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4D LABS SEMICONDUCTORS

USER MANUAL

# Workshop4 IDE

## USER GUIDE

**Document Revision: 2.1**
**Document Date: 29th July 2017**

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## 1. Description

This user guide provides an introduction to Workshop4, the 4D Labs integrated development environment. Workshop4 supports multiple development environments for the user, to cater for different user requirements and skill level.

The **Designer** environment enables the user to write 4DGL code in its natural form to program 4D Labs processors of choice.

A visual programming experience, suitably called **ViSi**, enables drag-and-drop type placement of objects to assist with 4DGL code generation and allows the user to visualise how the display will look while being developed.

An advanced environment called **ViSi-Genie** doesn't require any 4DGL coding at all, it is all done automatically. Simply lay the display out with the objects required, set the events to drive them and the code is written for the user automatically. ViSi-Genie provides the latest rapid development experience from 4D Labs. (Not available for Goldelox)

A **Serial** environment is also provided to transform display modules powered by 4D Labs processors into a slave serial module, allowing the user to control the display from any host microcontroller or device with a serial port.

Additionally, Workshop4 also offers Arduino compatible environments that allows the user to easily create a project with both a 4D and an Arduino product. More details can be found in Choose Your Arduino Compatible Environment.

To install Workshop4, please refer to the document *Workshop4 Installation*.

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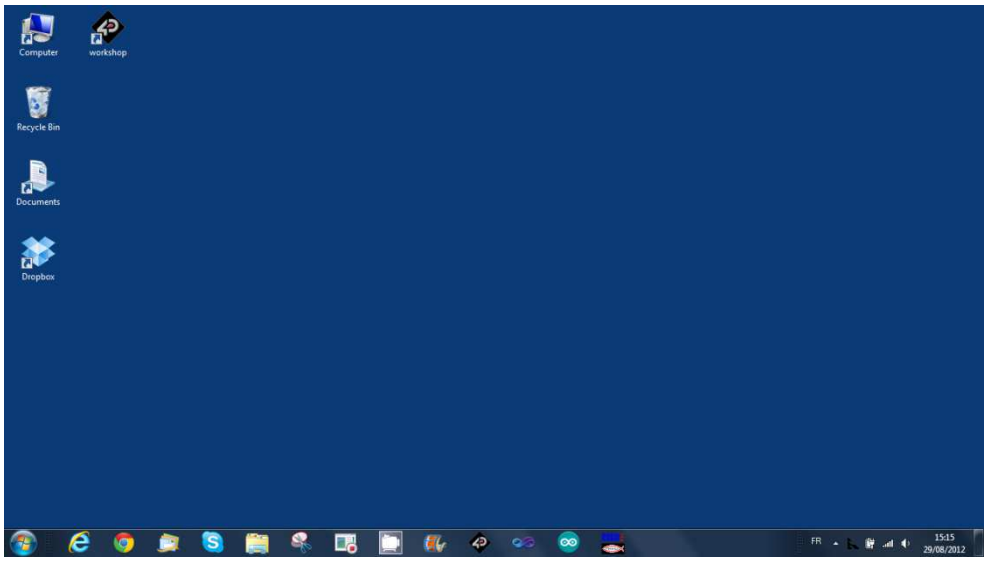
## 2. Workshop4

There is an alias for 4D Workshop on the desktop:




Launch 4D Workshop by double-clicking on the icon:

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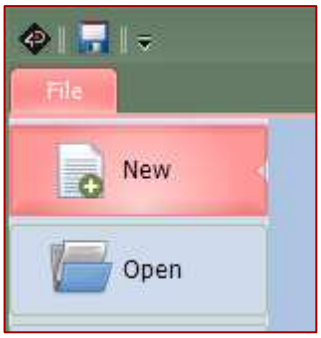
## 3. Create a New Project

Workshop4 opens and displays the **Recent** page:

To create a new program, there are multiple options:

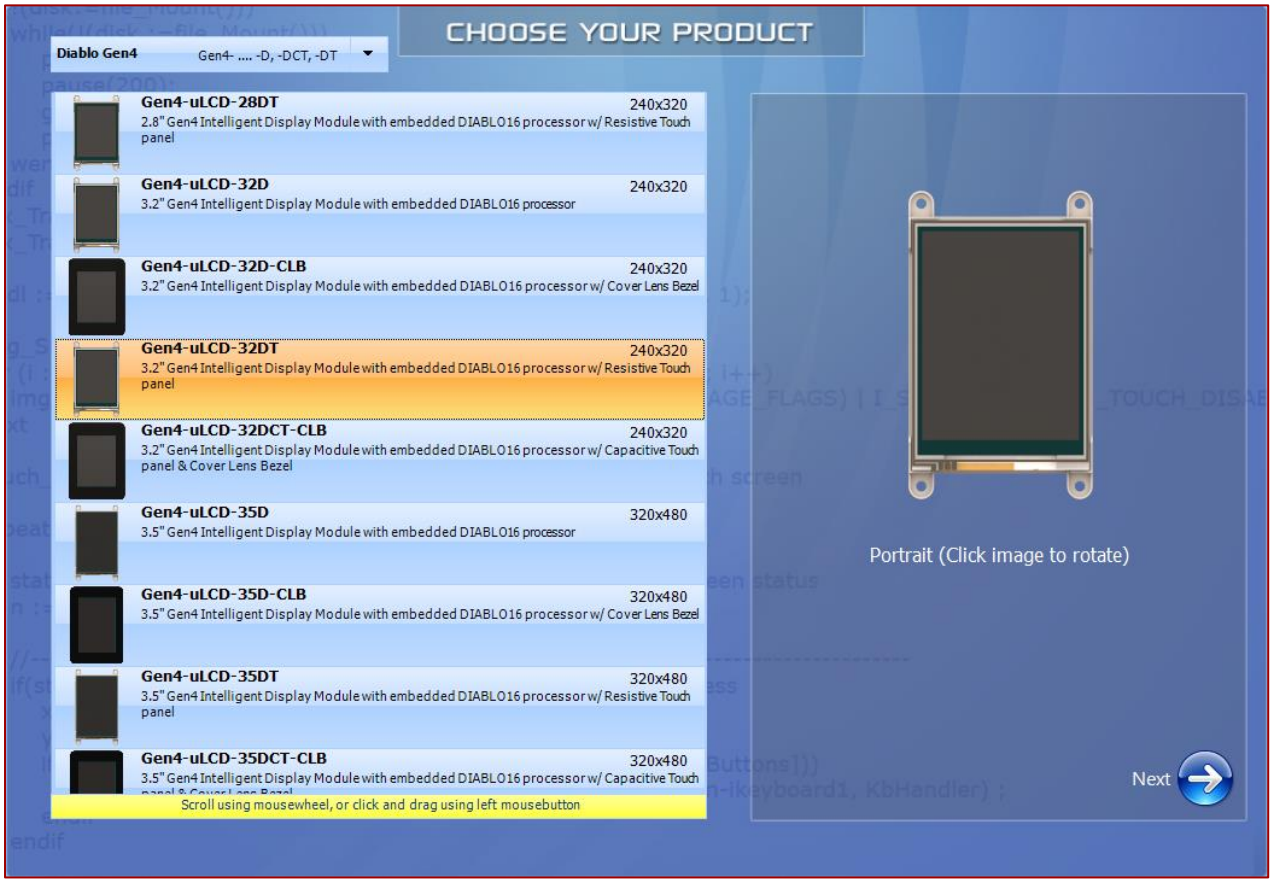
- Click on the top left-most icon **New**



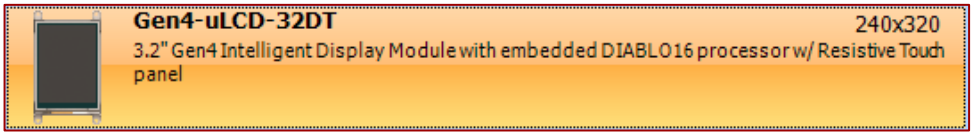
- Click on the icon close to **Create a new 4D Systems Project** on top
- Click on the **Create a new Project** to create a project instance based on your last project settings.

