

EZ-Matrix® V4.1.0.3 User Guide



Table 1 – Revision History

Date	Version	Author	Reason
5/19/04	0.1	James T. Heires	Original
6/24/04	0.2	James T. Heires	Demo feedback
7/3/04	0.3	James T. Heires	Added support section
7/13/04	0.4	James T. Heires	Corrected spelling errors
7/21/04	0.5	James T. Heires	Added role to change request form
7/23/04	0.6	James T. Heires	Added description of algorithm
7/25/04	0.7	James T. Heires	Added reports details
8/1/04	0.8	James T. Heires	Added unique session name, purge database
6/24/05	0.9	James T. Heires	Added clarification about multi-line comments with embedded blank lines
10/30/05	1.0	James T. Heires	Added sections about creating and modifying rules, and session time-out
2/2/06	1.1	James T. Heires	Added trusted site instructions
2/19/06	1.2	James T. Heires	Clarified changed measure, updated copyright date, added ® to name
11/15/14	1.3	James T. Heires	Added v4.1.0.3 enhancements

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1. About EZ-Metrix®

Overview

EZ-Metrix is a web-based source code counting utility. The first tool of its kind, EZ-Metrix combines a consistent measurement of source code across programming languages, platforms and operating systems with the portability of a hosted application. Armed with an EZ-Metrix account, you will be able to connect to the Internet, login to EZ-Metrix for the first time, select and measure source code and produce meaningful reports all within minutes!

What's New?

Comparison algorithm is faster and more accurate. The Levenshtein-distance algorithm has been implemented to obtain improved counts of new, modified and unmodified lines of code and comments. As an added bonus, this has improved performance by ~33% as compared with v4.0.1.2.

Difference threshold is now expressed as a percentage, rather than a fixed character count. This means that changes to a given line of code (or comment) will be counted consistently across lines of any length. Lines will be treated as modified if the % of characters in the original line does not exceed the threshold value. Otherwise the line will be counted as both New and Deleted. See Creating Rules for a more detailed explanation.

Brand new Help system which displays in a separate browser window, and is better organized and complete, with measurement definitions and report details.

Bug fixes related to comparison counts have been implemented and tested.

Copyright

EZ-Metrix is protected under international copyright laws. Duplication, redistribution or reselling without express written permission from James Heires Consulting, Inc. is unlawful. Persons violating the law will be prosecuted to the full extent of the law.

Features

EZ-Metrix comes standard with several useful features that are offered to make your job easier and much faster than other tools.

Basics

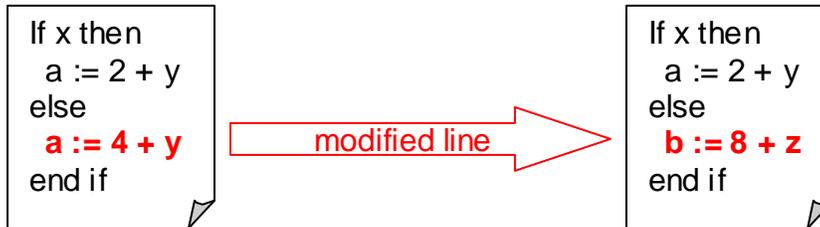
EZ-Metrix parses source code written in *more than 85* programming languages and produces size metrics (Source Lines of Code, Comments and Blank lines) for each file. Size measures are determined by using a rules engine that describes the attributes of the supported programming languages. Rules can be added or modified to support proprietary or special languages.

Source code measures are gathered using the Physical Source Statements (PSS) algorithm¹. All ASCII source code may be counted by EZ-Metrix – binary files may produce unpredictable results. For a complete listing of supported programming language, see Appendix A – Supported Languages or visit our website (<http://www.ez-metrix.com>) for an updated list.

¹ Physical Source Statements (PSS): Source statements that measure the quantity of software in lines of code. – IEEE Std 1045-1992, IEEE Standard for Software Productivity Metrics

Comparison

EZ-Metrix can also compare two versions of a file (or group of files) to determine what has changed. Comparison metrics can be used to determine the differences between two versions of the source code and produce reports of the resulting measures.



This modified count can be helpful when quantifying how much code has changed between two versions of a system, module or file. Over its useful lifetime, more time, money and effort is spent modifying software than is spent developing it in the first place, so this comparison feature is likely to be quite valuable.

In addition to modified lines, EZ-Metrix also counts new, deleted and unmodified lines. Separate counts in all of these categories are provided for code and comments alike. Blank line counts are also counted separately.

Reports

Reports from measurement sessions are available any time after they are created, and are available on screen. In addition, each report may be exported to a Microsoft Excel-compatible file format. Three file-based measures and up to eight different line-based measures are produced in each report, plus information about the measurement session.

File Results

```
Filename: adc.c
Comment Lines: 62780
Blank Lines: 13250
Source Code Lines: 23970
Total Lines in File: 100000
```

Rules

EZ-Metrix uses a flexible and configurable rules engine, which defines how to differentiate lines of code from comments and blank lines, and how to define modified lines. The rules that configure EZ-Metrix for the supported programming languages can be tailored to the specific needs of the user. Rules may be created, stored and modified. Deleting a rule requires administrative assistance. See [Creating Rules](#) for more information about creating and modifying rules. EZ-Metrix comes preconfigured to support a few popular languages. Other languages which can be supported by EZ-Metrix (by the user creating rules) are listed in [Section 9](#).

Security

All source code measured by EZ-Metrix stays on the local computer, *never being sent over the Internet*. Because the EZ-Metrix application is downloaded to the local computer, the system does not require uploading your files. This way, all your source code remains secure. In addition, all your reports are stored on the server, so that no other user (outside of those associated with your administrator's account) may view or download your reports.



2. Getting Started

Before starting your first measurement or Administration session, be sure you have available your username and password and that your system satisfies the minimum system configuration requirements described in section 7.

Trusted site

Open Internet Explorer (IE) and configure <http://www.jamesheiresconsulting.com> as a trusted site. In IE version 6.0 this is performed as follows. If you have an earlier version of IE, please consult your user guide or help system to establish trusted sites.

