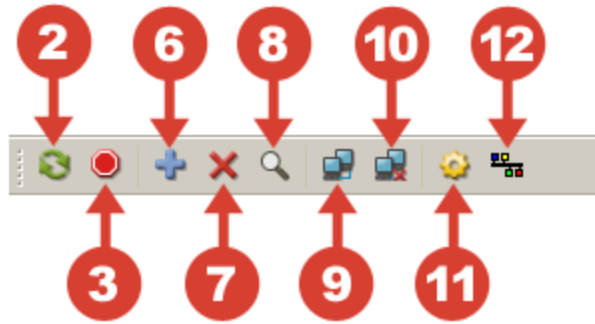


Figure 2.2: Toolbar Controls

- 1 Exit**
Exit the program.
- 2 Refresh**
Search the system for available instruments.
- 3 Abort Refresh**
Cease any current attempt to gather instrument information. There are some circumstances where an instrument may be unable to respond the information query.
- 4 Show Toolbar**
Display the Toolbar.
- 5 Hide Toolbar**
Hide the Toolbar.
- 6 Add Instrument**
Manually add an instrument that is not automatically found by ZFind™. See *Adding an LXI Instrument* below.

- 7 Remove Instrument**
Remove an instrument from the list. This function is only available for manually added instruments.
- 8 Search for LXI Instruments**
Attempt to find available LXI instruments using the VXI-11 discovery protocol. See *Adding an LXI Instrument* below.
- 9 Share Instrument**
Share a local instrument over the local area network. This instrument can be accessed from other computers by using the IP address of the computer that is sharing the card in the resource name. This functionality is available for M-Class PCI, PXI and VXI Instruments only. Once an instrument is shared, it may be used over the network in the same fashion as an LXI instrument, using the sharing computer's IP address in the Resource Name. Sharing is limited to one instrument at a time, and only one remote user may connect to a shared instrument at a time.
- 10 Un-Share Instrument**
Remove a shared instrument from the local area network.
- 11 LAN Settings**
View the LAN configuration panel for the selected instrument. This function is only available for LXI instruments.
- 12 EPICS Settings**
View the EPICS PV Upload panel for the selected instrument. This function is only available for EPICS instruments.
- 13 About**
View the ZFind™ about information

Adding a LAN Instrument


LXI and shared instruments are not automatically added to the instrument list in ZFind™ and other applications. This is because only a single socket connection may be active to a LAN instrument. To limit unnecessary communication and timeouts, ZTEC® applications require a list of networked instruments that they should try to communicate with.

The added instrument list file may reside in a few different locations, based on operating system and current environment variables. On Linux systems, there will be a *.zcard* in the */home/<username>* directory. On Windows systems, the file, *zcard.txt*, will reside in the same directory as the ZFind™ executable when no *ZTEC_DATA* environment variable is defined. When the *ZTEC_DATA* environment variable is defined, the *zcard.txt* file will be found at this variable's first value. The default value for *ZTEC_DATA* is *%APPDATA%\ZTEC Instruments*, which when expanded is *C:\Documents and Settings\<username>\Application Data\ZTEC Instruments*. With all environment variables expanded, a value for *ZTEC_DATA* must be less than 496 characters.

Once an instrument's resource name has been added to this list, it is visible to all ZTEC® applications that have that *zcard* file on their path. The *zcard* path used by the application can be checked in the about popup. The *zcard* file may be edited directly, but it is suggested that instruments be added and removed from the list through ZFind™ to reduce the possibility of errors.

Note: PC firewall and port settings may affect ZFind™'s ability to find and talk to LAN instruments.

Known Address

If the IP address of the desired instrument is already known, it can be added by selecting Add Instrument from the toolbar, selecting the  icon in the menu, or entering Ctrl+A through the keyboard. This will cause the Add Instrument Dialogue will appear.