**Note:** Another option is displayed on the image above. **Create a new 4D Labs Project** is an upcoming Workshop4 feature which allows to create a project with a customized display module powered by 4D Labs' processors

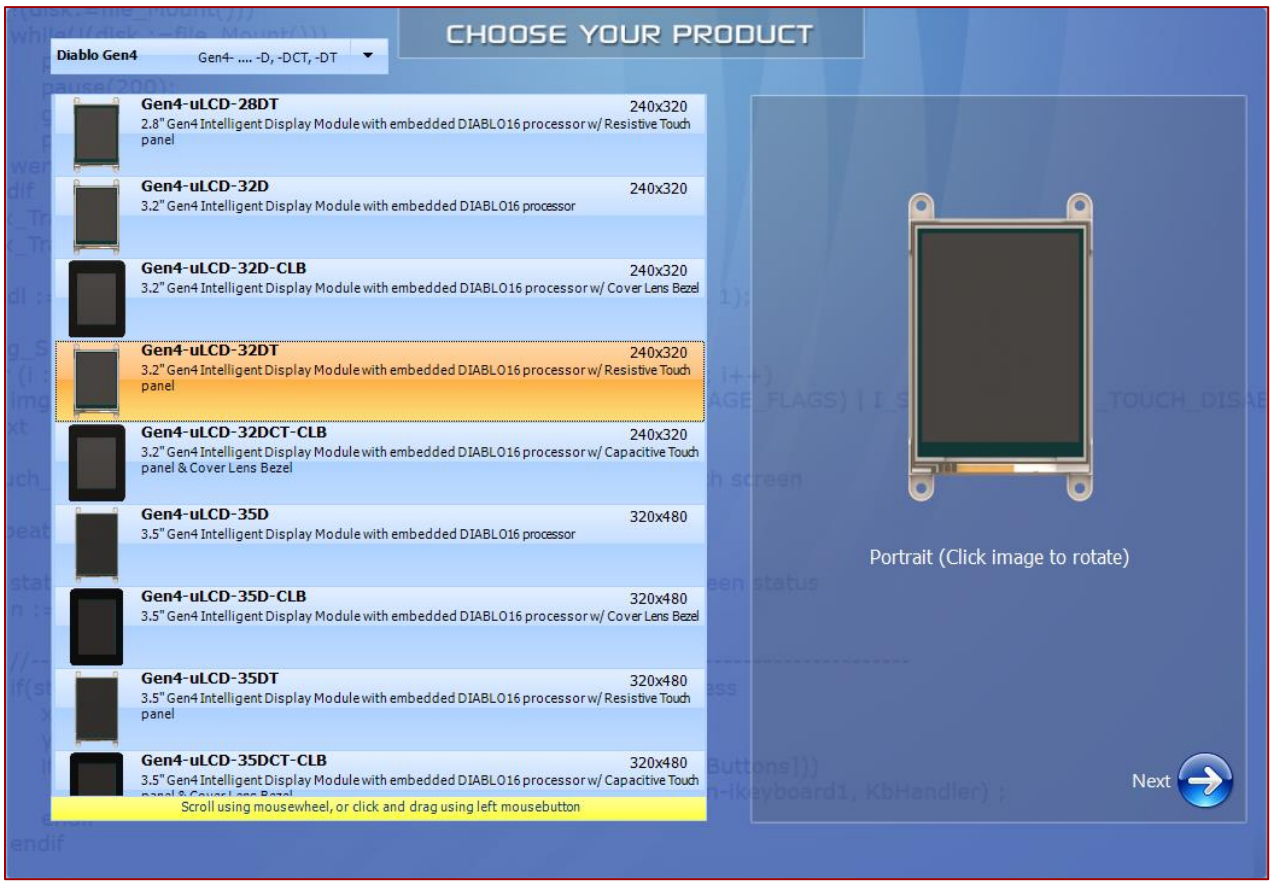
Both of the first two options update the main window with the selection of the screen:



Select the screen, here the gen4-uLCD-32DT




The selected screen is displayed:

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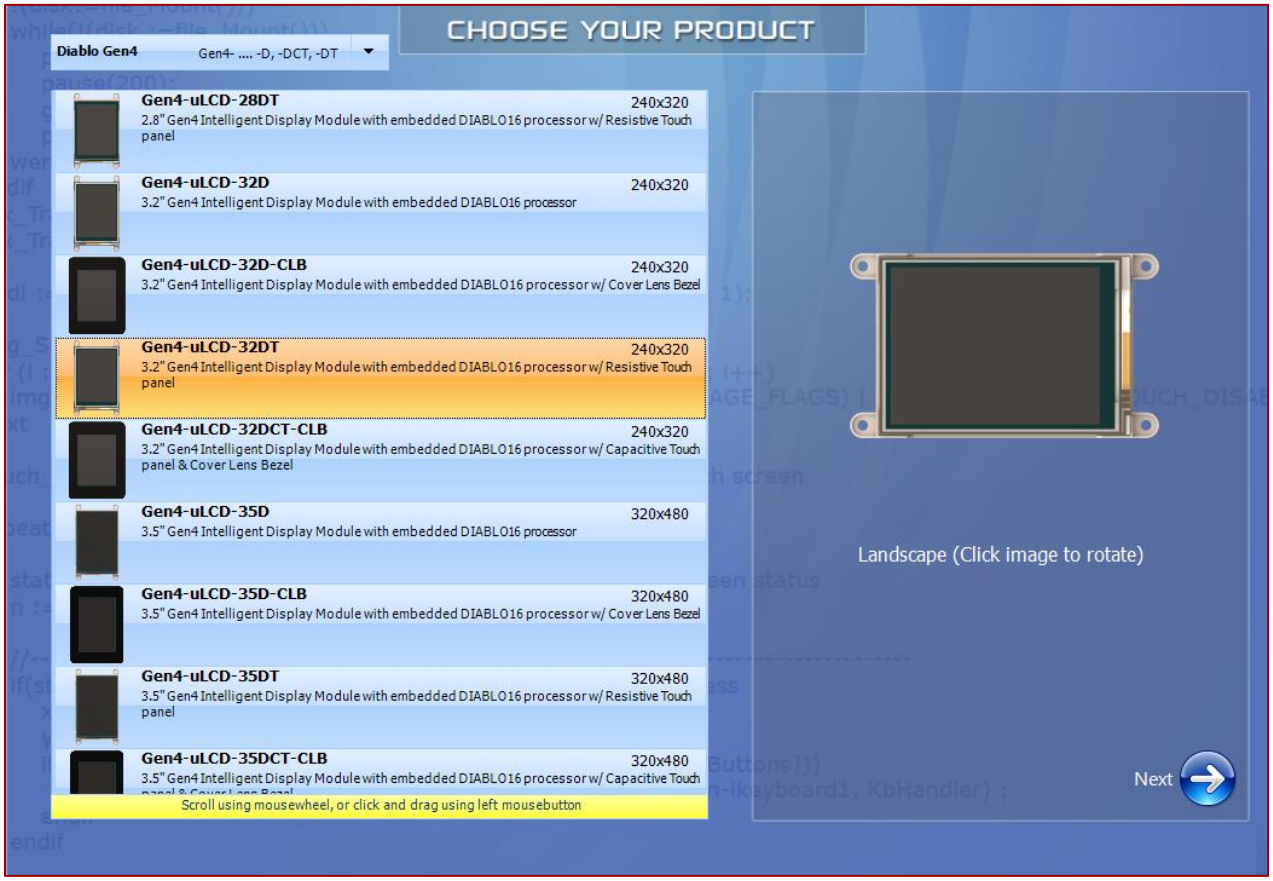
Orientation is portrait by default. To set it to landscape, just click on the image of the screen to rotate it:




Press **Next** to proceed:

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## 4. Choose Your 4D Environment

The main window now asks for the environment for the project:

Four main environment options are available:

- Designer,
- ViSi,
- ViSi-Genie,
- Serial

…and two editor options:

- Create System File,
- Create Text File.

