Diablo EZReporter Software

Advanced Post-Run Reporting and Analysis for Chromatography Data Systems

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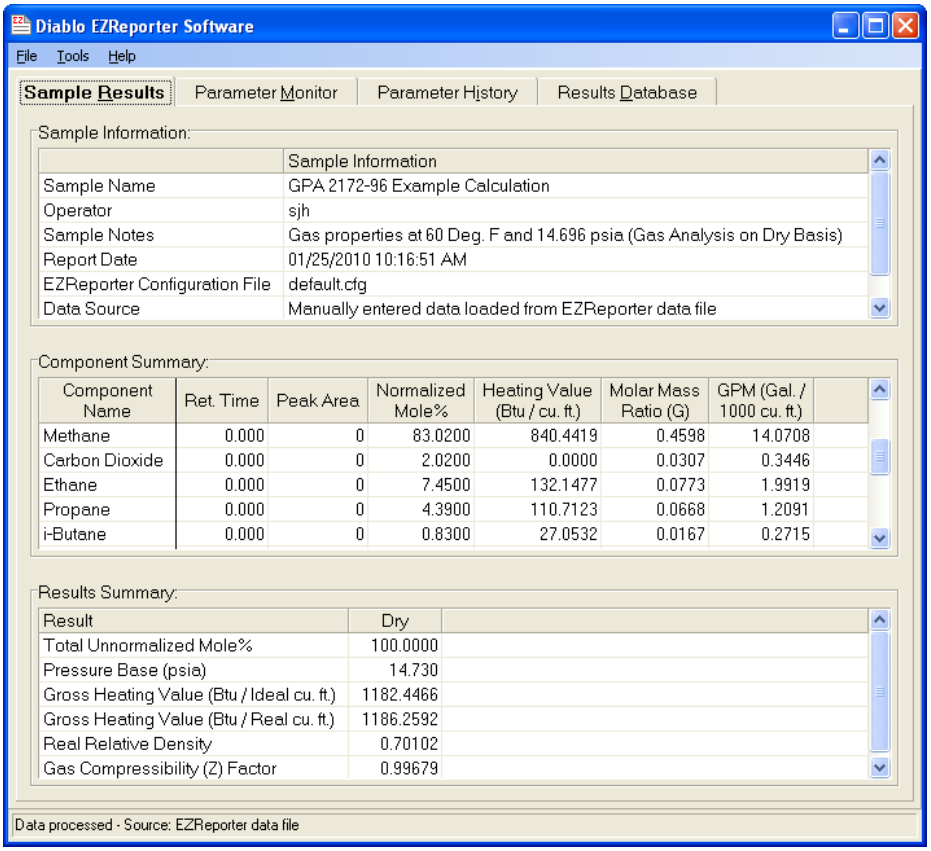

Diablo Analytical EZReporter Software

Reference Manual

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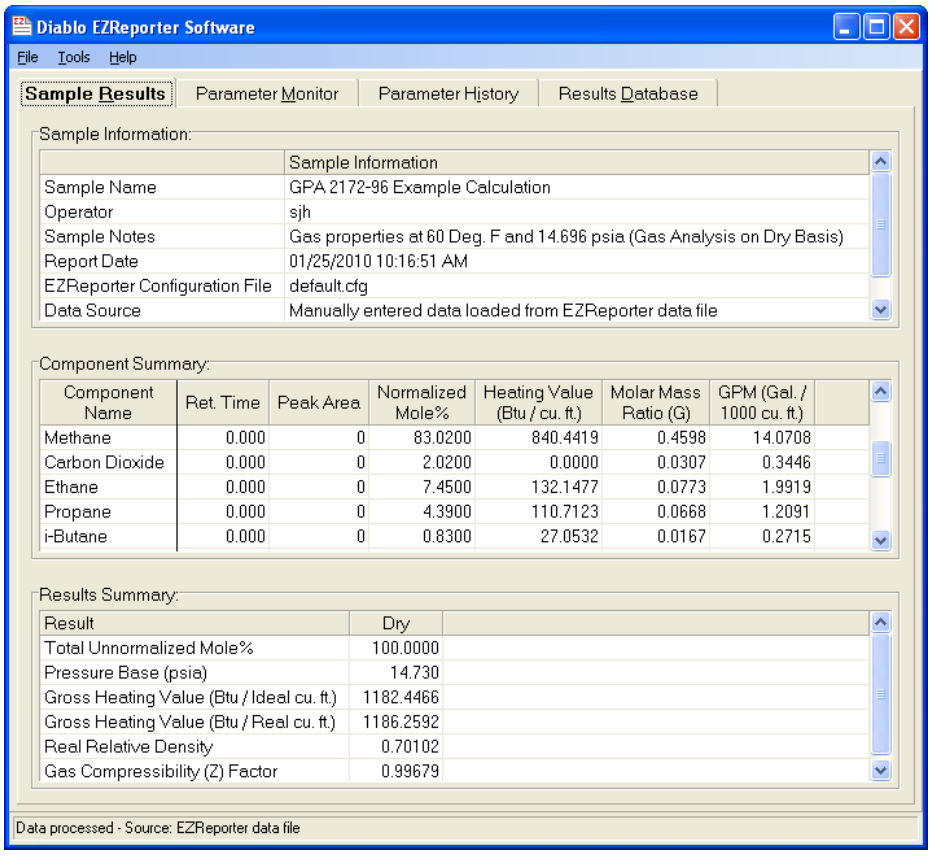
Introduction

EZReporter Software Overview

Advanced Post-run Reporting and Analysis for Chromatography Data Systems.

EZReporter is a flexible, advanced post-run analysis and reporting solution for a number of supported chromatography data systems.



The Diablo Analytical EZReporter Software

The EZReporter software includes a base reporting module and three optional modules: a Natural Gas Analysis (NGA) calculation and reporting module, a Results Database module, and an Analog & Digital Output module used with the National Instruments Compact FieldPoint hardware. These modules are combined in several different "Editions" of the EZReporter software.

EZReporter Edition	Modules Included
Standard Edition	Base Module Only
Natural Gas Analysis Edition	Base and Natural Gas Analysis Modules
Results Database Edition	Base and Results Database Modules
NGA Database Edition	Base, NGA, and Results Database Modules
Analog and Digital Output Edition	Base and Analog & Digital Output Module

The Base Module is required for all Editions of the software. You can also license and activate individual Modules at a later time if your needs change. The features included in each module are summarized below.

Base Software Module

The Base software module can be licensed by itself or you can add one or both of the optional modules. The features present in the base module include:

- **Process Results Automatically from supported chromatography data systems**
- **Multi-Channel Reporting**: Results from multiple detector channels can be combined into a single report with both raw and normalized amounts displayed.
- **Easily Updated and Customized**: The component list is completely customizable. Components can be added to or deleted from the component list.
- **Data Export**: Results can be exported to a text file for transfer to a Laboratory Information Management System (LIMS), Process Control System, or even Microsoft Excel. The format of the text file can be easily customized using EZReporter's flexible Export Templates.
- **Monitor Specific Results**: You can set up both component and calculated results as monitored parameters that are displayed in a separate monitoring window.
- **High and Low Alarms:** You can set both high and low alarm limits for monitored parameters.
- **Trend/History Plots**: You can plot the historical value of any of the monitored parameters. The trend plot can be printed, copied to the Windows clipboard, and the historical data can be exported to a comma-delimited text file.
- **Include Results from Other Analyzers:** The component list can be configured so that results from other analyzers can be entered manually for specified components and included in the reports.

Optional Natural Gas Analysis Module

The optional Natural Gas Analysis (NGA) module is designed to perform Natural Gas / Refinery Gas / Natural gas Liquids (NGL) heating value and related

calculations. The results from these calculations are available for reporting, monitoring, trend plotting, and exporting through the base module. The features present in the NGA module include:

- **Standard GPA/ASTM/ISO Calculations**: Calculates Dry/Saturated/Wet Gross and Net Heating Value, Real Relative Density, Gas Compressibility factor, GPM value, Wobbe Index, and a large number of other results using GPA 2172-09, 2177-03, 2186-02, ASTM D2598-02 (vapor pressure and relative density), and ISO 6976 standard calculations.
- **Physical Properties can be Easily Customized**: The component list is completely customizable. Components can be added to or deleted from the component list, and calculation factors (Heating Value, Molar Mass Ratio, Summation Factor, and GPM Volume Factor, etc.) can be updated by the user as needed.
- **Standard Physical Property Tables**: Standard component physical property tables are provided for:
  - the GPA 2145-03 and GPA 2145-09 Standards
  - the GPSA Engineering Data Book (12th Edition, 2004)
  - the ASTM D3588-98 (2003) standard
  - the GPA TP-17 Standard
  - the ASTM D2598-02 (2007) standard (vapor pressure and relative density)
  - the ISO 6976 Standard

Optional Results Database Module

The optional Results Database module allows you to capture results and save them in a local SQLite database. A few of the capabilities of the Results Database are listed below.

- **Local "Zero Configuration" Database**: Sample results including sample information, individual component results, and calculated natural gas analysis (NGA) results can be added automatically to a local results database.
- **Search for Results**: You can search the results database for historical results by Sample Name or Results ID. Results can be filtered further by Injection or Report Date and Results or Export Status.
- **Batch Processing**: You can batch reprocess multiple results from the database. Reprocessing options include printing reports, exporting results, and trend-plotting results.
- **Statistical Analysis**: Statistics including average, standard deviation, %RSD, maximum, and minimum are calculated and displayed when performing sample name searches**.**
- **Compare Results**: A results comparison window can be used to compare the component normalized mole% values between two samples using either the GPA 2261 repeatability or reproducibility limits (or any other limits entered by the user).
- **Track Result Status**: Each result in the database has a "Status" field that can be set to "None", "Accept", or "Reject" status. The status field

can then be used in searches or batch reprocessing to filter which results are selected.

- **Import Results**: You can import results into the Results Database from comma- or tab-delimited text files.

Optional Analog and Digital Output Module

The EZReporter Analog and Digital Output Module allows you to generate analog/signal outputs and digital/alarm outputs based on Monitored Parameter results using National Instruments Compact FieldPoint I/O hardware. See the Analog and Digital Output Module Quick Start Guide for information on the Compact FieldPoint hardware requirements and the capabilities of this optional module.

Notes for BTU Calculator Users

The Diablo EZReporter Software is the next-generation of the Diablo BTU Calculator Software. The EZReporter Natural Gas Analysis (NGA) Edition is the direct replacement for the BTU Calculator software. Existing licenses of the BTU Calculator can be upgraded to the EZReporter NGA Edition.

System Requirements

The software is designed for operation under the Microsoft Windows 7 Professional and Windows XP Professional operating systems. See the EZReporter Quick Start Guide for your chromatography data system for any special requirements.

Important:

Important: It is the customer's responsibility to set up the Gas Chromatograph and chromatography data system so that calibrated peak results are produced from the analysis.

Installing the Software

To install the software, simply run the installation program that was downloaded from our web site or provided on the installation CD-ROM. Follow the directions presented by the installation program. The installation program will install the Diablo EZReporter in trial mode on new systems, or will update licensed installations to the latest version of the software.

Important:

Important: You must be logged in to an account with Administrator privileges in order to install the software.

Important: Any users who will be running the software under a non-administrator account must have full read/write permissions to the EZReporter directories and files. The installation program grants these rights to the "Everyone" user group. However, if the "Everyone" user group is disabled on the network, then you will have to grant these permissions manually.

Installation Paths and Folders

The EZReporter software is installed to the folder,

"C:\Program Files\Diablo EZReporter" (Win XP and Win 7-32 bit)

"C:\Program Files (x86)\Diablo EZReporter" (Win 7-64 bit)

EZReporter configuration and template files are saved in the "Settings" folder,

"C:\Program Files\Diablo EZReporter\Settings" (Win XP and Win 7-32 bit)

"C:\Program Files (x86)\Diablo EZReporter\Settings" (Win 7-64 bit)

EZReporter data files are saved by default in the "Data" folder,

"C:\Program Files\Diablo EZReporter\Data" (Win XP and Win 7-32 bit)

"C:\Program Files (x86)\Diablo EZReporter\Data" (Win 7-64 bit)

Upgrading from the Diablo BTU Calculator Software

The EZReporter Natural Gas Analysis (NGA) Edition replaces the BTU Calculator software and can read existing BTU Calculator configuration and data files directly.

The EZReporter installer doesn't touch an existing BTU Calculator installation - the two programs can be installed and run on the same computer.

Automatic Import of Configuration and Template Files

The first time you start EZReporter, the software will attempt to import any custom (non-default) configuration or export template files from the BTU Calculator installation folder. It will also edit the imported configuration files so that the default data directory and/or export directory no longer point to their old location in the BTU Calculator folder structure (if that is where they were set). The original files are not modified by the import procedure.

Configuration and template files are now kept in the "Settings" folder under the EZReporter installation folder in order to reduce clutter in the main installation folder and make it easier to find these files.

Changes to Chromatography Data System Methods

You may need to update your chromatography data system methods in order to have them use EZReporter instead of the BTU Calculator for automatic processing. See the EZReporter Quick Start Guide for your data system for more information.

Software License and Registration

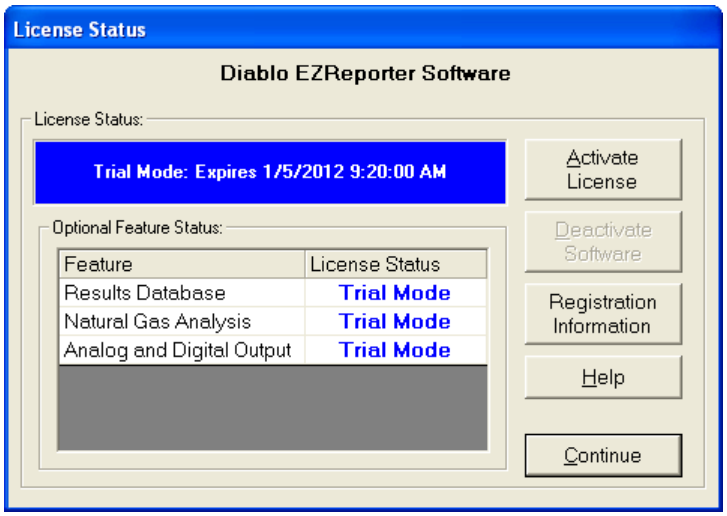
The EZReporter software is distributed as a fully functional 30-day trial application. The trial version has all of the features of the registered version, but you will be reminded that you are running the trial version with a "nag" screen each time you start the software. At the end of the 30-day trial period the application will no longer start unless you purchase a license or request an evaluation extension from Diablo Analytical.

Important:

Important: The Results Database, Natural Gas Analysis (NGA), and Analog & Digital Output Modules are add-on options that require payment of additional license fees and require separate license activation codes (unless they are included in the particular software edition that you have licensed). However, you can evaluate these features during the 30-day trial period of the base software. If you activate the base software without also activating the optional module, then those features from the un-activated module will be disabled.

Activating your License

Please refer to the Diablo Software License Guide for information on how to activate the base EZReporter module or any of the optional modules. This guide can be accessed through the "Help" button on the License Status window that is displayed when you start the software or by selecting the "License Status" option of the "Help" menu. An Adobe Acrobat (PDF) version of the guide is also saved in the EZReporter installation folder.



The EZReporter "License Status" window used to activate the software.

Technical Support

The Diablo EZReporter software was written and is supported by:

Diablo Analytical, Inc.
5141 Lone Tree Way
Antioch, CA 94531

Phone: (925) 755-1005
Fax: (925) 755-1007

Phone

If you want to speak directly with technical support, call us at **(925) 755-1005**.

Fax

Fax a description of your problem or suggestion to us at **(925) 755-1007**.

Electronic Mail

Use our dedicated support address for e-mail based technical support:
support@diabloanalytical.com

World Wide Web

Use our web-based help desk to submit and track support requests:
http://www.diabloanalytical.com/support.htm

Natural Gas Analysis Calculations

The calculations used in the Natural Gas Analysis module are based on the GPA 2172-09 Standard, the GPA 2186-02 Standard for Natural Gas Liquids (NGL) calculations, and the ISO 6976 Standard. The physical properties used in the calculations can be chosen and/or modified by the user. However, the software includes example configuration files and standard component physical property tables from a number of different data sources including GPA 2145-09 and ISO 6976.

Special Considerations for the ISO 6976 Standard

The ISO 6976 Standard includes physical properties for a number of different combustion and metering temperatures. The description of the standard physical property data source for the ISO data is of the form, "ISO 6976 (1995) at 25/20 Deg. C", where the first temperature is the combustion temperature (25 Deg. C in this example) and the second temperature is the metering temperature (20 Deg. C in this example).

Important:

Important: If you upgrade or re-install the EZReporter Software, all of the default configuration files will be overwritten with the current versions. Consequently, if you use any of the default configuration files as the basis for a custom configuration, make sure to save your configuration file with a different file name.

See "Natural Gas Analysis" on page 54 for more information on configuring EZReporter for Natural Gas Analysis.

Disclaimer

Important:

Important: It is the customer's responsibility to ensure that the physical properties and other settings in the EZReporter configuration generate results that are correct for their application.

The choice of which physical property values to use is a business decision that can only be determined by you and your use of the data and results.

Please review the License Agreement and Limited Warranty displayed at the beginning of the printed manual for Diablo's limits on liability.

Pressure Base

All of the default configuration files use a Pressure Base of 14.696 or 14.73 psia. It is the customer's responsibility to determine the correct Pressure Base to use for their specific requirements. Note that the North American Energy Standards Board (NAESB) specifies a standard pressure base of 14.73 psia. Consequently many companies are adopting 14.73 as the standard pressure base for these calculations. The ISO default configuration files all use a Pressure Base of 101.325 kPa.

Rounding

Normalized mole percent values are rounded to the number of decimal places specified in the Calculation Settings tab of the configuration editor (see "Component Amount Precision" on page 28). If rounding causes the *total* normalized mole% not to sum to 100%, then a correction is made to the normalized mole% of the most concentrated component in the sample (usually methane for NGA applications) to force the total to 100%.

Water Calculations

If water exists as a component in the component list, then "Saturated" results will be calculated using the base temperature (60 degrees F) and pressure and reported along with the "Dry" results. If you enter the water content manually so that the mole% of water is greater than 0, then "Wet" results will also be calculated based on that mole% value. You can also choose to calculate the water content correlation based on the actual flowing temperature and pressure. If you enable this option, then "Wet (flowing)" results will be reported instead of "Wet" results.

Note: in the case of configuration files that are based on the ISO 6976 standard, the water vapor pressure used in the calculation of saturated results is based on the metering temperature for the physical property data being used.

See "Component Settings for Natural Gas Analysis" on page 54 for more information on setting up the component list to include water, and "Water Settings for "Saturated" and "Wet" Calculations" on page 60 for information on setting up water-related calculation factors.

Important:

Important: All NGA calculations assume that the compositional analysis was performed on a *dry* basis. The component mole fractions from the dry analysis and calculated results are corrected for the water mole fraction when performing the saturated and wet calculations.

Disabling NGA Calculations

The Natural Gas Analysis calculations can be disabled if you want to use the software only for general reporting and exporting of analysis results. See "Disable Natural Gas Analysis Calculations and Reporting" on page 58 for more information.

Resources

Gas Processors Association

6526 East 60th Street

Tulsa, Oklahoma 74145

Phone: 918-493-3872

Web: www.gasprocessors.com

ASTM International

100 Barr Harbor Drive

PO Box C700

West Conshohocken, PA 19428-2959

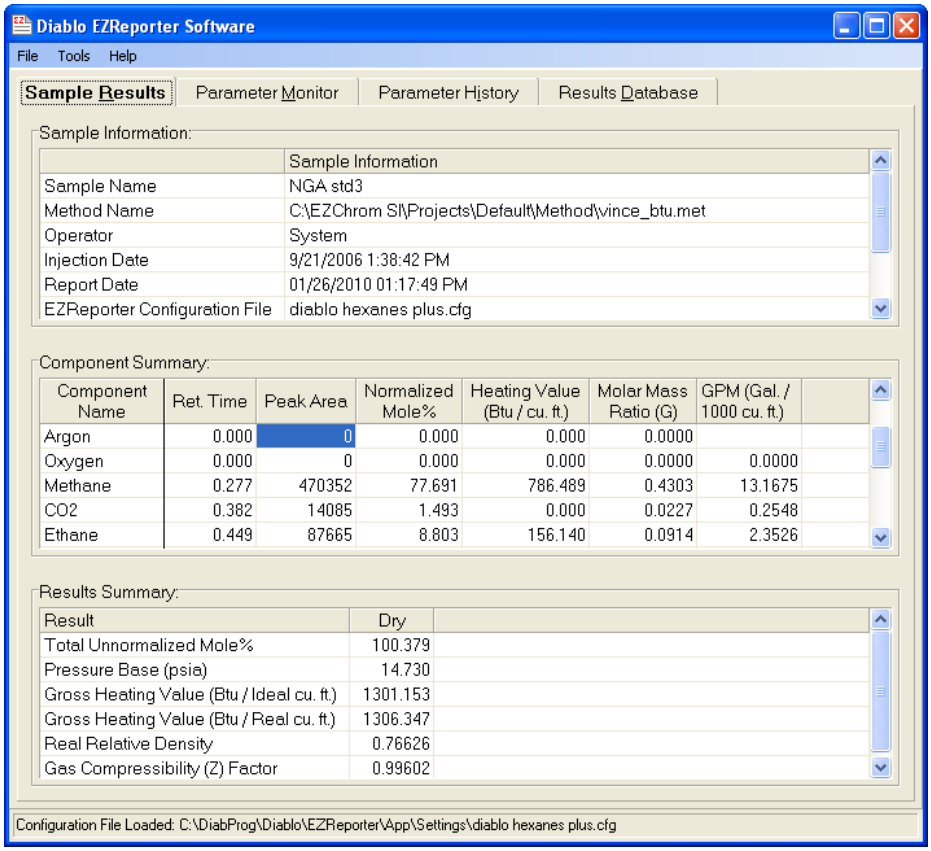
Phone: 610-832-9585

Web: www.astm.org

Getting Started

The Sample Results Window

After starting the software, the following window is displayed. This window shows the "Sample Results" tab containing the results of the last analysis (but will be blank when the software is first started).



The "Sample Results" tab on the Main Screen of the Diablo EZReporter Software

Sample Information

This section of the main screen contains the sample information that was passed to the software from the chromatography data system, or was entered by the user during manual processing. You can also define custom sample information fields if you would like to include additional data in the report. See "Sample Info" on page 33 for more information on this capability.

Note: Blank sample information fields are *not* displayed in the sample Information table.

Component Summary

This section contains a summary of the individual component results including,

- Component Peak **Retention Time**
- Component **Peak Area**
- Component **Raw Amount**
- Component **Normalized Amount**

NGA Edition:

- Component Normalized **Mole%**
- Component Normalized **Weight%**
- Component Normalized **Liquid Volume%**
- Component **Gross Heating Value** (BTU / ideal cu. Ft.) or **Superior Calorific Value** (MJ / m^3) on a volumetric basis
- Component **Gross Heating Value** (BTU/lbm) or **Superior Calorific Value** (MJ / kg) on a mass basis
- Component **Gross Heating Value** (BTU/gal.)
- Component **Superior Calorific Value** (kJ / mol) on a molar basis
- Component **Net Heating Value** (BTU/ideal cu. ft.) or **Inferior Calorific Value** (MJ / m^3) on a volumetric basis.
- Component **Net Heating Value** (BTU/lbm) or **Inferior Calorific Value** (MJ / kg) on a mass basis
- Component **Inferior Calorific Value** (kJ / mol) on a molar basis
- Component **Molar Mass Ratio** (Ideal Relative Gas Density)
- Component **Ideal Gas Density** (lbm/cu. ft. or kg/m^3)
- Component **GPM** value (gallons / 1000 cu. ft.)
- Component **Compressibility** (xi * bi)
- Component **Vapor Pressure** (psia)
- Component **Relative Liquid Density**
- Component **Absolute Liquid Density** (lbm/gal.)
- Component **Molecular Weight**
- Component **D2598 Vapor Pressure (**psig**)**

- Component **D2598 Relative Density**

Results Summary

The calculation results are displayed in this section of the main screen. Results displayed include,

- **Total un-normalized Amount**
- **Total Normalized Amount**

NGA Edition:

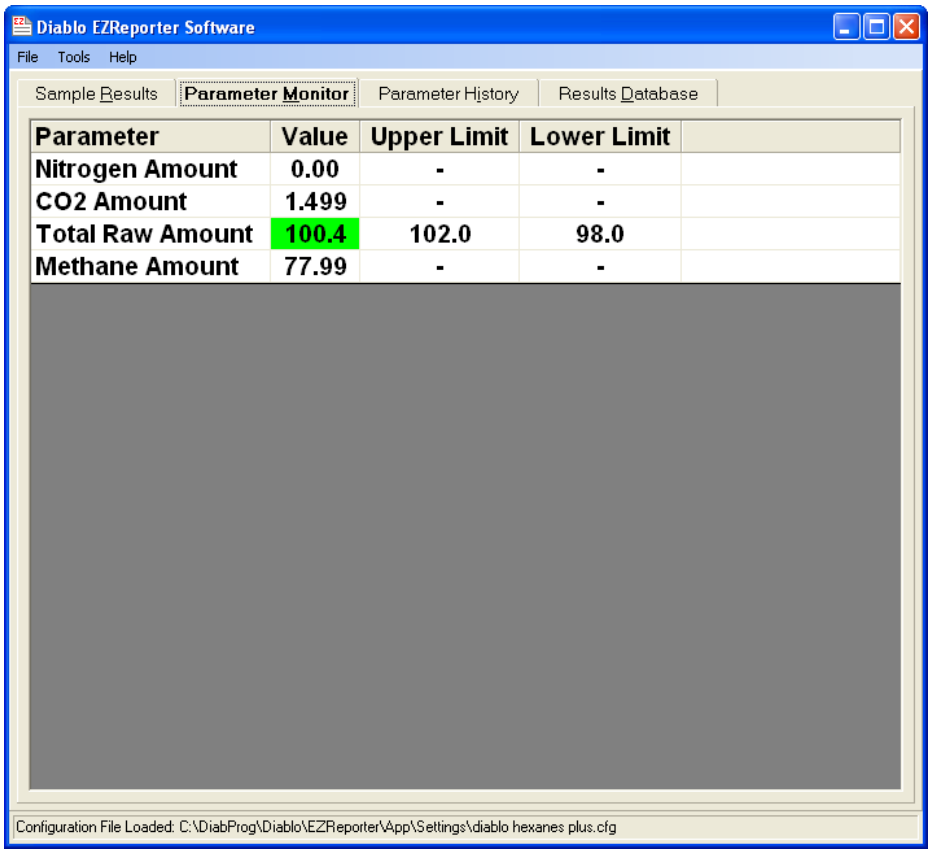
- **Pressure Base** used for the calculation
- **Gross Heating Value** (BTU / real cu. ft.) or **Superior Calorific Value** (MJ / m^3) on a volumetric basis
- **Gross Heating Value** (BTU / lbm) or **Superior Calorific Value** (MJ / kg) on a mass basis
- **Gross Heating Value** (BTU / gal.)
- **Superior Calorific Value** (kJ / mol) on a molar basis
- **Net Heating Value** (BTU / real cu. Ft.) or **Inferior Calorific Value** (MJ / m^3) on a volumetric basis
- **Net Heating Value** (BTU / lbm) or or **Inferior Calorific Value** (MJ / kg) on a mass basis
- **Inferior Calorific Value** (kJ / mol) on a molar basis
- **Real Relative Gas Density**
- **Ideal and Real Gas Density** (lbm / cu. ft. or kg / m^3)
- **Gas Compressibility (Z) Factor**
- **Wobbe Index**
- **Total Molecular Weight**
- **Total GPM** (theoretical hydrocarbon liquid content)
- **Total Vapor Pressure** (psia and psig)
- **Total Relative Liquid Density**
- **Total Absolute Liquid Density** (lbm / gal and lbm / bbl)
- **Total Volume** (cu. ft. / gal.)
- **API Gravity**
- **D2598 Vapor Pressure (**psig**)**
- **D2598 Relative Density**

Customizing the Report

You can customize the report window by choosing which results to display, and what labels to use to describe each result. See "Report - Control" on page 29 for more information.

The Parameter Monitor Window

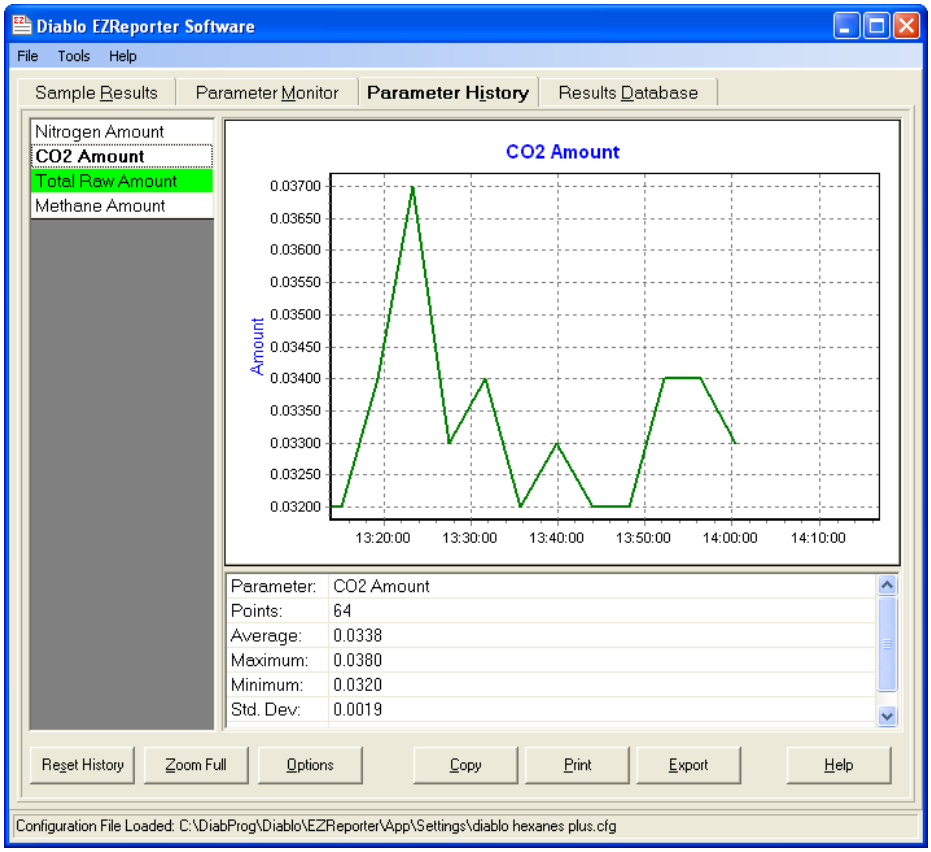
This window shows the Parameter "Monitor" tab that displays the results from the last analysis for any monitored parameters. High and low alarm limits can be set up for each monitored parameter. See "The Parameter Monitor" on page 49 for more information on this capability.