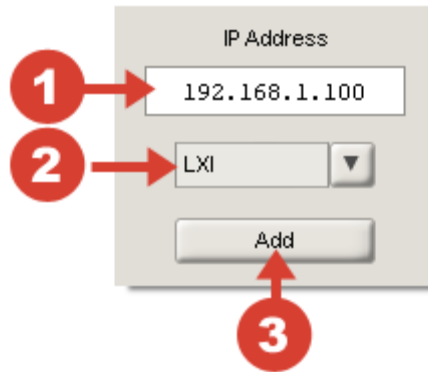


Figure 2.3: Add Instrument Dialogue

1 IP Address

Enter the IP address of the instrument to be added. Pressing Enter while this control is active is the same as clicking the Add button.


2 Type

Select whether the instrument being added is a shared instrument or an LXI instrument.

3 Add

Click to add the defined instrument to the list. To abort addition, simply click outside of the dialogue box or press escape.

Unknown Address

If the IP address of an LXI instrument is not known, it can be found using VXI-11 Discovery. Start the search by selecting *Search for LXI Instruments* in the toolbar, selecting the  icon in the menu, or by pressing 'Ctrl+F', and then pressing the *search* button. This will cause the VXI-11 Discovery Dialogue to Appear. Double-Clicking on a discovered instrument from this interface will add that instrument to ZFind and the zcard list.

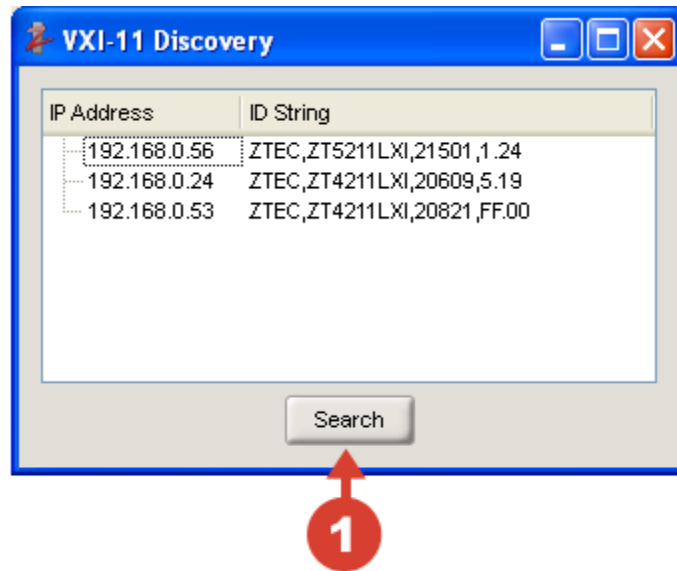



Figure 2.4: VXI-11 Discovery Dialogue

- 1 Search**
Initiate the VXI-11 search.

Configuring LAN Settings

When an LXI instrument is selected, *View LAN Settings* becomes available. After selecting *View LAN Settings* from the toolbar, selecting the  icon in the menu, or entering Ctrl+L through the keyboard, the webLXI interface will open in a browser window. This dialogue allows for viewing and changing the instrument's network device settings. The webLXI interface is served on port 80.

WebLXI Interface

The webLXI Interface is made up of webpage groups which present various instrument information and settings options. The main page of the webLXI interface is the *Welcome Page*. This page displays all LAN configuration information as well as instrument information. The *Welcome Page* is found at the address `http://[IP address]`, where [IP address] is the IP address assigned to the instrument. More information on this interface and the various pages can be found in the Instrument Manual.