Each option opens a customised environment with specific commands and controls. Different projects using different modules and environments can be opened simultaneously on Workshop4. The toolbar ribbon will adapt to the project tab that is selected, to suit its environment.

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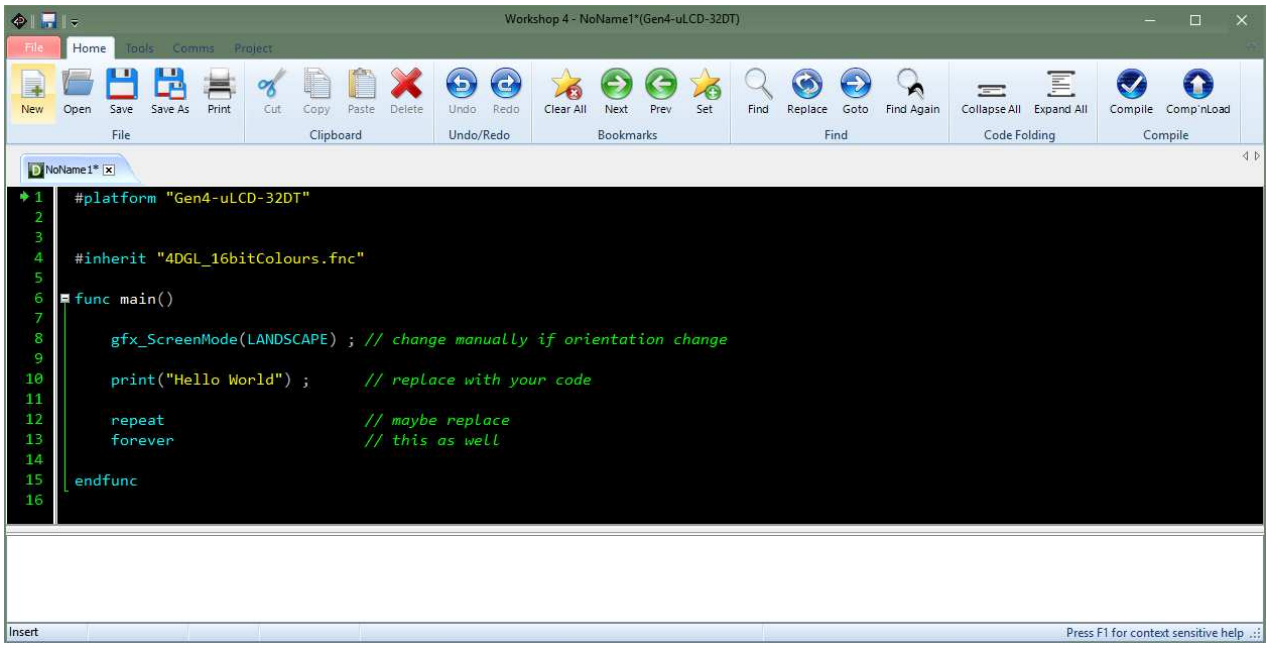
## 4.1. Designer

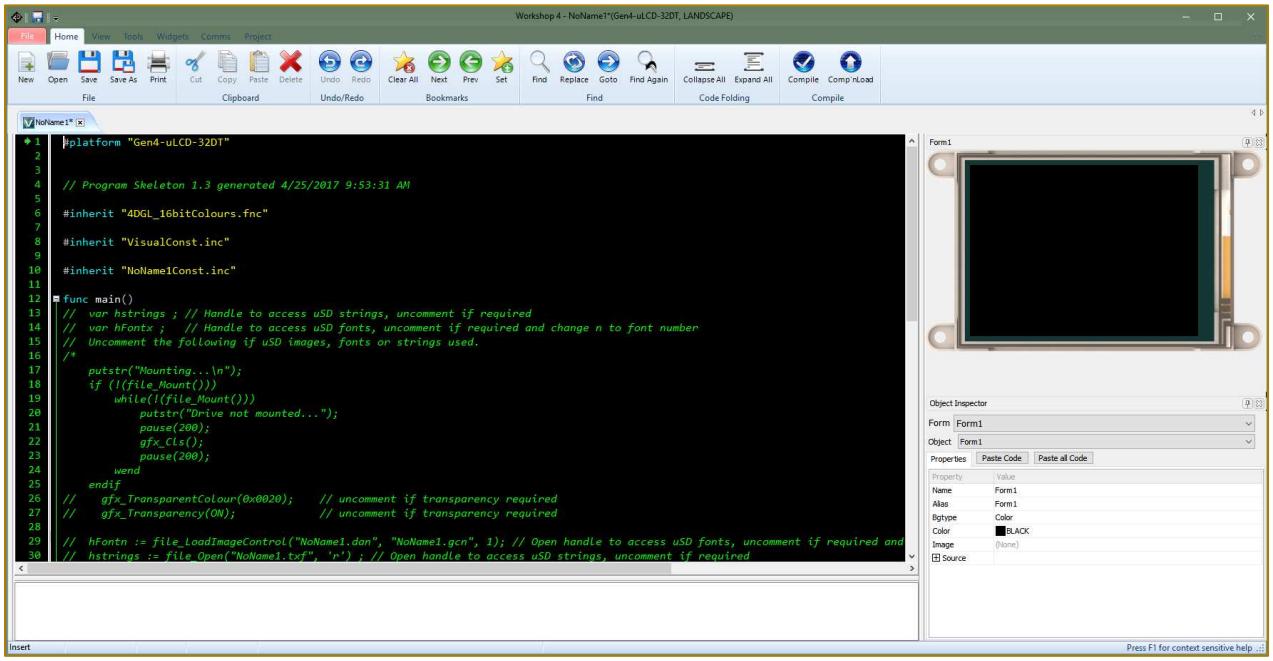
The **Designer** environment enables the user to write 4DGL code in its natural form to program the display module. 4DGL is a graphics oriented language allowing rapid application development, and the syntax structure was designed using elements of popular languages such as C, Basic, Pascal and others.




To learn more about Designer, please to refer to the 4DGL Internal Functions Reference Manual and 4DGL Programmers Reference Manual on the Workshop4 product page and to related application notes.

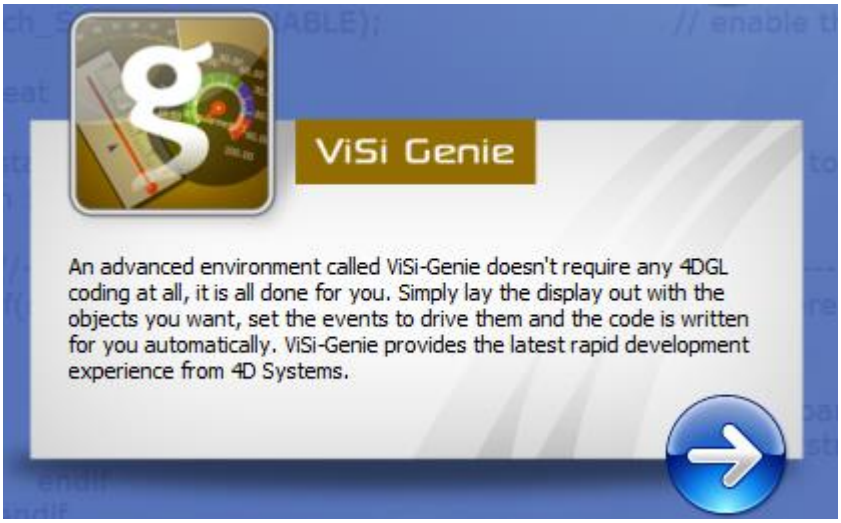
## 4.2. ViSi

A visual programming experience, suitably called **ViSi**, enables drag-and-drop type placement of objects to assist with 4DGL code generation and allows the user to visualise how the display will look while being developed.