The "Parameter Monitor" tab on the main screen of the Diablo EZReporter

The Parameter History Window

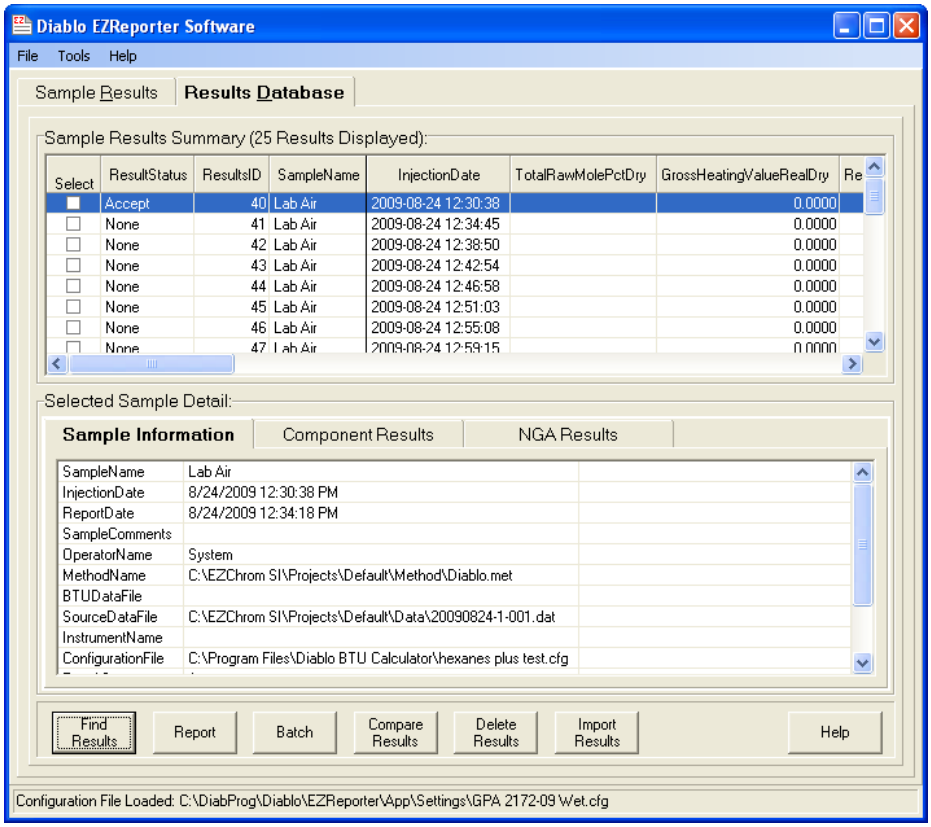
This window shows the Parameter History tab that can be enabled to plot the historical values of any of the monitored parameters. See "Parameter History" on page 49 for more information on this capability.



The "Parameter History" tab on the main screen of the Diablo EZReporter Software.

The Results Database Window

If the optional Results Database module is active, then the Results Database tab/window will be visible. For more information about the Results Database module see, "The Results Database" on page 70.



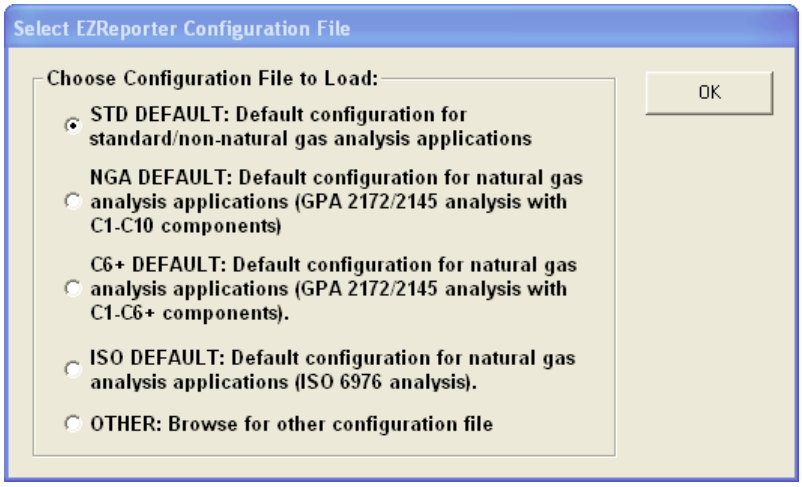
The "Results Database" tab on the main screen of the Diablo EZReporter Software.

Quick Start Instructions

The following instructions describe the key steps that should be performed when using the software for the first time. You will find more detailed instructions in later sections of this manual.

Load and Edit the Configuration File

The first time you run EZReporter the following window will be displayed allowing you to choose the default configuration file you would like to load:



Choose the default configuration that most closely matches your application or browse for a specific configuration file. Once you have loaded the configuration file, you should configure the settings for your application. To open the configuration editor, select the "Edit Configuration.." option of the "Tools" menu.

Additional information about configuring the software can be found in "Configuring the Base Software" on page 24 and "Natural Gas Analysis" on page 54. The default configuration files shipped with the software are listed in the following table.

Important

Important: If you upgrade or re-install the EZReporter Software, all of the default configuration files listed in this table will be overwritten with the current versions. Consequently, if you use any of these default configuration files as the basis for a custom configuration, make sure to save your configuration file with a different file name.

EZReporter Standard Configuration Files	
File	**Description**
Default Configuration Files	
STD Default.cfg	The default configuration for standard/non-natural gas analysis applications. It does not include any pre-configured components. You will need to add the components required for your analysis.
NGA Default	A default configuration for natural gas analysis applications (GPA 2172/2145 analysis with C1-C10 components). The Pressure Base is set to 14.73 in this file.
C6+ Default.cfg	An alternate configuration for natural gas analysis applications (GPA 2172/2145 analysis with C1-C6+ components).. The calculation factors used for the hexanes plus component are based on a 60:30:10 mixture of hexane, heptane, and octane. The GPA 2145-09 Standard was used to calculate the Hexanes+ calculation factors.

EZReporter Standard Configuration Files	
File	**Description**
ISO Default.cfg	A default configuration for natural gas analysis applications (ISO 6976 analysis). The physical property data are for a combustion temperature of 15 Deg. C and a metering temperature of 15 Deg. C.
ISO 6976 (0-0 Deg C).cfg	Similar to the ISO Default configuration except the physical property data are for a combustion temperature of 0 Deg. C and a metering temperature of 0 Deg. C.
ISO 6976 (15-0 Deg C).cfg	Similar to the ISO Default configuration except the physical property data are for a combustion temperature of 15 Deg. C and a metering temperature of 0 Deg. C.
ISO 6976 (25-0 Deg C).cfg	Similar to the ISO Default configuration except the physical property data are for a combustion temperature of 25 Deg. C and a metering temperature of 0 Deg. C.
ISO 6976 (15-15 Deg C).cfg	Identical to the ISO Default configuration with a combustion temperature of 15 Deg. C and a metering temperature of 15 Deg. C.
ISO 6976 (205-20 Deg C).cfg	Similar to the ISO Default configuration except the physical property data are for a combustion temperature of 20 Deg. C and a metering temperature of 20 Deg. C.
ISO 6976 (25-20 Deg C).cfg	Similar to the ISO Default configuration except the physical property data are for a combustion temperature of 25 Deg. C and a metering temperature of 20 Deg. C.
NGL Default (WtPct-Combined).cfg	A default configuration for Natural Gas Liquids (NGL) with "combined" extended fraction reporting. With this calculation and reporting method the extended fraction results are reported separately and are also combined into the standard /total results through the specified combined component (usually Hexanes Plus). This configuration includes the full component list from GPA TP-17 and GPA 2145-09.
NGL Default (WtPct-Combined-Corrected).cfg	A default configuration for Natural Gas Liquids (NGL) with "combined" extended fraction reporting. This configuration file is the same as the "Combined" configuration, but it is also set up to correct the raw component amounts in the extended fraction using a correction ("bridge") factor calculated from the iso-pentane and n-pentane amounts from the standard component range (usually from the TCD detector) and the extended component range (usually from the FID detector).
NGL Default (WtPct-Separate).cfg	A default configuration for Natural Gas Liquids (NGL) with "separate" extended fraction reporting. With this calculation and reporting method, the extended fraction results are reported separately from the standard/total results. This configuration includes the full component list from GPA TP-17 and GPA 2145-09.
GPA 2145-03.cfg	Contains the components and factors in the GPA 2145-03 Standard. The Pressure Base is set to 14.696 in this file.
GPA 2145-09.cfg	Contains the components and factors in the GPA 2145-09 Standard. The Pressure Base is set to 14.696 in this file.

EZReporter Standard Configuration Files	
File	**Description**
GPA 2177-03.cfg	A configuration based on the GPA 2177-03 standard. The pressure base is set to 14.696 in this file.
ASTM D3588-98 (2003).cfg	Contains a sub-set of the components and factors in the ASTM D3588-98 (2003) standard. The Pressure Base is set to 14.696 in this file.
Refinery Gas.cfg	A configuration containing common components found in refinery gas. Physical properties are taken from GPA 2145-09, ASTM D3588 (98), GPSA Engineering Data Book (2004) and other sources.
Calculation Check Configuration Files	
GPA 2172-09 Calculation Check at 14.696 psia.cfg	A configuration designed to check the GPA 2172-09 NGA calculations made at a bas pressure of 14.696 psia. Simply load the corresponding data file (GPA 2172-09 Example Data at 14.696 psia.btu) and switch to the "Parameters" table.
GPA 2172-09 Calculation Check at 14.65 psia.cfg	Same as above except it is designed to check the calculations at a bas pressure of 14.65 psia. Make sure to load the correct data file (GPA 2172-09 Example Data at 14.65 psia.btu)
GPA 2177-03 Calculation Check (VolPct).cfg	A configuration designed to check the GPA 2177-03 calculations made at a baes pressure of 14.696 psia. Simply load the corresponding data file (GPA 2177-03 (VolPct).btu) and switch to the "Parameters" table.
GPA 2186-02 Calculation Check (MolPct-Separate).cfg	A configuration designed to check the GPA 2186-02 NGL calculations using the Mole% component amounts and separate extended fraction report. Simply load the corresponding data file (GPA 2186-02 Calculation Check (MolPct-Separate).btu) and switch to the "Parameters" table.
GPA 2186-02 Calculation Check (WtPct-Combined).cfg	A configuration designed to check the GPA 2186-02 NGL calculations using the Weight% component amounts and combined extended fraction report. Simply load the corresponding data file (GPA 2186-02 Calculation Check (WtPct-Combined).btu) and switch to the "Parameters" table.
GPA 2186-02 Calculation Check (WtPct-Separate).cfg	A configuration designed to check the GPA 2186-02 NGL calculations using the Weight% component amounts and separate extended fraction report. Simply load the corresponding data file (GPA 2186-02 Calculation Check (WtPct-Separate).btu) and switch to the "Parameters" table.
ISO 6976 Calculation Check.cfg	A configuration designed to check the ISO 6976 NGA calculations. Simply load the corresponding data file (ISO 6976 Calculation Check.btu) and switch to the "Parameters" table.

Important:

Hint: The order of the components in the component settings table is the order that they will be printed in the report. You can easily rearrange the component order by first selecting a component's row in the table by ***left*** clicking on that row with the mouse. Next, while the cursor is still pointing to that row, click and hold the ***right*** mouse button and drag the component to a new location in the table. The row being moved will be highlighted in red. Release the right mouse button when the component is located at the desired position in the table.

Important: Be careful rearranging the order of components if you are using Calculated Results or Export Templates that refer to component results. In those instances components are identified by a component index, which is the order of the component in the component table. If you rearrange the component table after you have set up a Calculated Result or Export Template, it is possible that the wrong component will be referenced.

Specify Other NGA Calculation Parameters

Make sure to set the Pressure Base to the correct value for your location or your contractual requirements (see "Natural Gas Analysis Settings" on page 57).

Set the Report Preferences

Modify the report titles as desired. In addition, check "Print report for automatically processed results" if you would like a report to be printed automatically when the software generates a report upon receiving and processing results from the chromatography data system. The report will be printed to the default printer.

Set the Data File Preferences

Specify the directory into which you would like to save EZReporter data files – use the "Browse" button to select or create the desired directory (see "Data Files" on page 32).

Automatic file saving

Check this box if you would like to have a data file created in the default data directory during automatic processing of data from the chromatography data system. The data files are named using a date + time format:

YYYYMMDD-HHMMSS.BTU

Where YYYYMMDD is the current date and HHMMSS is the current time (e.g. 20050208-153423.BTU).

File Naming Options

Check this box if you would like to have the sample name added to the Date+Time formatted file name during automatic processing. If you enable this option, then you can also choose whether to add the sample name *before* (e.g. NGA Sample-20050208-153423.BTU) or *after* (e.g. 20050208-153423- NGA Sample.BTU) the file name.

Set up your Chromatography Data System

Follow the instructions in the EZReporter Quick Start guide to set up your chromatography data system to send results automatically to EZReporter for processing. The Quick Start Guides can be found on the installation CD, or can be accessed via links in the Diablo EZReporter program group.

Running the Software

The Main Menu

The Diablo EZReporter is configured and controlled using the following menu options:

File Menu

New Data File

Select this option to create a new data file and manually enter mole percent data. See "Data Processing and Reporting" on page 51 for more information on this capability.

Open Data File…

Select this option to open an existing EZReporter data file saved on disk.

Save Data File As…

Select this option to save the current data and results to an EZReporter data file.

Export Current Results

Select this option to export the current results to a text file using the settings specified in the Export section of the current configuration.

Save to Results Database

Select this option to save the current results to the Results Database. This option is only available if the Results Database license is in trial mode or has been activated.

Load Configuration…

Select this option to load a configuration file from disk. This is a shortcut to opening the configuration editor and pressing the "Load" button.

Sample-Specific Configurations…

Select this option to enable the use of sample-specific configuration files when processing results automatically from a supported data system. See "Sample-Specific Configuration Processing" on page 52 for more information.

Print

This menu option allows you to print either the results that are currently displayed in the main screen (Print > Report), or the current settings being used by the software (Print > Current Settings).

The “Print > Report” menu option allows you to send the report to either the printer (Print > Report > Send to Printer) or save it to an Adobe PDF file (Print > Report > “Save as PDF).

The “Print > Parameter History Plot…” menu option allows you to print the trend plot and summary statistics for the parameter currently selected in the Parameter History window.

Print Setup…

This option allows you to configure the printer.

Exit

This option immediately closes the software.

Tools Menu

Edit Configuration…

This option displays the EZReporter Configuration Dialog box. See "Configuring the Base Software" on page 24.

Backup Current Configuration Files...

This option backs up the current EZReporter configuration and log files into a single “Zip” archive file and optionally allows you to copy the file to a flash drive or other backup location. The file is named, ‘ezrbackup-yyyymmdd-hhmmss.zip’, where ‘yyyymmdd’ is the current year month and day, and ‘hhmmss’ is the current hour, minute, and second of the day. The file is created in the EZReporter installation folder.

Edit Current Data Set…

This option allows you to re-edit manually entered data sets. It is not available when an automatically processed data set from a chromatography data system is loaded. See "Data Processing and Reporting" on page 51.

Show Export Template Variables…

Displays a table of the “variables” that can be used in an export template file. See the Appendix for more information about Export Templates.

Help Menu

Help Contents…

Displays the contents page of the Diablo EZReporter help file.

View Release Notes

Opens the current release notes (readme.txt). The release notes document the latest changes and enhancements to the software that may not have made it into this document.

NGA Physical Property Update Procedure…

Displays a special help file that describes the procedure you can use to update your existing EZReporter NGA configurations with new physical property constants

License Status…

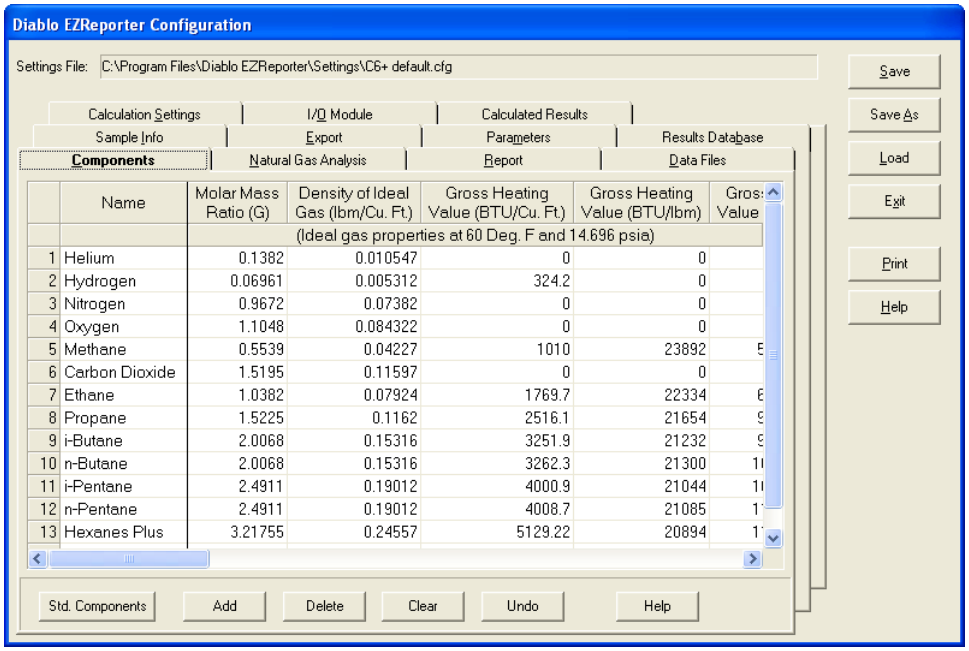
Displays the current license status of the Diablo EZReporter software. This menu option is not displayed in versions of the software that were purchased under a site license.

About Diablo EZReporter…

Displays support and version information about the Diablo EZReporter.

Configuring the Base Software Module

The software is configured using the "Diablo EZReporter Configuration" window, which is displayed by selecting the "Edit Configuration.." option of the "Tools" menu. Note that this dialog box is resizable.



The Diablo EZReporter Configuration Window.

Managing Configuration Files

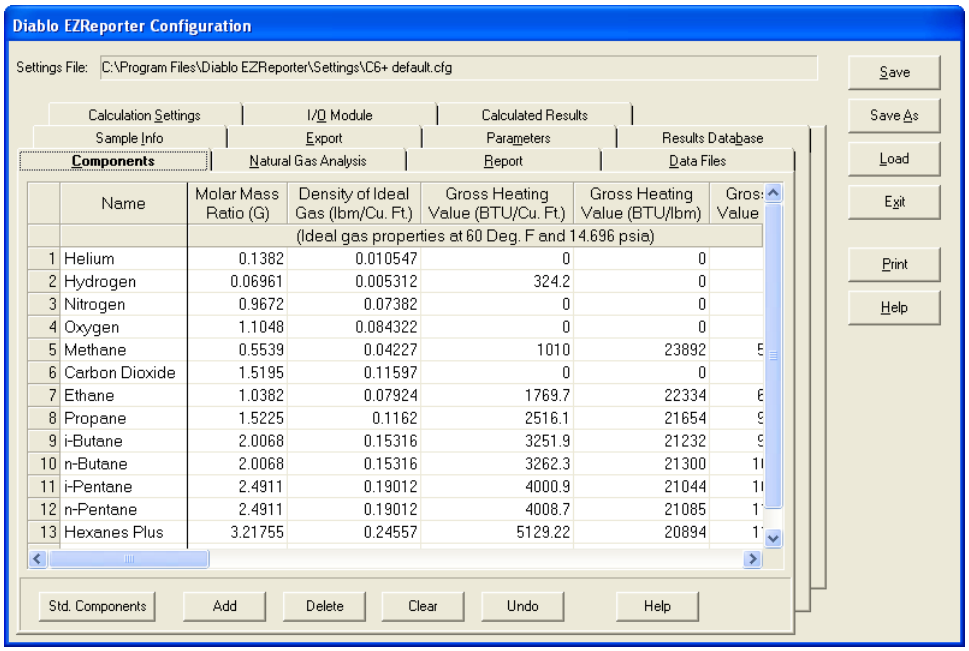
You can Load and Save configuration files using the "Load and "Save" buttons. The "Save As" button allows you to save the current configuration to a new file. Configuration files are saved by default in the Diablo EZReporter installation directory. You can also print a settings report using the "Print" button.

Important

Important: If you upgrade or re-install the EZReporter Software, all of the default configuration files will be overwritten with the current versions. Consequently, if you use any of the default configuration files as the basis for a custom configuration, make sure to save your configuration file with a different file name.

Components

The components "tab" of the configuration dialog is used to manage the list of components that will be included in the calculations and report. See also "Component Settings for Natural Gas Analysis" on page 54 if you are using the Natural Gas Analysis option of the EZReporter software.



The "Components" tab of the Diablo EZReporter configuration window.

Component Name

The component names entered in the components table will be displayed in the component summary tables and reports.

Important:

Important: If you are going to be processing data from a chromatography data system, then you must make sure that the names in the EZReporter component table match the names in the chromatography data system calibration/report exactly.

Repeatability and Reproducibility Limits

Note: These fields are only visible if the Results Database Module is active.

These two fields contain relative-percent values for each component and are used in the Results Database results comparison window to compare the normalized Mole% results from two samples. Although they are intended to be used with the GPA 2261 repeatability (r) and reproducibility (R) limits shown in the table below, you can use whatever values are appropriate for your needs. See "Comparing Results" on page 79 for more information.

Component	Repeatability (Relative %)	Reproducibility (Relative %)
Nitrogen	2	7
Carbon Dioxide	3	12
Methane	0.2	0.7
Ethane	1	2
Propane	1	2
Isobutane	2	4
n-Butane	2	4
Isopentane	3	6
n-Pentane	3	6
Hexanes Plus	10	30

GPA 2261-00 Repeatability and Reproducibility Limits

Repeatability limits are typically used to compare results from the same sample, instrument, experimental conditions, and analyst (for example when evaluating a calibration or validation standard). Repeatability limits should not be used to compare flowing samples whose composition may change with time.

Reproducibility limits are typically used to compare results from the same sample and method, but different instruments and analysts.

Manual Amount/Mole% Entry

Check this box if you are using the software to generate reports automatically from a chromatography data system, and you need to be able to enter the specified component mole percent based on the results of a separate analysis.

When results from the data system are processed, a dialog box will be displayed, allowing you to enter the component's un-normalized amount or mole%, which will then be included in subsequent calculations.

Adding new components

Press the "Add" button to add a new row to the component table manually. The row will be added *below* the currently selected row. Enter the component name and calculation factors for the new component.

Deleting existing components

To delete a component from the component list, select the row containing the desired component and press the "Delete" button".

Changing the component order

The order of the components in the component settings table is the order that they will be printed in the report. You can easily rearrange the component order by first selecting a component's row in the table by ***left*** clicking on that row with the mouse. Next, while the cursor is still pointing to that row, click and hold the ***right*** mouse button and drag the component to a new location in the table. The row being moved will be highlighted in red. Release the right mouse button when the component is

located at the desired position in the table.

Important:

Important: Be careful rearranging the order of components if you are using Calculated Results or Export Templates that refer to component results. In those instances components are identified by a component index, which is the order of the component in the component table. If you rearrange the component table after you have set up a Calculated Result or Export Template, it is possible that the wrong component will be referenced.

Clearing the table

Press the "Clear" button to delete all components from the component table.

Undoing changes to the component list

Press the "Undo" button to return the component list to the last saved configuration.

Component Table Context Menu

The following context menu will pop up when you right click with the cursor anywhere in the component table:

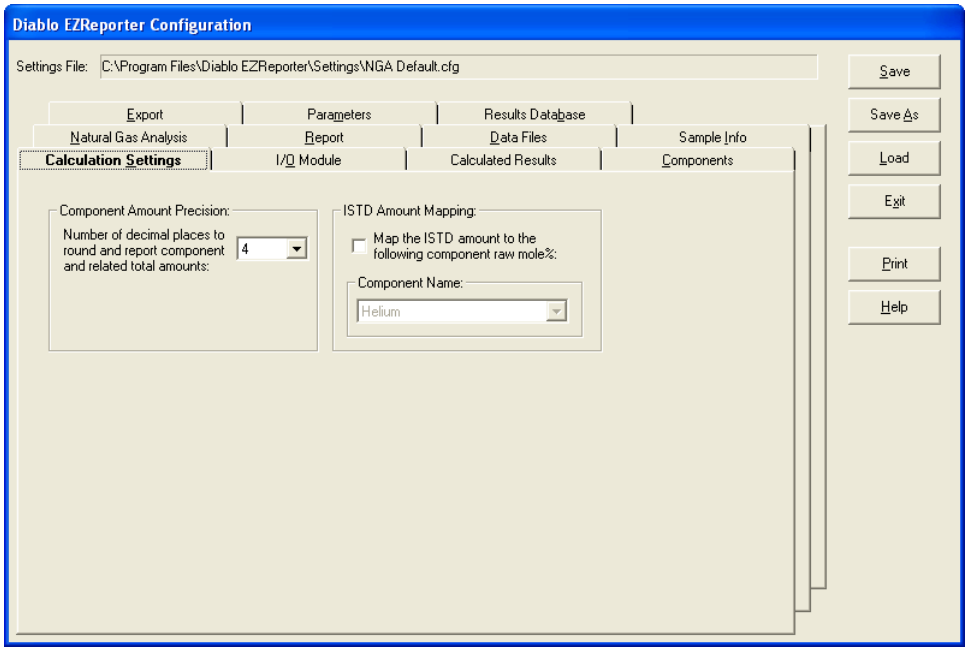
Add new component below: Clicking this option will result in a new blank line being added to the component table directly below the currently selected line.

Clone selected component below: Clicking this option will result in a new line being added to the component table directly below the currently selected line. All of the component physical property data and other settings will be copied from the selected component. The cloned component name will have a "*" appended to it as a reminder that you need to rename it (duplicate component names are not allowed).

Delete selected component: Clicking this option will delete the currently selected component.

Calculation Settings

The "Calculation Settings" tab of the configuration window allows you to modify miscellaneous settings associated with calculations.



The "Calculation Settings" tab of the Diablo EZReporter configuration window

Component Amount Precision

Use this option to set the number of decimal places to round the component amount or mole percent values prior to their being used in calculations. Component and related total amounts will also be displayed in the report using this number of decimal places.

Important:

Important: The normalized mole% values will be rounded to the number of decimal places specified in this setting before they are used in any calculations. In addition, if rounding causes the *total* normalized mole% not to sum to 100%, then a correction is made to the normalized mole% of the most concentrated component in the sample (usually methane in NGA applications) to force the total to 100%.

Internal Standard Amount Mapping

This is an *advanced* option that allows you to map the Internal Standard Amount from an analysis to the raw mole% of one of the components. This means that you can enter a result from another analyzer (e.g. H2S from a Draeger tube) into the chromatography data system sequence, and have it automatically applied to the specified component without requiring reprocessing or prompting.

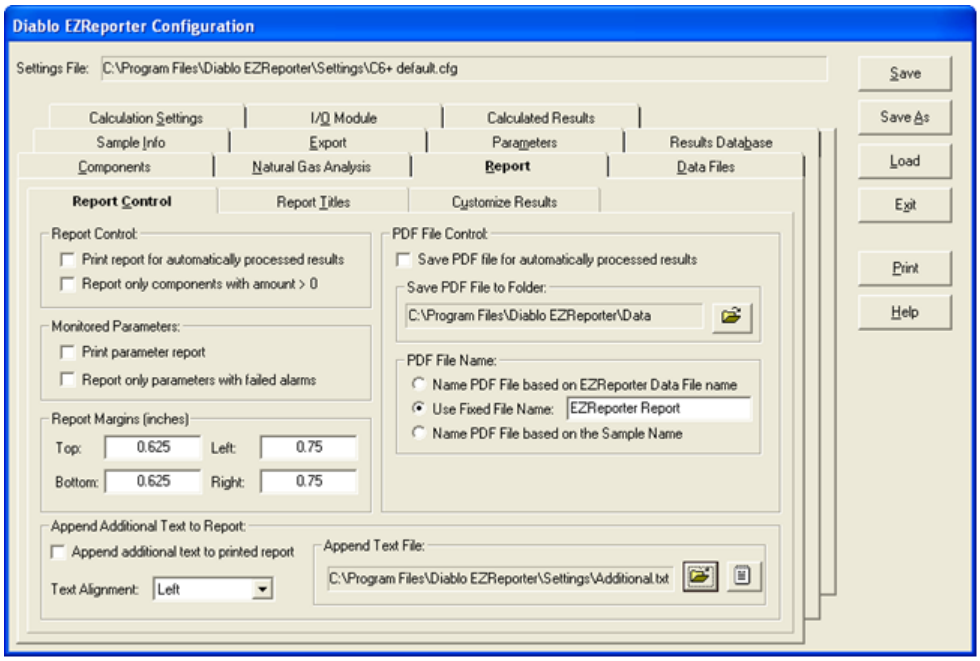
Important:

Note 1: Some data systems will switch the ISTD Amount from 0 or blank to 1 in the sequence table. Consequently, you may need to enter a very small non-zero number for 0 (for example 0.000001).

Note 2: There may be additional method settings required to enable this capability. Please see the EZReporter Quick Start Guide for your data system.

Report - Control

The "Report" tab of the configuration dialog allows you to customize the printed report.



The "Report Control" section of the "Report" Tab of the Diablo EZReporter Configuration Screen

Report Control

Check the "**Print report for automatically processed results**" box if you would like a report to be sent to the default printer when processing data automatically from a chromatography data system.

By default, all components in the component table will be included in the report. Check "**Report only components with amount > 0**" if you would like components with a raw amount of 0 to be excluded from the component results in the report.

Monitored parameters

Check the "Print parameter report" option if you would like to have a monitored parameter report printed along with the standard results report. If you also check the "Report only parameters with failed alarms" option, then only those parameters whose value has exceeded an enabled alarm limit will be included in the parameter report.

Report Margins

You can set the margins of the printed report in inches in order to make space for letterhead or logo, or to increase or decrease the number of lines printed on each page.

PDF File Control

These settings allow an Adobe Acrobat, "PDF" version of the report to be saved to a specified folder when processing results automatically. To enable this option check, "**Save PDF file for automatically processed results**".

Save PDF File to Folder: Click the "Open" button to select the directory to which the "PDF" files will be saved.

PDF File Name: These options are used to specify the PDF file name. You can choose to name the PDF file based on the name of the EZReporter data file (see the "Data Files" tab), or you can enter a "fixed" file name. If you choose the first option, the PDF file will have the same base file name as the EZReporter data file. You can also have the export file named based on the sample name from the chromatography data system.

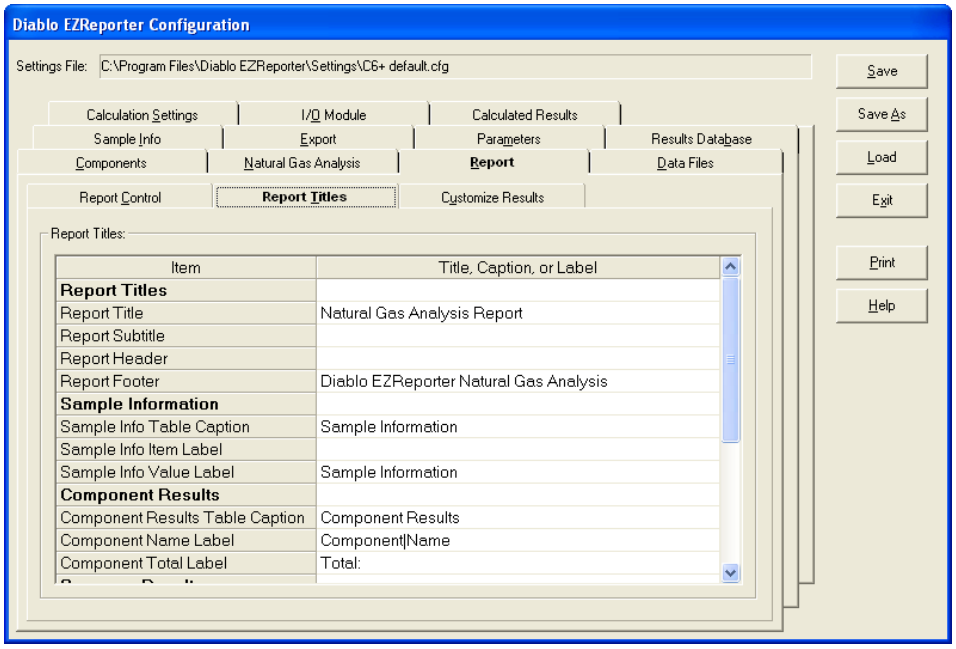
Append Additional Text

This option allows you to append additional custom text to the bottom of the report – below the total/summary results table. You can either edit the file "additional.txt" by clicking the Notepad icon, or browse and select a different file containing the desired text. You can also choose whether the text is left, center, or right justified on the report page.

