



**4D SYSTEMS**  
*TURNING TECHNOLOGY INTO ART*

## **Workshop 4 - ViSi-Genie**

### **User Guide**

**USER GUIDE**

**Document Date: 21<sup>st</sup> March 2013**  
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## 1. Introduction to ViSi-Genie

This user guide provides an introduction to ViSi-Genie, the codeless rapid development tool for designing and building graphic user interface on 4D Systems screens.

**ViSi-Genie** is a breakthrough in the way 4D Systems' graphic display modules are programmed, it provides an easy method for designing complex Graphics User Interface applications without any coding. It is an environment like no other, a code-less programming environment that provides the user with a rapid visual experience, enabling a simple GUI application to be 'designed' from scratch in literally seconds.

ViSi-Genie does all the background coding, no 4DGL to learn, it does it all for you.

Pick and choose the relevant objects to place on the display, much like the ViSi environment, yet without having to write a single line of code. The full animation of the objects is done under-the-hood, such as pressing a button or moving the thumb of the slider. Each object has parameters which can be set, and configurable events to animate and drive other objects or communicate with an external host.

Simply place an object on the screen, position and size it to suit, set the parameters such as colour, range, text, and finally select the event you wish the object to be associated with, it is that simple. Objects are classified in three different groups:

**INPUT OBJECTS**, as a button or a keyboard, **OUTPUT OBJECTS**, as a gauge or a meter, and **COMBINED OBJECTS** or **INPUT/OUTPUT OBJECTS**, as a slider which acts as both an input and an output.

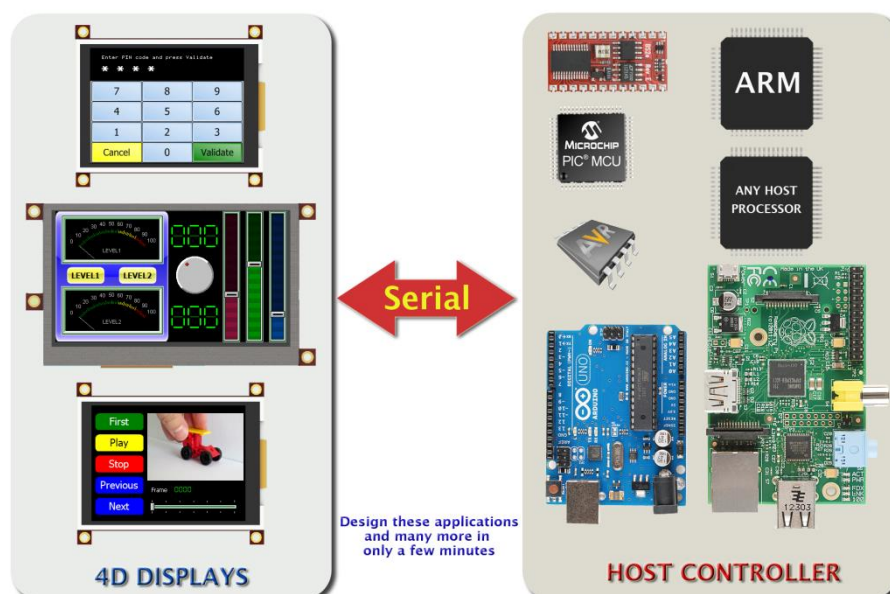
In seconds you can transform a blank display into a fully animated GUI with moving meters, animated press and release buttons, and much more. All without writing a single line of code!

ViSi-Genie provides the user with a feature rich rapid development environment, second to none.

This document should be used in conjunction with the *ViSi-Genie Reference Manual*.