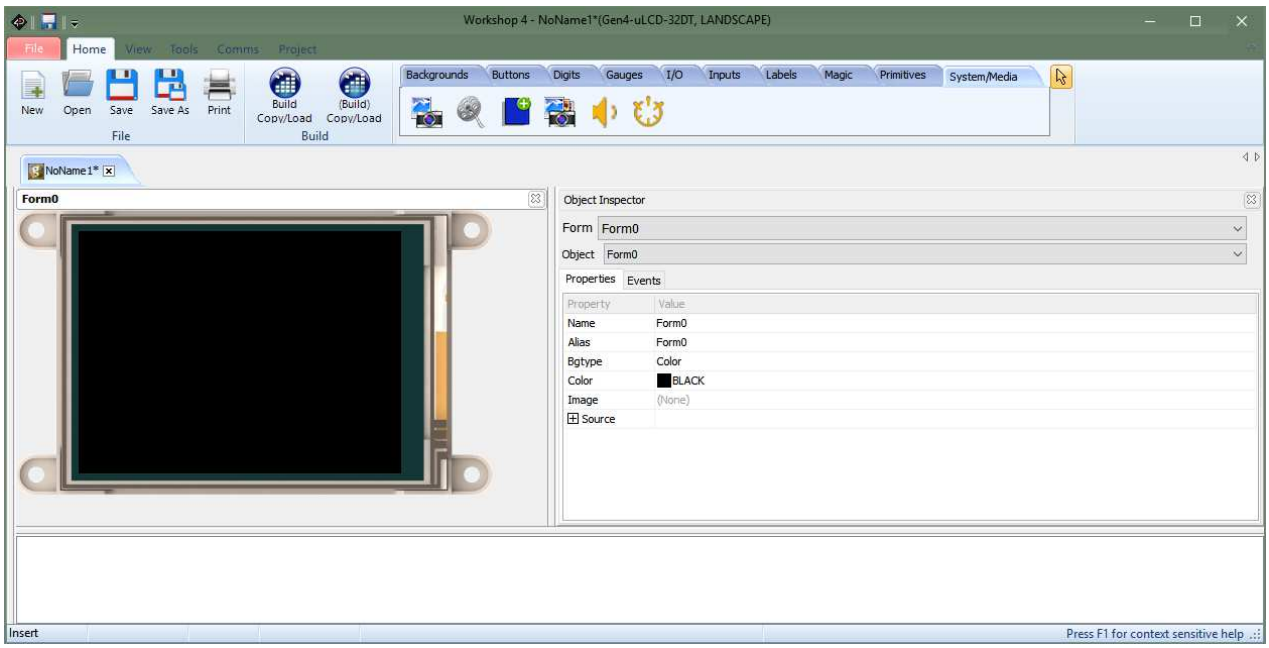



To learn more about ViSi, please to refer to the ViSi User Guide on the Workshop4 product page and to related application notes.

## 4.3. ViSi-Genie

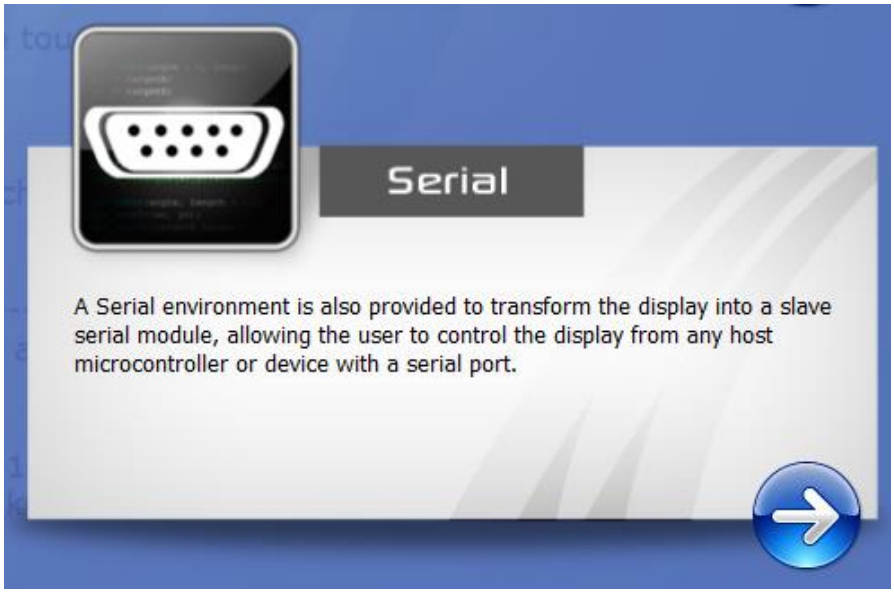



An advanced environment called **ViSi-Genie** doesn't require any 4DGL coding at all, it is all done for the user. By simply laying the display out with the wanted objects and setting the events to drive them, the code is written automatically. ViSi-Genie provides the latest rapid development experience from 4D Labs.




To learn more about ViSi-Genie, please to refer to the ViSi-Genie User Guide on the Workshop4 product page and to related application notes.

## 4.4. Serial




The **Serial** environment is provided to transform the module into a slave serial module, allowing communication and control from virtually any host micro-controller or device with a serial port.

For detail on this environment and steps on how to make your display module run under the Serial environment, please refer to the Serial Command Set Reference Manual on the Workshop4 product page and to related application notes.

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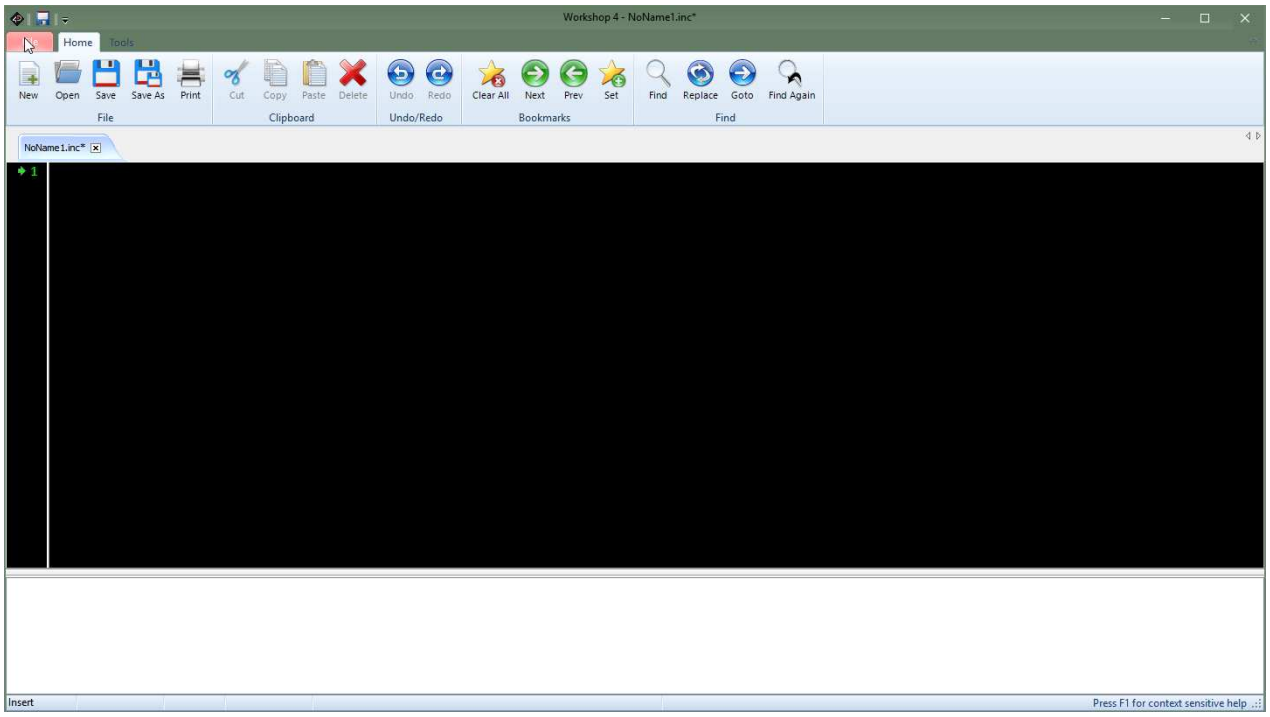
## 4.5. Create System File

The **Create System File** option provides an editor for all 4DGL-related projects, so a user can create or edit a 4DGL Include file, 4DGL Library file, a Function or System file. These can then be included in the user's 4DGL code.