Note: This additional text is only included in the printed report. It is not displayed on screen.

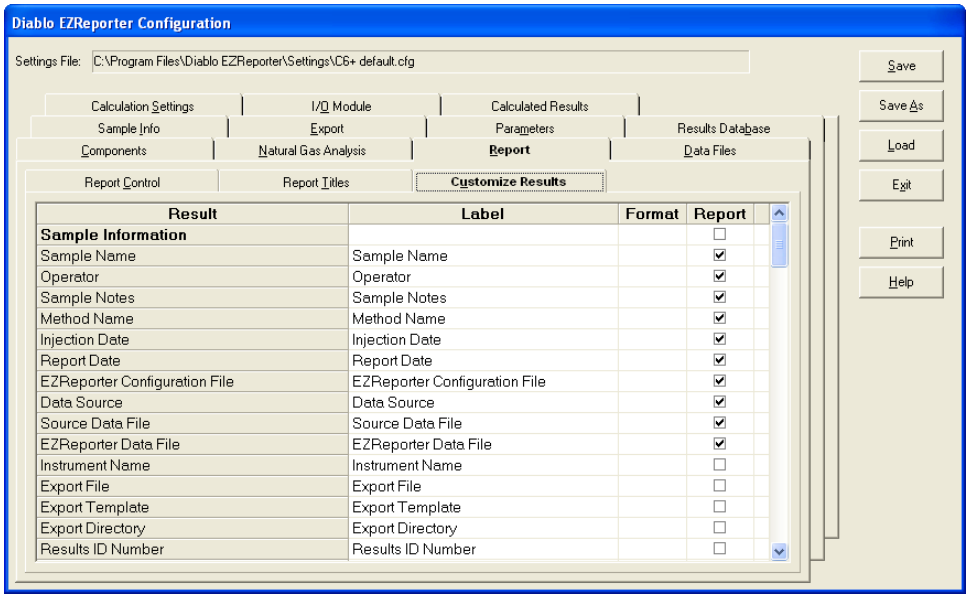
Report – Titles

You can modify all of the titles, captions, and labels displayed on the report in the "Report Titles" tab.



The "Titles" section of the "Report" Tab of the Diablo EZReporter Configuration Screen

Report - Customize



The "Customize" section of the "Report" Tab of the Diablo EZReporter Configuration Screen

The result table shown in the "Customize" tab of the Report configuration screen allows you to customize the viewed/printed report. You can change the text of the labels that identify a result on the report, set the formatting of numeric results, and add or remove results from the report by checking or un-checking the checkbox in the "Report" column.

Note that the "|" character is converted into a line break when the labels are rendered onto the report. This is particularly useful for component results when you want to minimize the width of the component result column.

Format

You can set the numeric formatting for a result by entering a format string in the corresponding field. Examples of common formatting strings are shown in the table below.

Important: The format of component and related total amount results is determined by the "Component Amount Precision" setting (see "Component Amount Precision" on page 28). You are not able to customize the format of those results.

Format String	Result
0	Will display all digits to the left of the decimal point and no digits to the right: The value 10000.2324 will be displayed as 10000 The value 0.2324 will be displayed as 0
0.00	Will display all digits to the left of the decimal point and two digits to the right of the decimal place: The value 232.4012 will be displayed as 232.40 The value 232 will be displayed as 232.00
0.0###	Will display all digits to the left of the decimal place, and from 1 to 4

	digits to the right of the decimal place: The value 232.4012 will be displayed as 232.4012 The value 232.4 will be displayed as 232.4 The value 232 will be displayed as 232.0

Common numeric formatting strings.

Context Menu

If you right click anywhere on the report/result table, the following context menu options will pop up:

Select all results: Check all of the results currently displayed in the table.

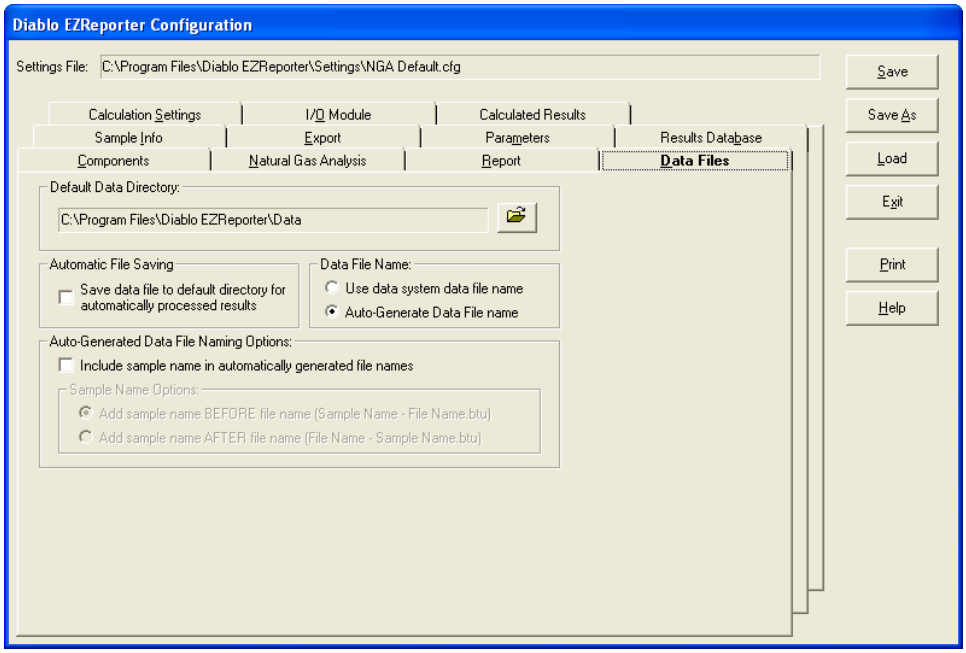
Select no results: Uncheck all of the results currently displayed in the table.

Select default results: Check only the results that are included in the default configuration.

Reset report labels to default values: Resets all of the report labels to their original, default value.

Data Files

The settings in the "Data Files" tab of the configuration dialog allow you to customize how data files are handled.



The "Data Files" Tab of the Diablo EZReporter Configuration Screen

Default Data Directory

Specify the directory into which you would like to save data files – use the "Browse" button to select or create the desired directory.

Automatic File Saving

Check this box if you would like to have a data file created in the default data directory during automatic processing of data from a chromatography data system. There are two options available for naming the data files

Use data system data file name

If you choose this option, the data file will be named based on the source data file name generated by the chromatography data system. The file will be named with the same base filename, but with the ".BTU" file extension instead of the ".DAT" file extension.

Auto-Generate Data File Name

The data files are named using a Date + Time format:

YYYYMMDD-HHMMSS.BTU

Where YYYYMMDD is the current date and HHMMSS is the current time (e.g. 20050208-153423.BTU).

Auto-Generated Data File Naming Options

Check this box if you would like to have the sample name added to the Date+Time formatted file name during automatic processing (e.g. NGA Sample-20050208-153423.BTU).

Sample Name Options

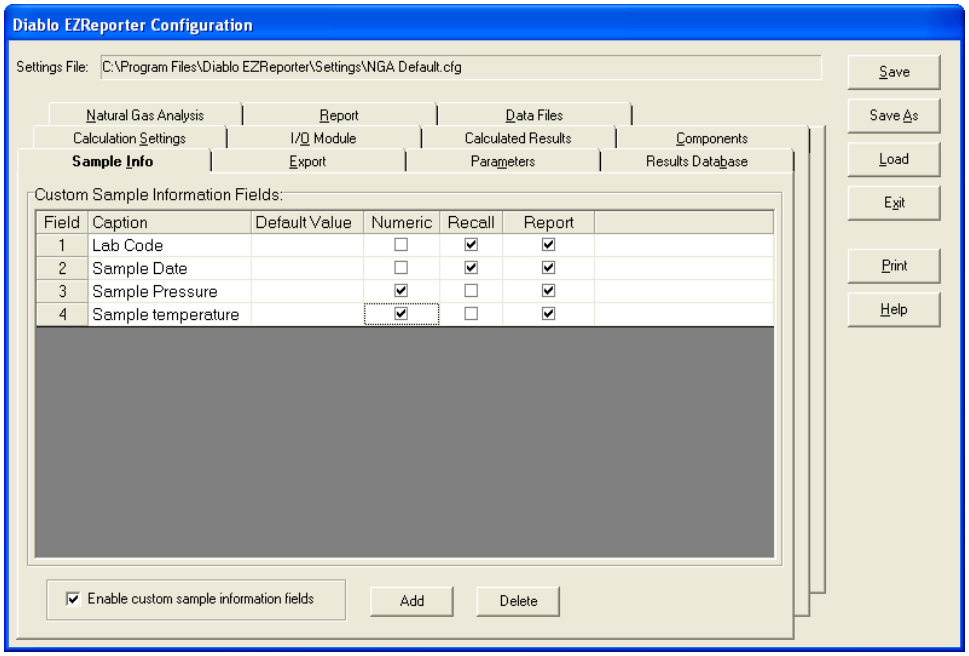
This option allows you to set whether the sample name is added before or after the file name. Select "Before" (e.g. NGA Sample-20050208-153423.BTU) if you want the data files to sort alphabetically by sample name when you view the data file directory in Windows Explorer. Select "After" (e.g. 20050208-153423-NGA Sample.BTU) if you want the data files to sort by the Date/Time.

File Format

This option sets whether the data files are saved using a Comma or a Tab as the delimiter character between fields in the file.

Sample Info

These options allow you to enable and configure custom sample information fields that can be used to report additional conditions like well number, pressure, temperature, etc. They are simply a way for the user to enter additional custom information during an analysis, and have that information printed on reports and saved in the data and export files.



The "Sample Info" Tab of the Diablo EZReporter Configuration Screen

Check the "Enable custom sample information fields" checkbox to enable the custom sample information fields. Press the "Add" button to add a new sample information field, or the "Delete" button to delete the field that is currently selected. The captions are displayed on the printed report, and when you are prompted to enter the associated custom sample information. You can also specify whether the field is numeric.

Default Value

A default value can be specified for each of the custom sample information fields. The default value will be displayed automatically when the Sample Information dialog box is displayed. However, if the "Recall" option is set and a previous value exists for the field, then the previous value will be displayed instead of the default value.

Numeric Sample Information Fields

If a sample information field is numeric, special numeric formatting and scaling can be applied to the value in the export file. See "Data Export" on page 35 for more information.

Recall Last Value

Check the "Recall" check box if you would like the last value entered into this field to be recalled when the form is displayed.

Report

If the "Report" checkbox is checked, then the field will be displayed in the "Sample Information" section of the report. If it is unchecked, then the field will not be added to the report.

Changing the order of Sample Information Fields

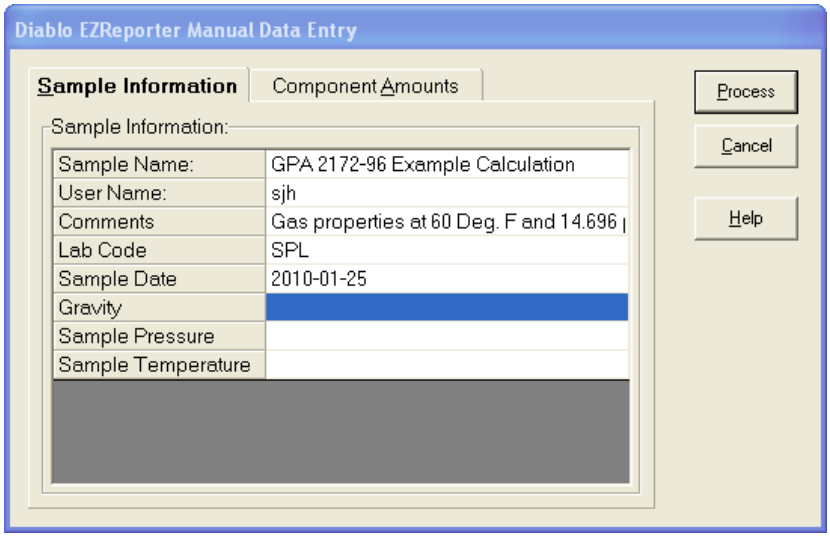
The order of the fields in the sample information table is the order that they will be printed in the report and displayed in the sample information prompt. You can easily rearrange the field order by first selecting a field's row in the table by ***left*** clicking on that row with the mouse. Next, while the cursor is still pointing to that row, click and hold the ***right*** mouse button and drag the field to a new location in the table. The row being moved will be highlighted in red. Release the right mouse button when the field is located at the desired position in the table.

Important:

Important: Be careful rearranging the order of the Sample Information fields if you are using Export Templates that refer to Sample Information fields. In those instances Sample Information fields are identified by their index, which is their order of in the sample information table. If you rearrange the sample information table after you have set up an Export Template, it is possible that the wrong Sample Information field will be referenced.

Entering custom sample information:

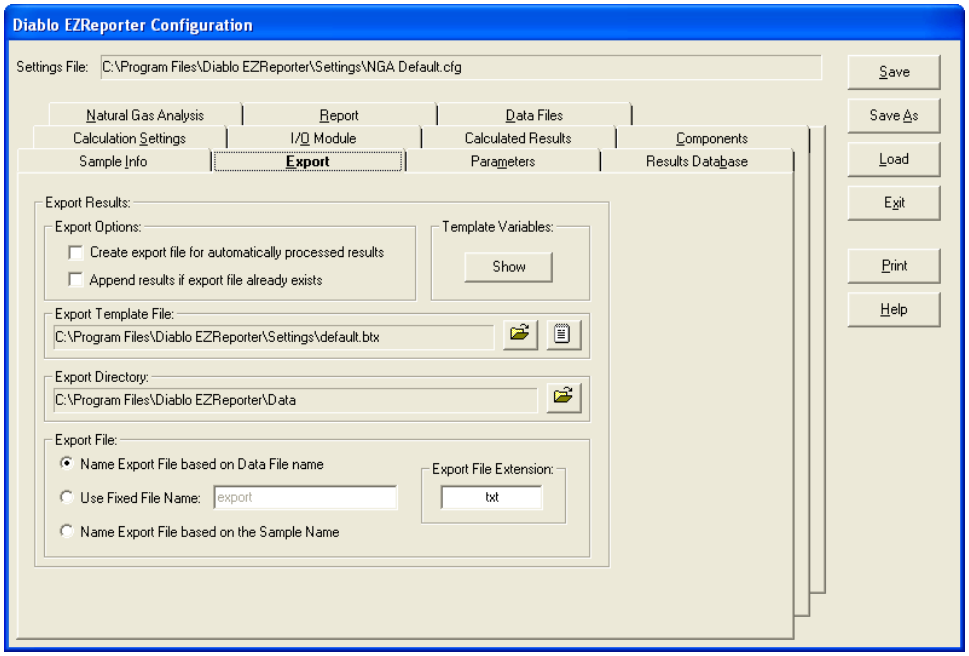
If you have enabled custom sample information fields, and if at least one of the fields contains a caption, then "Manual Data Entry" dialog box will be displayed when automatically processing results from a chromatography data system. This dialog box will display the caption(s) specified in the Sample Info configuration, and allow the associated custom sample information to be entered by the user. Alternatively, you can manually enter the sample information using the "Tools > Edit Current Data Set…" menu option.



The "Diablo EZReporter Manual Data Entry "window showing the custom sample information fields.

Data Export

The EZReporter software includes a flexible data export feature that allows you to create custom data export files in almost any format you might need. An export template file defines the format of the export file.



Export Configuration Panel

Export Options

Check "Create export file for automatically processed results" if you want the results from a chromatography data system to be exported automatically when the data is processed by the EZReporter software.

Check "Append results if export file already exists" if you want the exported results to be appended to any results that already exist in the specified export file. If this option is unchecked, then existing results will be overwritten.

Export Template File

Click the "Open" button to specify the template file that will be used to create the export file. Click the "Notepad" button to open the selected export template file in Windows Notepad for editing. See "Export Template Format" in the Appendix on page 86 for information on creating and editing Export Template files. Note that several example template files are included with the software in the application "Settings" folder.

Export Directory

Click the "Open" button to select the directory to which export files will be saved.

Export File

These options are used to specify the export file name. You can choose to name the export file based on the name of the EZReporter data file (see the "Data Files" tab), or you can enter a "fixed" file name. If you choose the first option, the export file will have the same base file name as the data file.

You can also have the export file named based on the sample name. This allows results from replicate runs of the same sample to be added appended to the same export file even though the data file names are different.

Export File Extension: Enter the file extension to use for the export file into this text box field. The default extension if this field is left blank is "txt".

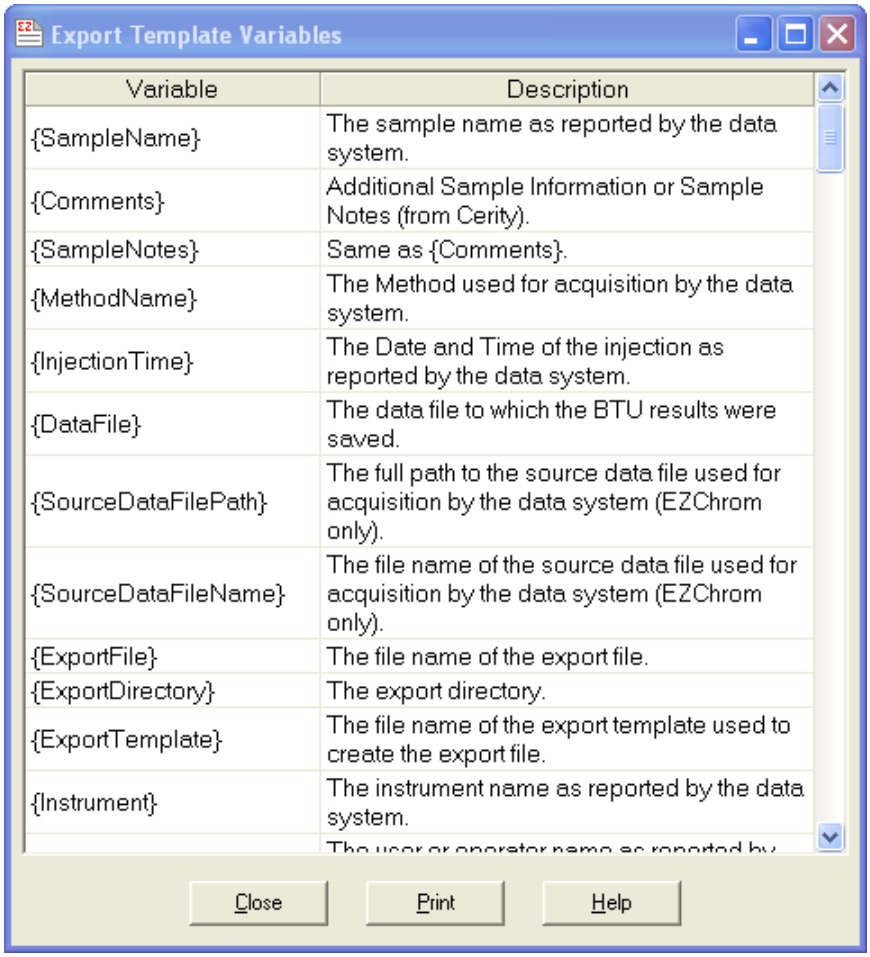
Note: if you enter a fixed export file name that already includes a file extension, it will take precedence over the entry in the Export File Extension field.

Show Template Variables

If you click this button, a table of supported template variables with descriptions will be displayed. You can print this list by pressing the "Print" button.

Hint:

Hint: If you double-click on a particular variable, it will be copied to the Windows clipboard so that you can paste it into a template file.

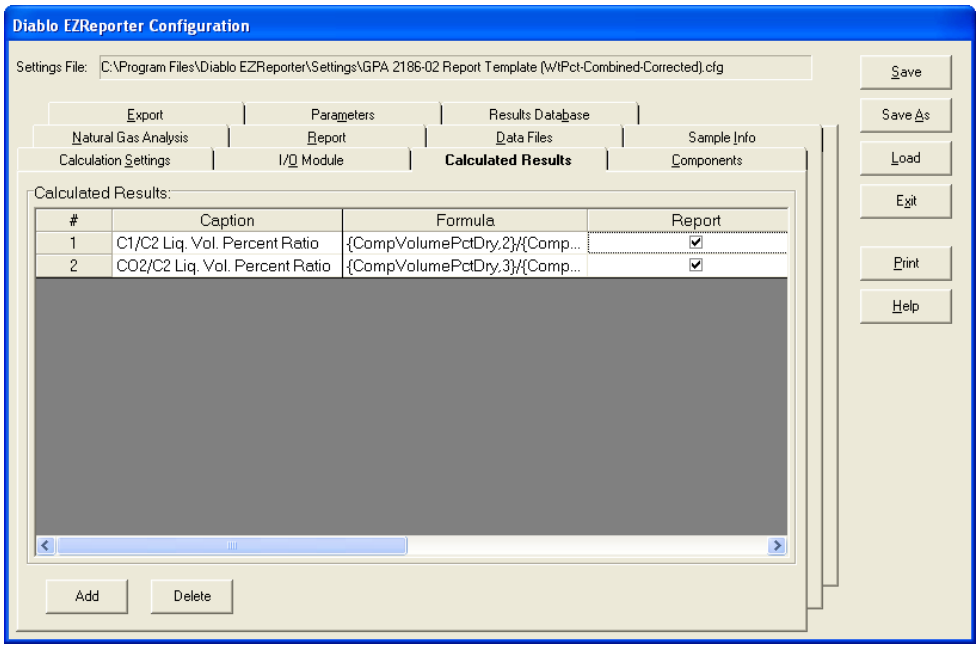


EZReporter Template Variable Table

Calculated Results

Calculated results are based on custom formulas you enter using the "Formula Builder". The Formula Builder allows you to select from a list of available result variables and supported arithmetic operators to build a custom formula that will be evaluated to a numeric value when processing results. The Calculated Result is then displayed in the Results Summary part of the report along with a descriptive caption that you also specify.

Calculated Results can also be used as Monitored Parameters for alarming and trend plotting and both the caption and value can be specified in an Export Template and exported to a text file.



The EZReporter Calculated Results configuration table

Adding Calculated Results to the Configuration and Report

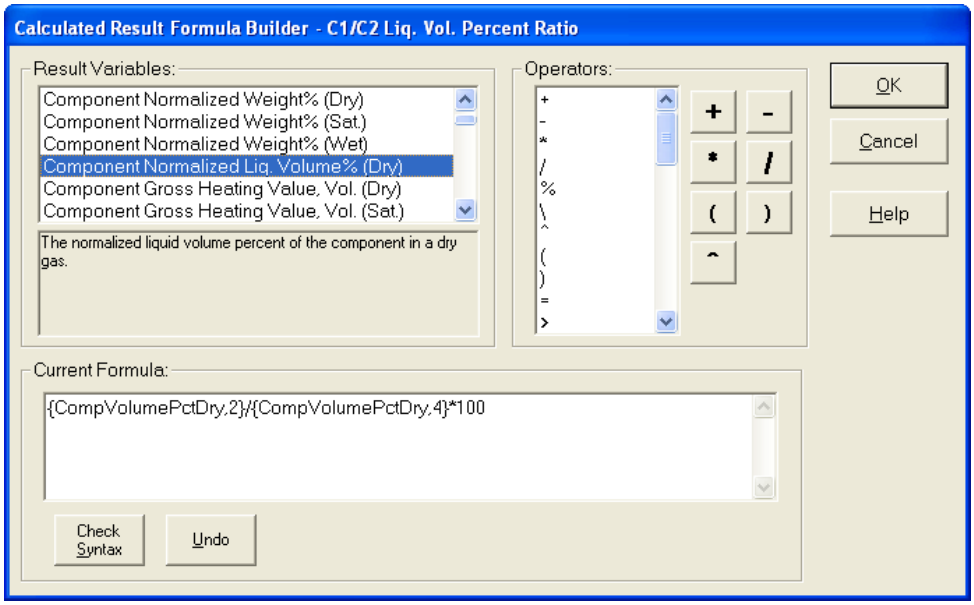
To add a Calculated Result to the configuration and report:

1. Click the "Add" button.
2. In the new line that is added to the Calculated Results table, enter a caption that describes the result. This caption will be displayed along with the calculated value in the "Results Summary" section of the report.
3. Click the […] button that is visible when you click in the "Formula" cell to display the Calculated Result Formula Builder and create the custom formula.
4. Check the "Report" checkbox if you want this Calculated Result displayed in the report.
5. Enter the desired numeric format string for this result. See "Format" on page 31 for information on specifying the numeric format.

Creating a Custom Formula using the Formula Builder

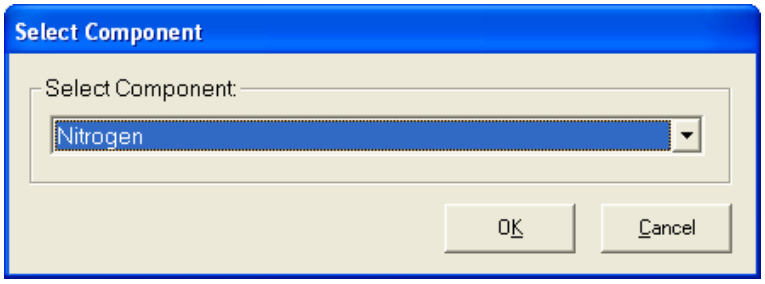
You create a custom formula for a Calculated Result using the Formula Builder tool that is displayed by clicking the […] button when the cursor is in the Formula cell of the Calculated Results table.

Formulas consist of Result Variables and arithmetic Operators (+,-,*, etc.). Simply double click the desired Result Variable or Operator from the respective list and it will be inserted at the current cursor location in the "Current Formula" box. See "Calculated Result Formula Builder Operators" on page 107 in the appendix for a description of supported operators.



The EZReporter Custom Calculation Formula Builder

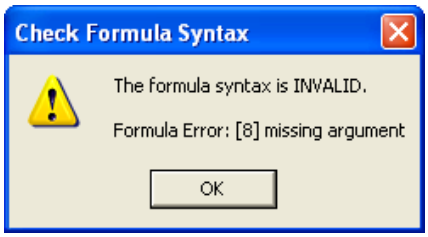
If the Result Variable you have selected is a Component Result, you will also be prompted to select the desired component.



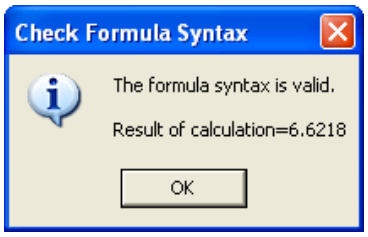
IMPORTANT:

Important: If you have included any Component Variables in the custom formula, you should ***not*** change the order of components in the main Component Table. Component variables are linked to the specific component by the component number, which is based on the order they are displayed in the component table. If you change the component order, it is possible that the formula will be linked to a different component than expected.

Once you have created the custom formula you can check that the syntax is valid by clicking the "Check Syntax" button. If the formula syntax is invalid, an error message will be displayed:

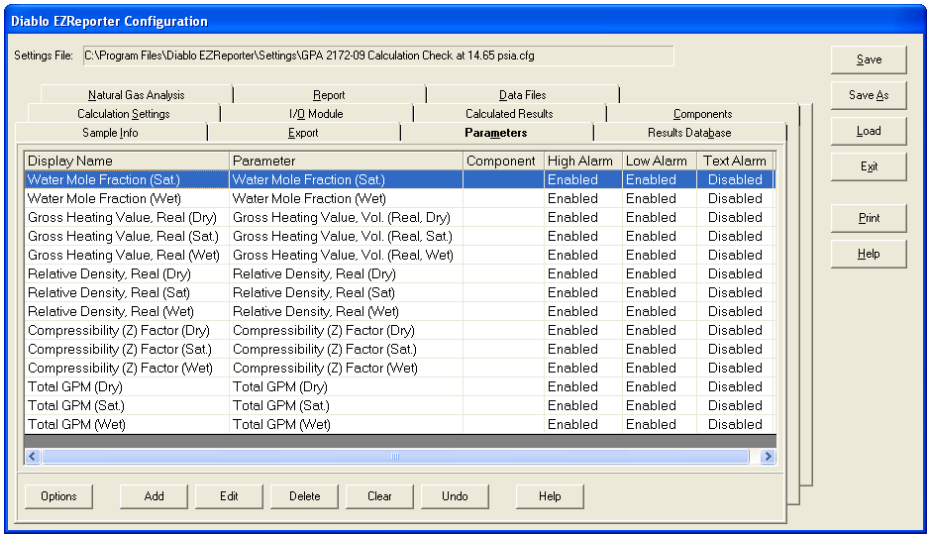


If the formula syntax is valid, the result of the calculation will be displayed. Note that the result of the calculation will be 0 unless there is a current report with actual results displayed in the main EZReporter Sample Result window in which case it will use the actual result values in the calculation.



Parameter Options

The "Parameters" tab allows you to configure a list of component or calculated results that will be displayed in the "Parameter Monitor" window of the main software screen. You can set both high and low alarm limits for these monitored parameters – if the parameter value exceeds either of these limits, the result will be displayed with a red background in the parameter table to alert you.



The Parameter Monitoring configuration panel

Options: Clicking the "Option" button displays the Monitoring Options dialog box. See "Setting Monitored Parameter Options" on page 41.

Add: Clicking the "Add" button allows you to configure and add a new parameter to the monitored parameter table. See "Adding or Editing Monitored Parameters" on page 43.

Edit: Clicking the "Edit" button allows you to edit the options for the parameter that is currently selected the parameter table. You can also double-click the desired row in the table to edit a parameter's options. See "Adding or Editing Monitored Parameters" on page 43.

Delete: Clicking the "Delete" button will remove the selected parameter from the parameter table.

Clear: Clicking the "Clear" button will clear the parameter table.

Undo: Clicking the "Undo" button will restore the parameter table to the last saved configuration.

Help: Clicking the "Help" button displays context-sensitive help for this topic.

Changing the Display Order of Parameters

To rearrange the order of the parameters in the parameter table, first select the row of the parameter you want to move by ***left*** clicking on that row with the mouse. Next, while the cursor is still pointing to that row, click and hold the ***right*** mouse button and drag the selected row to the desired new location in the table. Release the right mouse button when the field is located at the desired position in the table.

Cloning Parameters

Right clicking on a parameter in the table displays a context menu that allows you to clone the properties of the selected parameter to a new parameter. This allows you to create a new parameter quickly using an existing parameter as a template.

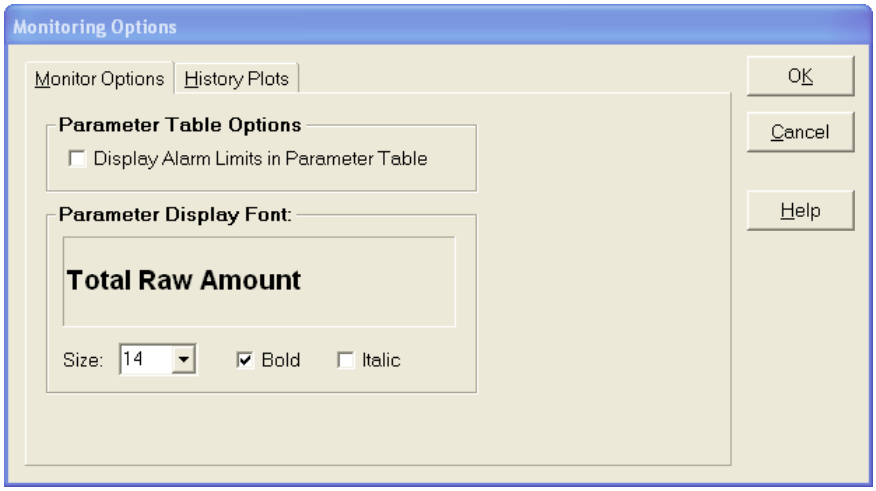
Auto-add All Components

Right clicking on a component parameter table displays a context menu that allows you to add the remaining components in the configuration to the parameter table using the selected component parameter as the template.