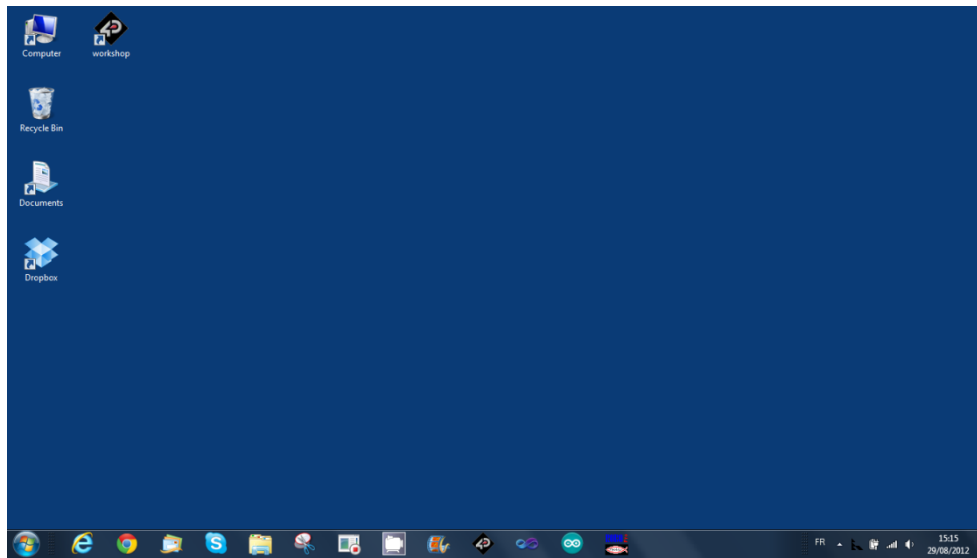
ViSi-Genie is included in the integrated development environment Workshop 4. To install Workshop 4, please refer to the document *Workshop 4 Installation*.

ViSi-Genie is currently only available for the Picaso platform; attempting to build a ViSi-Genie program for Goldelox will fail.



## 2. Launch Workshop 4

There is an alias for Workshop 4 on the desktop:



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



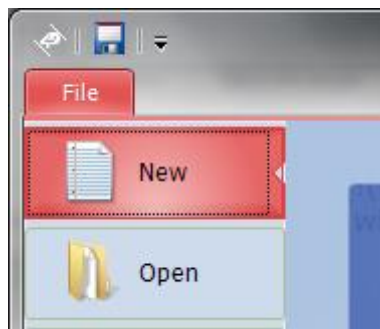
### 3. Create a New Project

Workshop 4 opens and displays the **Recent** page:



To create a new program, there are multiple options:

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



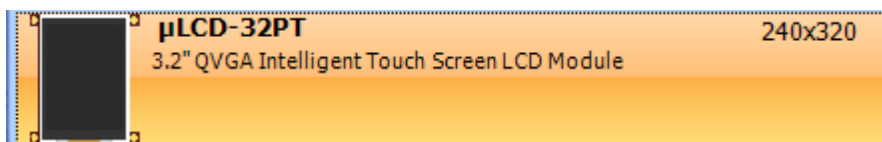
- Click on the icon close to **Create a New Project** on top or, if the settings have been already defined, click on the icon close to **Create a New Project** on bottom:



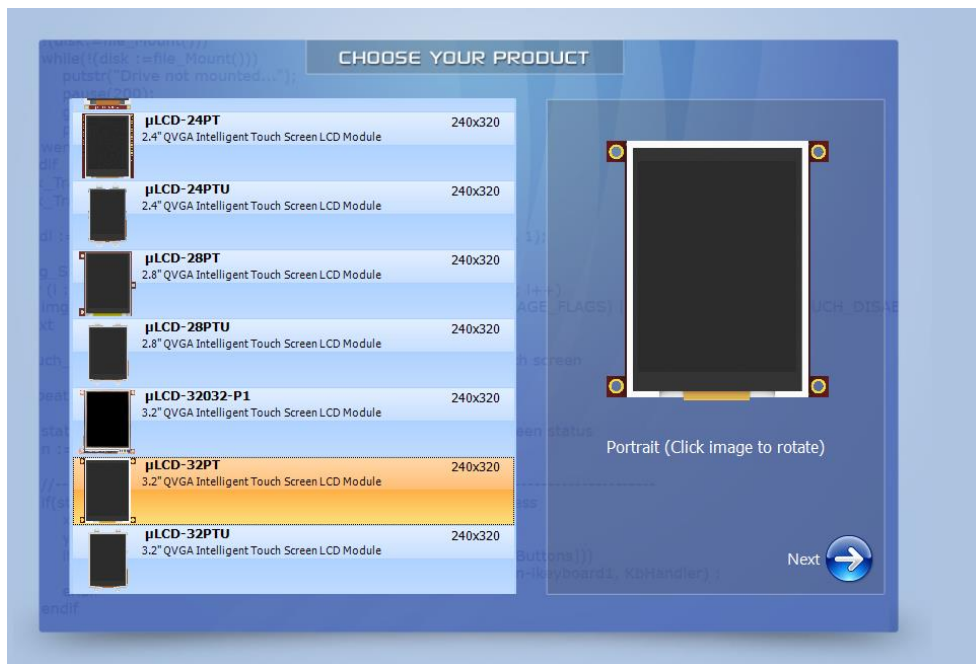
All those options update the main window with the selection of the screen:



Select the screen, here the μLCD-32PT:

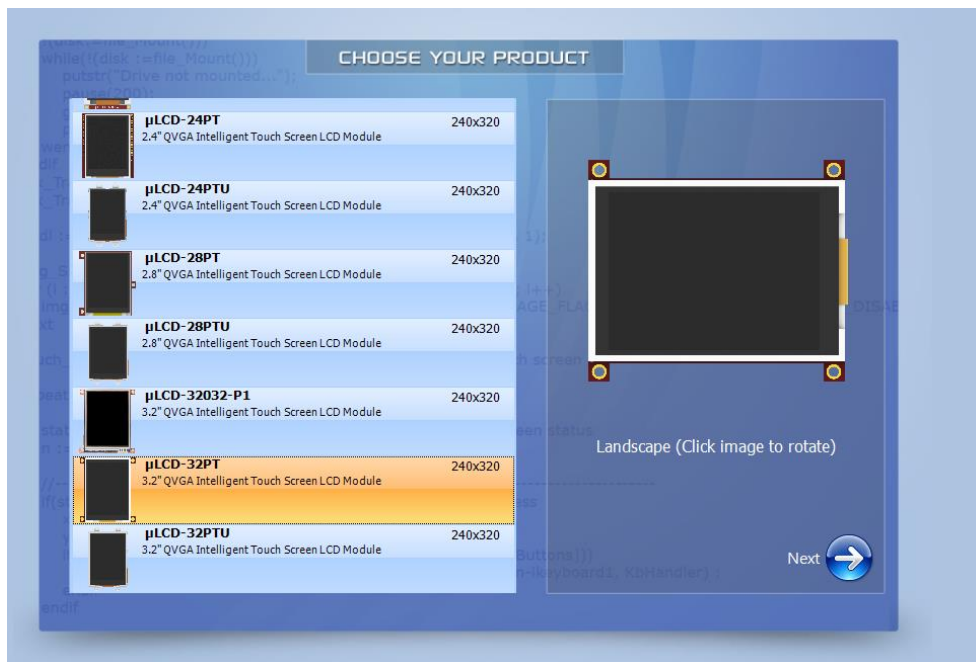


The selected screen is displayed:



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:





## 4. Select ViSi-Genie

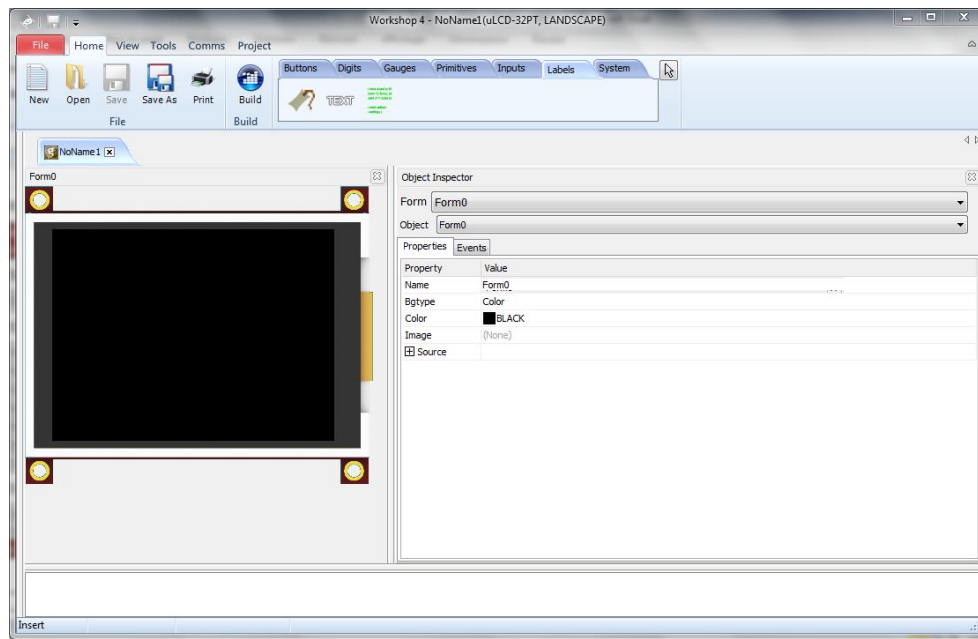
The main window now asks for the kind of project:



To select ViSi Genie, just click on the blue arrow:



The development environment is now displayed:



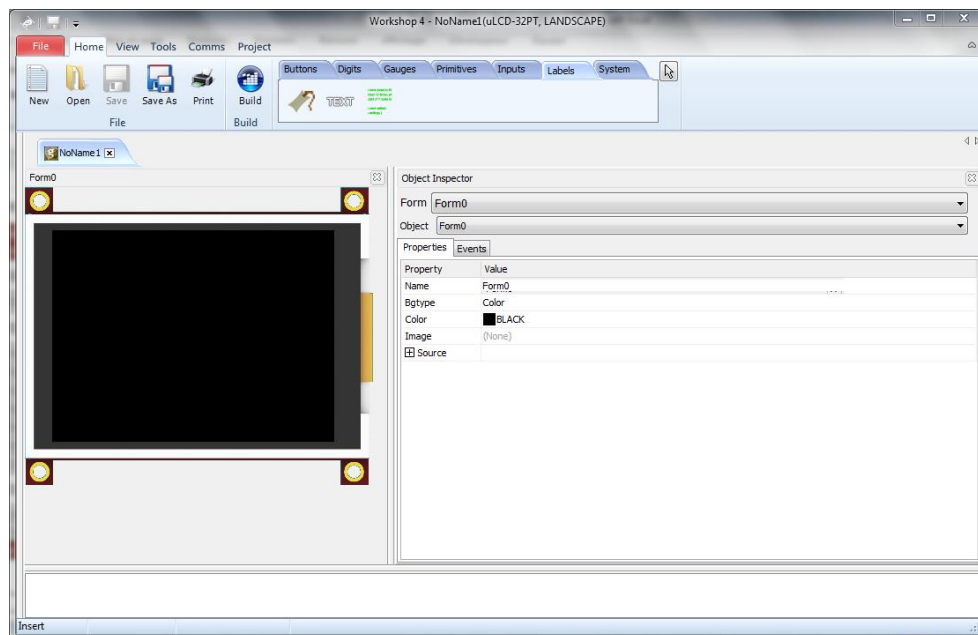
Workshop 4 displays an empty screen, called Form0.

- A **project** consists of one or more forms.
- A **form** is like a page on the screen.
- The form includes **objects**, like sliders, displays or keyboards.

You are ready to start.