1. Select **Tools** menu
2. Select **Internet options...**
3. Select the **Security** tab
4. Select the **Trusted sites** icon
5. Select the **Sites...** button
6. Type <http://www.jamesheiresconsulting.com> under **Add this Web site to the zone**
7. Select the **Add** button
8. Select the **OK** button
9. Select the **OK** button again

Logging in

Enter www.ezmetrix.com into your browser's address field and the Login Screen (Figure 1) will appear.

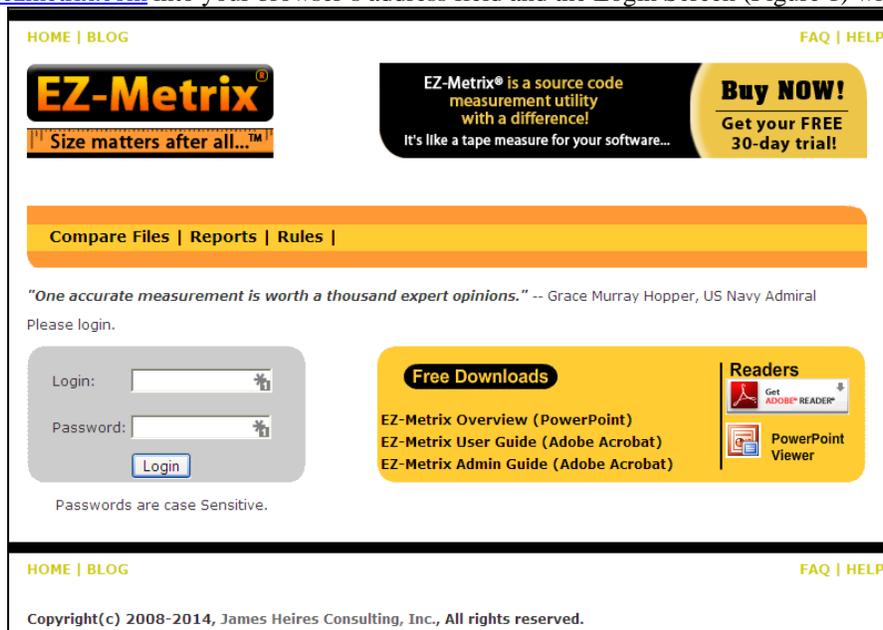


Figure 1 – EZ-Metrix Login Screen

Login with the username and password that was provided to you when you purchased EZ-Metrix. Make sure to use the exact password capitalization that was provided to you, as passwords are case-sensitive for your privacy. In other words, the password “Rover” is a different password than “rover.”

Unsigned Application

When logging in for the first time, you may get a security warning from your browser before the application is downloaded to your computer (see Figure 2). This warning indicates that the application is

not signed with a secure signature. Click on **Yes** to continue. After the first time you successfully login, you will no longer receive this security warning.

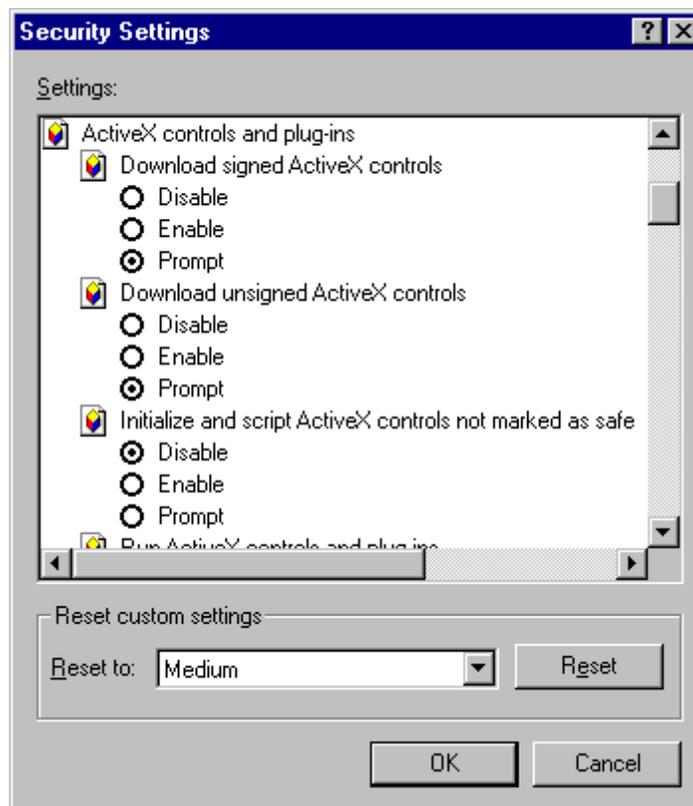


Figure 2 – Unsigned ActiveX control warning

Downloading ActiveX

You may also receive a warning about downloading ActiveX controls from IE. If this happens, you will have to change some settings on your browser to allow the application to be downloaded to your computer. In IE's **Tools/Internet Options...** menu, select the **Security** tab, then **Custom Level** to view the Security Settings dialog box, shown in Figure 3. In the **ActiveX Controls and Plugins** section, select **Prompt** in both the **Download signed ActiveX controls** and **Download unsigned ActiveX controls**, as shown.

Figure 3 – Internet Explorer Security Settings



Main Menu

After the application downloads, you will be presented with the EZ-Metrix Main Menu (see Figure 4). This is where all major system functions are available.