Setting Monitored Parameter Options

Click the "Options" button to set additional options for the Parameter Monitoring.

Monitor Options Tab



Parameter Monitoring Options Dialog – Monitor Options Tab.

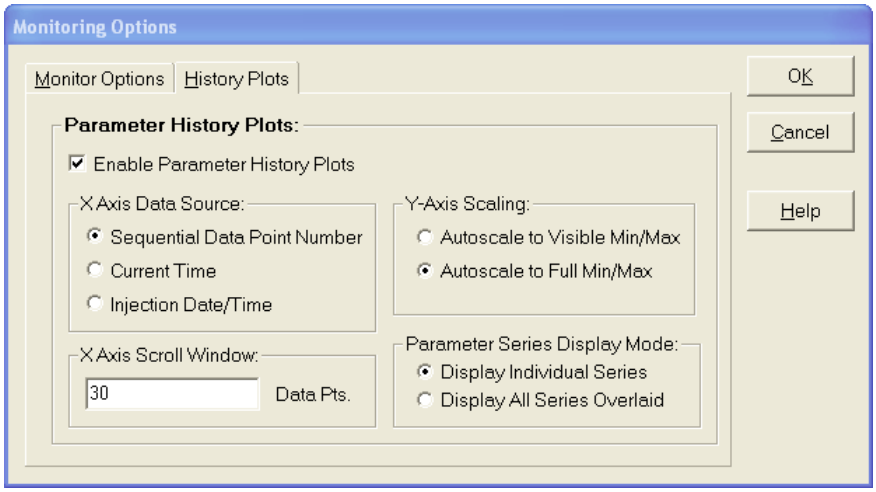
Parameter Table Options

Check the "Display alarm limits in parameter table" option if you would like to include the actual upper and lower alarm limits in the parameter table along with the parameter name and value. This can be especially useful when using relative alarm limits so that you can see the actual calculated limits for each parameter.

Parameter Display Font

In the "Parameter Display Font" section, use the "Size" list box and "Bold" and/or "Italic" check boxes to set the desired font for the Monitor Table. A preview of the font is displayed for you.

History Plots Tab



Parameter Monitoring Options Dialog – History Plots Tab

Enable Parameter History Plots: Check this box to enable history plots for the monitored parameters. Note that this option will be set automatically if history plots are enabled for any of the individual parameters.

X-Axis Data Source: You can choose to plot the parameter values against a sequential data point/run number, the current time when the report/results are generated, or the injection date/time of the chromatographic run.

X-Axis Scroll Window: The X-Axis will automatically zoom to this time (in minutes) or data point window. When new results are received, older data points outside this window will no longer be visible. However, the entire history plot can be displayed at any time by clicking the "Zoom Full" button, or double-clicking on the plot window.

Y-Axis Scaling: You can choose to have the y-axis scale adjusted automatically so that the range includes only the data points that are visible in the current plot/window. Alternatively, you can choose to have the y-axis scale adjusted so that it represents the full range of parameter values, including those outside the current plot/window.

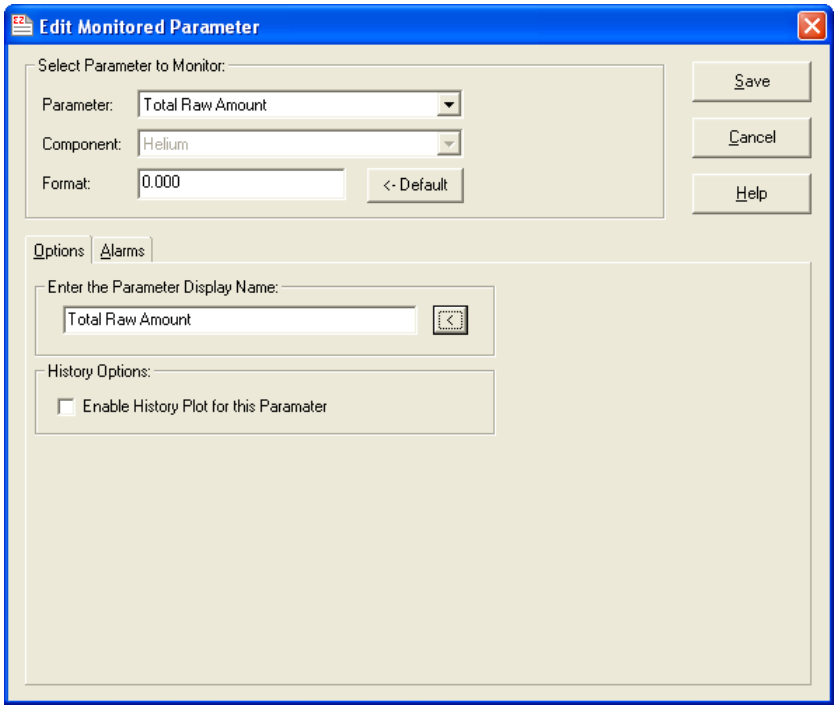
Important:

Important Note: If you have enabled either high or low alarm limits in the parameter configuration, then those limits will be displayed as red, dotted lines on the history plot. Those alarm limits are included when determining the Y-axis range.

Parameter Series Display Mode: You can display each parameter history plot series either individually or with all series overlaid on the same axes.

Adding or Editing Monitored Parameters

Click the "**Add**" button to add a new monitored parameter or the "**Edit**" button to edit the monitored parameter currently selected in the parameter table (you can also double click the line in the table that you want to edit). You can also clear the current table by pressing the "**Clear**" button, or undo any changes you have made to the table by pressing the "**Undo**" button.



The Edit Monitored Parameter dialog

Parameter: Select the parameter that you want to monitor from this list box. If you select a parameter that is derived from a component result (component amount,

for example), then you will also need to specify the corresponding component from the component list box.

Note that if the NGA Module is active, the parameter list will include a number of different NGA-related result parameters. If the NGA module is not active, only chromatographic parameters like retention time, peak area, and amount will be listed.

Component: If you select a parameter that is derived from a component result (component amount, for example), then you will also need to specify the corresponding component from the component list box.

Format: You can set the numeric formatting for the displayed parameter value by entering a format string in this text box. Examples of common formatting strings are shown in the table below.

Format String	Result
0	Will display all digits to the left of the decimal point and no digits to the right: The value 10000.2324 will be displayed as 10000 The value 0.2324 will be displayed as 0
0.00	Will display all digits to the left of the decimal point and two digits to the right of the decimal place: The value 232.4012 will be displayed as 232.40 The value 232 will be displayed as 232.00
0.0###	Will display all digits to the left of the decimal place, and from 1 to 4 digits to the right of the decimal place: The value 232.4012 will be displayed as 232.4012 The value 232.4 will be displayed as 232.4 The value 232 will be displayed as 232.0

Common numeric formatting strings.

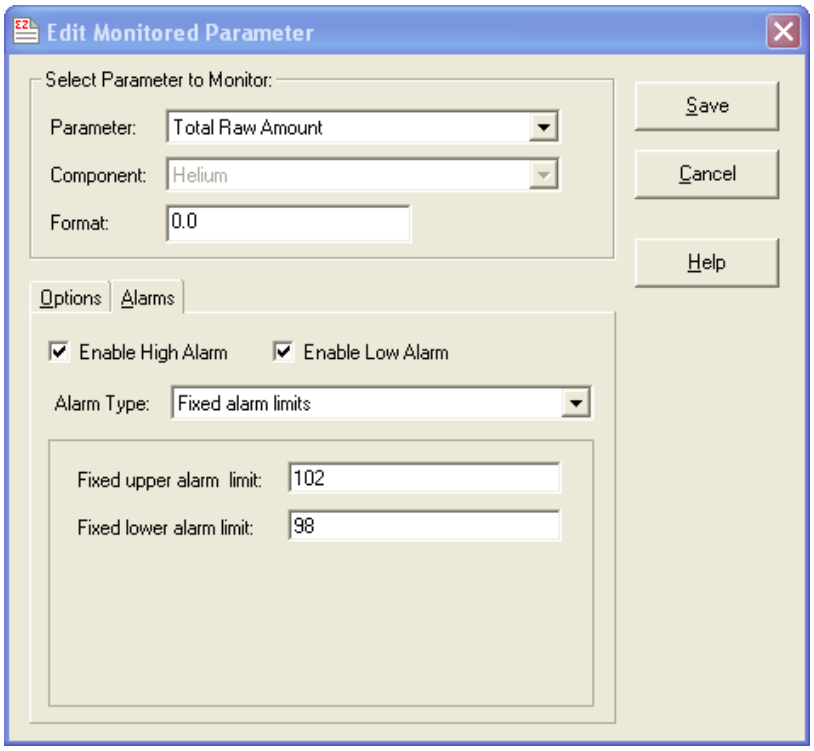
Default: If you click the "Default" button, the default formatting string for this type of parameter will be copied into the format text box for you.

Display Name: The text entered into the "Display Name" text box will be displayed for this parameter in the Monitor Table. You can click the [<] button to copy text from the parameter and component (if appropriate) list boxes into the text box.

Enable History Plot for this parameter: If you check this box, then the value of this monitored parameter will be plotted in the Parameter History display.

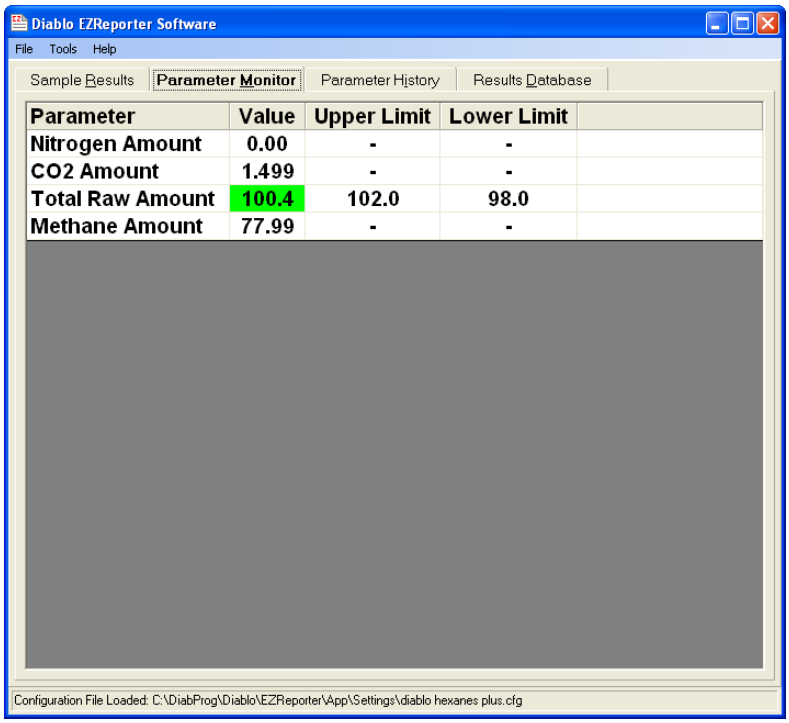
Parameter Alarms

You can enable both high and/or low parameter alarms by checking either one or both of these check boxes and selecting the desired alarm type/limit.



The "Alarms" tab of the Edit Monitored Parameter window showing both High and Low Alarms enabled.

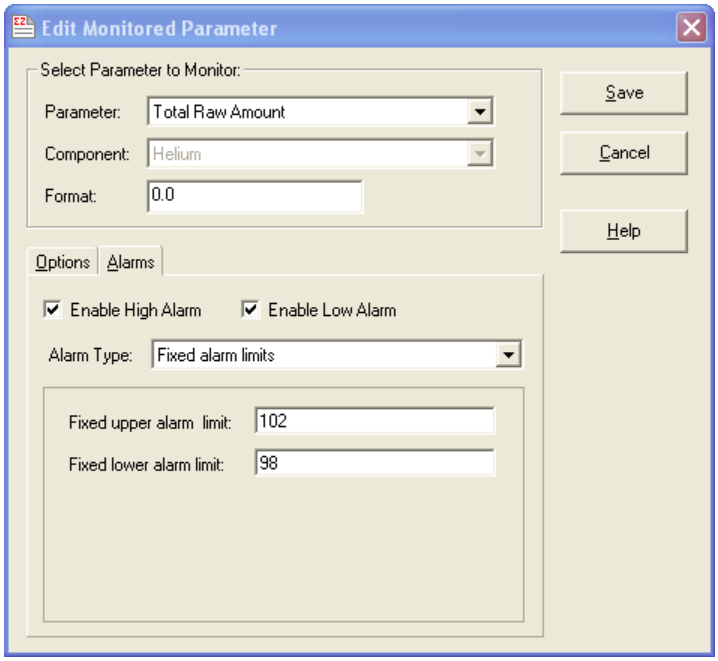
If an alarm is enabled and the parameter value exceeds the specified limit, the result will be displayed with a red background in the Monitor Table to alert you. Conversely, if the alarm is enabled and the parameter value does *not* exceed the limit, the result is displayed with a green background.



The EZReporter software supports several types of Alarms, including fixed alarm limits, and relative alarm limits. Use the "Alarm type" list box to select the type of alarm limits to use for the parameter.

Fixed Alarm Limits

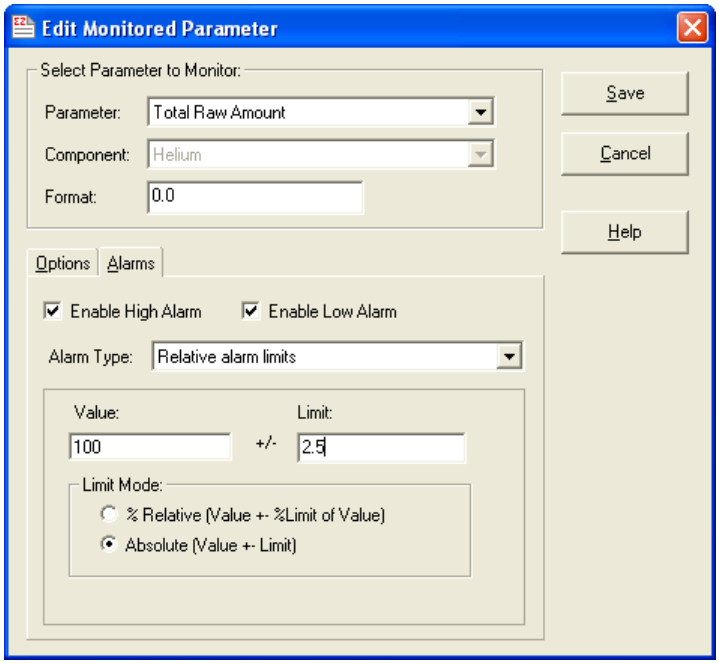
With the "Fixed alarm limits" alarm type you simply enter the upper and lower values for the alarm limits.



The "Alarms" tab of the Edit Monitored Parameter window showing the settings for fixed upper and lower alarm limits.

Relative Alarm Limits

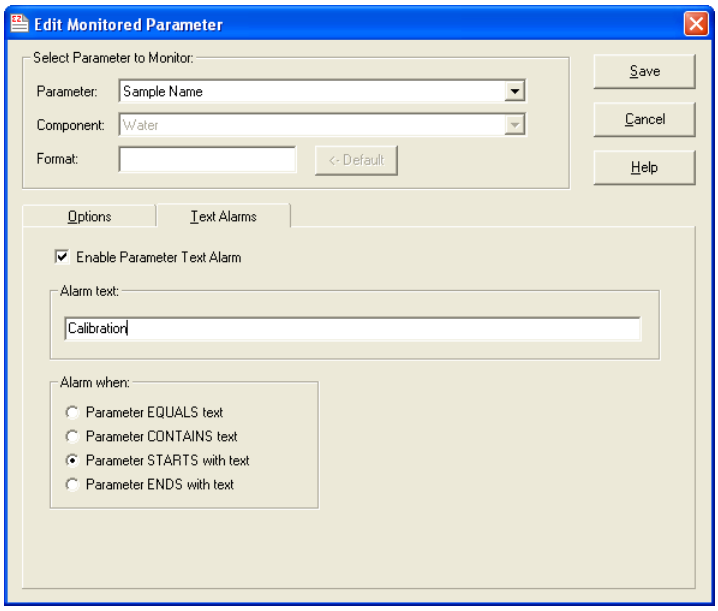
With "Relative alarm limits" you must enter an alarm value and the limits are calculated relative to that value. You can specify whether you want the limits calculated as a percent relative to the Value (Value +/- %Limit of the Value) or use absolute limits (Value +/- Limit).



The "Alarms" tab of the Edit Monitored Parameter window showing the settings for relative alarm limits.

Text Alarms

Text alarms are available when the chosen parameter is a non-numeric, text result like "Sample Name". If you enable the Text Alarm, the alarm will be triggered when the parameter text matches the alarm condition defined by the "Alarm Text" and the "Alarm when" setting. The comparison is *not* case sensitive.



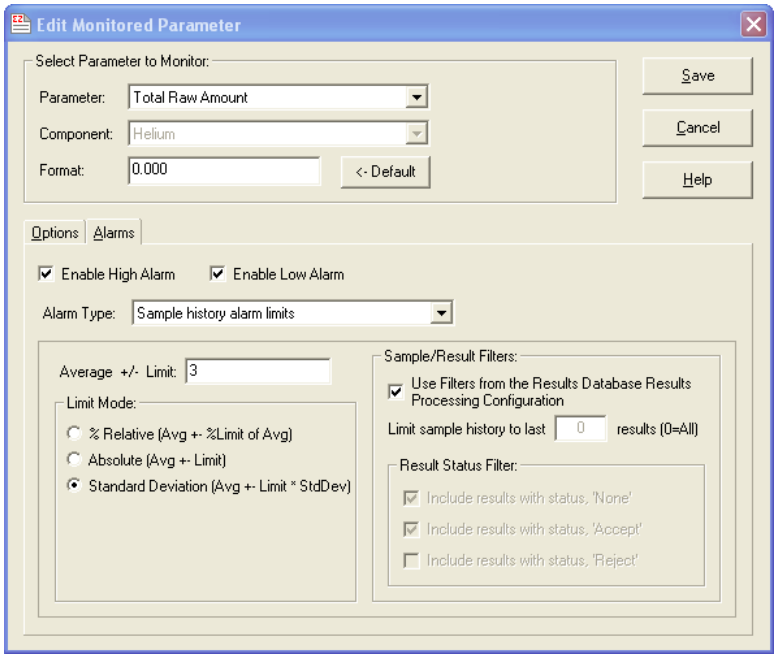
The "Text Alarms" tab of the Edit Monitored Parameter window showing the settings for a Text Alarm.

Sample History Alarm Limits

Sample History alarm limits are available as an option if the Results Database module is activated. With this type of alarm limit, the average and standard deviation are calculated from the historical results retrieved from the results database using the Sample Name along with additional filters. The following kinds of limits can be specified:

- %Relative (Avg +/- %Limit * Average): Here, the alarm limits are calculated as a percentage relative to the historical average for this sample.
- Absolute (Avg +/- Limit): Here the alarm limits are calculated as an absolute value around the historical average for this sample.
- Standard Deviation (Avg +/- Limit * Standard Deviation): Here the alarm limits are calculated using the historical average and standard deviation for this sample. You can specify the multiplier for the Standard Deviation in the Limit field.

The "***Sample/Results Filters***" section provides a way to further refine the sample results used to calculate the historical average and standard deviation. You can choose to filter the results using the same settings that are used when the results are displayed in the sample results summary table, or enter custom filters for this particular alarm.



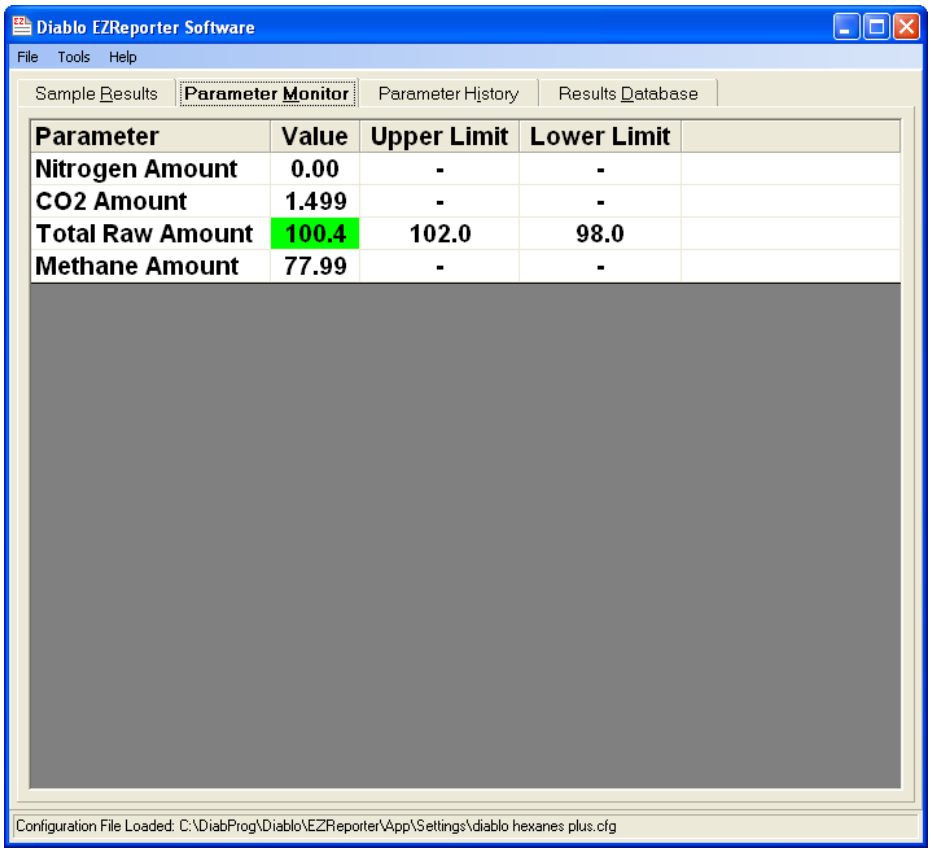
The "Alarms" tab of the Edit Monitored Parameter window showing the settings for relative alarm limits.

Using Monitored Parameters and History Plots

The Parameter Monitor

Monitored parameters are displayed in a table on the "Parameter Monitor" tab of the main software screen. The parameter table displays the results for monitored parameters from the last analysis or last data file loaded.

If either the high or low alarm is enabled for any of the monitored parameters, then the background color of the parameter value will be either red or green depending on whether the actual value exceeds the enabled alarm limit.



The EZReporter Parameter Monitor Window

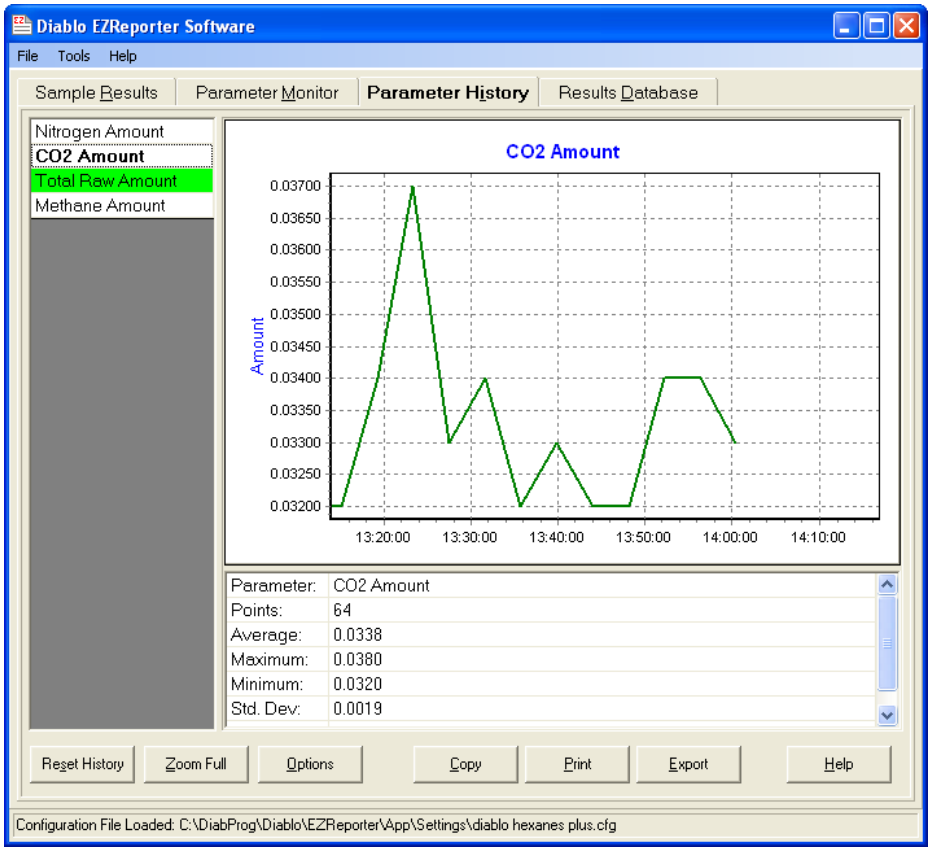
Parameter History

Historical values of monitored parameters can be plotted in the Parameter History window.

In order to display the parameter history window, you must enable history plots for each individual parameter whose results you want to plot. See "Parameter Options" on page 40" for more information.

The individual parameter history plots and summary statistics are displayed by clicking on the desired parameter display name in the parameter list. If either high or low alarm limits have been enabled for a parameter, then the parameter name will be displayed with either a red or green background to indicate whether the current

parameter value has exceeded an alarm limit (red background) or not (green background). In addition, the alarm limit is displayed a s red, dotted line on the history plot.

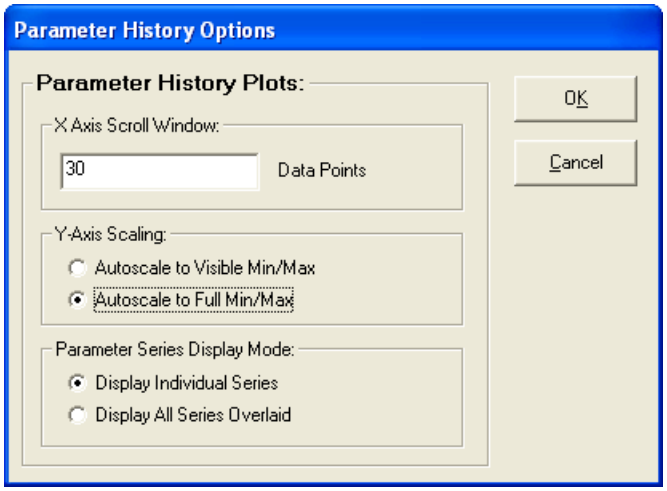


The "Parameter History" tab on the main screen of the Diablo EZReporter

Reset History: Click the "Reset History" button to clear and reset the history plot and summary statistics for all plotted parameters.

Zoom Full: Click the "Zoom Full" button to expand/contract the X and Y axes of the history plot to display the entire plot. Double-clicking in the history plot window performs the same function.

Options: Click the "Options" button to change the X-axis scroll window or Y-axis scaling mode:



Copy: Click the "Copy" button to copy the currently displayed trend plot to the Windows clipboard.

Print: Click the "Print button to print the currently displayed history plot and summary statistics.

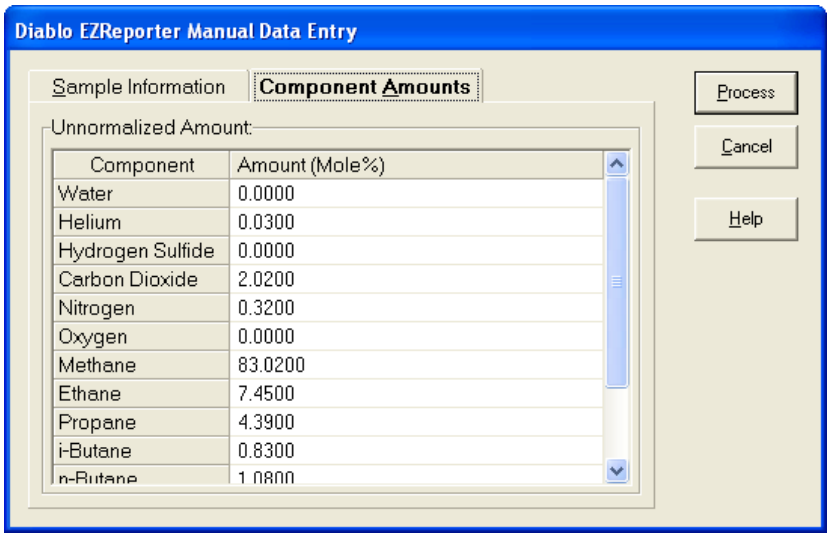
Export: Click the "Export" button to export the history results for all components to a comma-delimited text file.

Help: Click the "Help" button to display context-sensitive help for this topic.

Data Processing and Reporting

Manual Data Processing and Reporting

It is possible to enter component mole% values manually and calculate results based on those values. Select "New Data Set…" from the "file" menu. Any existing results will be cleared from the main screen, and you will be presented with the Manual Data Entry dialog. Enter the mole% values into the component table, and optionally a sample name, user name, and comments, and then press the "Process" button to perform the calculations.



Manual Data Entry Dialog Box

Important:

Important: Make sure to save these results to an EZReporter data file (select "Save Data Set As…" from the "File" menu) if you want to be able to recall the data at a later time. You can print a report by selecting "Print > Report" from the "File" menu.

You can re-edit the data you entered manually by selecting "**Edit Current Data Set…**" from the "**Tools**" menu. Note however, that for purposes of data integrity, this option is disabled for data sets from a chromatography data system that were processed automatically.

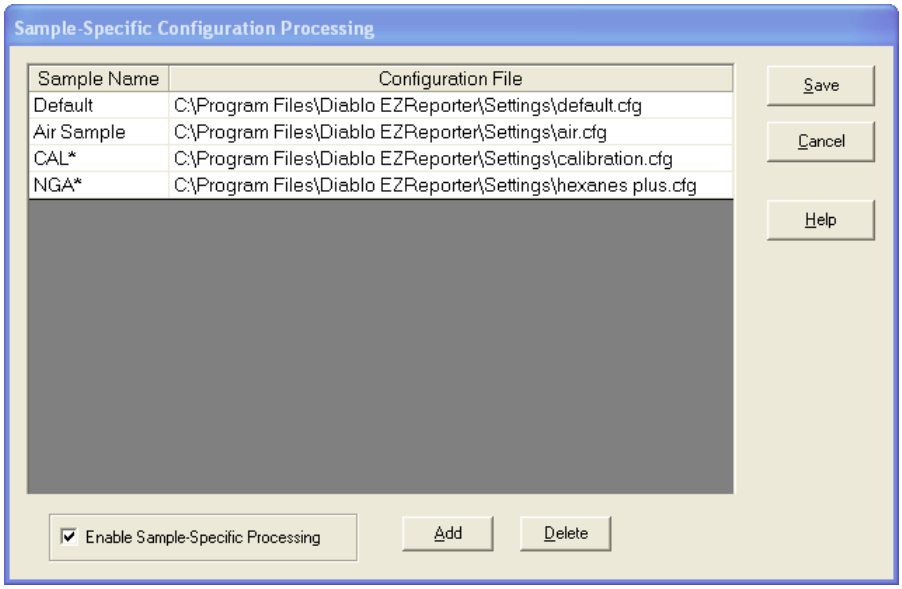
Automatic Data Processing and Reporting

Refer to the EZReporter Quick Start Guide for your chromatography data system for instructions on how to configure the data system to send results automatically to EZReporter for data processing and reporting.

Sample-Specific Configuration Processing

Sample-Specific Configuration Processing allows you to use different EZReporter configuration files based on the sample name when automatically processing results from a supported data system.

To configure this feature, select the “File > Sample-Specific Configurations…” menu option.



Check or uncheck the "Enable Sample-Specific Processing" checkbox to enable or disable this feature. If enabled during automatic processing of results from one of the supported data systems, the sample name from the data system is compared to the sample names in the table. If a match is found, the corresponding configuration file is loaded prior to processing the sample results.