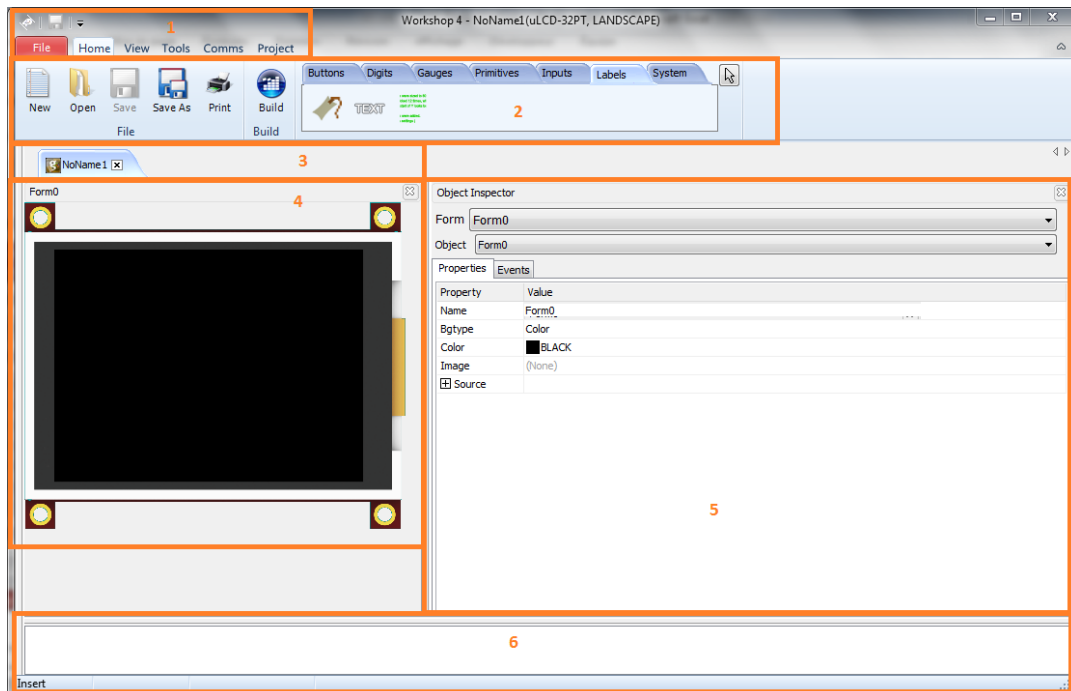
## 5. The Main Screen

The main screen appears:



Let's detail the different areas.

There are six different areas, from left to right, for top to bottom:



1. Menu;
2. Ribbon with icons;
3. List of open projects;
4. Form and WYSIWYG screen where to place the objects;
5. Object inspector, where properties and events are defined;
6. Messages about errors, warnings and notices.

### 5.1. Area 1: Menus

The menus include standard Windows options. Each menu displays a specific ribbon.

The debugger called **Genie Test Executor** is located under the Tool menu.



### 5.2. Area 2: Ribbon with Icons

For the Home menu, the ribbon includes the file related buttons and the objects grouped in panes:



The icons related to the files include **New** project, **Open** project, **Save** project, **Save as** project, **Print** project, and **Build** project.

The objects are grouped in seven panes, with input objects, output objects and composite objects.

Just click on an object to select it.

The **Build** button builds the project and uploads it to the screen.

### 5.3. Area 3: List of Open Projects

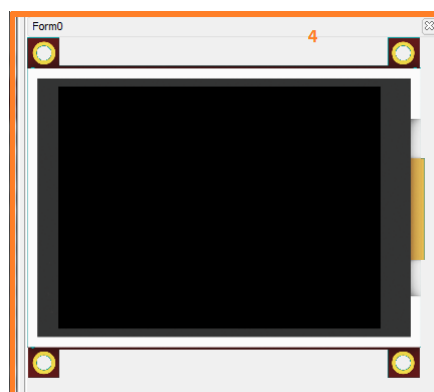
On top of the What-You-See-Is-What-You-Get (WYSIWYG) screen, the open projects are displayed:



Click on the tab to open it or on the cross to close it.