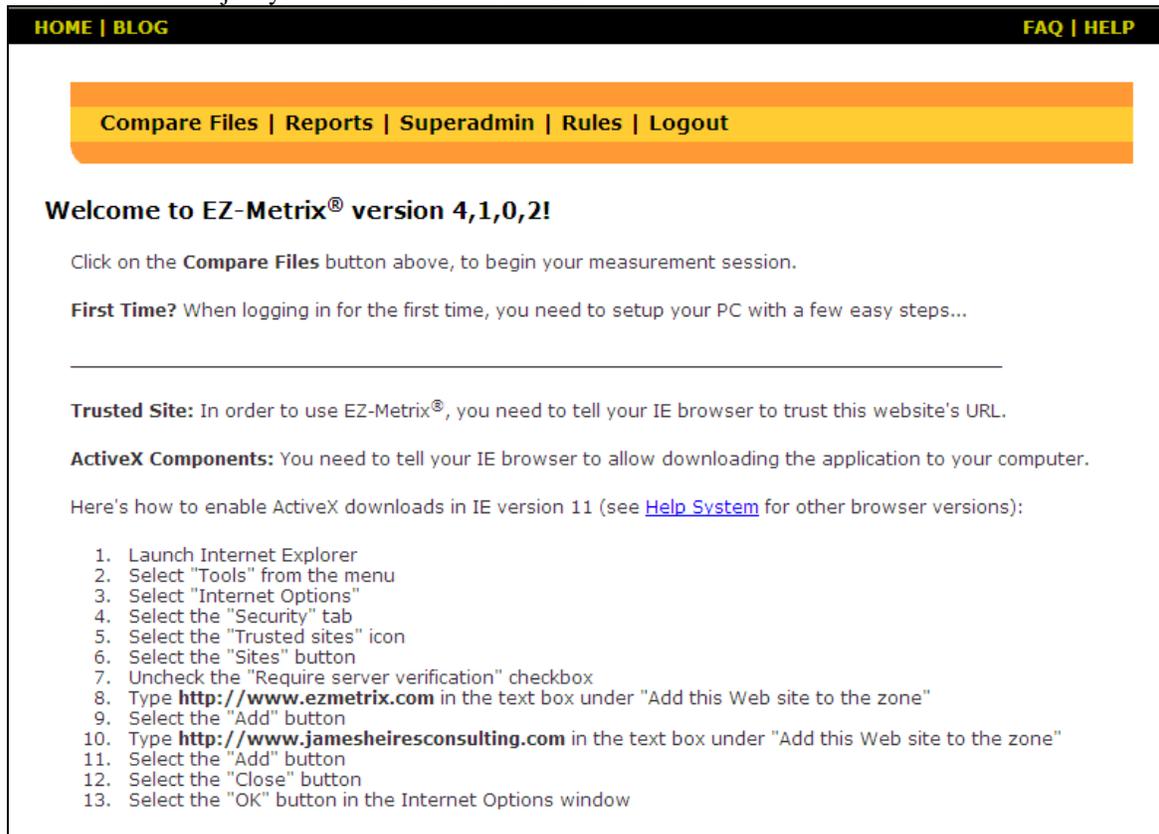


Figure 4 – EZ-Metrix Main Menu

Account Expiration

Every EZ-Metrix account is created with an expiration date, which is determined by the type of license purchased. When a user with an expired account attempts to log into the system with a valid username and password, a message will be displayed (shown in Figure 5).

If you suspect that your account has expired, contact your administrator for assistance. If you are the administrator, contact James Heires Consulting, Inc. for assistance.

Login failed because of incorrect user name, password, or your account has expired. Please try again.

Figure 5 – Login Failed Error Message

3. Running EZ-Metrix

After successfully installing and logging in, click on the **Compare Files** link to begin your measurement session. You will be presented the following screen (Figure 6) where you may indicate the files you wish to measure.

Figure 6 – Select Files

Select Source Files

Specify the rule associated with your source language with the **Select a Rule** pull-down menu. To create or modify a rule, see Creating Rules.

Provide a session name in the **Session Name** field (optional). *Note: session name must be unique.* If you provide a session name that is not unique, an error message will be displayed stating this. You should provide a unique session name (or a blank session name) to continue with the measurement session. If no session name is provided, the system will assign the current date and time as the session name.

Select the path name and the files (optional) you wish to measure in the **Old Version Directory** field, or use the browse button  to locate the path of interest. Next, click on the **Get Files** button to load the files into the text box beneath it. You may then edit the files listed in the text box, deleting files you don't wish to measure. You may filter the list of files by specifying a simple wildcard (e.g., *.php) after the path.

If you wish to only measure the size of these files (i.e., no comparison) click on the **Do not compare to another version** box. Click the **Run Compare** button to start measuring the source code. A confirmation screen is presented. (Figure 7)

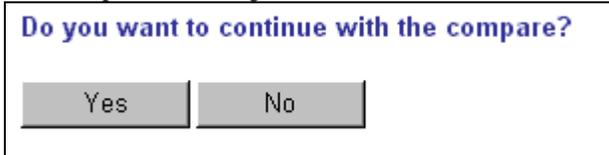


Figure 7 – Run Confirmation

Confirm by selecting Yes, and the counter will begin. While the counting engine is running, you will see a progress indicator (Figure 8) until such time as the measures are completed.



Figure 8 – Progress Indicator

When finished counting you will be presented with an on-screen report with your measurement results (Figure 9). The contents of a report are described in the Directory Results – Non-Comparison section.

HOME | BLOG **FAQ | HELP**

Compare Files | Reports | Superadmin | Rules | Logout

Session Information
Compare Date: 11/8/2014
Session ID: 4051
Session Name: 28- 10,000 line comparison
Rule ID: PHP
Compare Type: File Compare

Directory Results
Old Files Directory Path: C:\Documents and Settings\James\My Documents\Dropbox\EZ-Metrix\Version 5.0\Test Cases\Old\28\
New Files Directory Path: C:\Documents and Settings\James\My Documents\Dropbox\EZ-Metrix\Version 5.0\Test Cases\New\28\
Same Files: 1
Deleted Files: 0
New Files: 0

File Results
Filename: Calculate_TF.php
[Compare Results](#)
New Lines: 285
Deleted Lines: 285
Same Lines: 9036
Changed Lines: 0
[Detailed Line Counts](#)
Comment Lines in Old File: 475
Comment Lines in New File: 475
Blank Lines in Old File: 761
Blank Lines in New File: 761
Source Code Lines in Old File: 9132
Source Code Lines in New File: 9132
Same lines of code: 8561
Same lines of comments: 475
New lines of code: 285
New lines of comments: 0
Deleted lines of code: 285
Deleted lines of comments: 0
Changed lines of code: 0
Changed lines of comments: 0

HOME | BLOG **FAQ | HELP**

Figure 9 – On-screen Report

Reports

To work with reports, click on the **Reports** link in the menu bar. The Reports menu (Figure 10) is presented. From this menu, many report options are available: View Quick Report, View Past Reports, Export Data to File and Purge Data from Database (Admin only).