Simply click the "Add" button to add a sample name and the corresponding configuration file that should be used for that type of sample. You can include '*' and '?' wildcard characters in the sample name. The '*' character will match any character or characters in that position, while the '?' matches a single character in that position.

Note: If a sample name matches both a fixed sample name ("Air Sample") and a wildcard sample name ("Air*"), then the configuration file specified for the *fixed* sample name will be used. If a sample name matches more than one wildcard entry, then the configuration file for the first entry alphabetically will be used.

The mandatory "Default" configuration file is selected whenever a sample name doesn't match any of the sample names in the table.

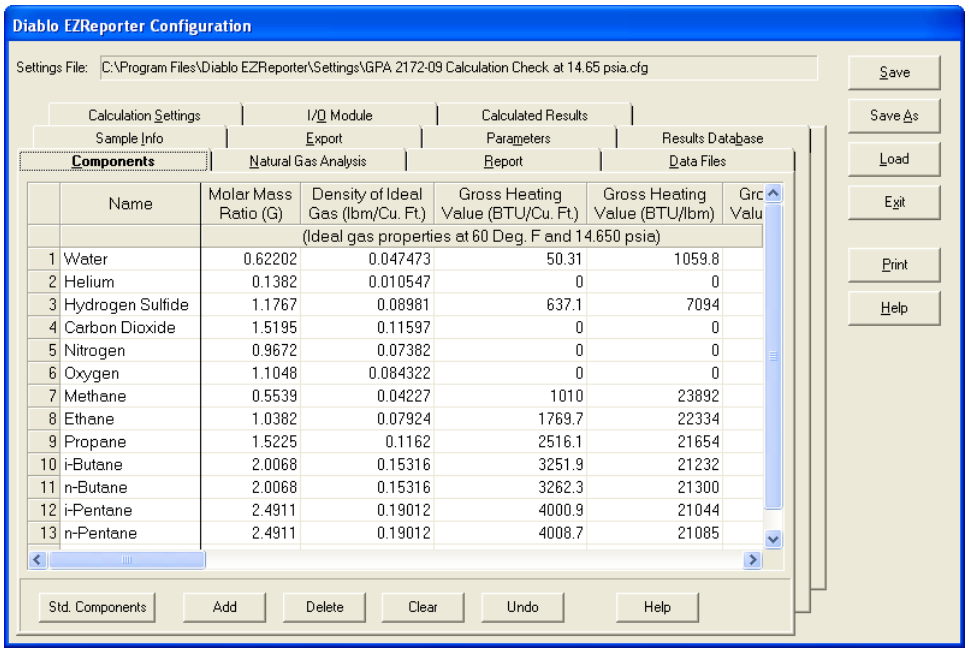
Natural Gas Analysis

Configuring Natural Gas Analysis

If you have activated the Natural Gas Analysis (NGA) option, you will need to configure the EZReporter software to generate the appropriate results for your situation.

Component Settings for Natural Gas Analysis

The components "tab" of the configuration dialog is used to manage the list of components that will be included in the calculations and report. You can either edit the component properties directly, or you can click the "Std Components" button to select from a list of standard components and their physical properties. See "Standard Component Physical Properties" on page 55 for more information



Component Name

The component names entered in the components table will be displayed in the component summary tables and reports.

Important:

Important: If you are going to be processing data from a chromatography data system, then you must make sure that the names in the component table match the names in the data system calibration table and report.

Component physical properties

Each default configuration file is based on a set of standard physical properties – usually based on GPA Standard 2145-03 or 2145-09 or ISO 6976 (1995). You should review the component physical properties to make sure that they are correct for your situation.

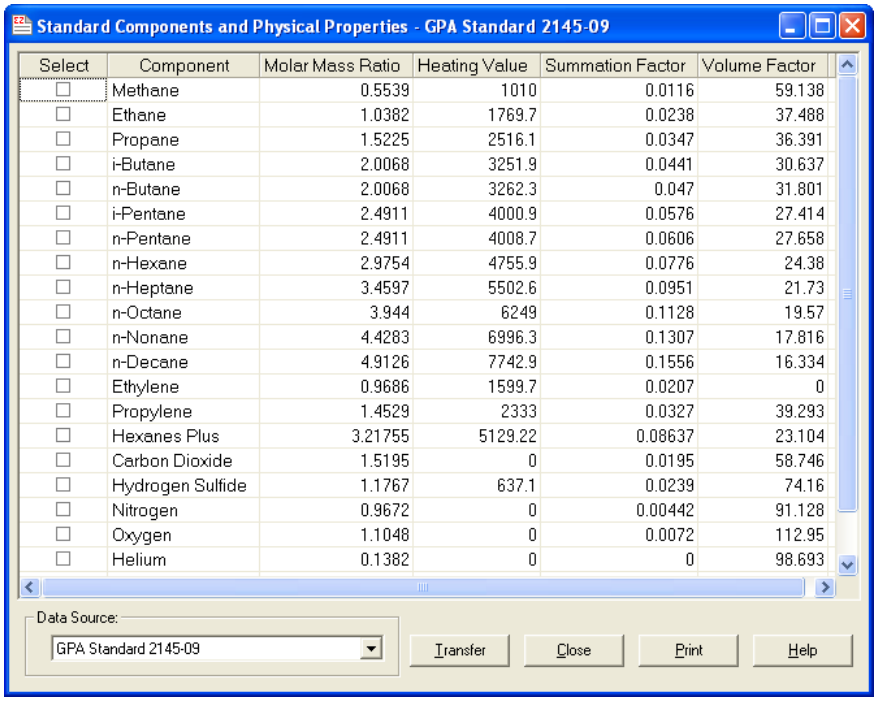
Important:

Important: These physical properties should be ideal gas properties at 60 Degrees F and 14.696 psia. Entering physical properties determined at different temperatures or pressures will result in incorrect calculations.

Standard Component Physical Properties

Press the "Std. Components" button on the Components tab of the configuration editor to display a table of standard components and their physical properties.

You can use the "Data Source" list box to display tables of standard physical properties from different data sources. These data sources currently include the GPA 2145-03 and 2145-09 Standards, the extended component list from the GPSA Engineering Data Book (12 Edition, 2004), the GPA TP-17 physical property tables, the ASTM D3588-98 (2003) and D2598-02 Standards, and the ISO 6976 Standard.



You can also double-click on any cell in the table to transfer that particular value to the Windows Clipboard. You can then paste that value into the component list.

Important:

Important: Physical properties for "Hexanes Plus" are calculated assuming a 60:30:10 mixture of hexane, heptane, and octane.

After checking the components you want to add/update, click the "Transfer" button to transfer them to the component list. If a component with the same name already exists in the component list, its physical properties will be updated to those from the table. If there is no matching component with the same name, then the "Unknown Component" dialog box will be displayed.

Context Menu

If you right click the cursor anywhere in the standard components table, the following context menu options will pop up:

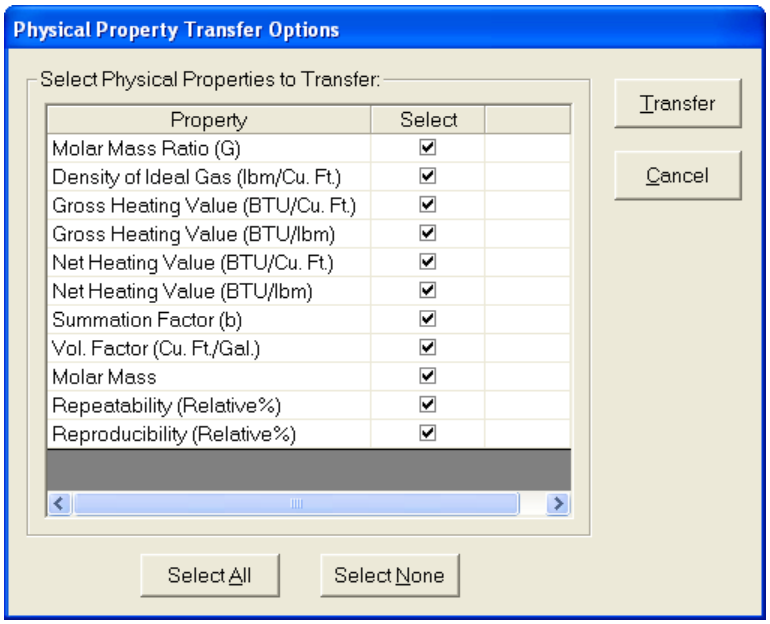
Select all components: Check all of the components in the displayed standard component table.

Select no components: Uncheck all of the components in the displayed standard component table.

Select matching components: Check the components in the displayed standard component table whose name matches a component name in the component table of the currently configuration.

Physical Property Transfer Options

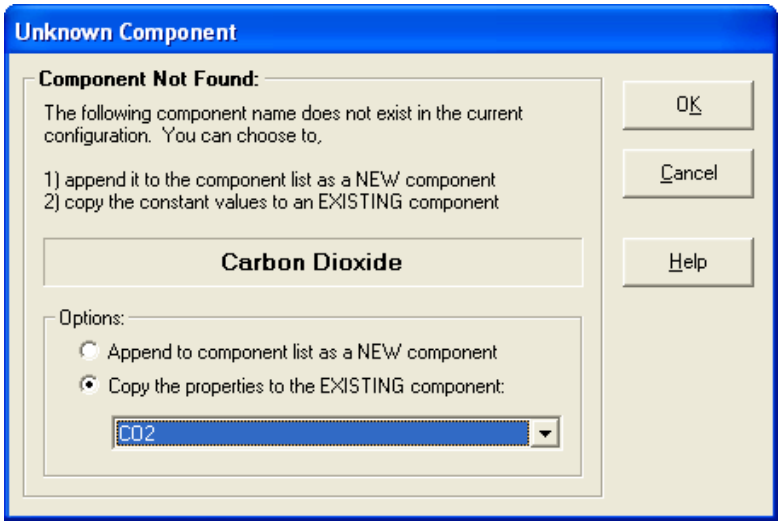
When you click the "Transfer" button, the following dialog box will be displayed allowing you to select which physical property data to transfer from the selected data source to the current configuration. When you have chosen the desired properties, click the "Transfer" button to begin the transfer.



Unknown Component Dialog Box

If you select a standard component whose name doesn't match one of the existing entries in your component list, the "Unknown Component" dialog box is displayed. This dialog box gives you the option to either append the selected standard component to the end of your component list, or to copy the physical properties for

the standard component to an existing component in your component list. This allows you to update the physical properties for components that you may have named differently than the standard names ("CO2" vs. "Carbon Dioxide", for example)



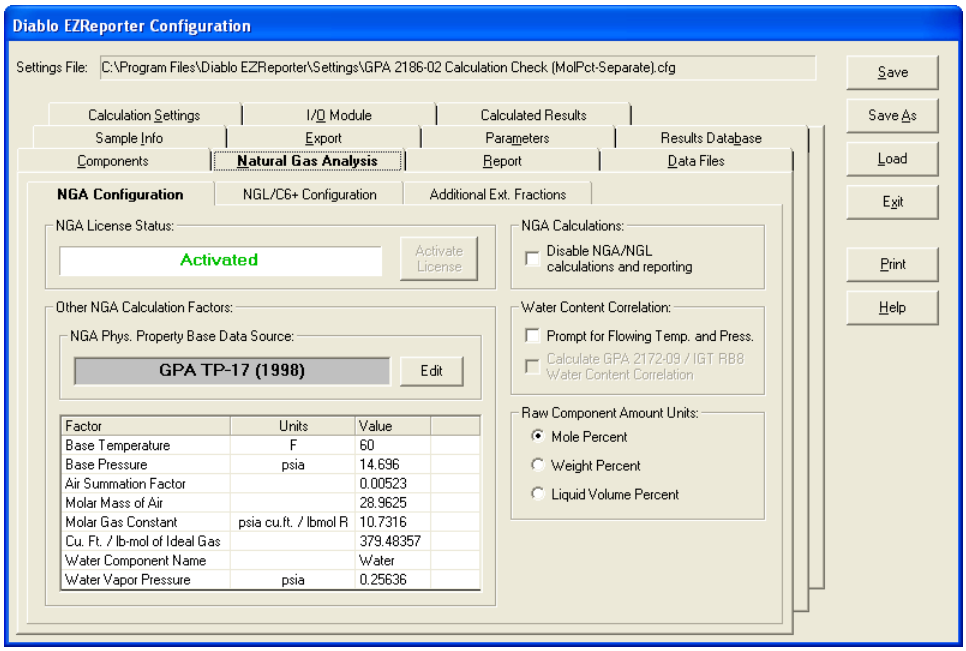
The "Unknown Components" dialog box.

To update the physical properties for an existing component, select "Copy the properties to an EXISTING component", and then choose the correct component name from the list box. Click "OK" to transfer the standard physical properties to the selected component in your configuration.

You will have to repeat this process for each unknown component in your configuration file.

Natural Gas Analysis Settings

The "Natural Gas Analysis" tab of the configuration dialog allows you to specify additional calculation factors.



The "Natural Gas Analysis" Tab of the Diablo EZReporter Configuration Screen

NGA License Status

This window displays the current license status of the Natural Gas Analysis (NGA) optional feature. If the EZReporter software is in trial mode or if the NGA feature is not activated, then the "Activate License" button is enabled. Click this button to display the license activation window.

Disable Natural Gas Analysis Calculations and Reporting

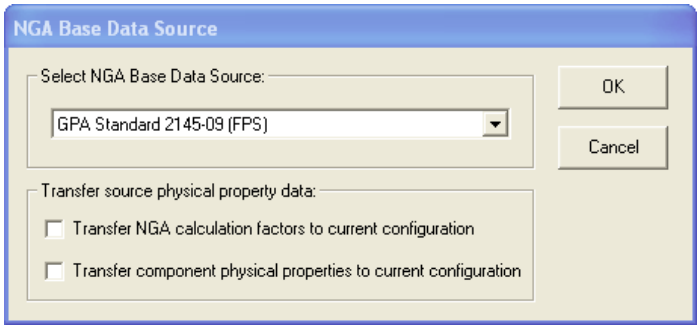
If you want to use the software for general reporting and exporting, you can disable NGA calculations and reporting by checking this check box under Report Control.

Important:

Important: The resulting report/results will not include any of the calculated NGA results – only the component retention time, peak area, raw (un-normalized) amount, total raw (un-normalized) amount, normalized%, and total normalized%. All other features of the software including exporting and monitoring, still work as normal.

NGA Physical Property Base Data Source

The physical property data source used as the basis for the physical properties in the configuration is displayed. The data source is set correctly in all of the default configuration files. However if you are loading an older configuration file, you will need to manually identify the correct data source by clicking the "Edit" button. The following window will be displayed for you to select the data source:



Important:

Important: Your selection is not validated in any way. If you want to be sure that the physical properties in your configuration are from the selected data source, then click the "Transfer" check boxes and update the physical properties of all your components with values from the selected data source.

Base Temperature

The Base Temperature is determined by the data source you are using and can not be changed. It is displayed for informational purposes only.

Base Pressure

Enter the pressure base in psia to use for the calculations into this text box. The calculated results will be corrected to reflect their values at the specified Pressure Base.

Note: All of the default configuration files that ship with the EZReporter software use a Pressure Base of either 14.696 or 14.73 psia (14.696 psia for the configuration files that derive from a GPA or ASTM standard, and 14.73 psia for "default.cfg" and "hexanes plus.cfg"). It is the customer's responsibility to determine the correct Pressure Base to use for their specific requirements. Note that the North American Energy Standards Board (NAESB) specifies a standard pressure base of 14.73 psia. Consequently many companies are adopting 14.73 as the standard pressure base for these calculations.

ISO Configurations all use a base/reference pressure of 101.325 kPa.

Air Summation Factor

The Air Summation Factor is used in the calculation of the real relative density. The current value of this property as specified in GPA Standard 2145-03 is **0.00523** and in GPA Standard 2145-09 is **0.00537**.

Cu. Ft. / lb – mol of Gas

This setting is the number of cubic feet of volume occupied by one lb. mol. of an ideal gas at 14.696 psia and 60 degrees F. It is used to calculate the **Cu. Ft. Vapor/Gallon of Liquified Product**. The default value of **379.48357** is taken from GPA Standard 2186-02.

Water Settings for "Saturated" and "Wet" Calculations

These settings are used when calculating "Saturated" and "Wet" results when water is included in the component list.

Component Name: If a component with this name exists in the component list, then "Saturated" results will be reported along with the "Dry" results. If the mole% of this component in the analysis data is greater than 0, then "Wet" results will also be calculated based on that mole% value.

Important:

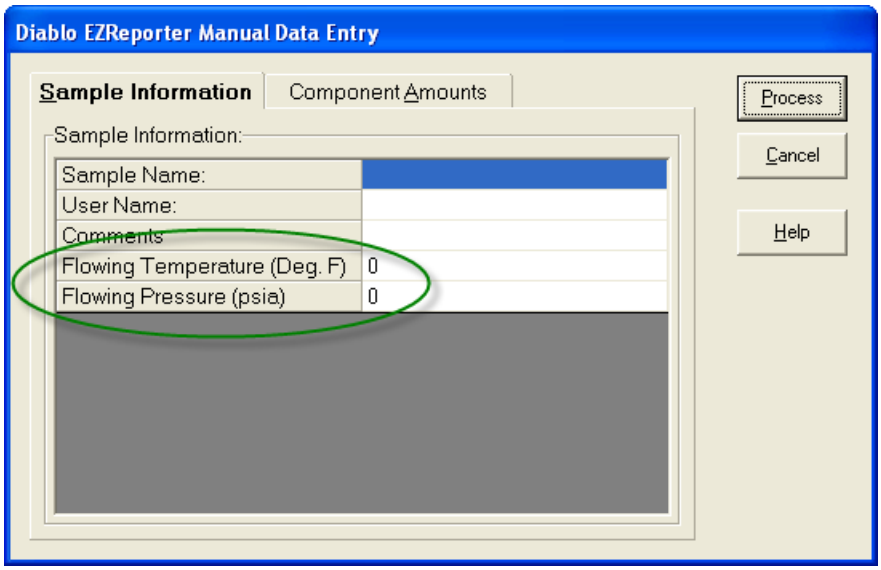
Important: The compound name in the component list must match this Water Component Name exactly.

Water Vapor Pressure: The vapor pressure of water at 60 Deg. F: **0.25640 psia**. This value was changed from 0.25636 in the GPA 2172-09 standard.

Water Content Correlation: the water content of a water-saturated gas at a specified flowing/saturation temperature and pressure can be calculated using the IGT RB 8 water content correlation that is described in the GPA 2172-09 standard. To enable this calculation, first check the "Prompt for flowing Temp. and Press." checkbox and then check "Calculate GPA 2172-09 / IGT RB 8 Water Content Correlation.

When these checkboxes are checked and the results processed, the Sample Information screen (shown below) will be displayed allowing you to enter the flowing temperature (in degrees F) and pressure (in psia). The saturation water content will then be calculated for those conditions and displayed in the summary results section of the report under the "Wet (flowing)" column.

Note: If you are processing results manually, you will need to select the "Tools > Edit Current Data Set…" menu option to display this dialog box and enter or change the flowing temperature and pressure.



The Sample information screen that is displayed to allow you to enter the flowing temperature and pressure for the water content correlation calculation.

Raw Component Amount Units

Select whether your GC results are calibrated and reported using Mole Percent, Weight Percent, or Liquid Volume Percent units. If your chromatography data system reports component raw amounts as Weight%, then EZReporter will calculate the corresponding component Mole% from the Weight%. Similarly, if your chromatography data system reports component raw amounts as Mole% or Volume%, then EZReporter will calculate the other normalized amounts.

NGL/Extended Fraction Reporting

Natural Gas Liquids (NGL)/Extended fraction (C6+) calculations involve renormalizing the extended fraction component amounts to 100% and then calculating the following results:

Supported NGL/Extended Fraction Results
C6+ Fraction: Total Raw Amount
C6+ Fraction: Vapor Pressure
C6+ Fraction: Relative Liquid Density (Specific gravity)
C6+ Fraction: Liquid Density (lbm / gal.)
C6+ Fraction: Liquid Density (lbm / bbl)
C6+ Fraction: Volume (cu.ft. / gal.)
C6+ Fraction: API Gravity
C6+ Fraction: Avg. Molecular Weight
C6+ Fraction: Gross Heating Value (BTU / cu.ft.)
C6+ Fraction: Gross Heating Value (BTU / lbm)
C6+ Fraction: Gross Heating Value (BTU / gal.)

In addition, with "Combined" reports the extended components are also normalized with the standard components and the total results for the extended components are calculated and integrated into the standard report through the "combined component", which is usually Hexanes Plus. EZReporter supports combined reports that include the following results:

Supported Results for NGL Combined Reports
Total Raw Amount
Total Normalized Mole% (Dry)
Total Normalized Weight%
Total Normalized Liquid Volume%
Gross Heating Value, Ideal (Dry)
Gross Heating Value (BTU / lbm)
Gross Heating Value (BTU / gal.)
Total Molecular Weight
Total Vapor Pressure
Total Relative Liquid Density (Specific Gravity)
Total Liquid Density (lbm / gal.)
Total Liquid Density (lbm / bbl)
Total Volume (cu.ft. / gal.)

API Gravity

Important: If you include total results other than those listed above in your combined report, those results will likely be incorrect.

Selecting the NGL Calculation and Reporting Method

The quickest way to get started with the EZReporter NGL/Extended Analysis and Report is to load and edit one of the default NGL configuration files. Choose the default NGL configuration file that is designed for your desired extended calculation and reporting method.

Note that all of these configuration files include all 169 components and their physical properties from the GPA TP17 standard (the standard range components use physical properties from the GPA 2145-09 standard). However, you can delete, rename, and reorder the components to meet your needs.

For additional information on configuring EZReporter NGL/Extended reports, see "Overview of NGL Configuration Window" on page 66.

Extended – Separate Report

With this calculation and reporting method, the extended fraction results are reported separately from the standard/total results. The extended results are *not* integrated into the standard/total results.

Default configuration file to use as a template:

NGL Default (WtPct-Separate).cfg

Extended – Combined Report

With this calculation and reporting method the extended fraction results are reported separately and are also combined into the standard /total results through the specified combined component (usually Hexanes Plus).

Default configuration file to use as a template:

NGL Default (WtPct-Combined).cfg

Extended – Combined Report with Raw Amount Correction

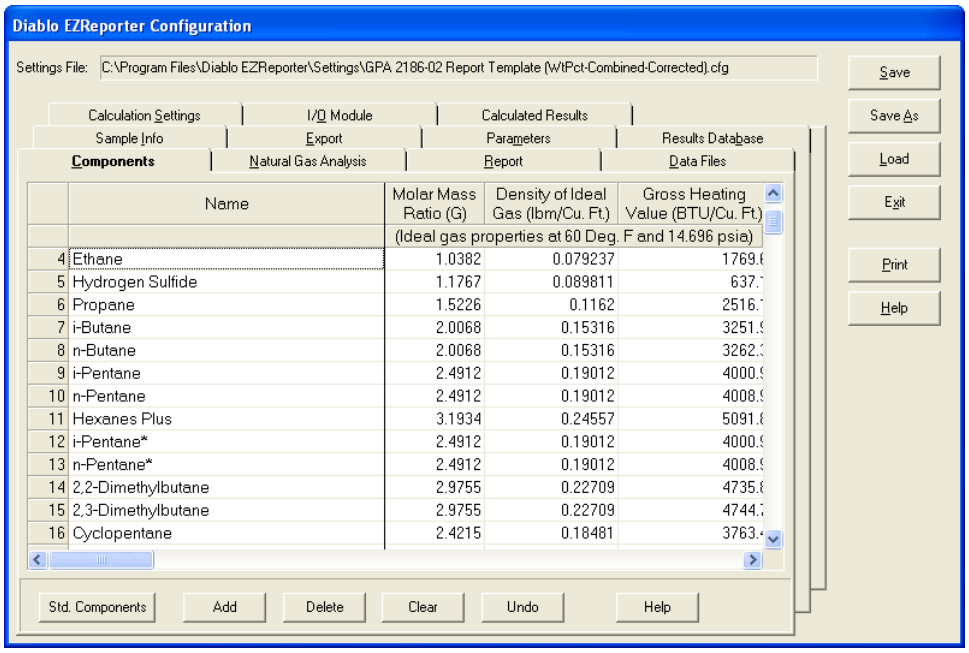
This configuration file is the same as the "Extended – Combined" configuration, but it is also set up to correct the raw component amounts in the extended fraction using a correction ("bridge") factor calculated from the iso-pentane and n-pentane amounts from the standard component range (usually from the TCD detector) and the extended component range (usually from the FID detector).

Default configuration file to use as a template:

NGL Default (WtPct-Combined-Corrected).cfg

Editing the Default Configuration

To select and customize the default NGL configuration you must first open the EZReporter configuration editor by clicking the "**Tools > Edit Configuration…**" menu option.



The EZReporter configuration editor

Customizing the Configuration

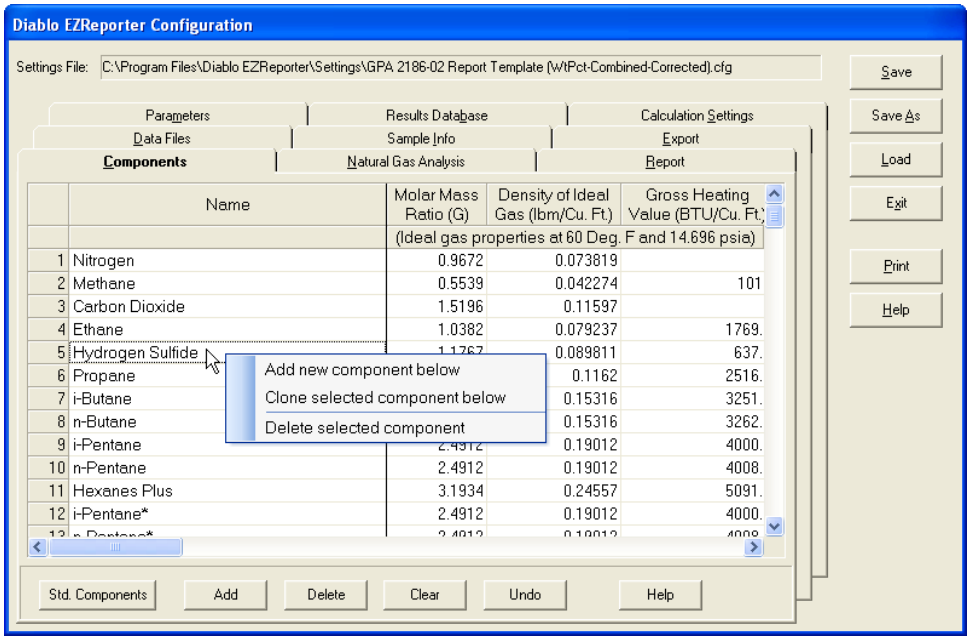
Next, perform the following steps:

1. Load the configuration file described above that best matches your NGL calculating and reporting requirements by clicking the "**Load**" button.
2. Before making any changes to the default configuration you should first save it to a different file name by clicking the "**Save As**" button. This step is important to ensure that your customized configuration will not be reset to default settings if you ever reinstall or upgrade the software.
3. Edit the component list to match your application as described in "Configuring the EZReporter Component List" on page 64. Pay close attention to the important component naming requirements.
4. Make any other changes to the NGL/C6+ configuration as described in "Overview of NGL Configuration Window" on page 66.
5. Make any other changes to the configuration required for your application. This may include customizing the results displayed in the report, changing the report header, setting up export options, etc. Please refer to the EZReporter Reference manual for more information on this topic.
6. Once you are finished customizing the configuration make sure to save your changes by clicking the "**Save**" button. It is also a good idea to make backups of custom configurations in case you have a hard drive failure or other computer problem. EZReporter provides an easy way to backup important configuration files by clicking the "**Tools > Backup Current Configuration Files…**" menu

option. It is always best to save the configuration on a flash drive or external hard drive or network share.

Configuring the EZReporter Component List

It is unlikely that the component list included in the default configuration that you chose will meet the needs of your application exactly. Fortunately, the component list can be modified easily. To customize the component list you must first open the EZReporter configuration editor by clicking the "**Tools > Edit Configuration…**" menu. If the "**Components**" tab isn't already displayed, click that tab to display the component table.



The EZReporter component configuration window

Important Component Naming Requirements

The two most important things to remember when configuring the EZReporter component list are:

1. The component names used in the peak/calibration table and reports from the gas chromatography data system must match the spelling of the component names in the EZReporter component table.

   For example, if carbon dioxide is reported as "Carbon Dioxide" by the chromatography data system, it must also be listed in the EZReporter component table as "Carbon Dioxide" or "carbon dioxide", not as "CO2".

2. The component names in EZReporter component table must all be unique.

   If you need to have multiple components with the same name, then append a numeric suffix or other unique character to the component name. For example, in the "Extended – Combined with Raw Amount Correction" configuration described above, the "i-Pentane" and "n-Pentane" from the extended detector channel are entered into the component table as "i-

Pentane*" and "n-Pentane*" to differentiate them from the same components reported from the standard detector channel. You could also use numeric suffixes like, "Nonanes1", "Nonanes2", "Nonanes3", etc.

Editing the Component list

Here are additional instructions on how to customize the component list in the default configuration file you have chosen in order to meet the needs of your specific application.

Deleting Components

It is unlikely that you will need all of the extended components that are included in the default configuration. To delete a component from the component list you simply select the desired row in the component table and either click the "Delete" button, or right-click on the row and select the "Delete selected component" from the pop-up menu that is displayed. If you delete one of the standard range components (C1-C6+, N2, CO2, Etc.) then you will need to edit the "Last Standard Component" setting in the NGL/C6+ Configuration.

Renaming Components

As described above, it is important that the component names in the EZReporter component table match the component names reported by the chromatography data system. To change the spelling of a component in the EZReporter component table, simple double-click on the desired component name and enter the new spelling.

Duplicating Components

If you want to duplicate an existing component, including all of its physical properties, simply select the row containing the component and the right click on the row and select "Clone selected component below". The selected component will be duplicated in the row immediately below. Because component names must be unique, the cloned version of the component will have a "*" appended to the component name (or multiple "*" characters to ensure that the name is unique). You are free to rename the duplicated component as long as it is still a unique name.

If you add a new component to the standard component range (C1-C6+, N2, CO2, Etc.) then you may need to need to edit multiple settings in the NGL/C6+ Configuration, including the "Last Standard Component", and "First Extended Component", etc

Changing the Component Order

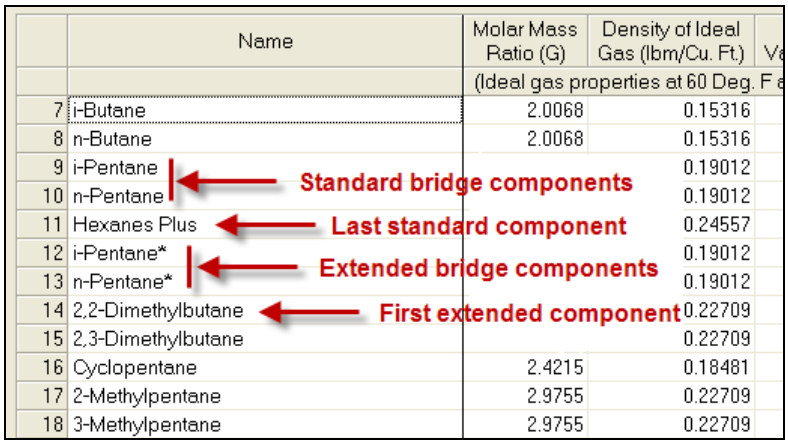
You can change the order of the components if necessary. However, it is important that the components maintain the following relative order:

The "standard" components (C1-C6+, N2, CO2, etc.) should be located at the top of the component table. The order that they are listed in the table is the order that they will appear in the report. The relative order of these components is not important. However, if you change the location of the bridge components (usually iC5 and nC5) or the combined component (usually C6+), then you may need to edit the NGL/C6+ configuration so that the correct components are selected for those settings. See "Extended Report Format" on page 68 for more information.