### 5.4. Area 4: Form and WYSIWYG Screen

The form represents a WYSIWYG screen.



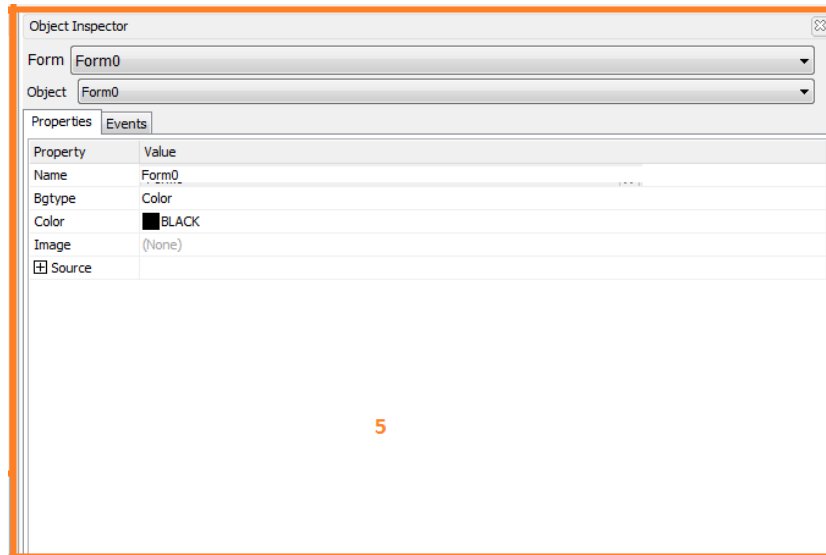
The active form is displayed there, with its objects. Objects are picked from the panes and can be resized and moved.

Click on an object to select it.

### 5.5. Area 5: Object Inspector

The object inspector provides all the information on the selected object:

- properties, as size and position;
- and events, where actions are defined.



### 5.6. Area 6: Message Window

The message window displays errors, warnings and notices after the project is built.



Before starting using the Workshop 4, we need to connect the screen and prepare a micro-SD card.

For more information about connecting the screen, please refer to the Workshop 4 User Guide.

The micro-SD card shall be FAT16-formatted. Partition can't exceed 2 GB.

For more information about formatting the micro-SD card, please check the details on chapter *Format the Micro-SD Card* described in the document Workshop 4 Installation.