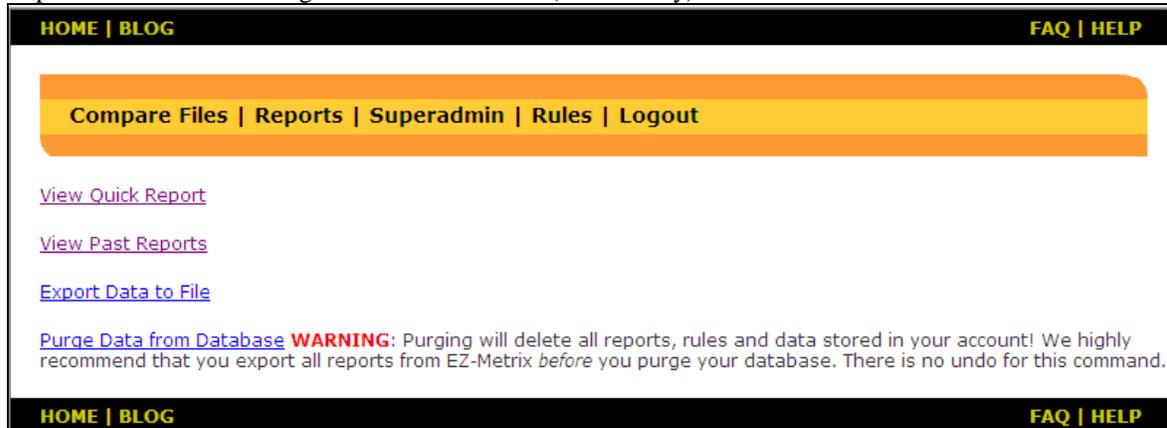


Figure 10 – Reports Menu

View Quick Report

A quick report is a report that shows the results of the latest measurement session carried out by any user in the company. In order to view a quick report, click on the **View Quick Report** hyperlink from the Reports Screen, and the latest measurement session report will be displayed (Figure 9). Note: This is simply a convenient way to retrieve the last report generated – the same report may be displayed by using the View Past Report menu item.

View Past Reports

To view reports that were created in the past, select the **View Past Reports** hyperlink from the **Reports Screen**. This will take you to the **View Past Reports Screen**, where you may select by name, any of your reports created in the past (see Figure 11). After you select a past report from the Session pull-down menu, click on the **Get Report** button and your report will be displayed (Figure 9).

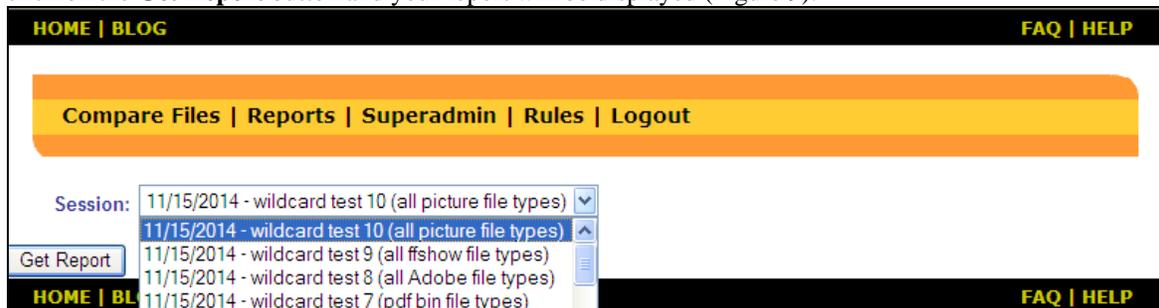


Figure 11 – View Past Report Screen

Export Data to a File

In order to carry out analyses of your measurement data, you may wish to save a report to a file, then import into another program such as Excel. Click **Export Data to File** and select the report you wish to

export from all prior reports in the drop-down list (Figure 12).

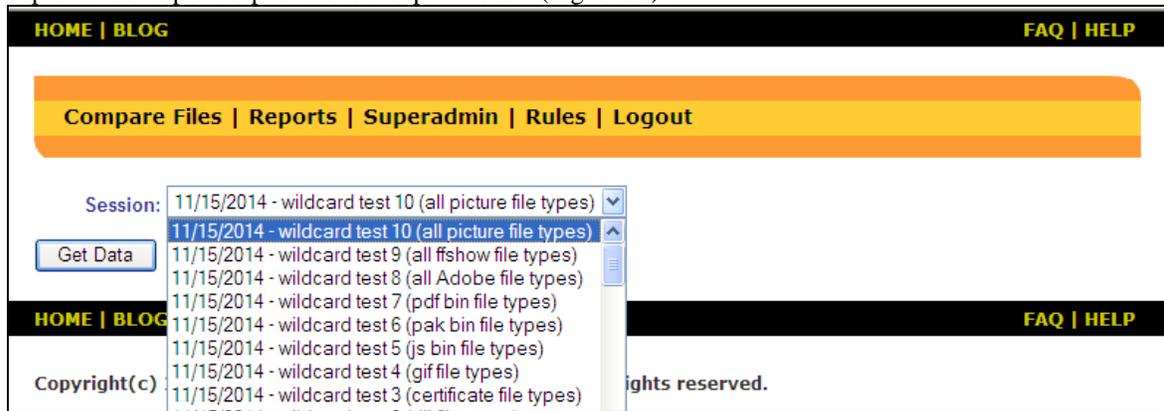


Figure 12 – Export to File

In the drop-down list, all reports are shown. When the **Get Data** button is clicked, you are presented with a confirmation screen (Figure 13).