If your method is configured to perform the extended amount correction, then the "bridge" components for the extended fraction must be placed *between* the last

standard component and the first extended component so that they are not included in the calculations and report (see the screen capture below).

The extended fraction components should be listed at the bottom of the component table – below the last standard component and extended fraction bridge components if they are present. The relative order of the extended components is not important.

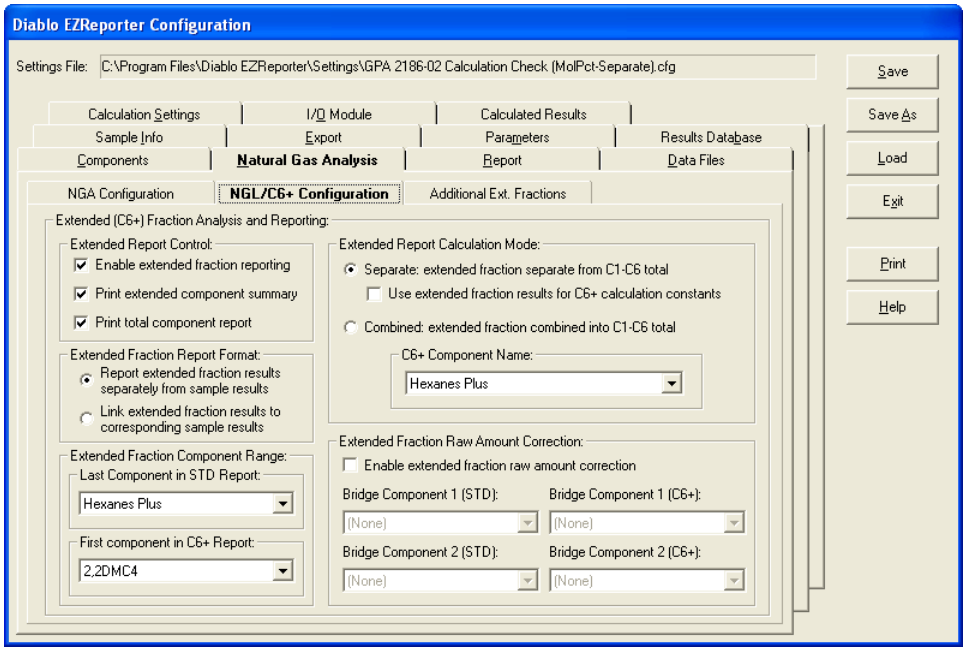


Screen capture of the component table showing the relative order of the components.

To change the order of a component in the component table, simply select the row in the table that contains the component you want to move and then click *and hold* the right mouse button while dragging the component to the new location in the table.

Overview of NGL Configuration Window

EZReporter is configured for the Natural Gas Liquids (NGL) extended calculations and reporting in the "**NGL/C6+ Configuration**" tab of the Natural Gas Analysis section of the configuration editor. To display this window, first open the configuration editor by clicking the "**Tools > Edit Configuration…**" menu option. Next select the "**Natural Gas Analysis**" tab, and then the "**NGL/C6+ Configuration**" tab.



The NGL/Extended (C6+) Configuration Window

Extended Report Control

Check "**Enable extended fraction reporting**" to enable and configure the extended fraction (C6+) calculations and reports. If you would like to have a summary table for the components in the extended fraction included when you print a report, then check "**Print extended component summary**". If you would like to print a total component report that includes the normalized mole%, weight%, and liquid volume% for all standard and extended range components, check "**Print total component report**".

Extended Fraction Report Format

These two options determine how the extended fraction results will be displayed on the printed report relative to the total sample results. If you choose "**Report extended fraction results separately from sample results**", then the extended fraction results will be appended to the results table below the sample results. If you choose, "**Link extended fraction results to corresponding sample results**", then the extended fraction results will be displayed in additional columns to the right of the corresponding total sample results.

Extended Fraction Component Range

These options are used to define the components that will be included in the standard/total report, and the components that will be included in the extended fraction report.

Last Component in STD Report: Select the last component to include in the standard/total report. This will usually be Hexanes Plus (C6+).

First Component in C6+ Report: Select the first component in the extended (C6+) fraction. This will usually be 2,2-Dimethylbutane. Note that all components after this component in the component list will be included in the extended fraction calculations and report.

Extended Report Format

These options are used to define how the extended fraction (C6+) results will be used in the calculation and report. There are two options:

Separate: With this method, the extended fraction is only reported separately from the standard/total results. The extended results are *not* integrated into the standard/total results. Consequently, the GC method and calibration must include Hexanes Plus in the standard portion of the report (usually from the TCD detector channel) as in a normal natural gas analysis report.

If you check, "**Use extended fraction results for C6+ calculation constants**", then the extended fraction results will be used as the physical constants for C6+ in the total sample calculations in place of the constants in the component table.

Here are the extended fraction results that are calculated and can be reported:

Supported NGL/Extended Fraction Results
C6+ Fraction: Total Raw Amount
C6+ Fraction: Vapor Pressure
C6+ Fraction: Relative Liquid Density (Specific gravity)
C6+ Fraction: Liquid Density (lbm / gal.)
C6+ Fraction: Liquid Density (lbm / bbl)
C6+ Fraction: Volume (cu.ft. / gal.)
C6+ Fraction: API Gravity
C6+ Fraction: Avg. Molecular Weight
C6+ Fraction: Gross Heating Value (BTU / cu.ft.)
C6+ Fraction: Gross Heating Value (BTU / lbm)
C6+ Fraction: Gross Heating Value (BTU / gal.)

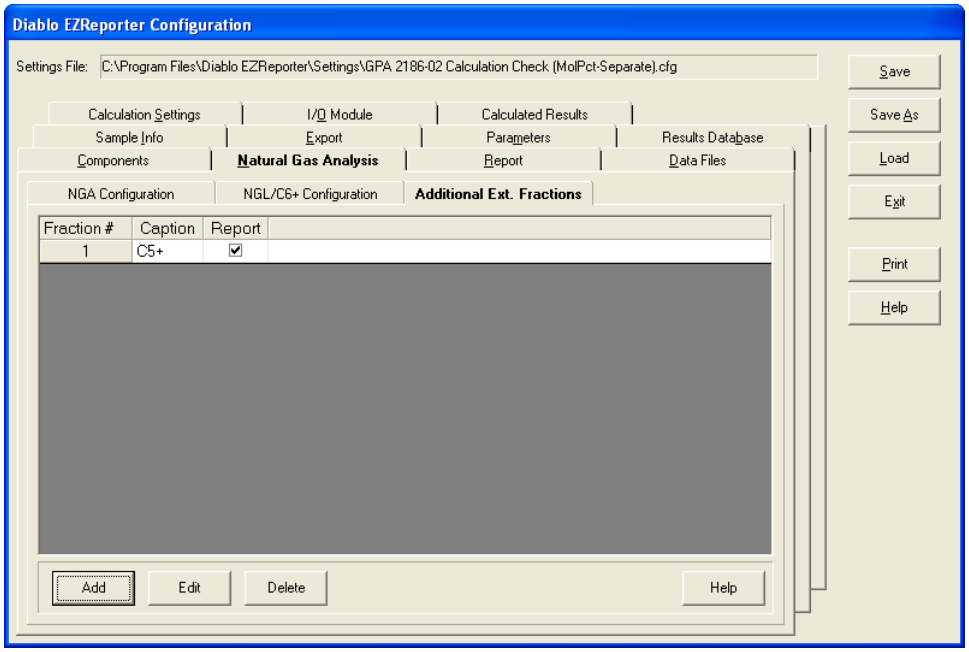
Combined: With this method the extended fraction results are reported separately and are also combined into the standard /total results through the specified combined component (Usually Hexanes Plus). Here are the standard/total results that can be used in a combined report:

Supported Results for NGL Combined Reports
Total Raw Amount
Total Normalized Mole% (Dry)
Total Normalized Weight%
Total Normalized Liquid Volume%
Gross Heating Value, Ideal (Dry)
Gross Heating Value (BTU / lbm)
Gross Heating Value (BTU / gal.)
Total Molecular Weight
Total Vapor Pressure
Total Relative Liquid Density (Specific Gravity)
Total Liquid Density (lbm / gal.)
Total Liquid Density (lbm / bbl)
Total Volume (cu.ft. / gal.)
API Gravity

Extended Fraction Raw Amount Correction

Combined reports have an additional option that allows the extended fraction component raw amounts to be corrected prior to normalizing. The correction ("bridge") factor is calculated from the raw amount ratio of one or two sets of bridge components. The correction assumes that the bridge component(s) in the extended fraction should have the same raw concentration as the corresponding component(s) in the standard fraction. The calculated correction factor is then applied to all of the component raw amounts in the extended fraction prior to their use in the combined report calculations.

Additional Extended Fractions

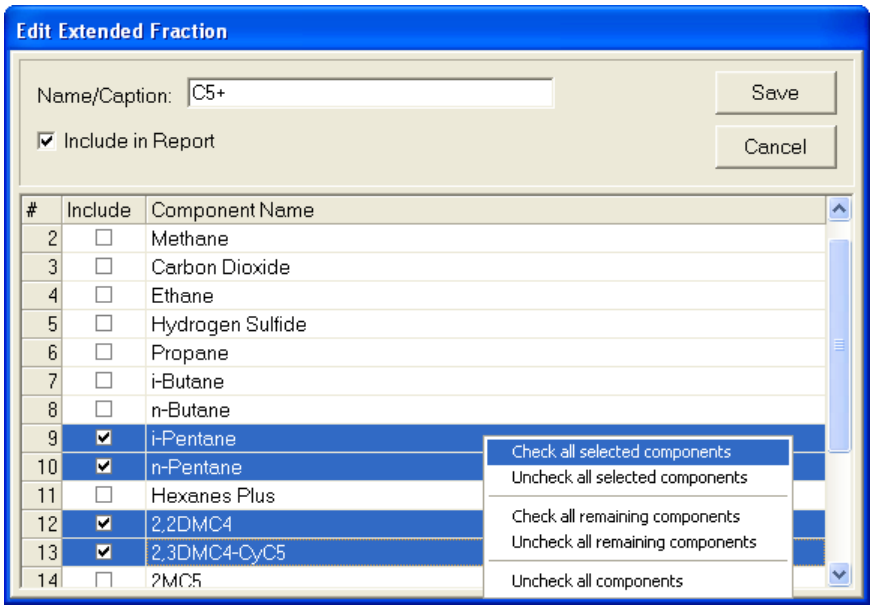


The "Additional Ext. Fractions" table allows you to define additional extended fraction ranges that can be calculated and reported in addition to the C6+ fraction.

To define an additional extended fraction, click the "**Add**" button to define the name/caption of an extended fraction, and then select the components to include in the extended fraction.

If you want to include the additional extended fraction in the printed report, make sure to check, **"Include in Repor**t".

Make sure to check the "**Save**" button to save the extended fraction settings.



You can use right-click context menu options to assist with selecting large extended component ranges.

1. You can ctrl-click and/or shift-click to select the desired list of components and then right click and choose "**Check all selected components**" from the context menu. You can also "**Uncheck all selected components**".

2. You can right click a component and then select "**Check all remaining component**s" from the context menu to check all components below the selected component in the table. Similarly, you can choose to "**Uncheck all remaining components**".

3. You can uncheck all components by selecting "**Uncheck all components**" from the context menu.

The Results Database

Overview of the Results Database

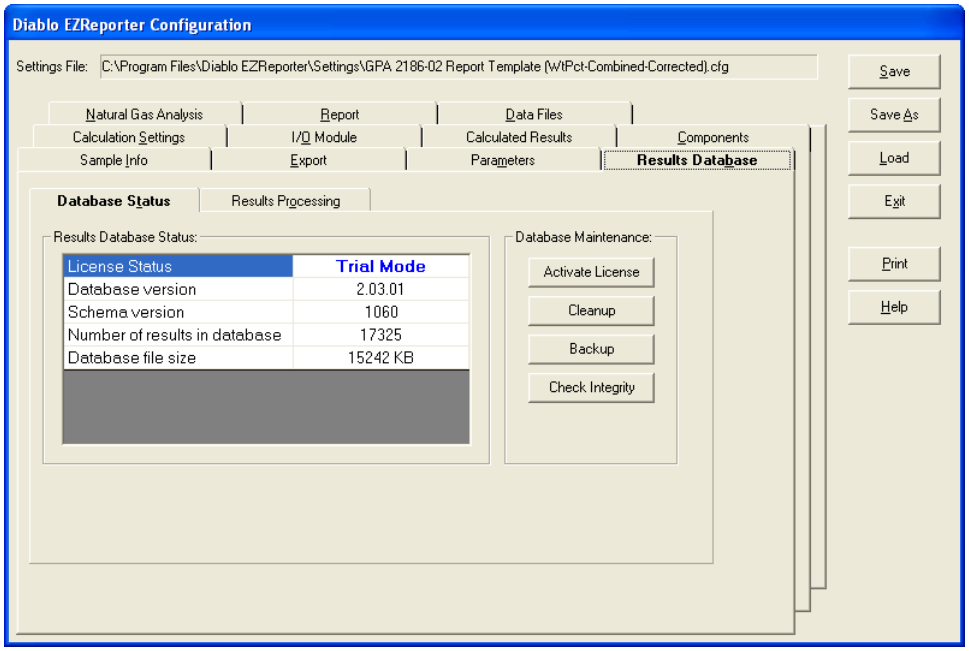
The Results Database is an optional add-on for the Diablo EZReporter software that allows you to capture results and save them in a local SQLite database. A few of the capabilities of the Results Database are listed below.

- Sample results including sample information, individual component results, and calculated natural gas analysis (NGA) results can be added to a local results database.
- Sample results in the database can be searched and batch reprocessed (for printing reports, creating history plots, or exporting results).
- Statistics including average, standard deviation, %RSD, maximum, and minimum are calculated and displayed when performing sample name searches.
- A results comparison window can be used to compare the component normalized mole% values between two samples using either the GPA 2261 repeatability or reproducibility limits (or any other limits entered by the user).
- Each result in the database has a "Status" field that can be set to "None", "Accept", or "Reject" status. The status field can then be used in searches or batch reprocessing to filter which results are selected.
- You can enable a result confirmation screen that displays the current monitored parameters and their alarms and allows you to "Accept", "Reject" or "Cancel" the result before it is added to the database. In addition, you can enter a result comment from a pre-filled list of comment strings.

Configuring the Results Database

The Results Database uses a self-contained, serverless, zero-configuration, SQLite database that is stored on the local hard drive. There is no complex database setup or configuration required.

The "Results Database" tab of the configuration editor allows you to set up the EZReporter to add results to the database automatically as well as to check the status of the database and perform database maintenance functions.



The Results Database tab of the configuration editor.

Database Status

License Status: Displays the license status for the results database.

Database Version: Displays the current version of the database.

Schema Version: an internal version resource that is incremented whenever the database schema is modified.

Number of results in database: The number of results that are currently present in the results database.

Database file size: The physical size of the 'Results.db' database file on disk.

Database Maintenance

The buttons in the "Database Maintenance" section of the Results Database configuration window are used to perform the maintenance activities listed below.

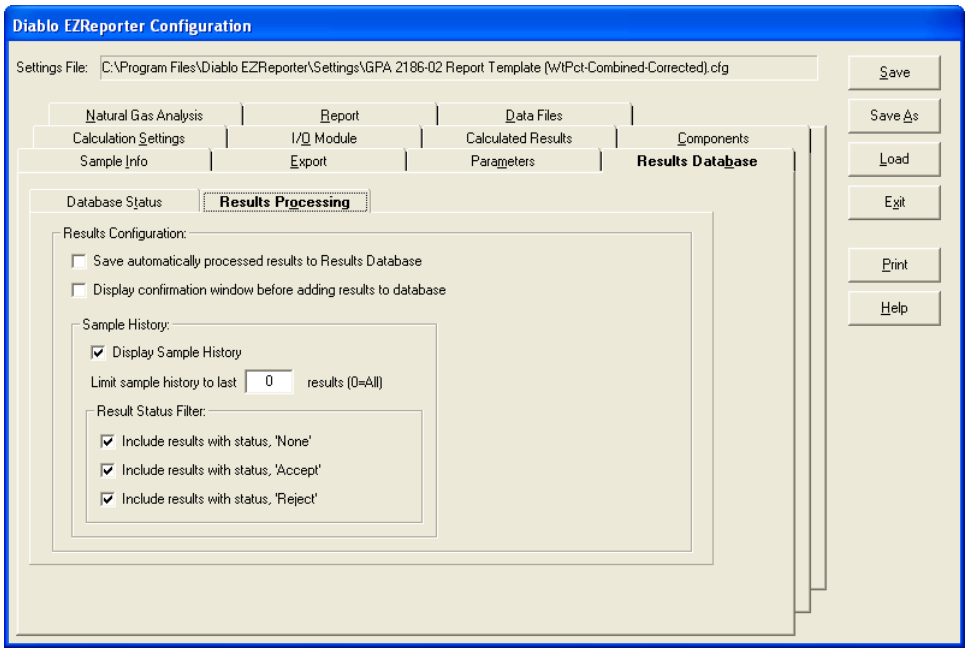
Activate License: This button is enabled if the Results Database license has not been activated. It displays the license activation dialog that allows you to activate this feature.

Cleanup: Compresses and re-indexes the database file. This is most often used to reclaim space (and reduce the database file size) taken up by deleted database results records.

Backup: Backs up the current results database. The format of the backup file is "Results-YYYYMMDD-HHMMSS.db", where "YYYYMMDD" is the current date, and "HHMMSS" is the current time. Backup files are saved in the EZReporter installation folder.

Check Integrity: Performs a check of the integrity of the database. It looks for out-of-order records, missing pages, malformed records, and corrupt indices.

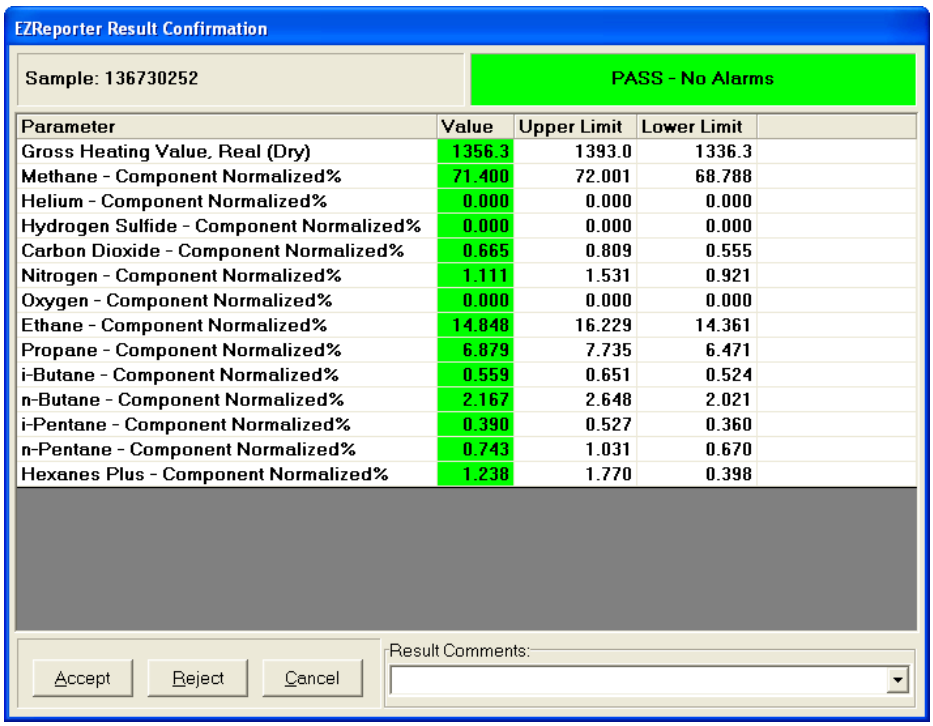
Results Processing



Save automatically processed results: If you check the "Save automatically processed results…" check box, then results that are processed automatically from one of the supported data systems will be added automatically to the results database.

Display confirmation window: If you check "Display confirmation window", the result confirmation dialog box is displayed before the result is added to the results database. This dialog box re-displays the parameter monitor table with all of the alarm limits visible. Clicking the "Accept" or "Reject" buttons will cause the result to be added to the database with the corresponding result status. Clicking "Cancel" will cancel adding the result to the database. Any text that is entered into the Result Comments box will be saved in the "ResultComments" database field for that result.

Note: You can have a set of pre-defined result comments loaded automatically into the Result Comments list box by adding those comments to a file named, 'ResultComments.dat". If this file is found in the EZReporter installation folder, each line of text present in the file will be added as a separate item in the list box.

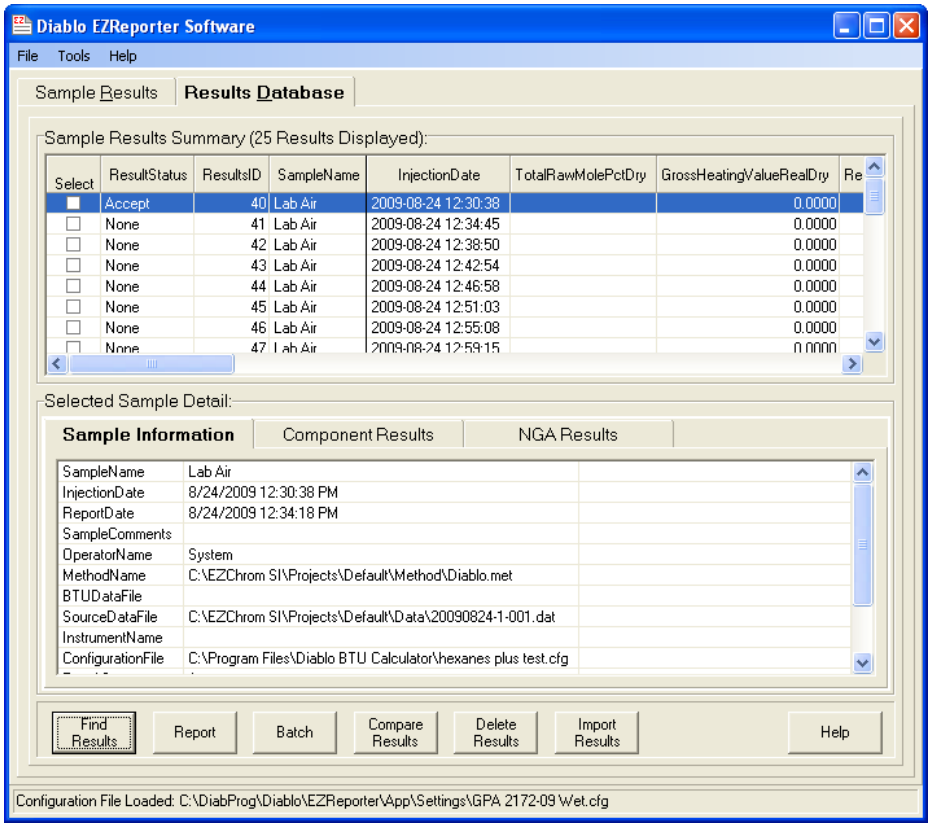


The Result Confirmation Screen that allows you to review the results before adding them to the results database.

Display Sample History: Check "Display Sample History" If you would like to display the sample history for automatically processed results. The history is retrieved from the Results Database based on the Sample Name of the result. You can limit the number of results that are displayed in the sample history, and you can filter the results further based on the results status.

The Results Database Window

If the Results Database has been licensed or is still in trial mode, then the Results Database tab will be visible on the main software window. The Results Database window is divided into two main sections: the "Sample Results Summary" table and the "Selected Sample Detail" table.



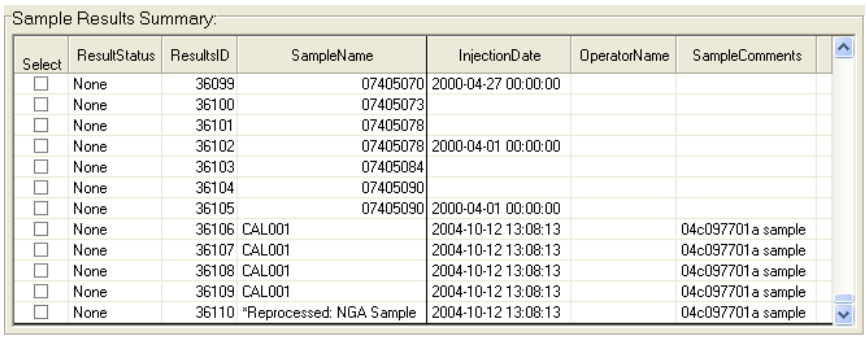
The Results Database window of the EZReporter Software.

When you click on a result in the Sample Results Summary table, the detailed results for that sample are displayed in the "Selected Sample Detail" tables below.

Sample Results Summary Table

The Sample Results Summary Table displays the results that have been selected using the "Find results" dialog. The summary table takes one of two forms. When results from multiple samples with different sample names are displayed, then only summary sample information is displayed in the table. When results with a single sample name are displayed, then the summary table displays summary statistics (average, standard deviation, %RSD, maximum, and minimum) for a number of component and NGA results to allow you to evaluate the result history for that particular sample.

Multiple Sample Summary



Single Sample Summary

Sample Results Summary:

Select	ResultStatus	ResultsID	SampleName	InjectionDate	GrossHeatingValueRealDry	RealRelativeDensityDry	TotalRa
☑	None	34460	69289		1081.9000	0.6213	
☑	None	34461	69289		1082.3000	0.6214	
☐	None	34462	69289		1078.4000	0.6180	
☐	None	34463	69289		1073.3000	0.6210	
☐	None	34464	69289		1085.9000	0.6230	
☐							
☐			Average:		1079.8500	0.6205	
☐			Std Dev:		4.2279	0.0019	
☐			%RSD:		0.3915	0.3107	
☐			Minimum:		1073.3000	0.6180	
☐			Maximum:		1085.9000	0.6230	

Note: If you have disabled NGA calculations (see "Disable Natural Gas Analysis Calculations and Reporting" on page 58), then the Single Sample Summary table will not include any of the natural gas analysis results.

Selected Sample Detail Tables

When you click on a result in the Sample Summary table, detailed results for that sample are displayed in the three Selected Sample Detail tables.

Sample Information Detail

This table contains the sample information fields for the selected sample.

Sample Information | Component Results | NGA Results

SampleName	*Reprocessed: NGA Sample
InjectionDate	10/12/2004 1:08:13 PM
ReportDate	7/27/2009 3:16:56 PM
SampleComments	04c097701a sample
OperatorName	
MethodName	BTU
BTUDataFile	C:\DiabProg\Diablo\Diablo BTU\App\data\ NGA Sample-02022005-151436.btu
SourceDataFile	
InstrumentName	
ConfigurationFile	C:\DiabProg\Diablo\Diablo BTU\App\hexanes plus.cfg

Component Results Detail

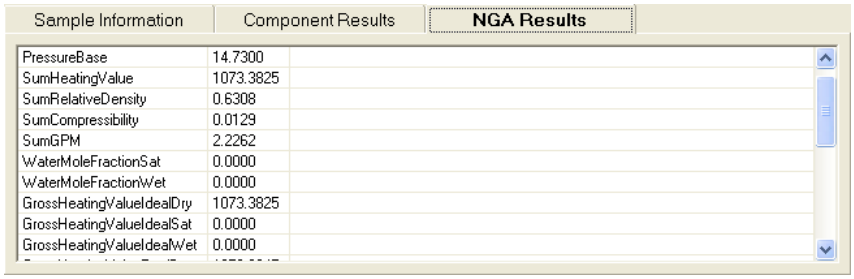
This table contains the component results for the selected sample. If you have disabled NGA calculations (see "Disable Natural Gas Analysis Calculations and Reporting" on page 58), then the Component Results Detail table will not include any of the natural gas analysis results.

Sample Information | Component Results | NGA Results

ComponentName	ComponentNumber	PeakRT	PeakArea	RawAmount	NormAmount	HeatingValue	RelativeDensi
Helium	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0(
Hydrogen	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0(
Nitrogen	3	0.3240	32852.0000	3.4368	3.5558	0.0000	0.0:
Argon	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0(
Oxygen	5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0(
Methane	6	0.3370	536405.0000	85.4867	88.4468	895.3794	0.4:
Carbon Dioxide	7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0(
Ethane	8	0.5400	45466.0000	4.3832	4.5350	80.4416	0.0-

NGA Results Detail

This table contains the natural gas analysis (NGA) results for the selected sample. If you have disabled NGA calculations (see "Disable Natural Gas Analysis Calculations and Reporting" on page 58), then the NGA Results tab will not be displayed.



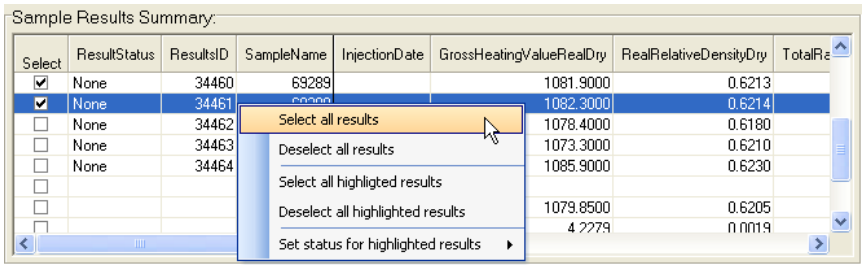
Using the Results Database

Selecting and Deselecting Results

Important:

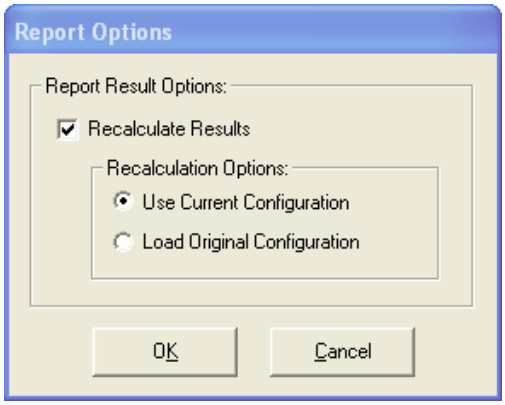
The database menus and dialogs differentiate between "selecting" a result and "highlighting" a result. "Selecting" a result means that you have checked the "Select" checkbox in the first column of the line containing the result. "Highlighting" a result means that you have clicked on a particular line in the result table, causing it to be highlighted.

You can click, control-click, and shift-click to highlight results in the Sample Results Summary table and the "select" them by right-clicking and using one of the context menu options:



Generating a Report for a Selected Result

To generate a report for a result in the database, simply highlight it by clicking on the row containing the result in the Sample Results Summary table, and then click the "Report" button at the bottom of the Window. The Report Options window will be displayed.

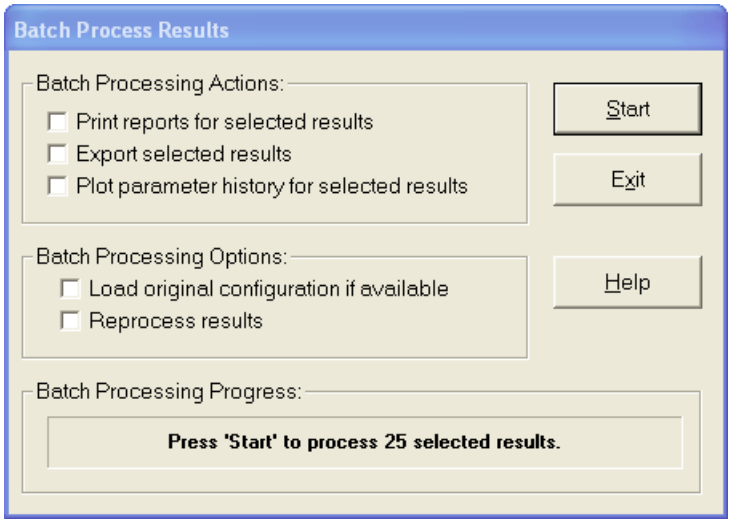


If the "Recalculate Results" checkbox is left unchecked, then the results will be displayed as they were calculated for the original report. If you check "Recalculate Results", you will then have the option of using the currently loaded configuration file settings, or the original configuration file settings (if available) for the calculations.