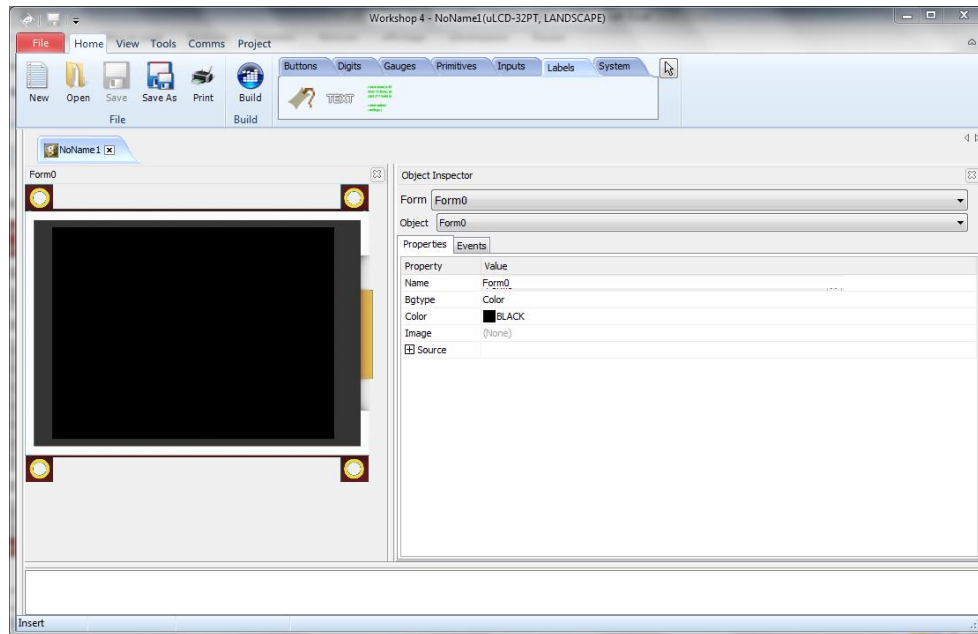
## 6. A First ViSi-Genie Project

Workshop 4 display an empty screen, called **Form0**.

A **form** is like a page on the screen.

The form includes **objects**, like sliders, displays or keyboards.

A **project** consists of one or more forms.



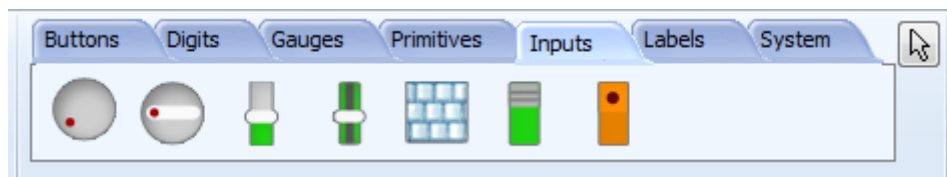
The form is empty.

We are going to build a form with two objects: a track bar that updates a meter.

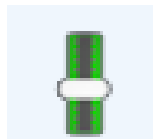
### 6.1. Adding Objects

The track-bar is an **input object** and the meter is an **output object**.

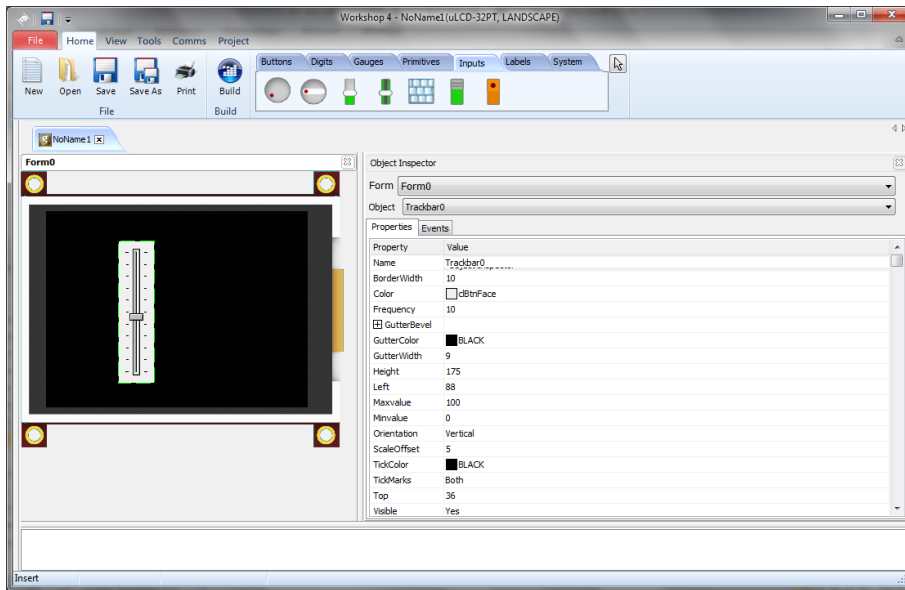
Select the **Inputs** pane...



...then the **Track-bar** object...

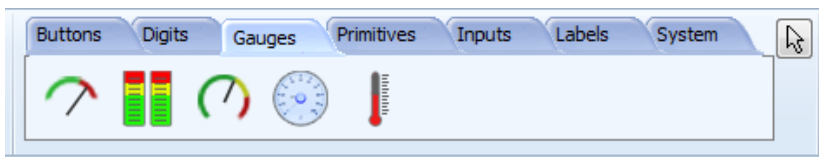


...and then click on the desired location on the form to place it:



Now, the same applies for the meter.