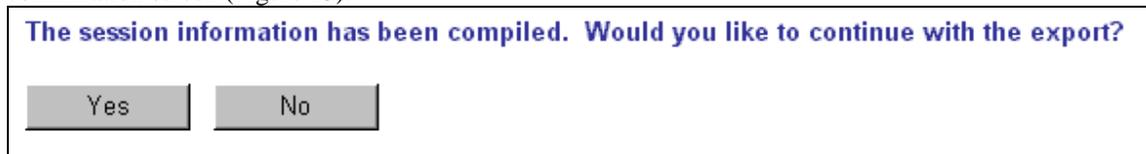


Figure 13 – Export Confirmation

When the report export command is confirmed by clicking **Yes**, a file save dialog box is presented (Figure 14). This allows you to name and locate the resulting file as you wish. The file type must be **Text File (*.txt)** when exporting a report (you may rename it later).

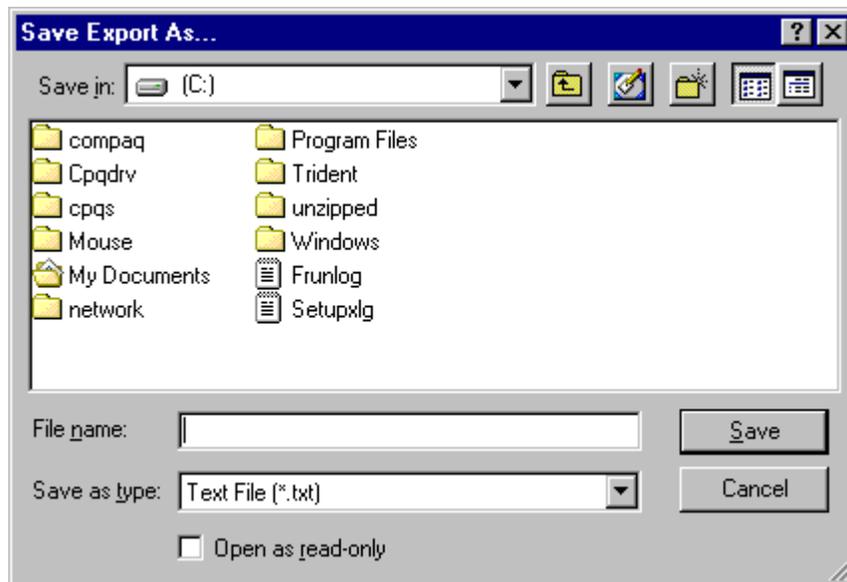


Figure 14 – Export Save As Dialog Box

You may specify the name of the file with which to save your report. The report will be saved in a delimited format, where the vertical bar character (i.e., “|”) is the delimiter character.

When complete, you will be presented with a confirmation of successful file creation (Figure 15). Click **OK** to return to the Reports Menu (Figure 10).

To import the resulting file into Excel, launch Excel and select the **File/Open** command then select the file you named above. Follow Excel's instructions to import the delimited file ("|" is separator character).

When the file has been successfully imported, it can be formatted and saved in native Excel format, graphed, or prepared for importing into another application.



Figure 15 – Export Success

Importing to Excel

To import the resulting file into Excel, launch Excel and select the **File/Open** command then select the file you named above. Follow Excel's instructions to import the delimited file ("|" is separator character).

When the file has been successfully imported (Figure 16), it can be formatted and saved in native Excel format, graphed (Figure 17), or prepared for importing into another application.

	A	B	C	D	E	F
1	comparedate	sessionid	sessionname	ruleid	comparetype	directorypath
2	7/17/04	502	Admin single file	C	Physical Line Count	F:\My Documents\EZ-Metrix\Tes
3						
4						
5	filename	commentlinesinfile	blanklinesinfile	sourcelinesinfile	totallinesinfile	
6	atod.c	80	75	115	270	
7	aux3.c	207	103	193	503	
8	AUX4.C	120	51	104	275	
9	AUX5.C	155	86	188	429	
10	auxadc.c	121	74	176	371	
11	auxiliary.c	304	219	750	1273	
12	cfgmod.c	144	24	45	213	
13	cnfgbits.c	85	20	16	121	
14	crc16.c	24	12	71	107	
15	crc16_O.c	24	12	71	107	
16	eacCRC16.c	149	7	51	207	
17	ecb.c	40	12	61	113	
18	ecbcnfg.c	81	22	17	120	
19	ecbstate.c	16	14	42	72	
20	echu.c	240	111	1008	1359	