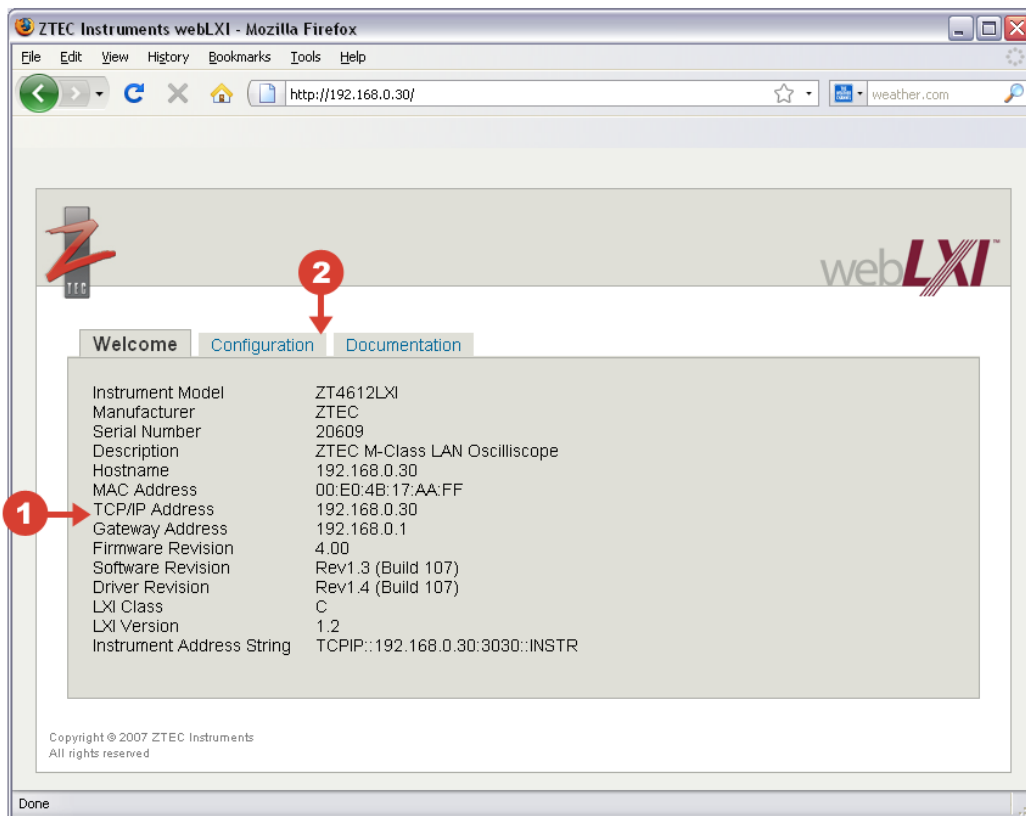


Figure 2.5: webLXI Welcome Page


1 Items

The Welcome Page, shown above, is a read-only display of the current instrument configuration, but other pages in the webLXI interface present the various controls and editable settings for the LXI Instrument located on the network at the current IP Address.

2 Tabs

Click the tabs to view other webLXI pages or web page groupings. Note that the Configuration Tab and all of its pages are secured with password-access.

Uploading an EPICS PV File

When an EPICS-enabled instrument is selected, *Upload EPICS PV File* becomes available. After selecting *Upload EPICS PV File* from the toolbar, selecting the  icon in the menu, or entering Ctrl+E through the keyboard, the EPICS PV Dialogue will appear. This dialogue allows for changing EPICS PVs. For more information on changing PVs, review the EPICS Interface manual.

