

PEL Logidraw

User Guide



About this Document

This guide is designed to assist the user in becoming quickly familiar with the capabilities of Logidraw, its interface and how the program is used.

It has been produced to the recommendations of British Standard BS7649 – Guide to the design and preparation of documentation for users of application software.

Trademarks

All trademarks acknowledged.

Contacting PEL Support Services

This program is developed, maintained and supported by PEL Support Services, ABB. We run a Hotline telephone and email service to answer any queries about Logidraw

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Change History

This table records the changes made to each new revision of this document.

Changes to approved issues are indicated by a double revision bar on the outer margin next to the text. This is an example.

Revision	Date	Description of change
1.0	10 October 2002	First Approved Issue
1.1	24 October 2005	Removed Industrial IT logo

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1. Getting started with Logidraw

1.1. Introduction

Logidraw 95 represents state of the art software for the development and printing of Hazard Assessment Logic Diagrams. It is full 32-bit software and runs under Microsoft Windows 95 operating system.

It was developed from the earlier Logidraw software but has large a number of enhancements for greater flexibility and ease of use.

This document is intended as an introduction to using the software for those who have a working knowledge of the techniques of Hazard Assessment and the principles involved.

There is also a logidraw95.hlp file, which is accessed from Help in the Logidraw95 menu, for on-line assistance.

2. Starting a New Project

Procedure



1. Access Logidraw by selecting **Start | Programs | PEL** | then click on the **Logidraw** icon (see left).
2. A splash screen showing the program name and version number appears briefly before the start up screen is displayed.
3. Begin a new project by selecting File/New Project from the menu.

This opens the following window for entering a title for the project.

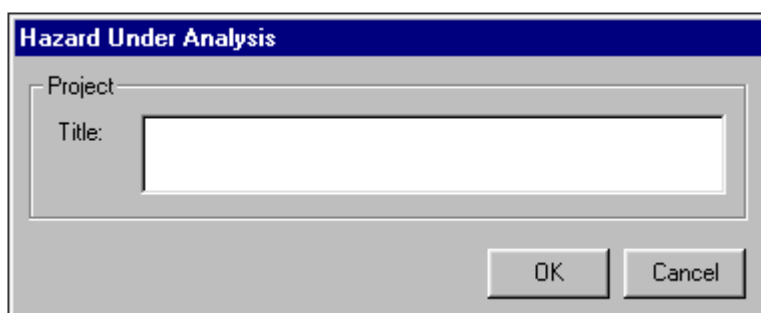


Figure 1 Starting a New Project window

2.1. Defining Inputs

Procedure

1. Click the Add Input button or select Data/Inputs/Add from the menu. This opens the Inputs dialogue box (see Figure 2) for entering the Description of an input (Comment Box) and the numeric data describing it (Value).

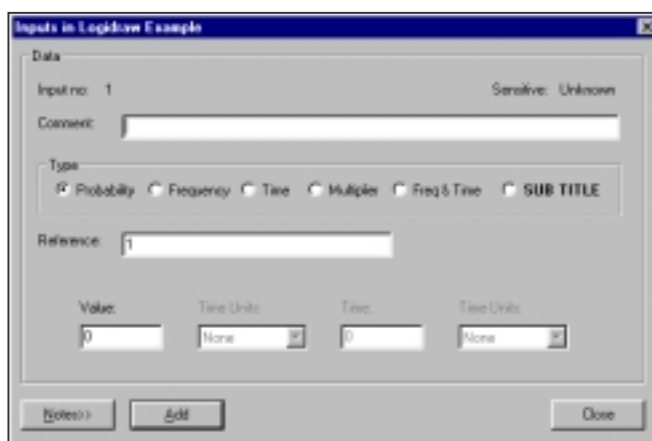


Figure 2 Logidraw Inputs dialog

2. The type of input is selected using the Type Buttons (Probability, Frequency, Time, etc.).
3. For input types of Frequency or Time, the additional drop-down box allows units to be specified. For example 'year' for frequency and 'years' for Time.

4. A further option of specifying both Frequency and Time is offered to permit an input to describe the frequency and the duration of an event. Using this option the values of frequency and time are multiplied ('And' function) to give a probability.
5. The 'Sub Title' option allows a line space or Sub-Heading to be inserted into the logic diagram to enhance the clarity.