Figure 16 – Report Imported to Excel

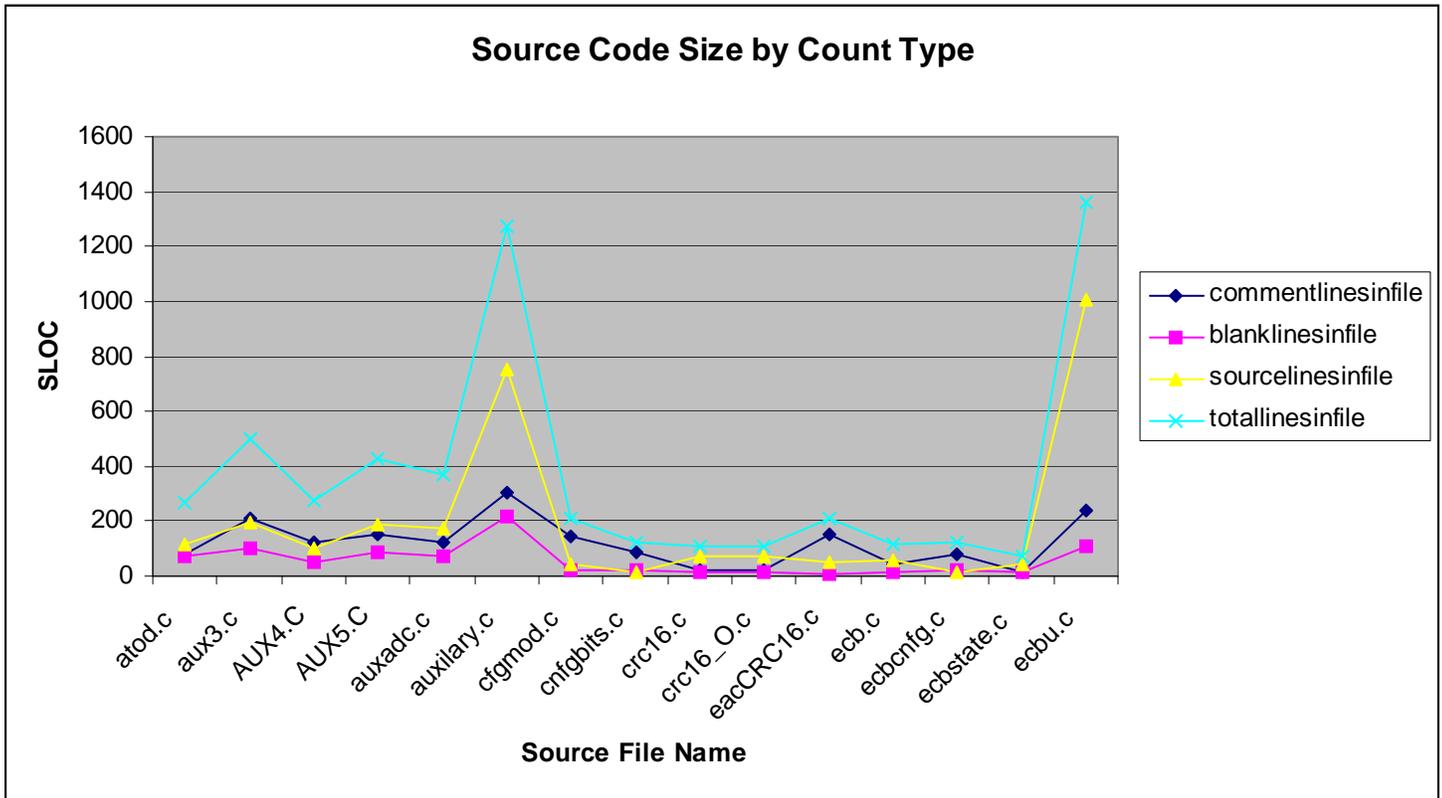


Figure 17 – EZ-Metrix Report Export Graphed by Excel

Creating Rules

EZ-Metrix is very flexible, and can accommodate many programming languages through the use of a simple rules engine. Rules are established by programming language in order to instruct EZ-Metrix how a given language separates comments from code, and allows you to decide how much of a change to a line constitutes a new line (the remainder are considered changed lines). Some common languages and their typical rule definitions are included for your convenience in Appendix B – Typical Rule Settings by Language.

To create a new rule, click on the Rules link item from the main menu (Figure 4), and you will be presented with the rules page (Figure 18). New rules need to be created to support new languages or dialects.



Figure 18 – Rules Screen

Selecting **Create a New Rule** allows you to specify a new rule to suit your particular needs (Figure 19). Each rule requires a name, and a difference threshold as a minimum. Optional fields are the single line comment character string and beginning and ending multi-line comment strings.

Figure 19 – Create a New Rule Menu

When your new rule has been fully defined, click on the **Create New Rule** button and a confirmation screen is displayed. The newly created rule is immediately available for use in a measurement session.

Modifying Rules

When you wish to change an existing rule, select **Modify an Existing Rule** from the Rules Menu (see Figure 18). You are then presented with a screen where you must choose a rule to modify (Figure 20).

Figure 20 – Modify an Existing Rule Screen

Once a rule has been selected, click on the **Get Rule** button and the Modify an Existing Rule Detail screen is displayed (Figure 21).

HOME | BLOG FAQ | HELP

Compare Files | Reports | Superadmin | Rules | Logout

* Required Fields

Rule ID:*

Single line comment character:

Beginning multiline comment character:

Ending multiline comment character:

Difference threshold. If the number of changed characters is greater than this number, it will be considered a new line. If the number of differences is less than or equal to this number, the line will be considered a changed line.*

HOME | BLOG FAQ | HELP

Figure 21 – Modify an Existing Rule Detail Screen

When the changes to the rule have been updated, click on the **Update Rule** button and a confirmation message appears.

Purge Data from Database

If you wish to delete all stored reports, rules and data from the database (generated by all users from your Customer ID), click on the **Purge Data From Database** link. After a confirmation message, all your saved data will be deleted from the database. If you wish to save the data prior to purging, you should export the desired reports to files prior to purging the database (see .Export Data to a File).

4. How EZ-Metrix Works

Directory Results – Non-Comparison

The directory results measure results at the file level.

Total Files in Directory

This is a simple count of the number of files measured in the selected directory.

File Results – Non-Comparison

File results are those measures that pertain to the measurement of a single list of source files.

Total Lines in File

The total lines measurement for a given file is defined by the sum total number of physical lines of code, comments and blank lines. This measurement serves as a foundation upon which the other measures (defined below) are based.

$$\text{Total Lines in File} = \text{Lines of Code} + \text{Comment Lines} + \text{Blank Lines}$$

Comment Lines

Comment lines are those defined by the rules in use during the measurement session. Rules may be created by the user in order to determine where a comment begins and/or ends. EZ-Metrix utilizes these rules to separate lines of code from comments, and measures these separately. If a comment is on the same line as code, the line will be considered a line of code, and will not be considered a comment line. If the comment is on a line without code, it will be considered a comment line. If a blank line is embedded within a multi-line comment, it will be counted as a comment line, not a blank line.

EZ-Metrix reduces the total number of physical lines in the file by the number of comment lines in each source file, and retains the number of comments as a separate measurement.

Blank Lines

A blank line is defined as a line with nothing on it but a carriage return, and not surrounded by multi-line comment delimiters (e.g., not embedded within a comment).

EZ-Metrix reduces the total number of physical lines by the number of blank lines in each source file, and retains the number of blank lines as a separate measurement.

Source Code Lines

A source code line is defined by those lines which are not comments or blanks (see above for definitions). In other words:

$$\text{Source Code Lines} = \text{Total Lines in File} - \text{Comment Lines} - \text{Blank Lines}$$

Directory Results - Comparison

The directory results measure results at the file level.

Same Files

The number of source files which have remained unchanged, as compared to the old (i.e., baseline) source file list. Files are considered the same if the new and old filenames are identical. This measurement is produced and reported once for each comparison session.