The selected results are then transferred to the main "Sample Results" window, and you can treat the report just as if had been loaded from disk or processed from a chromatography data system.

Batch Processing Multiple Results

Multiple results can be batch processed by first selecting the desired results in the Sample Results Summary table (the check box in the first column must be checked). Next click the "Batch" button to display the Batch Process Results dialog box.



The Batch Process Results dialog box.

Batch Process Selected results

You can choose to batch print, batch export, and/or plot the selected results by checking the appropriate checkbox.

During batch processing each selected result is transferred back to the main Sample Results window and then printed, exported, and/or plotted in the parameter history window.

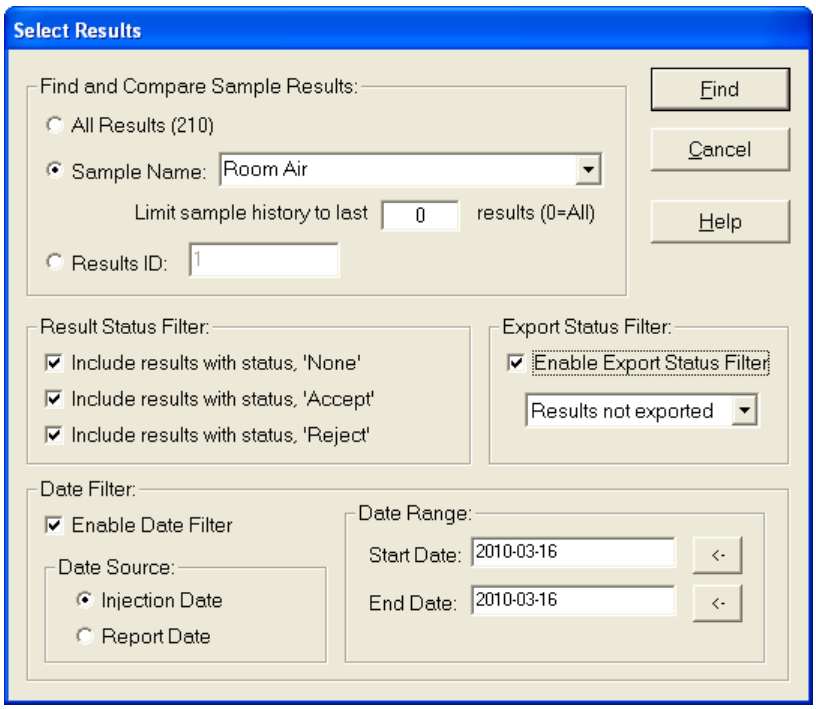
Processing Options

The current configuration settings, including the export settings and parameter history settings will be used to process the results unless you check the "Load original configuration if available" checkbox. If you enable this option, the original configuration file used to generate each result will be loaded and used if it is available.

If you check the "Reprocess results" check box, then all of the natural gas analysis results will be recalculated using the specified configuration file. If this box is left unchecked, then the results will be printed/exported as originally reported. You would enable this option if you wanted to reprocess results after making changes to physical property values, etc.

Finding Results in the Database

Click the "Find Results" button to select the results to display in the Sample Summary table.



The Select results dialog box.

Retrieve All Results

This option will retrieve all results from the database and display them in the Sample Results Summary table. The number of results currently in the database is displayed in parenthesis).

Find by Sample Name

The Sample Name list box is pre-filled with all of the sample names that are present in the current database. You can either select a sample name from the list, or type a sample name into the list box.

A sample name search returns all samples in the database that have the specified sample name. The Sample Results Summary table will be configured to compare the

results of these samples by calculating and displaying summary statistics. See "Sample Results Summary Table" on page 74 for more information.

You can limit the number of results displayed in the sample history by entering a value > 0 in the "Limit sample history" field.

Results ID

Enter the database results ID for the specific result you want to find.

Filters

A number of filters can be enabled to refine your search. Each of the following filters acts on the results retrieved using the options above.

Results Status Filter

You can filter the results that are returned from the search based on setting of the results status field for each result ("None", "Accept", or "Reject").

Export Status Filter

You can filter the results that are returned from the search based on setting of the Export Status field for each result. The export status field is changed from 0 (result not exported) to 1 (result exported) when the result has been saved to an export file using the batch export feature of the results database.

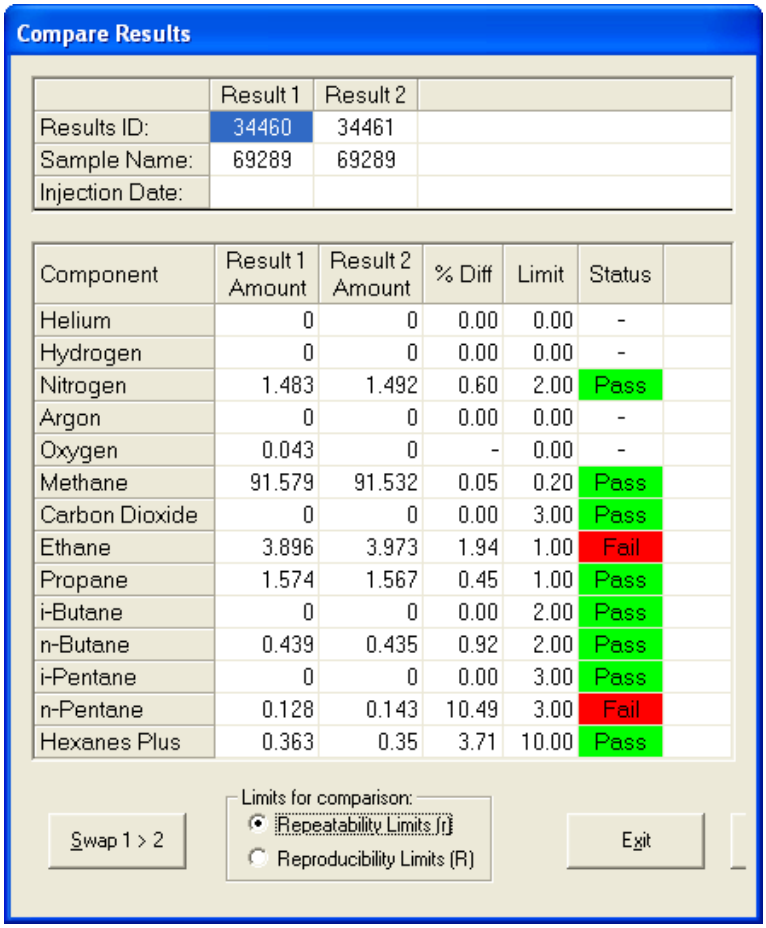
Date Filter

You can filter the results that are returned from the search based on either the injection date or the report date (which is usually the date the result was added to the results database). You can specify both a starting and ending date range.

Comparing Results

The results comparison window can be used to compare the component normalized mole% values between two samples using either the GPA 2261 repeatability or reproducibility limits (or any other limits entered by the user).

First select the two sample results you want to compare by clicking the "Select" check box in the first column of the Sample Summary results table. Note that if more than two results are selected, only the first two in the table will be compared. Next, check the "Compare" button.



The Compare Results window.

The %Difference for the two results is calculated as:

% Difference =ABS[((Result 1 – Result 2) / (Result 2)) * 100]

You can press the "Swap 1 > 2" button to do the reverse comparison. You can also switch between repeatability and reproducibility limits by clicking the desired limit option.

The component repeatability and reproducibility limits are entered into the component configuration table. See "Repeatability and Reproducibility Limits" on page 25.

Note: If you have disabled NGA calculations (see "Disable Natural Gas Analysis Calculations and Reporting" on page 58), then ***raw*** component amounts will be used for the comparison instead of the ***normalized*** component amounts.

Deleting Results from the Database

Select the result(s) that you want to delete by checking the "Select" checkbox for each result and then press the "Delete" button. In order to reduce the size of the database file after deleting records, you must also click the "Cleanup" button in the database maintenance options of the configuration editor.

Adding Results to the Database

There are three ways to add results to the Results Database:

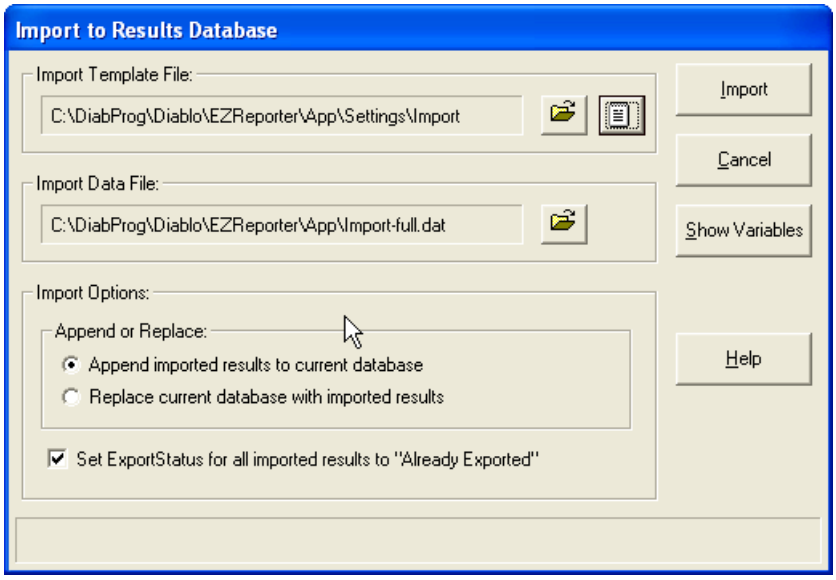
1. Enable the option to add automatically processed results from the chromatography data system to the database. See "Results " on page 72.
2. With the desired result displayed in the main Sample Results window, select the "Save to Results Database" option of the main "File" menu.
3. Import results from a comma- or tab-delimited text file. See "Importing Results into the Database" on page 81.

Importing Results into the Database

You can import results from a comma- or tab-delimited text file into the Results Database using the "Import Results" option.

The source text file must contain one result per line with each value separated by a comma or tab. An Import Template file is used to specify the order of the columns/fields in the Import Data File and how those fields/columns map into the database.

When you click the "Import" button, the following dialog box is displayed. You can select the Import Template File and Import Data File by clicking the respective browse button. You can open the Import Template File in Windows Notepad to edit the template file by clicking the corresponding notepad button.



The Results Database Import dialog box.

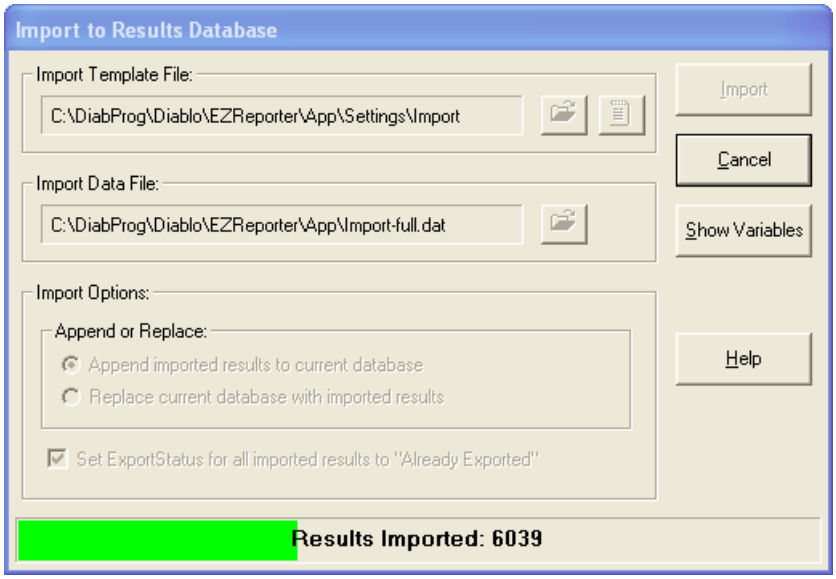
Import Options

You can choose to append the imported results to the current database, or replace all of the current results with the imported results. You can also choose to set the Export Status for each result to "Already Exported" if you don't want the imported results to be re-exported.

Importing

When you click the import button, the import progress is displayed in the progress bar at the bottom of the dialog box. Press the "Cancel" button to cancel the import.

Important: Canceling an Import does not delete results that have already been added to the database. If you want to delete those records that have already been added, you must use the "Delete" option. See "Deleting Results from the Database" on page 80.

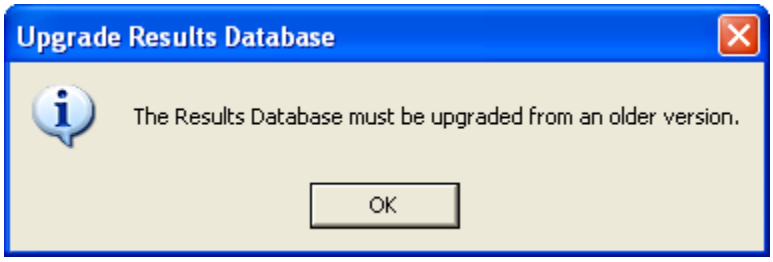


Details on creating the Import Template file can be found in the Appendix. See "Results Database Import Template Format" on page 100.

Upgrading the Results Database Format

As new features and capabilities are added to the Results Database in future versions of the software, the database format (schema) may change. However, the software has been designed to detect when you are using an older version of the database format and will allow you to upgrade the database to the latest format automatically without affecting your data.

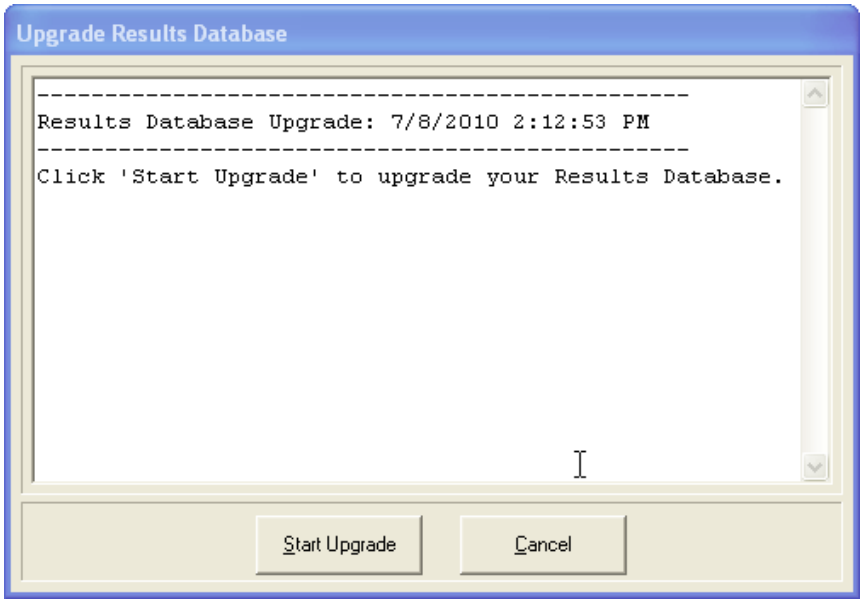
After installing a new version of the software, the following message will be displayed when the software is started if it detects that you are using an older version of the database format.



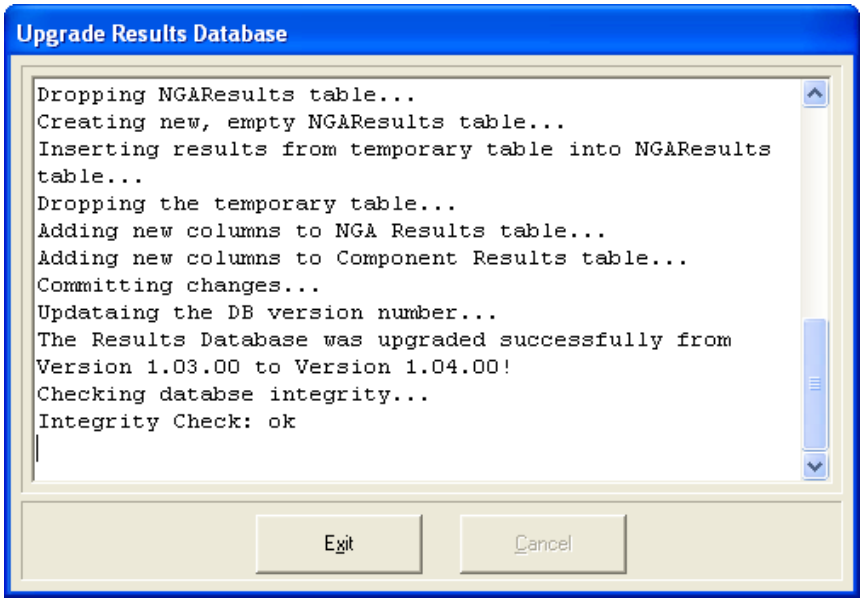
Note: the current version of the Results Database you are using is displayed in the "Results Database Status" table in the Results Database tab of the configuration Editor (see "Database Status" on page 72).

After clicking the "OK" button, the following "Upgrade Results Database" window will be displayed. Press the "Start Upgrade" button to upgrade your existing database to the latest version. Note that your current database will be backed up automatically so that it can be restored if any errors are detected during the upgrade process.

You can also choose to “Cancel” the database upgrade. However, the results database will be disabled if you choose to do so. You will be prompted to upgrade the database each time you start EZReporter until the database has been upgraded successfully.



The progress of the upgrade is logged to the window. Note that some of the upgrade steps may take several seconds to complete, particularly if your existing database is very large.



At the end of the upgrade process a message will be displayed indicating whether or not the upgrade was successful. The upgrade log is saved automatically to the file, “results_database_upgrade_log.txt”, which is located in the software installation folder.

If the database was ***not*** upgraded successfully, then the results database will be disabled until the problem can be found and fixed. Please contact support in this case to assist you in determining the problem. You will probably be asked to send your results database file and the upgrade log file to support.

Appendix

EZReporter Data File Format

EZReporter data files are comma-delimited text files that can be imported into LIMS or process data systems. An example file is listed below.

Hint:

Hint: Although the EZReporter data files are text files that can be used directly to send results to other customers or databases, Export files are a much better, more flexible way to do this. See "Data Export" on page 35 for more information on Export Templates and Export Files.

```
SampleName,"GPA 2172-96 Example Calculation"

MethodName,""

UserName,""

Comments,"Gas properties at 60 Deg. F and 14.696 psia
(Gas Analysis on Dry Basis)"

InjectionTime,""

SettingsFile,"C:\Program Files\ Diablo
EZReporter\Settings\GPA 2172-96 Wet.cfg"

ProcessMode,3

DataSource,1

Instrument,""

SampleInfo1,"1456" (optional)

SampleInfo2,"82" (optional)

SampleInfo3,"" (optional)

SampleInfo4,"" (optional)

,,"Component","Ret.Time","Peak Area","Unnormalized
Mole%","Normalized Mole%","Gross Heating Value","Molar
Mass Ratio","Summation Factor"

Component,1,"Helium",0.000,0,0.03,0.03,0,0.00004146,0
```

```
Component,2,"Nitrogen",0.000,0,0.32,0.32,0,0.003095136,0
.00001408

Component,3,"Carbon
Dioxide",0.000,0,2.02,2.02,0,0.03069592,0.00039794

Component,4,"Methane",0.000,0,83.02,83.02,838.502,0.4598
64384,0.00963032

Component,5,"Ethane",0.000,0,7.45,7.45,131.84265,0.07734
59,0.00178055

Component,6,"Propane",0.000,0,4.39,4.39,110.45679,0.0668
4214,0.00151016

Component,7,"i-
Butane",0.000,0,0.83,0.83,26.99077,0.01665644,0.00038014

Component,8,"n-
Butane",0.000,0,1.08,1.08,35.23284,0.02167344,0.00051624

Component,9,"i-
Pentane",0.000,0,0.31,0.31,12.40279,0.00772272,0.0001801
1

Component,10,"n-
Pentane",0.000,0,0.25,0.25,10.02225,0.006228,0.00015775

Component,11,"n-
Hexane",0.000,0,0.3,0.3,14.2677,0.0089265,0.0002406

SumHV,1179.71779

SumMolarMass,0.69909204

SumZ,0.01480789

RawTotalMolePct,100

PressureBase,14.696

WaterMoleFractionSat,1.74442025040827E-02

GrossHeatingValueIdealDry,1179.71779

GrossHeatingValueRealDry,1183.53165556816

GrossHeatingValueIdealSat,1159.13855397357

GrossHeatingValueRealSat,1163.31848048984

RealRelativeDensityDry,0.701094431772844

RealRelativeDensitySat,0.700006424492229

GasCompressibilityFactorDry,0.996777555082519

GasCompressibilityFactorSat,0.996406894082425
```

Export Template Format

Export templates are plain-text files with a ".btx" file extension that are used to define how results will be saved to the text files created by the export feature of the EZReporter software. Any text editor like Windows Notepad can edit export

template files. However, make sure they are saved with the ".BTX" file extension (Notepad will sometimes append a ".TXT" file extension to the end of the ".BTX" extension.)

The export function will replace any "variables" it finds within the export template file with the current value of the variable. Variables are pre-defined names enclosed between braces: {VariableName}.

Note: The template examples shown below are included in the template file, "Example Export Template.btx".

Any other text that is present in the template file will be exported "as is" unless it is part of a comment or other special template section.

```
{StartComment}

Any text present between {StartComment} and
{EndComment} will not be saved to the export file.
Comments can be used to annotate the template file.

{EndComment}
```

The lines between StartHeader and EndHeader will only be saved to a new export file. They will not be saved when new results are appended to an existing export file. This can be used to create a column header for a summary list of results from multiple runs, for example.

```
{StartHeader}

Date, Name, Ret. Time, Area, Mole%

{EndHeader}
```

"DecimalPlaces" is a special variable used to set the number of decimal places to include for calculated results (4 places in this example). It affects the results that are exported after its place in the template. Note that the default value is the number of decimal places specified in the Data Files configuration.

Note: It is generally best to change the number of decimal places to report using the option in the Data Files section of the EZReporter configuration editor rather than the "Decimal Places" variable.

```
{DecimalPlaces,4}
```

To create a comma-delimited export file, simply include commas between the fields you wish to separate. In addition, if you want quotation marks to enclose text fields, simply include them in the template as shown below.

```
"CurrentDate", "{Now}"
```

```
"SampleName", "{SampleName}"
"UserName", "{UserName}"
```

To create a tab-delimited file, simply use the tab key on your keyboard, or include the special tab variable, "Tab", between the fields you wish to separate as shown below.

```
CurrentDate    {Now}
SampleName     {SampleName}
UserName {UserName}
```

or

```
MethodName{Tab}{MethodName}
SettingsFile{Tab}{SettingsFile}
InjectionTime{Tab}{InjectionTime}
```

You can use the special component loop to print the component-specific results (Name, Mole%, Area, etc.) for *all* of the components in the current configuration. The components are exported in the same order that they appear in the configuration editor.

```
{StartCompLoop}
{CompName},{CompRT},{CompArea},{CompNormMolePct}
{EndCompLoop}
```

If instead, you want to export the results for a specific component, simply include the component number in the variable as shown below. Components are numbered in the order they appear in the configuration editor, starting with 1 for the first component.

```
Component 1 Name:  {CompName,1}
Component 1 Mole%: {CompNormMolePct,1}
```

You can use the special line continuation variable, "_", to force the next line in the template to be appended to the current line instead of in a new line:

```
{CompName,1},{_}
{CompName,2},{_}
```

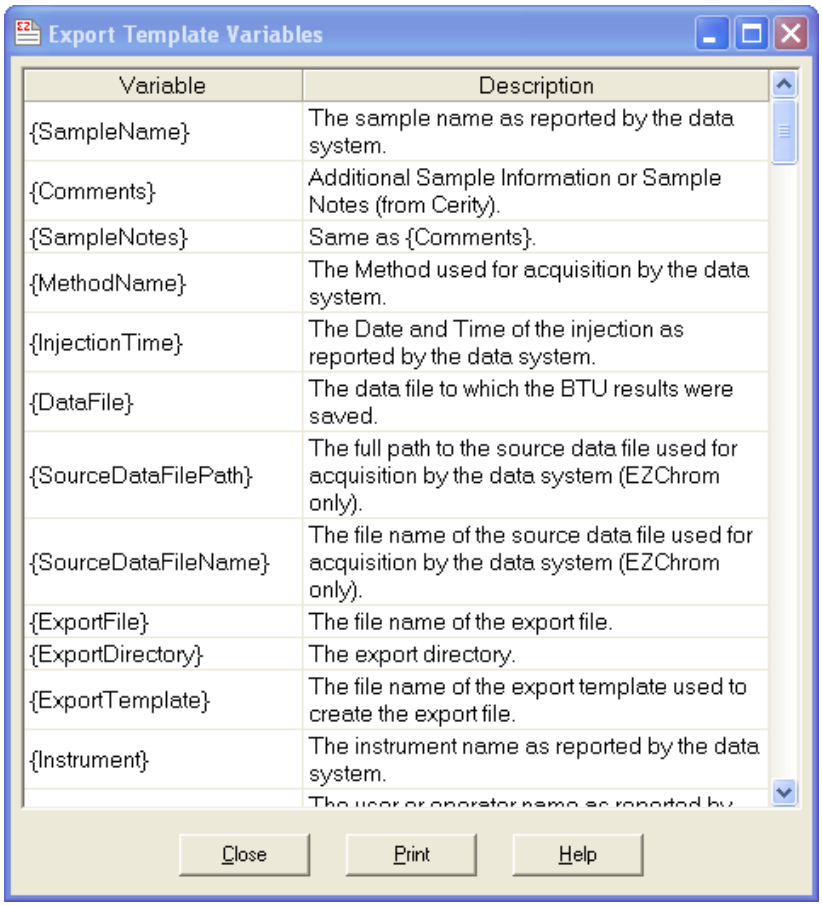
```
{CompName,3}
```

Line continuation is most useful in instances where you want all of the results to appear in a single line. For example, you would use the line continuation in a component loop to create a summary export file in which each line corresponds to a single run.

```
{StartCompLoop}
{CompName},{CompRT},{CompArea},{CompNormMolePct},{_}
{EndCompLoop}
```

Summary of Export Template Variables

You can view a list of the variables that are supported by Export Templates at any time by selecting either the "Tools > Show Export Template Variables…" menu option, or by clicking on the "Show" button in the Export section of the configuration editor.



EZReporter Template Variable Table

Hint:

Hint: If you double-click on a particular variable in the table, it will be copied to the Windows clipboard so that you can paste it into a template file.

Export Variable Format Strings and Scale Factors

Optional formatting strings and scaling factors can be specified for export variables to increase flexibility.

Important:

Important: The use of formatting strings and scaling factors is an advanced feature and should only be utilized when export file requirements dictate.

The export variable syntax is shown below:

```
{VariableName, [PARAMETER], [FORMAT], [SCALEFACTOR]}
```

VariableName: The name of the variable.

[PARAMETER]: An optional parameter value that is required for some variables.

[FORMAT]: A special format string that instructs the export engine on how to format the variable value before writing it to the export file.

[SCALEFACTOR]: If the variable is numeric, it will be multiplied by the specified scaling factor prior to formatting and writing the result to the export file.

The following table describes the special characters used to make up a format string.

Format Character	Description
Numeric Formatting	
0	Digit placeholder. Display a digit or a zero. If the variable has a digit in the position where the 0 appears in the format string, display it; otherwise, display a zero in that position.
#	Digit placeholder. Display a digit or nothing. If the variable has a digit in the position where the # appears in the format string, display it; otherwise, display nothing in that position.
.	Decimal placeholder. The decimal placeholder determines how many digits are displayed to the left and right of the decimal separator. If the format expression contains only number signs to the left of this symbol, numbers smaller than 1 begin with a decimal separator. To display a leading zero displayed with fractional numbers, use 0 as the first digit placeholder to the left of the decimal separator.
Text String Formatting	
@	Character placeholder. Display a character or a space. If the string has a character in the position where the "at" symbol (@) appears in the format string, display it; otherwise, display a space in that position.
&	Character placeholder. Display a character or nothing. If the string has a character in the position where the ampersand (&) appears, display it; otherwise, display nothing.
Date Formatting	
d	Display the day as a number without a leading zero (1 – 31).
dd	Display the day as a number with a leading zero (01 – 31).
m	Display the month as a number without a leading zero (1 – 12).
mm	Display the month as a number with a leading zero (01 – 12).
yy	Display the year as a 2-digit number (00 – 99).
yyyy	Display the year as a 4-digit number (100 – 9999).

Time Formatting	
h	Display the hour as a number without leading zeros (0 – 23).
Hh	Display the hour as a number with leading zeros (00 – 23).
N	Display the minute as a number without leading zeros (0 – 59).
Nn	Display the minute as a number with leading zeros (00 – 59).
S	Display the second as a number without leading zeros (0 – 59).
Ss	Display the second as a number with leading zeros (00 – 59).

The following table shows a few examples of format strings and scaling factors.

Variable	Variable Value	Value Exported
{CompRawMolePct,1,0.000}	1.523446	1.523
{CompRawMolePct,1,0.000}	85.67234	85.672
{CompRawMolePct,1,00000,1000}	85.67234	85672
{CompArea,2,00000000}	1234	00001234
{InjectionTime}	10/12/2004 1:08:13 PM	10/12/2004 1:08:13 PM
{InjectionTime,,mmddyyyy}	10/12/2004 1:08:13 PM	10122004
{InjectionTime,,HhNn}	10/12/2004 1:08:13 PM	2013
{SampleName,,@@@@@@@@}	Sample Name	Sample N
{SampleName,,@@@@@@@@}	RC1	RC1*****

* = a space character

Full List of Export Template Variables

The following table lists all of the variables that are supported by EZReporter's Export Templates.

Hint:

Hint: The most up to date list of export template variables can always be viewed and printed by clicking the "Tools > Show Export Template Variables…" menu option.