Note. At this stage it is good practice to enter the Comment, Value and Type information though the Comment and Value information can be added later. To add the defined input to the diagram, click the 'Add' button; to close the window when sufficient new inputs have been generated, click the 'Close' button.

2.2. Optional Notes Entry

The 'Notes>>' button opens a window which can be used for recording details about the input: its purpose, the background to its value, assumptions made which relate to that input, calculations deriving the value for the input.

The text entered in the 'Notes' window and the 'Comment' description of the input appear in the *.Txt file described later under 'Logidraw 95 *.Txt Files'

2.3. Editing Input Positions

Procedure

1. Inputs can be Cut, Copied, Pasted and Deleted using the usual Edit commands. First select the input by clicking once on the Comment Text on the left of the logic diagram. The input will be highlighted and the background of the text will change to light blue.
2. The input can then be Cut, Copied or Deleted either using the menu options or the short-cut key combinations: Ctrl+X for Cut; Ctrl+C for Copy; and Del for Delete.
3. A Cut or Copied input can be pasted into a specific new position. Prior to Pasting, select the pasting position by highlighting the input in the required location. Then Paste (Ctrl+V). If no pasting position is specified the input is pasted at the bottom of the diagram.

Note. Connected inputs can be copied but not Cut or Deleted; the connection must first be removed.

4. Unconnected inputs can be dragged to new positions by clicking and dragging. During the dragging operation, a white >> symbol appears.

2.4. Editing Input Data

Procedure

1. To edit the input data for a single input, double click the Comment Text for the relevant input.
2. To edit the input data for a number of inputs, select Edit/Input, Gate Values. This will open an editing window showing data for all the inputs and gates. An input can then be selected and edited.

3. Connecting and Editing with Logic Gates

3.1. Connecting Inputs to New Logic Gates

Procedure

1. To connect a number of inputs to a logic gate, first select the inputs by holding down the Ctrl Key and clicking on the Comment Text of each input on the logic diagram. Each selected input will be highlighted and the background of the text will change to light blue.
2. An Input can be deselected by continuing to hold down the Ctrl Key and clicking that input again.
3. Then click the 'Connect as Gate' button, select the type of gate required AND or OR and click OK.

3.2. Connecting an Input to an Existing Logic Gate

Procedure

1. To connect an inputs to an existing logic gate, first select the input by clicking on the Comment Text of the input on the logic diagram. Then click on the gate.
2. The selected input and gate will be highlighted and the background of each will change to light blue.
3. Either can be deselected by holding down the Ctrl Key and clicking that item again.
4. Then click the 'Add Connection' button.

3.3. Connecting Inputs and/or Gate Outputs into New Logic Gates

Procedure

1. To connect a selection of inputs and existing outputs of Gate into a new logic gate, first select the inputs (if any) by holding down the Ctrl Key and clicking on the Comment Text of each input on the logic diagram. Each selected input will be highlighted and the background of the text will change to light blue.
2. Then select the gates by holding down the Ctrl Key and clicking on the each gate required. Each selected gate will be highlighted and the background will change to light blue.
3. An Input or gate can be deselected by holding down the Ctrl Key and clicking that input or gate again.
4. Then click the 'Connect as Gate' button, select the type of new gate required (AND or OR) and click OK, and the inputs and selected gate outputs will form the inputs for the new gate.

3.4. Removing Connections

1. To remove the connection between an input and a gate, highlight the input and click the 'Remove Connection' button.
2. To remove the connection between two gates, hold down the Ctrl Key and click each of the two gates to highlight them. Then click the 'Remove Connection' button.

3.5. Editing and Deleting Gates

3.5.1. Editing

The comment text and other information for a gate can be edited either by double clicking the gate or using the Input/Gate edit facility (See section 2.4 for more information).

3.5.2. Delete Gate

Procedure

1. To delete a gate, select the gate and click the 'Delete Gate' button. This will invite the choice 'Do you wish to keep the connections to the left of this gate' 'Yes / No' ?
2. The answer 'No' removes the gate and leaves the logic, previously connected to the selected gate, unconnected.
3. The answer 'Yes' removes the gate but connects all the inputs to the removed gate to the logic gate to which the output of the removed gate had been connected.