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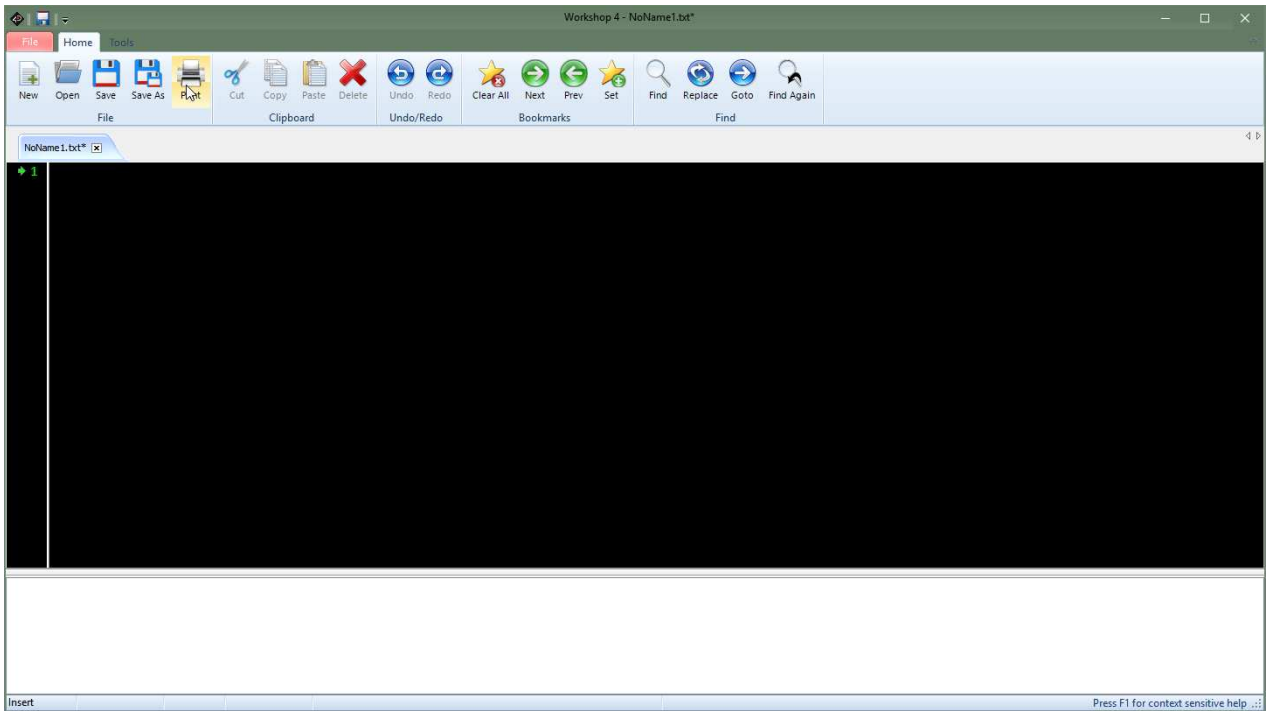
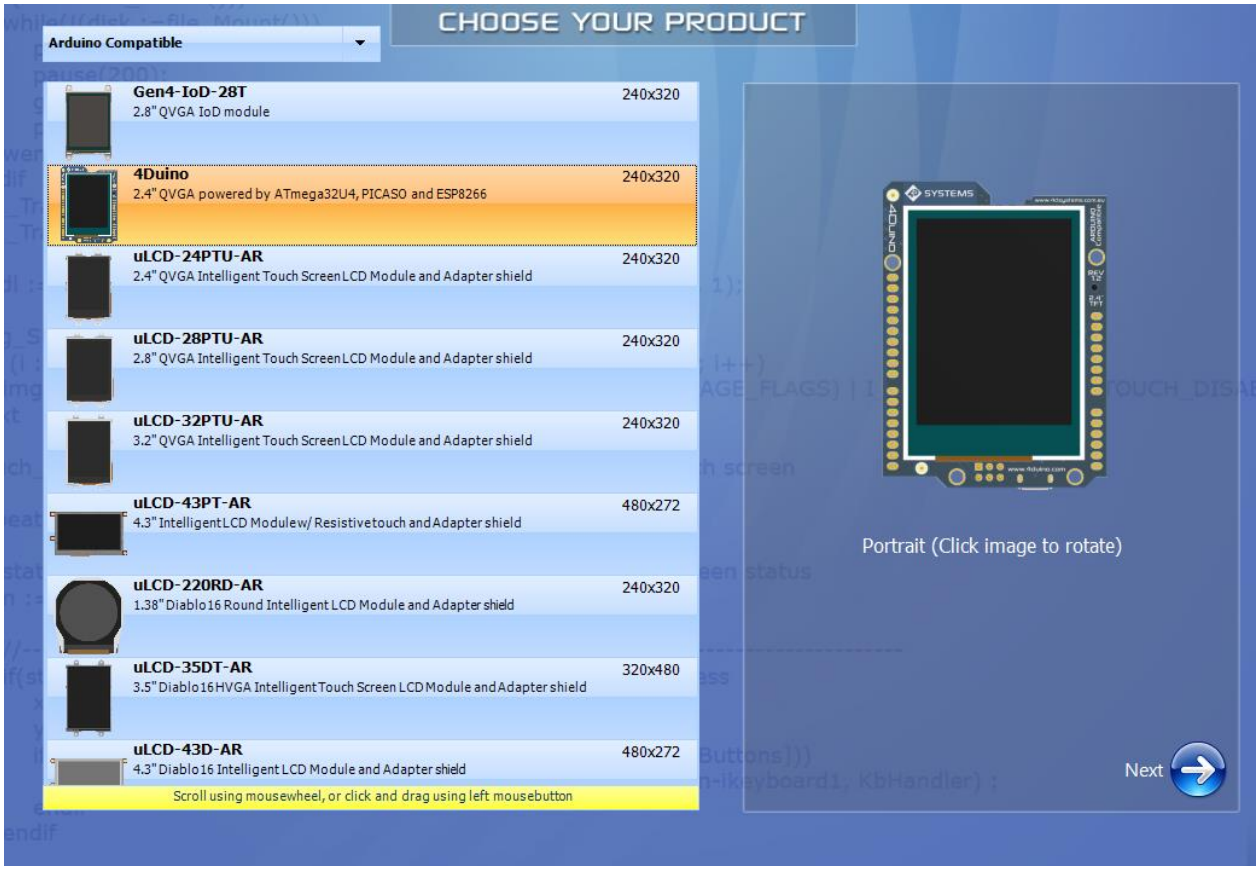
## 4.6. Create Text File

The **Create Text File** environment features a plain editor, suitable for writing basic documentation, application notes, data files or anything else requiring plain text files.



## 5. Choose Your Arduino Compatible Environment

When choosing a 4D Systems product, you can see that there is a product group named **Arduino Compatible** which includes both gen4-IoD-28T and 4Duino. It also includes a wide range of 4D Systems' display modules setup with an Arduino board.




Workshop4 allows the users to write their Arduino code and customize their 4D graphics user interface at the same time in a single integrated development environment.

## 5.1. Basic Graphics

The Arduino compatible Basic Graphics environment enables the user to write Arduino code directly to program this Arduino compatible module. It requires no uSD card and allows graphics primitives to be dragged and dropped on the screen and placed in your code. It utilizes the Serial SPE library for the processor used in the display, and therefore embraces the full set of Serial SPE Commands are available to the User, to produce the Graphical User Interface required.

## 5.2. Extended Graphics

A visual programming experience, suitably called Arduino compatible Extended Graphics, enables drag-and-drop type placement of Workshop4 objects to assist with Arduino code generation and allows the user to visualize how the display will look while being developed. A uSD card will be required in order to hold the graphics. It utilizes the Serial SPE library for the processor used in the display, and therefore embraces the full set of Serial SPE Commands are available to the User, to produce the Graphical User Interface required.