Export Variable	Export Variable Description
Component Result Variables	
CompNum	The current component number being processed in a component loop.
CompName	The name of the component.
CompRT	The retention time of the component as reported by the data system.
CompArea	The integrated peak area of the component as reported by the data system.
CompRawAmount	The concentration of the component as reported by the data system.
CompNormAmount	The normalized amount of the component calculated by normalizing all of the raw

	component concentrations to 100%. For NGA applications this is the dry normalized mole% (water content exlcuded).
CompNormMolePctSat	The normalized mole percent of the component calculated by normalizing all of the raw component concentrations to 100%. Corrected for the saturated water mole percent.
CompNormMolePctWet	The normalized mole percent of the component calculated by normalizing all of the raw component concentrations to 100%. Corrected for the actual water mole percent if it has been entered.
CompWeightPctDry	The normalized weight percent of the component in a dry gas.
CompWeightPctSat	The normalized weight percent of the component in a water-saturated gas.
CompWeightPctWet	The normalized weight percent of the component in a wet gas.
CompVolumePctDry	The normalized liquid volume percent of the component in a dry gas.
CompGrossHvDry	The calculated gross heating value (BTU/cu.ft.) of the component in an ideal, dry gas. Corrected for pressure base.
CompGrossHvSat	The calculated gross heating value (BTU/cu.ft.) of the component in an ideal, water-saturated gas. Corrected for pressure base.
CompGrossHvWet	The calculated gross heating value (BTU/cu.ft.) of the component in a ideal, wet gas. Corrected for pressure base.
CompNetHvDry	The calculated net heating value (BTU/cu.ft.) of the component in an ideal, dry gas. Corrected for pressure base.
CompNetHvSat	The calculated net heating value (BTU/cu.ft.) of the component in an ideal, water-saturated gas. Corrected for pressure base.
CompNetHvWet	The calculated net heating value (BTU/cu.ft.) of the component in a ideal, wet gas. Corrected for pressure base.
CompGrossHvLBMDry	The calculated gross heating value (BTU/lbm) of the component in a dry gas.
CompGrossHvLBMSat	The calculated gross heating value (BTU/lbm) of the component in a water-saturated gas.
CompGrossHvLBMWet	The calculated gross heating value (BTU/lbm) of the component in a wet gas.
CompNetHvLBMDry	The calculated net heating value (BTU/lbm) of the component in a dry gas.
CompNetHvLBMSat	The calculated net heating value (BTU/lbm) of the component in a water-

	saturated gas.
CompNetHvLBMWet	The calculated net heating value (BTU/lbm) of the component in a wet gas.
CompGrossHvGalDry	The calculated gross heating value (BTU/gal.) of the component in a dry gas.
CompRelDensity	The calculated relative density (Xi * Gi) of the current component in a dry gas.
CompRelDensitySat	The calculated relative density (Xi * Gi) of the current component in a water-saturated gas.
CompRelDensityWet	The calculated relative density (Xi * Gi) of the current component in a wet gas.
CompGasDensity	The calculated ideal gas density (lbm/cu.ft.) of this component in a dry gas.
CompGasDensitySat	The calculated ideal gas density (lbm/cu.ft.) of this component in a water-saturated gas.
CompGasDensityWet	The calculated ideal gas density (lbm/cu.ft.) of this component in a wet gas.
CompCompressibility	The calculated compressibility (Xi * bi) of the current component in a dry gas.
CompCompressibilitySat	The calculated compressibility (Xi * bi) of the current component in a water saturated gas.
CompCompressibilityWet	The calculated compressibility (Xi * bi) of the current component in a wet gas.
CompGPM	The calculated GPM (Gal./1000 cu.ft.) of the component in a dry gas. Corrected for pressure base.
CompGPMSat	The calculated GPM (Gal./1000 cu.ft.) of the component in a water saturated gas. Corrected for pressure base.
CompGPMWet	The calculated GPM (Gal./1000 cu.ft.) of the component in a wet gas. Corrected for pressure base.
CompMWDry	The calculated molecular weight of the component in a dry gas.
CompMWSat	The calculated molecular weight of the component in a water saturated gas.
CompMWWet	The calculated molecular weight of the component in a wet gas.
CompVPDry	The calculated vapor pressure of the component in a dry gas at 100 degrees F.
CompRelLiqDensityDry	The calculated relative liquid density of the component in a dry gas.
CompAbsLiqDensityDry	The calculated liquid density (lbm/gal.) of the component in a dry gas.
Total/Summary Result Variables	
TotalRawAmount	The total raw amount, including water if it has been entered.

TotalRawMolePct	The total raw mole percent (excluding water)
TotalNormAmount	The total normalized amount (should always be 100%)
TotalNormMolePct	The total normalized mole pct for a dry gas (should always be 100%)
TotalNormMolePctSat	The total normalized mole pct for a water-saturated gas (should always be 100%)
TotalNormMolePctWet	The total normalized mole pct for a wet gas (should always be 100%)
TotalNormWeightPctDry	The total normalized weight percent for a dry gas (should always be 100%)
TotalNormWeightPctSat	The total normalized weight percent for a water a saturated gas (should always be 100%)
TotalNormWeightPctWet	The total normalized weight percent for a wet gas (should always be 100%)
TotalNormVolumePctDry	The total normalized liquid volume percent for a dry gas (should always be 100%)
SumCompressibility	The calculated sum of component compressibility values (Sum Xi * bi) for a dry gas.
SumCompressibilitySat	The calculated sum of component compressibility values (Sum Xi * bi) for a water saturated gas.
SumCompressibilityWet	The calculated sum of component compressibility values (Sum Xi * bi) for a wet gas.
PressureBase	The Pressure Base used in the calculations.
FlowingTemperature	The flowing temperature in degrees F.
FlowingPressure	The flowing pressure in psia.
WaterMoleFractionWet	The water mole fraction if it has been entered or has been calculated by the water content correlation.
WaterMoleFractionSat	The water mole fraction calculated for saturated conditions at the base temperature and base pressure.
GrossHvIdealDry	The total gross heating value (BTU/cu.ft.) for an ideal, dry gas.
GrossHvIdealSat	The total gross heating value (BTU/cu.ft.) for an ideal, water saturated gas.
GrossHvIdealWet	The total gross heating value (BTU/cu.ft.) for an ideal, wet gas.
GrossHvRealDry	The total gross heating value (BTU/cu.ft.) for a real, dry gas
GrossHvRealSat	The total gross heating value (BTU/cu.ft.) for a real, water saturated gas.
GrossHvRealWet	The total gross heating value (BTU/cu.ft.) for a real, wet gas.
GrossHvLBMDry	The total gross heating value (BTU/lbm) for a dry gas.

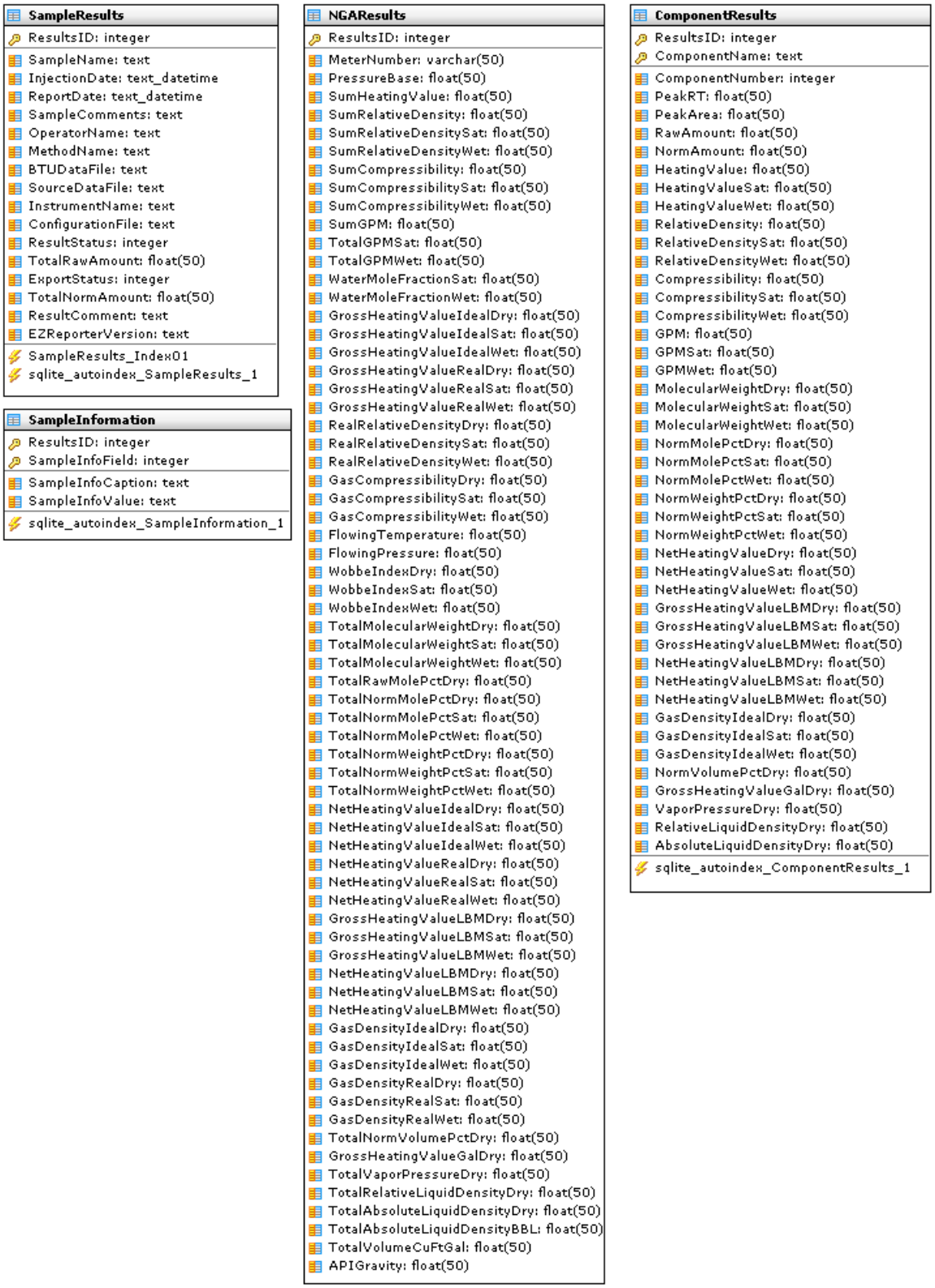
GrossHvLBMSat	The total gross heating value (BTU/lbm) for a water-saturated gas.
GrossHvLBMWet	The total gross heating value (BTU/lbm) for a wet gas.
NetHvIdealDry	The total net heating value (BTU/cu.ft.) for an ideal, dry gas.
NetHvIdealSat	The total net heating value (BTU/cu.ft.) for an ideal, water saturated gas.
NetHvIdealWet	The total net heating value (BTU/cu.ft.) for an ideal, wet gas.
NetHvRealDry	The total net heating value (BTU/cu.ft.) for a real, dry gas
NetHvRealSat	The total net heating value (BTU/cu.ft.) for a real, water saturated gas.
NetHvRealWet	The total gross heating value (BTU/cu.ft.) for a real, wet gas.
NetHvLBMDry	The total net heating value (BTU/lbm) for a dry gas.
NetHvLBMSat	The total net heating value (BTU/lbm) for a water-saturated gas.
NetHvLBMWet	The total net heating value (BTU/lbm) for a wet gas.
IdealRelDensityDry	The calculated sum of component ideal relative density values (Sum Xi * Gi) for a dry gas.
IdealRelDensitySat	The calculated sum of component ideal relative density values (Sum Xi * Gi) for a water saturated gas.
IdealRelDensityWet	The calculated sum of component ideal relative density values (Sum Xi * Gi) for a wet gas.
RealRelDensityDry	The real relative density (specific gravity) calculated for a dry gas.
RealRelDensitySat	The real relative density (specific gravity) calculated for a water saturated gas.
RealRelDensityWet	The real relative density (specific gravity) calculated for a wet gas.
GasDensityIdealDry	The gas density (lbm/cu. ft.) calculated for an ideal, dry gas.
GasDensityIdealSat	The gas density (lbm/cu. ft.) calculated for an ideal, water-saturated gas.
GasDensityIdealWet	The gas density (lbm/cu. ft.) calculated for an ideal, wet gas.
GasDensityRealDry	The gas density (lbm/cu. ft.) calculated for a real, dry gas.
GasDensityRealSat	The gas density (lbm/cu. ft.) calculated for a real, water-saturated gas.
GasDensityRealWet	The gas density (lbm/cu. ft.) calculated for a real, wet gas.
GasCompressibilityDry	The compressibility calculated for a dry gas.
GasCompressibilitySat	The compressibility calculated for a water saturated gas.
GasCompressibilityWet	The compressibility calculated for a wet

	gas.
TotalGPMDry	The theoretical hydrocarbon liquid content (Gal. / 1000 cu. ft.) calculated for a dry gas.
TotalGPMSat	The theoretical hydrocarbon liquid content (Gal. / 1000 cu. ft.) calculated for a water saturated gas.
TotalGPMWet	The theoretical hydrocarbon liquid content (Gal. / 1000 cu. ft.) calculated for a wet gas.
WobbeIndexDry	The Wobbe Index calculated for a dry gas.
WobbeIndexSat	The Wobbe Index calculated for a water saturated gas.
WobbeIndexWet	The Wobbe Index calculated for a wet gas.
TotalMWDry	The total molecular weight for a dry gas.
TotalMWSat	The total molecular weight for a water saturated gas
TotalMWWet	The total molecular weight for a wet gas
TotalVPDry	The total vapor pressure (psia) at 100 degrees F.
TotalRelLiqDensityDry	The total relative liquid density at 60 deg F.
TotalAbsLiqDensityDry	The total absolute liquid density (lbm / gal.). This result is calculated from the sum of the individual component values, not by conversion from relative liquid density.
TotalAbsLiqDensityBBL	The total absolute liquid density (lbm / bbl).
TotalVolumeCuFtGal	The total volume (cu. ft. / gal.) corrected for base pressure.
APIGravity	The calculated API Gravity of the liquified product.
Sample Information and Header Variables	
SampleName	The sample name as reported by the data system.
UserName	The user or operator name as reported by the data system.
Comments	Additional Sample Information or Sample Notes as reported by the data system.
MethodName	The method used for acquisition by the data system.
InjectionTime	The date and time of the injection as reported by the data system.
ReportDate	The date and time that the results were calculated and reported.
SettingsFile	The EZReporter settings/configuration file used to calculate the results.
SourceDataFileName	The file name of the source data file used for acquisition as reported by the data system.

DataFile	The data file to which the EZReporter results were saved.
Instrument	The name of the instrument used for acquisition as reported by the data system.
ExportFile	The file name of the export file.
ExportTemplate	The file name of the export template used to create the export file.
ExportDirectory	The directory in which the export file is saved.
ResultsID	The results ID from the Results Database. This field is only valid for sample results that have been retrieved from the results database.
ResultStatus	The result Status from the Results Database: 0=None, 1=Accept, 2=Reject. This field is only valid for sample results that have been retrieved from the results database.
ResultComment	A user-entered comment entered in the result confirmation screen.
EZReporterVersion	The EZReporter version number.
SampleInfo	The value of the custom sample information field as entered by the user. Usage: {SampleInfo, 1} is the value of custom sample information field #1.
SampleInfoCaption	The caption for the custom sample information field as set in the configuration file. Usage: {SampleInfoCaption, 1} is the caption associated with custom sample information field #1.
Tab	The ASCII \"tab\" character.
Now	The current date and time as reported by the operating system
StartCompLoop	Start a component processing loop. All template lines between {StartCompLoop} and {EndCompLoop} will be repeated once for each component in the configuration. Use the component loop to report component-specific results.
EndCompLoop	End a component processing loop (see {StartCompLoop})
StartHeader	All template lines between {StartHeader} and {EndHeader} will only be exported the first time an export file is written. The header lines will not be written when additional results are appended to an existing export file.
EndHeader	See {StartHeader}
StartComment	Any text between {StartComment} and {EndComment} will not be exported. Use to annotate your template file.
EndComment	See {StartComment}

UCase	Place on a line by itself to convert all subsequent export lines to upper case.
LCase	Place on a line by itself to convert all subsequent export lines to lower case.
NoCase	Place on a line by itself to report all subsequent export lines in their original case.
DecimalPlaces	Place on a line by itself to set the number of decimal places that will be reported for calculated numeric results. The default value is the number of decimal places specified in the Data Files configuration. Usage: {DecimalPlaces,3}, sets the number of decimal places reported to 3.
_	Line continuation variable placed at the end of a line to force the next line in the template to be appended to the current line instead of to a new line.

Results Database Table Diagram



Results Database Import Template Format

The Results Database Import Template file defines how the fields/columns in the comma- or tab- delimited Import Data File are mapped into the results database.

The Import Template file is a simple text file in which "tags" (special character strings enclosed in curly braces) are used to define how to handle the data in the Import Data File.

You must first define whether the import file is tab or comma delimited by placing the following tag in the template file:

{delimiter,comma} or {delimiter,tab}

If you don't include the delimiter tag, then the import routine assumes a comma-delimited file

Next, you add a **{StartColumns}** tag to the template file. Each row after the {StartColumns} tag corresponds to a sequential column in the import file.

The subsequent field/column tag strings correspond exactly to the database field names listed below. For fields in the "ComponentResults" Table, use the field name followed by the component name separated by a comma.

As a simple example, consider the following small data set:

	1	2	3	4
1	Sample Name	Gross Heating Value	Methane%	Ethane%
2	CAL001	1086.2	89.415	4.233
3	CAL002	1087.1	89.891	4.562
4	CAL003	1082.3	88.753	4.102

The Import Data File for this data set would look like the following using commas as the delimiter:

```
CAL001, 1086.2, 89.415, 4.233
CAL002, 1087.1, 89.891, 4.562
CAL003, 1082.3, 88.753, 4.102
```

The corresponding Import Template File would be:

```
{delimiter,comma}
{StartColumns}
{SampleName}
{GrossHeatingValueRealDry}
{NormAmount, Methane}
{NormAmount, Ethane}
```

Important:

Important: Make sure that the component names you use in the import template are consistent with the component names you use with your configuration files.

If you want to skip a column in the Import Data File for some reason, simply insert a line in the template file at that location that contains no tag. For example, if you don't want to import the Gross Heating Value, then the Import Template File would be:

```
{delimiter,comma}
{StartColumns}
{SampleName}

{NormAmount, Methane}
{NormAmount, Ethane}
```

Comment Text

The import routine ignores any text not contained within the curly braces. This means you can add comments to the Import Template File to help you keep track of things. For example it is useful to label the column to which each row corresponds (sometimes columns are identified by numbers and sometimes by letters, so it is convenient to include both – 1/A corresponds to the first column, etc.)

```
{delimiter,comma}
{StartColumns}
1/A {SampleName}
2/B
3/C {NormAmount, Methane}
4/D {NormAmount, Ethane}
5/E
6/F
etc.
```

In this example, columns 2, 5, and 6 would be skipped during import.

SkipLines

If the Import Data File contains "header lines" that don't contain data at the beginning of the file then you can use the **{SkipLines, N}** tag to skip over those lines before starting to import data. For example, if the Import Data File looks like this:

```
Sample Name,Gross Heating Value,Methane%,Ethane%
CAL001, 1086.2, 89.415, 4.233
CAL002, 1087.1, 89.891, 4.562
CAL003, 1082.3, 88.753, 4.102
```

You would add a SkipLines tag that skips 1 line somewhere above {StartColumns} tag:

```
{SkipLines,1}
{delimiter,comma}
{StartColumns}
1/A {SampleName}
2/B {GrossHeatingValueRealDry}
3/C {NormAmount, Methane}
```

```
4/D {NormAmount, Ethane}
```

Full List of Results Database Fields

The following table lists all of the database fields that are supported by EZReporter's Import Templates.

Hint:

Hint: The most up to date list of import template fields can always be viewed and printed by clicking the "Show Variables" button on the Database Import window.

Database Field	Description
Component Fields (ComponentResults Table)	
ComponentName	The name of the component.
PeakRT	The retention time of the component as reported by the data system.
PeakArea	The integrated peak area of the component as reported by the data system.
RawAmount	The concentration of the component as reported by the data system.
NormAmount	The normalized amount of the component calculated by normalizing all of the raw component concentrations to 100%. For NGA applications this is the dry normalized mole% (water content exlcuded).
NormMolePctSat	The normalized mole percent of the component calculated by normalizing all of the raw component concentrations to 100%. Corrected for the saturated water mole percent.
NormMolePctWet	The normalized mole percent of the component calculated by normalizing all of the raw component concentrations to 100%. Corrected for the actual water mole percent if it has been entered.
NormWeightPctDry	The normalized weight percent of the component in a dry gas.
NormWeightPctSat	The normalized weight percent of the component in a water-saturated gas.
NormWeightPctWet	The normalized weight percent of the component in a wet gas.
NormVolumePctDry	The normalized liquid volume percent of the component in a dry gas.
HeatingValue	The calculated gross heating value of the component in an ideal, dry gas. Corrected for pressure base.
HeatingValueSat	The calculated gross heating value of the component in an ideal, water-saturated gas. Corrected for pressure base.

HeatingValueWet	The calculated gross heating value of the component in a ideal, wet gas. Corrected for pressure base.
GrossHeatingValueLBMDry	The calculated gross heating value (BTU/lbm) of the component in a dry gas.
GrossHeatingValueLBMSat	The calculated gross heating value (BTU/lbm) of the component in a water-saturated gas.
GrossHeatingValueLBMWet	The calculated gross heating value (BTU/lbm) of the component in a wet gas.
NetHeatingValueLBMDry	The calculated net heating value (BTU/lbm) of the component in a dry gas.
NetHeatingValueLBMSat	The calculated net heating value (BTU/lbm) of the component in a water-saturated gas.
NetHeatingValueLBMWet	The calculated net heating value (BTU/lbm) of the component in a wet gas.
GrossHeatingValueGalDry	The calculated gross heating value (BTU/gal.) of the component in a dry gas.
GrossHeatingValueLBMDry	The calculated gross heating value (BTU/lbm) of the component in a dry gas.
RelativeDensity	The calculated relative density (Xi * Gi) of the current component in a dry gas.
RelativeDensitySat	The calculated relative density (Xi * Gi) of the current component in a water-saturated gas.
RelativeDensityWet	The calculated relative density (Xi * Gi) of the current component in a wet gas.
GasDensityIdealDry	The calculated ideal gas density (lbm/cu.ft.) of this component in a dry gas.
GasDensityIdealSat	The calculated ideal gas density (lbm/cu.ft.) of this component in a water-saturated gas.
GasDensityIdealWet	The calculated ideal gas density (lbm/cu.ft.) of this component in a wet gas.
Compressibility	The calculated compressibility (Xi * bi) of the current component in a dry gas.
CompressibilitySat	The calculated compressibility (Xi * bi) of the current component in a water saturated gas.
CompressibilityWet	The calculated compressibility (Xi * bi) of the current component in a wet gas.
GPM	The calculated GPM (Gal. per 1000 cu. ft.) of the component in a dry gas. Corrected for pressure base.
GPMSat	The calculated GPM (Gal. per 1000 cu.

	ft.) of the component in a water saturated gas. Corrected for pressure base.
GPMWet	The calculated GPM (Gal. per 1000 cu. ft.) of the component in a wet gas. Corrected for pressure base.
MolecularWeightDry	The calculated molecular weight of the component in a dry gas.
MolecularWeightSat	The calculated molecular weight of the component in a water saturated gas.
MolecularWeightWet	The calculated molecular weight of the component in a wet gas.
VaporPressureDry	The calculated vapor pressure of the component in a dry gas at 100 degrees F.
RelativeLiquidDensityDry	The calculated relative liquid density of the component in a dry gas.
AbsoluteLiquidDensityDry	The calculated liquid density (lbm/gal.) of the component in a dry gas.
Total/Summary Fields (SampleResults and NGAResults Tables)	
TotalRawAmount	The total raw amount, including water if it has been entered.
TotalRawMolePctDry	The total raw mole percent (excluding water)
TotalNormAmount	The total normalized amount (should always be 100%)
TotalNormMolePctDry	The total normalized mole pct for a dry gas (should always be 100%)
TotalNormMolePctSat	The total normalized mole pct for a water-saturated gas (should always be 100%)
TotalNormMolePctWet	The total normalized mole pct for a wet gas (should always be 100%)
TotalNormWeightPctDry	The total normalized weight percent for a dry gas (should always be 100%)
TotalNormWeightPctSat	The total normalized weight percent for a water a saturated gas (should always be 100%)
TotalNormWeightPctWet	The total normalized weight percent for a wet gas (should always be 100%)
TotalNormVolumePctDry	The total normalized liquid volume percent for a dry gas (should always be 100%)
SumCompressibility	The calculated sum of component compressibility values (Sum Xi * bi) for a dry gas.
SumCompressibilitySat	The calculated sum of component compressibility values (Sum Xi * bi) for a water saturated gas.
SumCompressibilityWet	The calculated sum of component compressibility values (Sum Xi * bi) for a wet gas.
PressureBase	The Pressure Base used in the calculations.
FlowingTemperature	The flowing temperature in degrees F.
FlowingPressure	The flowing pressure in psia.

WaterMoleFractionWet	The water mole fraction if it has been entered or has been calculated by the water content correlation.
WaterMoleFractionSat	The water mole fraction calculated for saturated conditions at the base temperature and base pressure.
GrossHeatingValueIdealDry	The total gross heating value for an ideal, dry gas
GrossHeatingValueIdealSat	The total gross heating value for an ideal, water saturated gas.
GrossHeatingValueIdealWet	The total gross heating value for an ideal, wet gas.
GrossHeatingValueRealDry	The total gross heating value for a real, dry gas
GrossHeatingValueRealSat	The total gross heating value for a real, water saturated gas.
GrossHeatingValueRealWet	The total gross heating value for a real, wet gas.
GrossHeatingValueLBMDry	The total gross heating value (BTU/lbm) for a dry gas.
GrossHeatingValueLBMSat	The total gross heating value (BTU/lbm) for a water-saturated gas.
GrossHeatingValueLBMWet	The total gross heating value (BTU/lbm) for a wet gas.
GrossHeatingValueGalDry	The total gross heating value (BTU/gal.) for a dry gas.
NetHeatingValueIdealDry	The total net heating value (BTU/cu.ft.) for an ideal, dry gas.
NetHeatingValueIdealSat	The total net heating value (BTU/cu.ft.) for an ideal, water saturated gas.
NetHeatingValueIdealWet	The total net heating value (BTU/cu.ft.) for an ideal, wet gas.
NetHeatingValueRealDry	The total net heating value (BTU/cu.ft.) for a real, dry gas
NetHeatingValueRealSat	The total net heating value (BTU/cu.ft.) for a real, water saturated gas.
NetHeatingValueRealWet	The total gross heating value (BTU/cu.ft.) for a real, wet gas.
NetHeatingValueLBMDry	The total net heating value (BTU/lbm) for a dry gas.
NetHeatingValueLBMSat	The total net heating value (BTU/lbm) for a water-saturated gas.
NetHeatingValueLBMWet	The total net heating value (BTU/lbm) for a wet gas.
SumRelativeDensity	The calculated sum of component ideal relative density values (Sum Xi * Gi) for a dry gas.
SumRelativeDensitySat	The calculated sum of component ideal relative density values (Sum Xi * Gi) for a water saturated gas.
SumRelativeDensityWet	The calculated sum of component ideal relative density values (Sum Xi * Gi) for a wet gas.
RealRelativeDensityDry	The real relative density (specific gravity)

	calculated for a dry gas.
RealRelativeDensitySat	The real relative density (specific gravity) calculated for a water saturated gas.
RealRelativeDensityWet	The real relative density (specific gravity) calculated for a wet gas.
GasCompressibilityDry	The compressibility calculated for a dry gas.
GasCompressibilitySat	The compressibility calculated for a water saturated gas.
GasCompressibilityWet	The compressibility calculated for a wet gas.
GasDensityIdealDry	The gas density (lbm/cu. ft.) calculated for an ideal, dry gas.
GasDensityIdealSat	The gas density (lbm/cu. ft.) calculated for an ideal, water-saturated gas.
GasDensityIdealWet	The gas density (lbm/cu. ft.) calculated for an ideal, wet gas.
GasDensityRealDry	The gas density (lbm/cu. ft.) calculated for a real, dry gas.
GasDensityRealSat	The gas density (lbm/cu. ft.) calculated for a real, water-saturated gas.
GasDensityRealWet	The gas density (lbm/cu. ft.) calculated for a real, wet gas.
SumGPM	The theoretical hydrocarbon liquid content (Gal. / 1000 cu. ft.) calculated for a dry gas.
TotalGPMSat	The theoretical hydrocarbon liquid content (Gal. / 1000 cu. ft.) calculated for a water saturated gas.
TotalGPMWet	The theoretical hydrocarbon liquid content (Gal. / 1000 cu. ft.) calculated for a wet gas.
WobbeIndexDry	The Wobbe Index calculated for a dry gas.
WobbeIndexSat	The Wobbe Index calculated for a water saturated gas.
WobbeIndexWet	The Wobbe Index calculated for a wet gas.
TotalMolecularWeightDry	The total molecular weight for a dry gas.
TotalMolecularWeightSat	The total molecular weight for a water saturated gas
TotalMolecularWeightWet	The total molecular weight for a wet gas
TotalVaporPressureDry	The total vapor pressure (psia) at 100 degrees F.
TotalRelativeLiquidDensityDry	The total relative liquid density at 60 deg F.
TotalAbsoluteLiquidDensityDry	The total absolute liquid density (lbm / gal.). This results is calculated from the sum of the individual component values, not by conversion from relative liquid density.
TotalAbsoluteLiquidDensityBBL	The total absolute liquid density (lbm / bbl).
TotalVolumeCuFtGal	The total volume (cu. ft. / gal.) corrected

	for base pressure.
APIGravity	The calculated API Gravity of the liquified product.
Sample Information Fields (SampleResults Table)	
SampleName	The sample name as reported by the data system.
OperatorName	The user or operator name as reported by the data system.
SampleComments	Additional Sample Information or Sample Notes as reported by the data system.
MethodName	The method used for acquisition by the data system.
InjectionDate	The date and time of the injection as reported by the data system.
ReportDate	The date and time that the results were calculated and reported.
ConfigurationFile	The EZReporter settings/configuration file used to calculate the results.
SourceDataFile	The file name of the source data file used for acquisition as reported by the data system.
BTUDataFile	The data file to which the EZReporter results were saved.
InstrumentName	The name of the instrument used for acquisition as reported by the data system.
ResultsID	The results ID from the Results Database. This field is only valid for sample results that have been retrieved from the results database.
ResultStatus	The result Status from the Results Database: 0=None, 1=Accept, 2=Reject. This field is only valid for sample results that have been retrieved from the results database.
ResultComment	A user-entered comment entered in the result confirmation screen.

Calculated Result Formula Builder Operators

The following table lists the arithmetic operators that can be used along with Result Variables to create a Calculated Result custom formula using the Formula Builder tool. See "Creating a Custom Formula using the Formula Builder" on page 39 for more information on custom formulas.

Operator / Function	Description	Note
+	addition	
–	subtraction	
*	multiplication	

Operator / Function	Description	Note
/	division	35/4 = 8.75
%	percentage	35% = 0.35
\	integer division	35\4 = 8
^	raise to power	3^1.8 = 7.22467405584208 (°)
>	greater than	return 1 (true) 0 (false)
>=	equal or greater than	return 1 (true) 0 (false)
<	less than	return 1 (true) 0 (false)
<=	equal or less than	return 1 (true) 0 (false)
=	equal	return 1 (true) 0 (false)
<>	not equal	return 1 (true) 0 (false)
tan(x)	tangent	argument (in radians) $x \neq k*\pi/2$ with $k = \pm 1, \pm 2\ldots$
atn(x)	inverse tangent	atn(pi/4) = 1
abs(x)	absolute value	abs(-5)= 5
sin(x)	sin	argument in radians
cos(x)	cosine	argument in radians
exp(x)	exponential	exp(1) = 2.71828182845905
log(x)	logarithm natural	argument x>0
logN(x,n)	N-base logarithm	logN(16,2) = 4
sqr(x)	square root	sqr(2) =1.4142135623731, also 2^(1/2)
int(x)	integer part	int(-3.8) = −4
fix(x)	integer part	fix(-3.8) = 3
dec(x)	decimal part	dec(-3.8) = -0.8
rnd(x)	random	returns a random number between x and 0
sgn(x)	sign	returns 1 if x >0 , 0 if x=0, -1 if x<0
min(a,b,...)	minimum	min(13,24) = 13
max(a,b,...)	maximum	max(13,24) = 24
round(x,d)	round a number with d decimal	round(1.35712, 2) = 1.36
Sum(a,b,...)	Sum	sum(8,9,12,9,7,10) = 55

Operator / Function	Description	Note
`Mean(a,b,...)`	Arithmetic mean	mean(8,9,12,9,7,10) = 9.16666666666667
`Meanq(a,b,...)`	Quadratic mean	meanq(8,9,12,9,7,10) = 9.30053761886914
`Meang(a,b,...)`	Arithmetic mean	meang(8,9,12,9,7,10) = 9.03598945281812
`Var(a,b,...)`	Variance	var(1,2,3,4,5,6,7) = 4.66666666666667
`Varp(a,b,...)`	Variance pop.	varp(1,2,3,4,5,6,7) = 4
`Stdev(a,b,...)`	Standard deviation	Stdev(1,2,3,4,5,6,7) = 2.16024689946929
`Stdevp(a,b,...)`	Standard deviation pop.	Stdevp(1,2,3,4,5,6,7) = 2

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