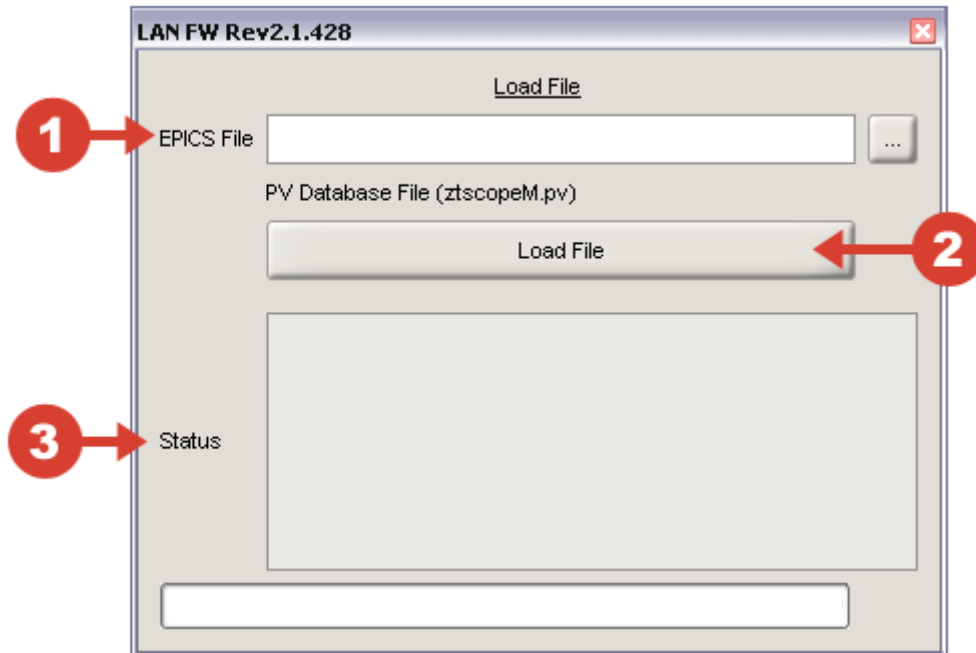


Figure 2.6: EPICS Settings Dialogue

1 EPICS File

Select the location of a PV database file to upload to the instrument.

2 Load File

Load the file from the EPICS File.

3 Status

The Status box displays messages describing the status of the current file upload. The lower bar tracks percent-complete.

During upload, ZFind™ will check the PV file for obvious errors such as missing brackets. If an error is detected an additional popup will appear giving the chance to exit upload or continue. The option is available because the checker may not be able to compensate for drastic changes to the default PV file. Uploading an invalid PV file will stop EPICS from booting. Detected errors are

reported with their line number in the PV file so that they may be tracked down and corrected.

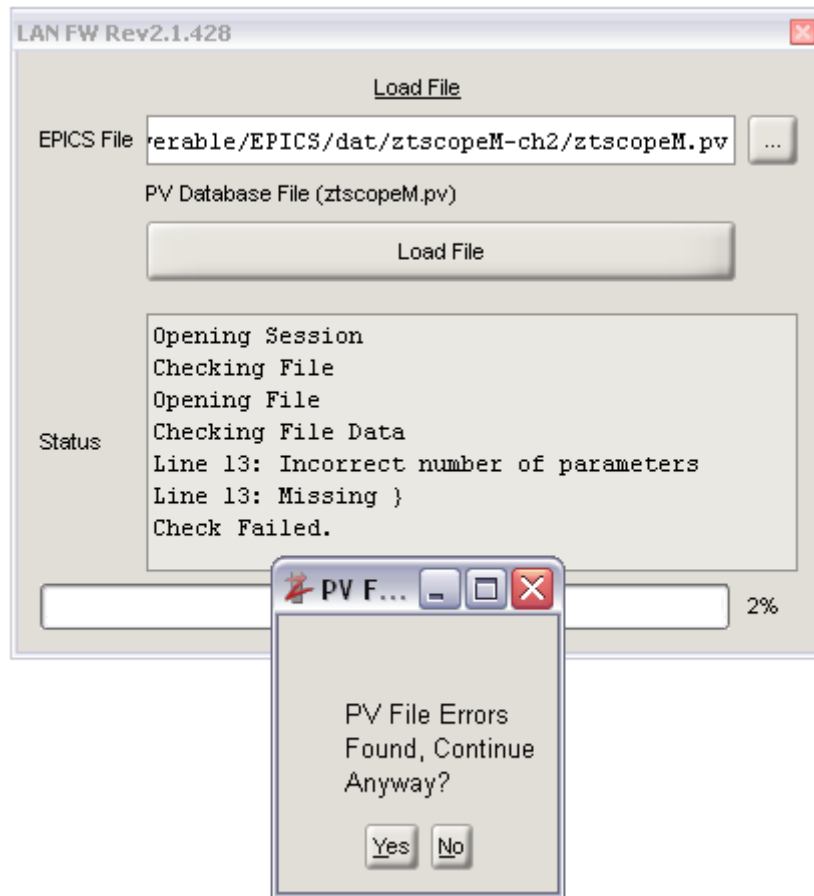


Figure 2.7: PV File Upload Interface

Instrument Calls



ZFind™ allows for low-level calls that enable advanced debugging and quick instrument communication. These calls require advanced knowledge of ZTEC® instrument communication and should be used in conjunction with the instrument manual. Sending an invalid low level command may cause instrument errors and can result in system errors on the controlling PC.