Deleted Files

The number of source files which have been deleted from the old (i.e., baseline) source file list. This measurement is produced and reported once for each comparison session.

New Files

The number of source files which have been added to the old (i.e., baseline) source file list. This measurement is produced and reported once for each comparison session.

File Results – Comparison

These file results are those measures that pertain to the comparison measurement of a list of source files.

New Lines of Code

The number of lines of source code (see definition above) which have been added to the old (i.e., baseline) source file. This measurement is produced and reported for each pair of source files provided to EZ-Metrix for comparison purposes. Note: a pair of source files is defined as those with identical filenames.

Deleted Lines of Code

The number of lines of source code (see definition above) which have been removed from the old (i.e., baseline) source file. This measurement is produced and reported for each pair of source files provided to EZ-Metrix for comparison purposes.

Same Lines of Code

The number of lines of source code (see definition above) which remain unchanged (are identical to each other), as compared to the old (i.e., baseline) source file. This measurement is produced and reported for each pair of source files provided to EZ-Metrix for comparison purposes.

Changed Lines of Code

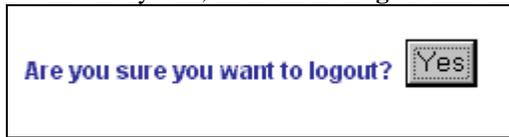
The number of changed (i.e., modified) lines, as compared to the old (i.e., baseline) source file. A changed line is defined by the difference threshold rule that establishes the number of mismatched characters (as a percentage) between old and new files in order to differentiate changed lines from those that have been deleted and replaced with a new line. If a line in the new source file has changed characters fewer or equal to the threshold (as a percentage of the old file), the line is counted as changed. A changed character may be one which is added, modified or deleted. The percentage of change is determined (new to version 4.1.0.3) using the Levenshtein-Distance algorithm.

For example, if you set the threshold to 5%, and compare two files where a 100-character long line is modified by adding 5 or fewer characters, EZ-Metrix will count this line as a changed line. If, however, 6 characters were added to an existing 100-character long line, EZ-Metrix counts this line as both a new and a deleted line.

When the comparison is performed according to this rule, EZ-Metrix measures how many lines have changed between the compared source files. This measurement is produced and reported for each pair of source files provided to EZ-Metrix for comparison purposes. Changed lines apply equally to both lines of code as well as lines of comments. For lines which contain both code and comments, the length of the line includes both code and comments.

5. Logging out of EZ-Metrix

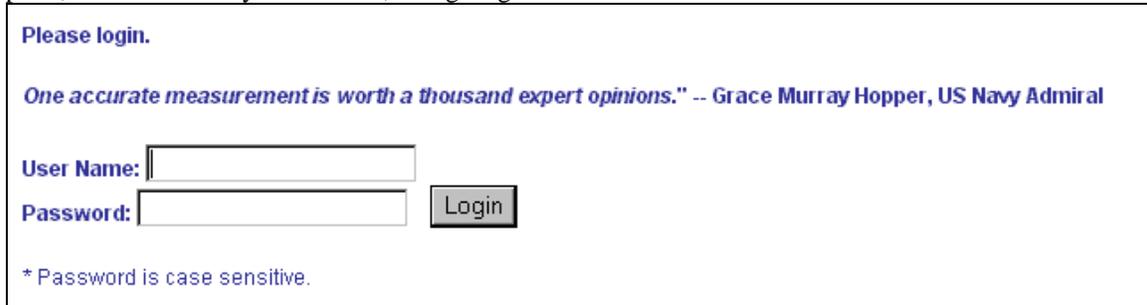
To exit the system, click on the **Logout** link and you are presented with a confirmation screen.



Are you sure you want to logout?

Figure 22 – Logout Confirmation

If you choose to exit the application you are presented with the home page once again (Figure 23). At this point, it is safe to exit your browser, or login again to start a new session.



Please login.

One accurate measurement is worth a thousand expert opinions." -- Grace Murray Hopper, US Navy Admiral

User Name:

Password:

* Password is case sensitive.

Figure 23 – Login Screen

6. Conventions

Several conventions are used by EZ-Metrix to ensure high quality results and a pleasant user experience. The user should understand these rules, in case the system behaves in a manner that raises questions in the mind of the user.

Unique Session Name

If a session name is provided to the system, it must be unique for each day of system use. If, for example, within a single day, a user names a session “Session #1” then later that same day chooses the same name for another measurement session, the system will produce an error message. The user will be forced to change the session name of the second instance, so that it is unique for that day. If the session name is left blank, the system assigns a unique session name for each session (Current date and time).

Session Time-out

For security reasons, after a 30-minute period of inactivity, your EZ-Metrix session will automatically time out. When this happens, any feature selected will result in the Login Screen to be displayed (Figure 1). If you would like to continue working, you will first have to login to EZ-Metrix before proceeding.

7. Minimum System Configuration

Before you get started with EZ-Metrix, your computer must satisfy these minimum system configuration requirements:

Operating Systems

- Windows 98SE
- Windows Me
- Windows 2000 SP2 or higher
- Windows XP with or without SP1
- Windows 7 or later.

Browsers

- Microsoft Internet Explorer 5.5 with Service Pack 1 or higher
- Microsoft Internet Explorer 6.0 with or without Service Pack 1
- Microsoft Internet Explorer 8 or later
- Google Chrome with IETab add-in (or equivalent) installed.

Trusted Site

In order to use EZ-Metrix, you must first setup your IE browser to trust the EZ-Metrix website. See Trusted site for details.

Active Internet Connection

In order to log in and use the EZ-Metrix system, you must be connected to the EZ-Metrix website. EZ-Metrix requires this connection to authenticate users and to store measurement reports and rules on the server.

Administrator Rights on Workstation

Depending upon your operating system, you may need to have administrator rights on the workstation that will be downloading the ActiveX application components. If the ActiveX components are not downloaded, the system will not operate correctly.