3.5.3. Delete Block

This function deletes a gate together with all the logic leading to its inputs.

3.6. Context Menus

Clicking on a gate or input with the right mouse button brings up a context menu with some of the editing options available for those entities.

4. Logidraw Files

4.1. Saving Files

Procedure

1. As soon as possible after starting to put data into the hazard analysis logic diagram, the file should be saved. Select 'File/Save As' from the menu.
2. The dialogue box which opens (see Figure 3) allows the definition of a file name. The extension '.LDR' may be specified. If no extension is included then the program will add the '.LDR' extension automatically.

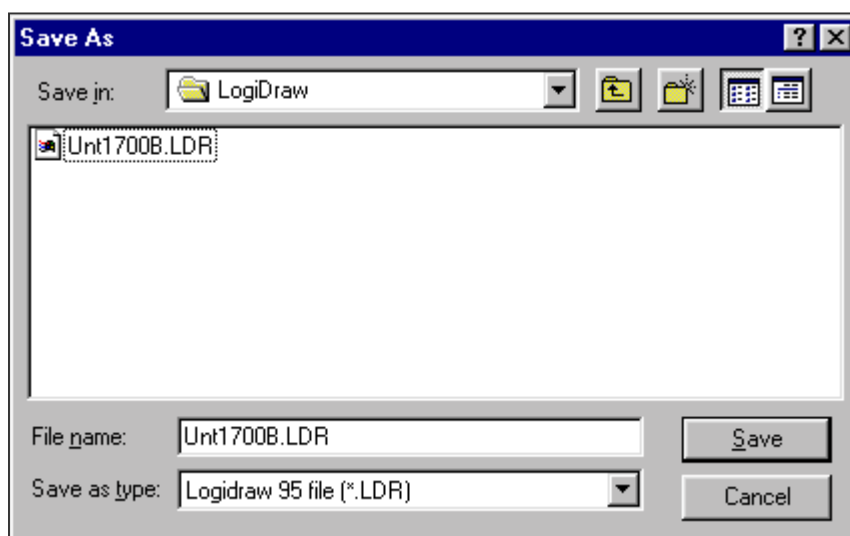


Figure 3 Logidraw Save As dialog

4.1.1. Logidraw 95 *.Ldr Files

The Logidraw 95 '.Ldr' file contain all the data for the logic diagram, including the input information, the gate types and connections, together with any notes associated with each of the inputs.

4.1.2. Logidraw 95 *.Txt Files

In addition to the '.Ldr' file Logidraw 95 saves automatically another file with the same name but a '.Txt' extension. This contains only the 'Comment' and 'Notes' for each of the inputs.

This file is particularly useful for hazard analysis reports where the input data is included as part of the report.

4.1.3. Compatibility with Previous *.Log Files

Logidraw 95 will also read the '.log' files generated by the Dos version of Logidraw. Logidraw 95 can then be used to save the files in '.Ldr' format.

The file type required is selected using the drop down selection box below the file name text box in the File/Open and File/Save As dialogues.

5. Printing the Logic Diagram

5.1. Overview

The logic diagram may be printed on any Windows 95 compatible printer.

Procedure

1. The printer is selected via the File/Printer Setup dialogue. Click the 'Setup' Button and select the printer from the drop-down text box, then in the lower part of the dialogue select the paper size and the orientation. (Using large format printers and suitable drivers, logic diagrams of up to A0 size may be printed.)
2. Having selected the printer and Clicked on OK, ensure that the 'Automatically attempt Folding if needed' and 'Automatically Reduce Font' boxes are checked. A Starting Font Size of 12 and a minimum of 6 are suitable initial values. Click OK again.
3. To print select File/Print from the menu. The Print Status box should indicate 'Diagram Size is OK'.
4. Click the 'Proceed' button to print the diagram.

6. Setting Customisation Options in Logidraw

6.1. General

This section lists and describes the various Logidraw options that are available.

File	This option sets the path for File/Open/Save As operations. Point this at the directory where you wish to locate your *.Ldr files.
Maths	This allows choice of the definition of what is a sensitive input. Default is that an input is 'sensitive' if halving the input causes a change of 5% in the value of the final gate.
Display	This allows setting of display parameters including colours.
Glossary	This option allows the storing of frequently used phrases. These can be recalled using Ctrl+W for use when entering Input and Gate Comments.
General	This sets the default View Options for display of (1) Project Toolbar, (2) Status-Bar and (3) Inputs Panel.
Input References	This allows selection of whether input reference numbers are automatically generated and allows setting of prefix, suffix and starting number. It also allow selection of whether a comments *.Txt file is saved when a project *.Ldr file is saved.