String Based Calls

All ZTEC® M-Class and VXI instruments from other classes use string based calls for low-level communication. To access the string based communication dialogue, double-click on any instrument of these types in the Tree Display. Multiple communication dialogues may be opened simultaneously.

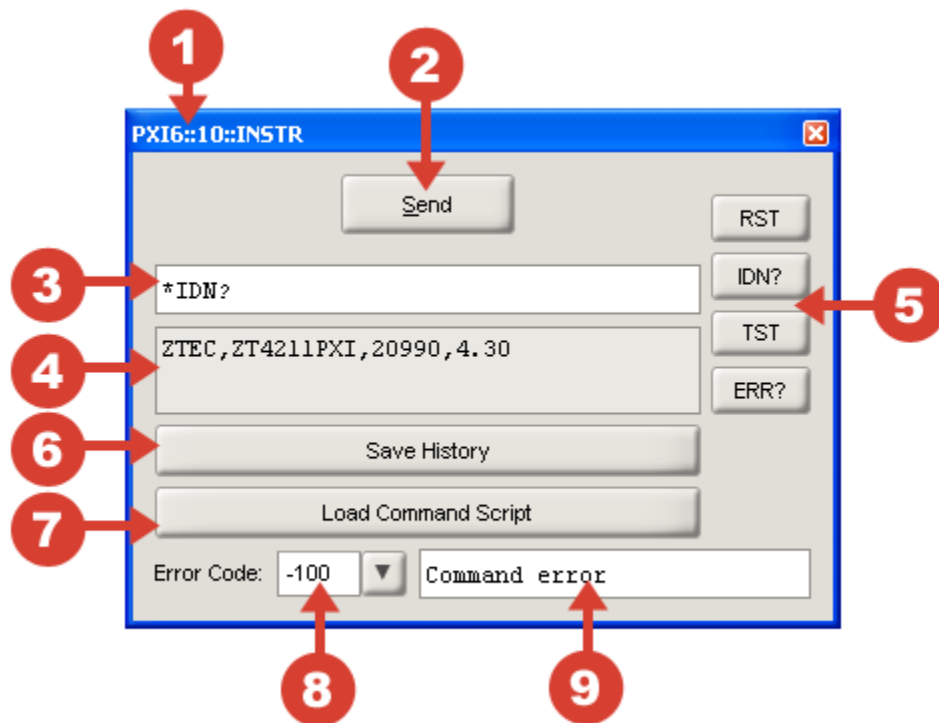


Figure 3.1: String Communication Dialogue

1 Resource Name

All dialogue windows display the resource name of the instrument that they are communicating with.

2 Send

Send the command that has been entered in the output text box and receive a response for the input text box if applicable.

3 Output Text Box

Enter commands and queries here to send them to the instrument. Commands will be sent when the “Send” button is pressed or when the “Enter” or “Return” key is hit when this control is active. Command history can be accessed using the up and down arrow keys; up arrow will go back one command and the down arrow will go forward one command in history.

4 Input Text Box

The instrument response to queries is displayed here. Any text displayed here is selectable in order to allow copying. Right-clicking in the Input Text Box presents the Copy (Control+C) and the Select All (Control+A) options.

5 Quick Commands

Click for quick access to a selection of useful commands. Select one of these to automatically load the output text box with the appropriate command string and send it to the instrument.