8. Getting Help

On-line Help

EZ-Metrix has an on-line help system that is available at any time (even when not logged in). To use the help system, click on the **Help** link **I HELP** located in the upper-right portion of every screen. A new browser window will launch and display help topics, while leaving your measurement session running in the original browser session.

The help system is displayed, showing numerous topics of helpful information, covering every major system function (Figure 24). When finished with the help system, click on any of the other menu items to invoke other system functions.

EZ-Metrix® Help
Size matters after all...

Install Docs Log In Measure Report Rules

Help On Help
Click on a button above related to the general topic of interest, or click a key word below to get detailed definitions.

Key Words

Session Information

Compare Date

Session ID

Session Name

Rule ID

Compare Type

Directory Results

Old Files Directory Path

New Files Directory Path

Installation Help

Two ActiveX controls need to be installed in order to use all EZ-Metrix features. These controls are not signed with a digital signature, so you will need to [set your browser](#) to download and use unsigned ActiveX controls. **THIS IS IMPORTANT!** If the ActiveX controls are not installed, EZ-Metrix will not work properly. Once this has been done properly, the ActiveX controls will download automatically (page refresh may be required).

- TLTBrowseDirButton is used to browse for a directory.
- SourceCodeCompare is used to compare the source files.

Once the ActiveX controls have been installed, you are ready to begin.

Temporarily [disable pop-up blockers](#) (if any).

If you are using firewall software, you may be warned when the ActiveX program starts up. If this happens, click on allow the script to run to completion.

Setting up Internet Explorer

(EZ-Metrix supports only Microsoft Internet Explorer at this time)
Other browsers such as [Google Chrome](#) or Mozilla Firefox may also work (with add-in programs), but these are untested with EZ-Metrix at this time.

Setup sequence for IE v6, IE v8, IE v11

Here's how to setup IE v6:

1. Open Internet Explorer
2. Select "Tools" from the menu
3. Select "Internet Options..."
4. Select the "Security" tab
5. Select the "Trusted sites" icon
6. Select the "Sites..." button
7. Type in <http://www.ezmetrix.com> under "Add this Web site to the zone"
8. Select the "Add" button

Figure 24 – Help System

Email support

In case the on-line help doesn't answer your questions, licensed users may request support via email. Send a detailed description of your symptom or question to: info@jamesheiresconsulting.com. You will get a response via email.

9. Appendix A – Supported Languages

1. ABAP	22. Expect	43. MUMPS	64. sed
2. Ada	23. fit	44. mySQL	65. SGML
3. ALGOL	24. flex	45. nmake	66. shell
4. ALGOL 60	25. Forth	46. Objective-C	67. SPARK
5. antlr	26. FORTRAN 90	47. Oracle	68. spock
6. as	27. Go	48. PADL	69. SQL
7. asp	28. Haskell	49. Pascal	70. TCL
8. Assembly	29. HTML	50. pdpas	71. TMS (testscripts - ts)
9. awk	30. humdrum	51. Perl	72. UNIX shell
10. bash	31. IFDL	52. Perl5	73. VB Class
11. BASIC	32. Java	53. PHP	74. VB Form
12. bison	33. Javascript	54. pike	75. VB.NET
13. Bourne shell and variants	34. JOVIAL	55. PL/SQL	76. VBA
14. C (ANSI)	35. Jscript.NET	56. PL1	77. Visual Basic
15. C shell	36. jsp	57. PLi	78. Visual C++
16. C#	37. leap	58. PowerBuilder	79. Visual Studio.NET
17. C++ (Msft)	38. lex	59. prl5 (PRL 5.0)	80. XML
18. ColdFusion	39. lisp	60. ps	81. Yacc
19. Delphi	40. LR	61. Python	
20. DHTML	41. make	62. Ruby	
21. dosbatch	42. Makefile	63. sdl	

10. Appendix B – Typical Rule Settings by Language

Language	Single Line Comment Character	Beginning Multiline Comment Character	Ending Multiline Comment Character
ABAP	*		
Ada83	--		
ALGOL		comment	;
ALGOL 60	;		
Antlr	//	/*	*/
As	#		
Asp	'	<!	-->
ASP		<!	>
Assembly	;		
Awk	#		
Bash	#		
BASIC	rem		
Bison		/*	*/
Bourne shell	#		
Bourne shell	:		
C (ANSI)		/*	*/
C shell	#		
C#	//	/*	*/
C++ (Msft)	//	/*	*/
ColdFusion	<!--	<!--	---->
Delphi	//		
DHTML		<!--	-->
Dosbatch	rem		
Expect	#		
Fit	#	#[]#
Flex	--	{	}
Forth		()
FORTRAN 90	!		
Haskell		{-	-}
HTML		<!--	-->
Humdrum	#		
IFDL		/*	*/
IFDL		{	}
Java	//	/*	*/
JavaScript		<!--	//-->
JOVIAL		comment	;
Jscript.NET	//	/*	*/
Jsp	//	<%--	--%>
Jsp	//	/*	*/
Leap		/*	*/
Lex		%{	%}

Language	Single Line Comment Character	Beginning Multiline Comment Character	Ending Multiline Comment Character
Lex		/*	*/
Lisp	;	#	#
LR	&C		
Make	#		
Makefile	#		
MUMPS	#		
MySQL	--		
MySQL	#		
Nmake		/*	*/
Objective-C	//	/*	*/
Oracle	--	/*	*/
PADL	%		
Pascal		{	}
Perl	#		
perl5	#		
PHP	// or #	/*	*/
Pike		/*	*/
PL/SQL	--	/*	*/
PL1		/*	*/
Pli		/*	*/
PowerBuilder	//	/*	*/
Python		<%--	--%>
Python	#		
Ruby	#	=begin	=end
Sdl		/*	*/
Sed	#		
SGML		<!	>
Shell	#		
SPARK	--		
Spock	!		
SQL	--	/*	*/
TCL	#	{	}
TCL/TK	#		
TMS	#	/*	*/
UNIX shell	#		
Visual Basic	'		
VB.NET	'		
VB.NET	REM		
Vbscript	'		
Vbscript	REM		
Visual C++	//	/*	*/
XML		<!--	-->
Yacc		/*	*/