## 5.3. Genie Graphics

An upcoming feature is an advanced environment called Arduino compatible Genie Graphics which utilizes the popular ViSi-Genie technology that is available in most 4D Systems Intelligent Displays. It utilizes the genieArduino library, and allows rapid development of GUI due to the powerful tools and widgets Workshop4 provides. Simply lay the display out with the objects you want, set the events to drive them and then utilize the genie functions inside the Arduino sketch to read or write information to those objects from the Atmel processor. This is a very clean and rapid development environment.

In the meantime, you can continue developing Genie Arduino applications using the current tools.

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## 6. Common File Menu

The **File** Menu is the first menu and common to all environments…

…with various buttons relating to the project that is open (or greyed out if no project is open):

- File-related buttons,
- Print-related buttons,
- And miscellaneous buttons, such as Help, Options and Samples.

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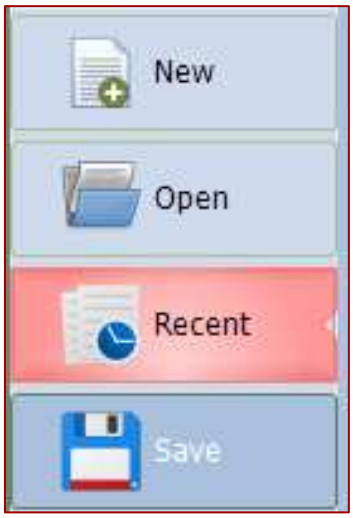
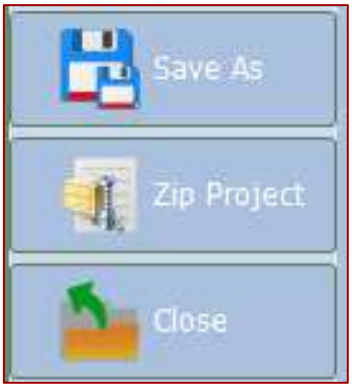
## 6.1. File-Related Buttons

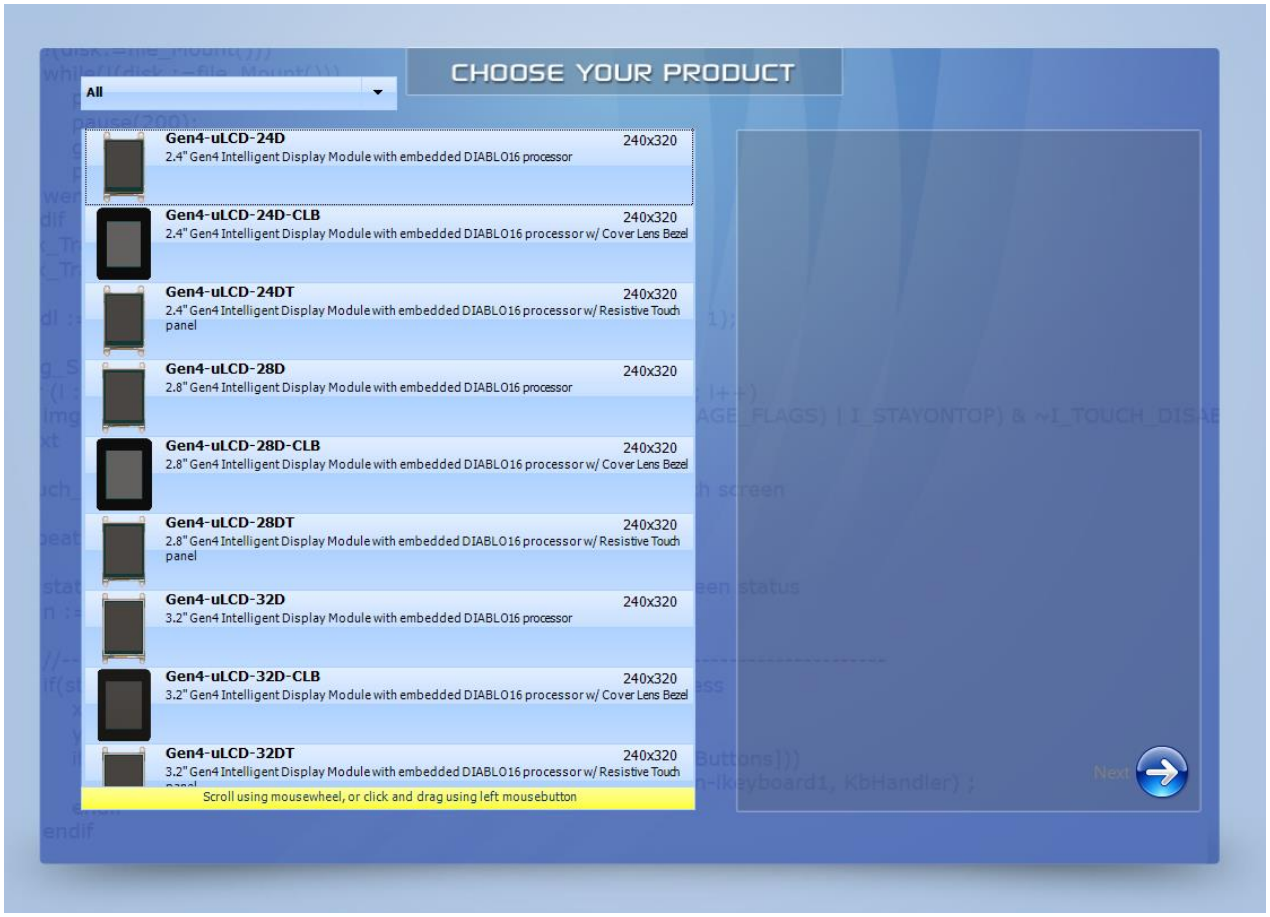
The buttons include all the actions related to projects: New, Open, Recent, Save, Save As, Zip Project and Close project.



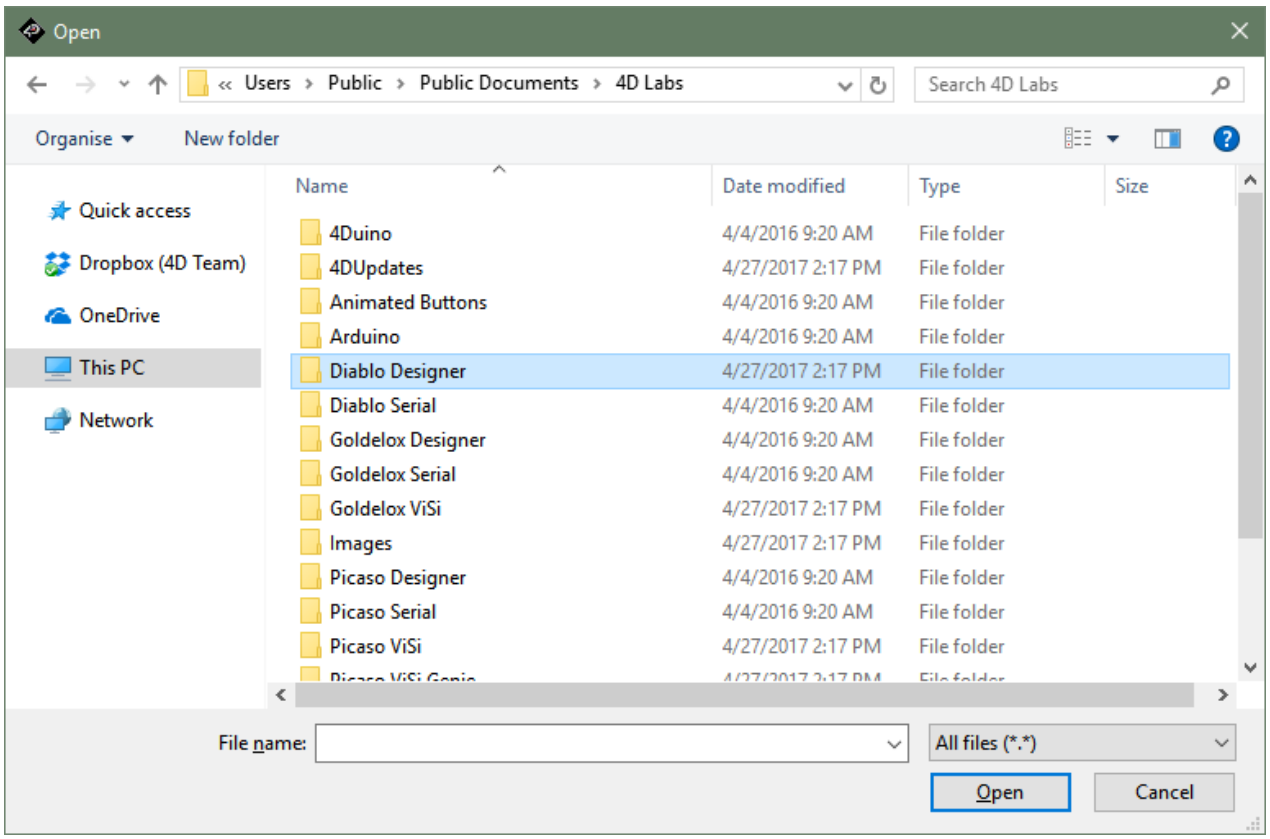




The options include:

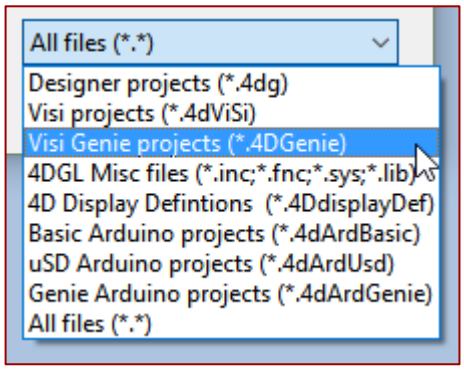
Click **New** to create a new project. A dialogue window asks for the screen and the kind of project.



Click **Open** to browse and open an existing project. A standard Open window opens.




Select **ViSi-Genie projects** among the different kinds listed below to load a ViSi-Genie project:

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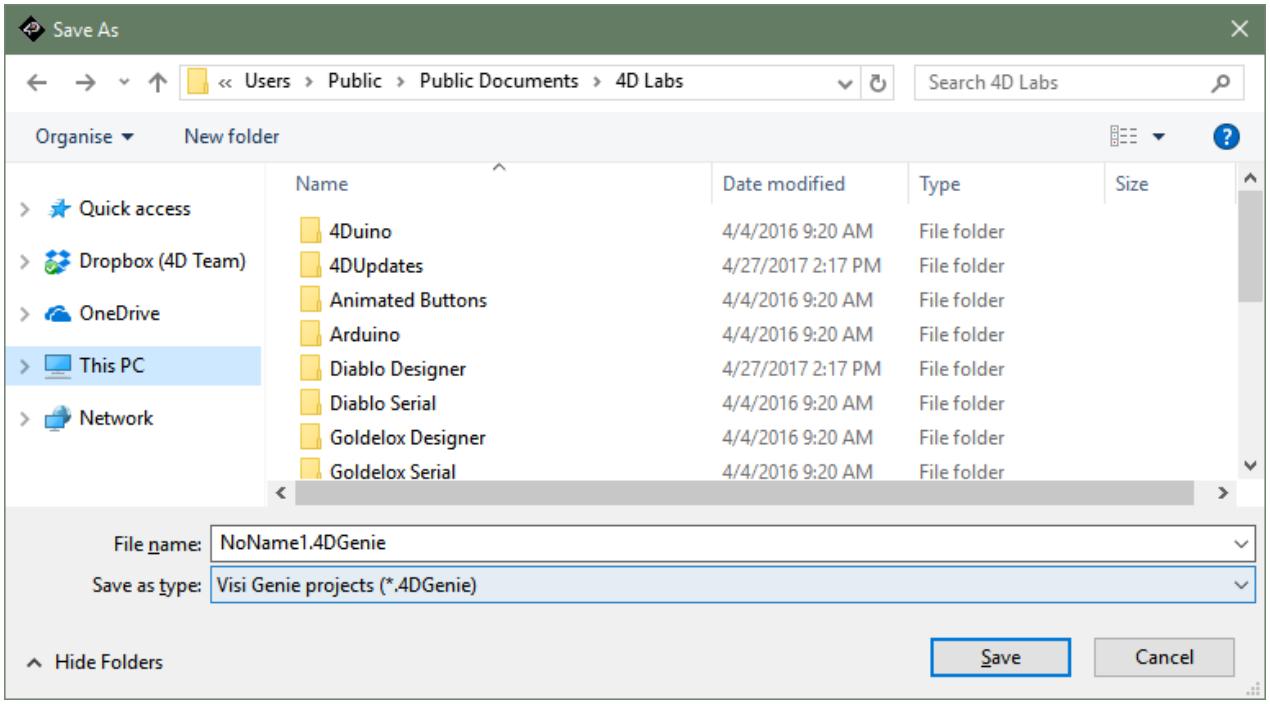
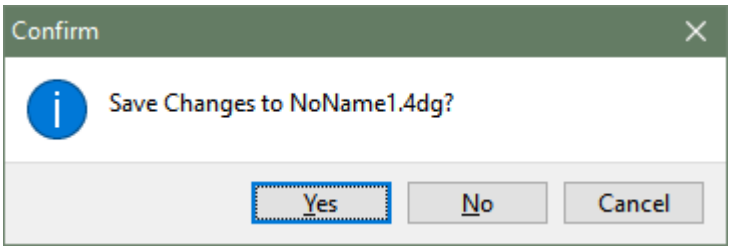
Click **Recent** to list the recently accessed files, and click on the project to open it.

Click **Save** to save the modified projects.
Click **Save As** to create a copy of already saved project and give it a new name. A standard Save window opens and asks for the location and the name:



Click **Zip Project** to make a compressed file out of the project. This is especially useful when then project is large and contains pictures and videos.

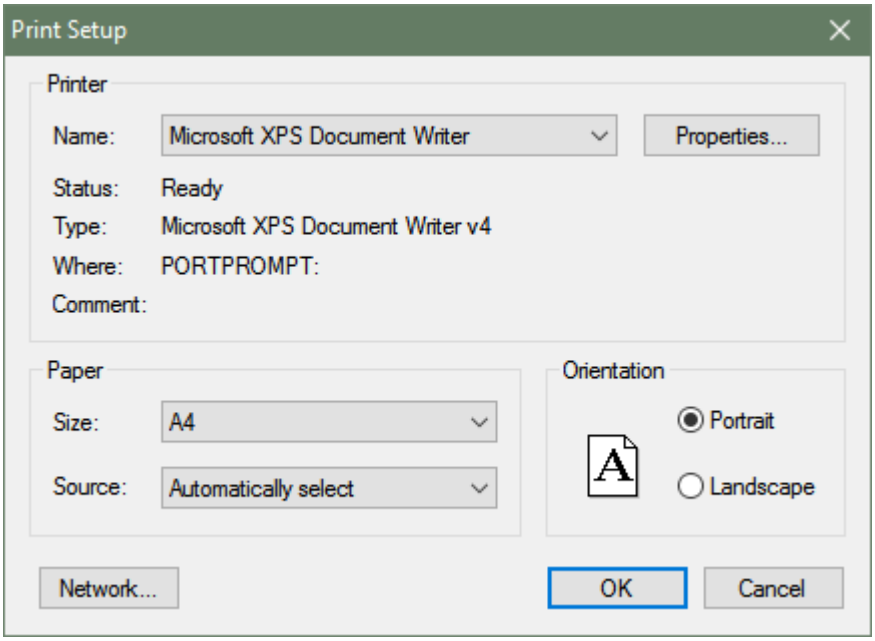
Click **Close** to close the current project. You will be prompted to save the changes to any modified project.