6 Save History

Save the current command history to a text file. This only saves the history of commands that have been sent through the current launch of the SCPI command interface window. Commands sent through previously closed windows, through code or through other GUIs are not available. Sample output:

```
*RST
*IDN? -> ZTEC,ZT4211PXI,20990,4.30
*TST? -> 0
SYST:ERR:ALL? -> 0
```

7 Load Command Script

Run a command script. This will step through the script sending one line at a time to the instrument as though the line had been entered as a command in the Send box. The command script may be any text based document containing a list of SCPI commands separated by line breaks. Command histories saved using the Save History function are compatible with this function; returned values are ignored. Entire lines may be commented out using the double slash “//” command at any point in the line.

ex :

<u>Command file</u>	<u>Actual Commands Sent to Instrument</u>
*RST	*RST
INP1 1	INP1 1
INP1? -> 1	INP1?
//INP2 0	INP2?
INP2?	
INP3 0 //	

8 Error Code

Select an error code to read its description.

9 Error Description

The Error Description box displays a text description of the selected error code.

Register Based Calls

All ZTEC® C-Class PCI and PXI instruments use register based calls for low-level communication. This interface is significantly more complicated than the M-Class and VXI string based calls. To access the register based communication dialogue, double-click on any C-Class PCI or PXI instrument in the tree-view. Multiple communication dialogue may be opened simultaneously.

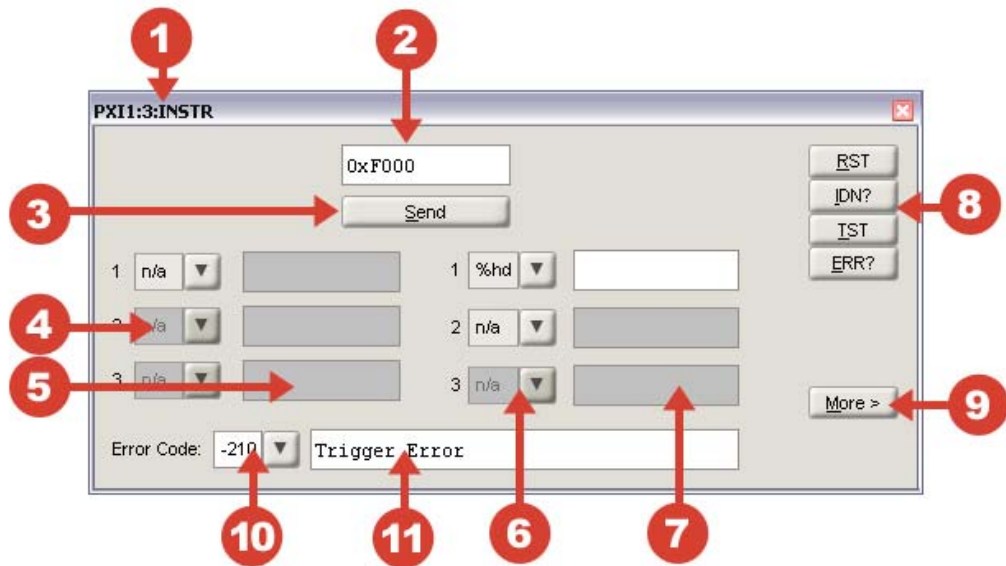


Figure 3.2: Register Communication Dialogue

- 1 Resource Name**

All dialogue windows display the resource name of the instrument that they are communicating with.
- 2 Command**

Enter the instrument command/query to perform
- 3 Send**

Initiate send and receive actions. Ensure that all send and receive parameters are entered appropriately prior to sending.
- 4 Send Parameter Types**

Select the type and number of parameters to send to the instrument. Parameters are enabled successively. Possible types are: unsigned short (%hu), unsigned integer (%u), and single (%f).

5 Send Parameters

Enter the values to be sent as parameters for a command.

6 Receive Parameter Types

Select the type and number of parameters to receive from the instrument. Parameters are enabled successively. Possible types are: unsigned short (%hu), unsigned integer (%u), single (%f), string (%s) and short (%hd).

7 Receive Parameters

The receive parameters display response values received from the instrument during queries.

8 Quick Commands

Click for quick access to a selection of useful commands. Selecting one of these will automatically load the command and input/output parameter type boxes with the appropriate values.

9 More

Click to display additional parameter fields. A few calls require more than three parameters on either send or receive.

10 Error Code

Select an error code to read its description.

11 Error Description

The Error Description box displays a text description of the selected error code.



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