7. Advanced Editing Techniques

7.1. General

Strictly speaking, advanced editing is not really a proper topic for an introductory guide. However, there are some occasions when these two options are particularly useful.

7.2. Insert Gate

This inserts a new gate between the output of a selected gate and the input of the gate it feeds. The new gate has the output of the selected gate as one input and a selected, unconnected input as its second input.

Procedure

1. To use this function, select the gate after which the new gate is to be inserted, and select an unconnected input as the other input for the new gate.
2. Then from the menu select Data/Insert Gate...

7.3. Replace Input with Gate Output

Suppose a user has a logic diagram where one of the inputs really requires some logic to define it. The user can develop the defining logic, select the end gate of this logic, select also the input which it defines, and then replace the input with the logic.

Procedure

1. To use, select the end gate of the defining logic, select the input it replaces, select from the menu Data/Replace Input with Gate Output.
2. This will move the defining logic into the part of the logic diagram previously occupied by the selected input.

8. Menu Structure

8.1. General

This table gives an overview of the various Logidraw menus and describes the options that are available.

Menu Item	Sub-Menu Item	Description
File	New Project	Opens dialogue for Naming Project
	Open	Opens dialogue for selecting files to open (either *.Ldr or *. Log types)
	Close	Closes current file (prompting user to save file)
	Close All	Closes all open files (prompting user to save each currently open file)
	Save	Saves current file with current filename (for new Projects this gives Save As dialogue) - during Saving both *.Ldr and *.Txt files are saved
	Save As	Saves files with new names; creates file name for new Projects
	Edit Title and Notes ..	Edit Project details recorded in Logidraw files
	Re-generate Notes File	Re-save the *.Txt file
	Print Setup	Sets Printer and Printing Options
	Print	Print the Logic Diagram
	Customise	Sets the user Preferences
	Exit	Exits program (prompting user to save each currently open file)
Edit	Input/Gate Values	Opens a window listing all inputs and gates which can then be selected and edited
	Restore as before last Delete	Undo deletes
	Cut	Standard Windows editing functions
	Copy	"
	Paste	"
	Delete Block	Deletes a highlighted gate and deletes all the logic leading to the inputs of the gate
	Delete Gate	Deletes a highlighted gate but leaves the logic leading to all the inputs of the gate
	Erase >>	Facility to erase all gates on the diagram or all gates are inputs
	Deselect All	Deselects all highlighted inputs and gates
View	Redraw	Redraws the screen
	Logic Only	Selects display of Logic without gate comments and numeric values
	Orientate Left to Right (Align)	Selects on-screen vertical alignment of gates according to hierarchical level in the logic

Menu Item	Sub-Menu Item	Description
	Orientate Right to Left (Optimise space)	Gates moved as close to inputs as permitted to Optimise space.
	Project Toolbar	Selects whether these items are displayed on-screen
	Status Bar	"
	Inputs Panel	"
Data	Inputs >>	Add/Regenerate Input References/Clear References
	Connect as Gate	Connects selected inputs and gate outputs as inputs to a new gate
	Connection >>	Add/Remove/Unlink Gate
	Insert Gate	Insert a new gate (See section 7.2)
	Replace Input with Gate Output	Replaces input with block of logic (See section 7.3)
Maths	Check for Minimum Cut Sets Infringement	Function not yet available
	Analyse one input	Enables the effect of a change to the value of a selected input to be calculated in terms of its % change on the value of the final gate output value.
	Find most sensitive path(s) to Gate	Highlights the sensitive paths to a selected gate.
	Automatic Real-time Sensitivity Calculation	Selects automatic sensitivity assessment of inputs and indication by line thickness
Window	Cascade	Standard Windows Options
	Tile	"
	<u>l</u>	"
Help	Contents	Access to Help File
	About	Copyright and Version date and number

Table 1 Overview of the Logidraw Menu Structure

Notes

Use these pages to record any note.

Notes