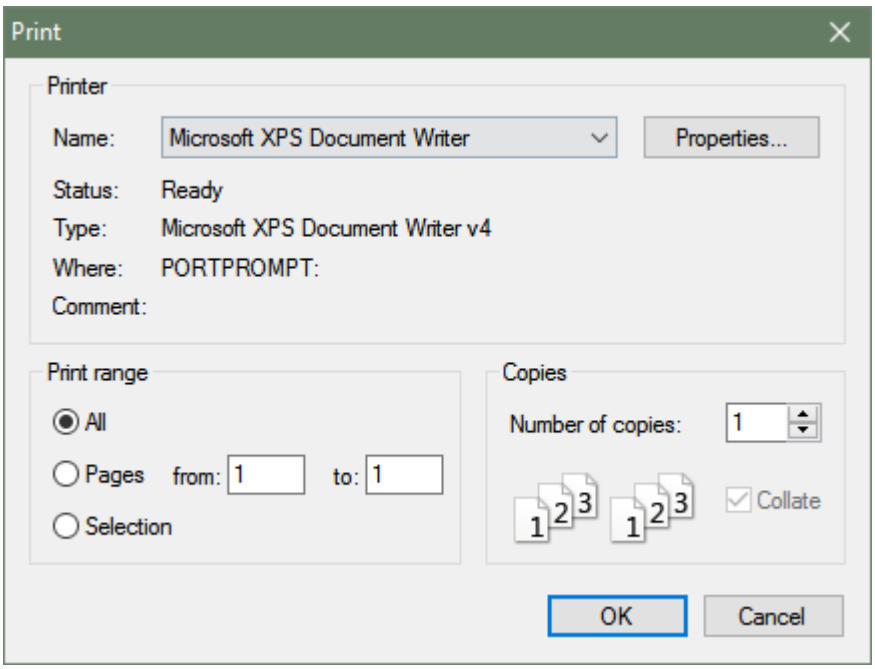

## 6.2. Print-Related Buttons

The buttons include all the actions related to print:

Click **Print Setup** to setup the printer:



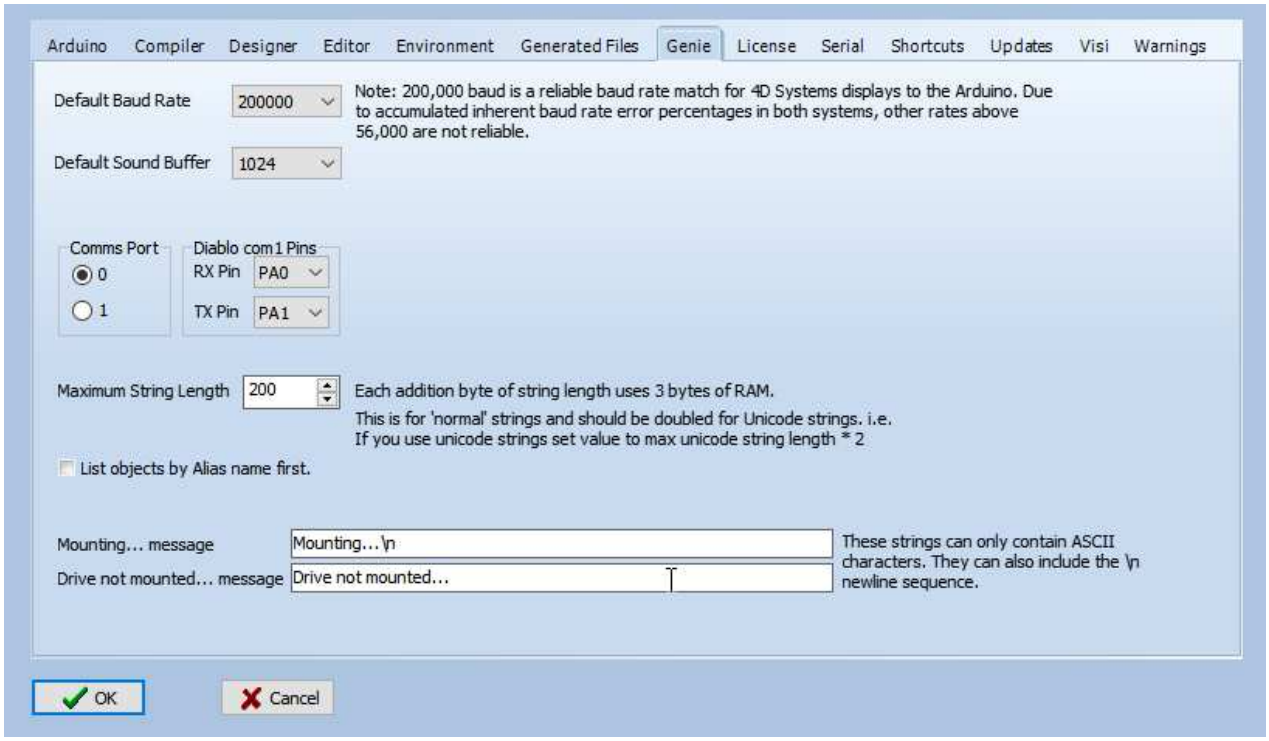
Click **Print** to print the project:



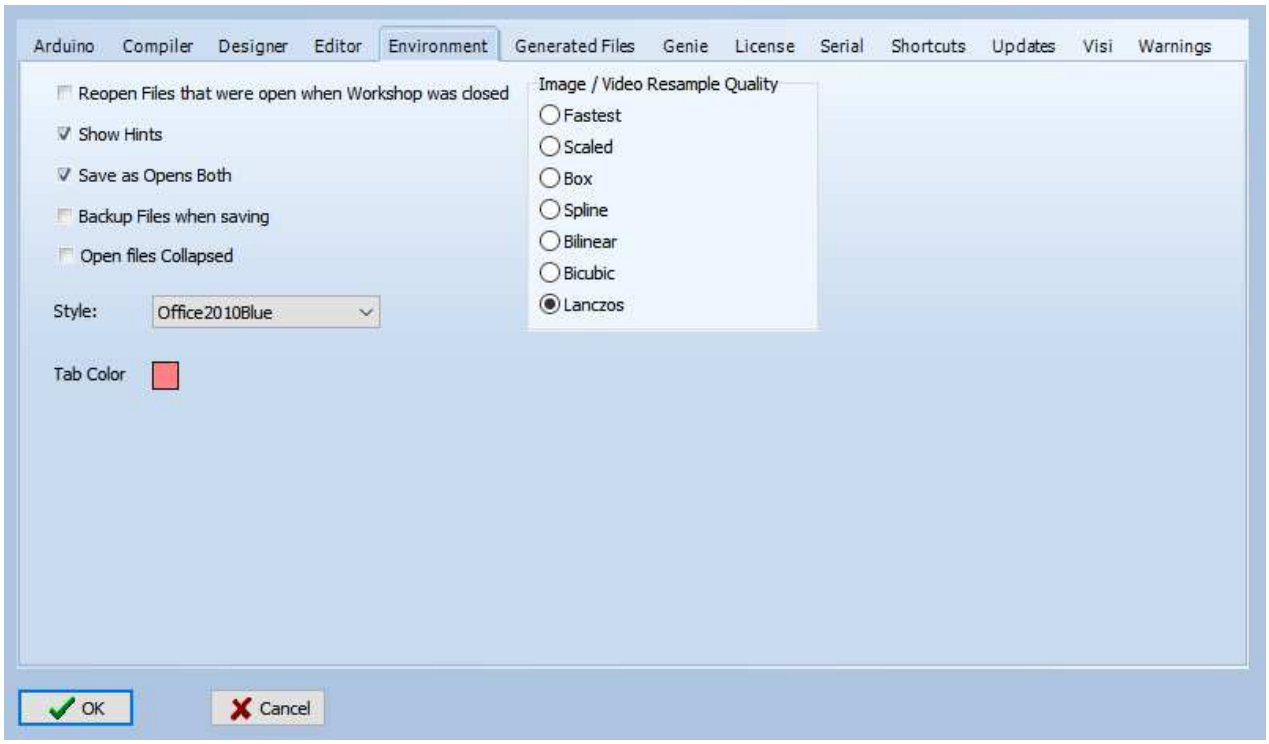

## 6.3. Miscellaneous Buttons

The Miscellaneous buttons include **Options**, **Help**, **Samples** and **Exit**.

Click **Options** to set the options for the current project:




Options include different panes. Select “Environment”.




Select the **Style** among different possibilities.