Select the **Gauges** pane...



...then the **Meter** object...



...and place it on the form.

The final form looks like:

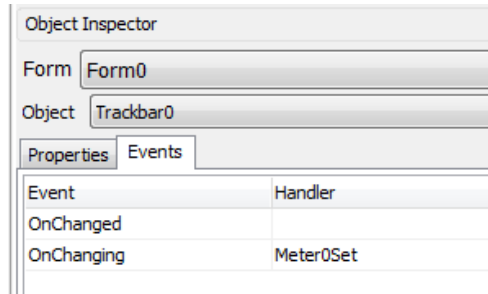


For a step-by-step example of a project, please refer to the application note 4D-AN-P4001 Getting Started – First Project with ViSi-Genie.

## 6.2. Linking Objects

Now, the objects need to be linked: moving the track-bar updates the meter.

Moving the track-bar raises an **event**, called **OnChanging**. When an **OnChanging** event arises, a message is sent to the meter with the value.



For the end-user, each time he moves the track-bar, the meter is updated accordingly.

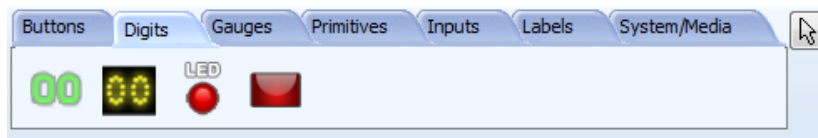
This example is detailed step-by-step on the application note 4D-AN-P4001 Getting Started – First Project with ViSi-Genie.

For a detailed presentation of the onChanging and onChanged events, please refer to the application note 4D-AN-P4002 ViSi-Genie – onChanging and onChanged Events.

## 6.3. Controlling Multiple Objects

As described in the previous section, an object sends a message to another single object.

Select the **Digits** pane...

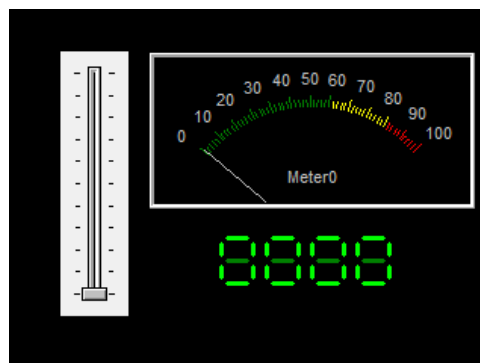


...then the **LedDigits** object...



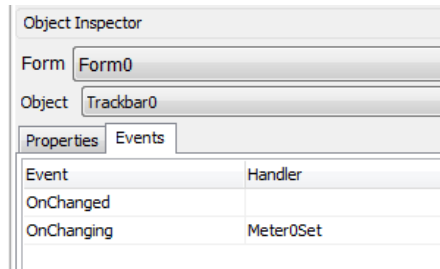
...and place it on the form.

The final form looks like:

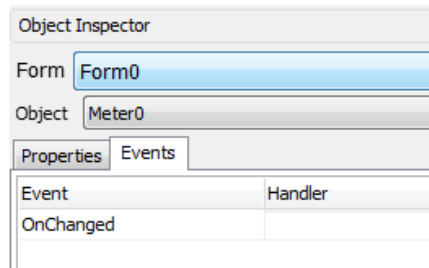




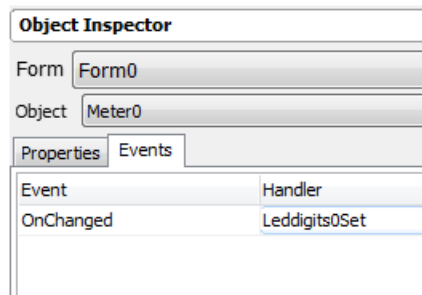
As previously, moving the track-bar raises the **OnChanging** event, which sends a message to **Meter0** with the value.



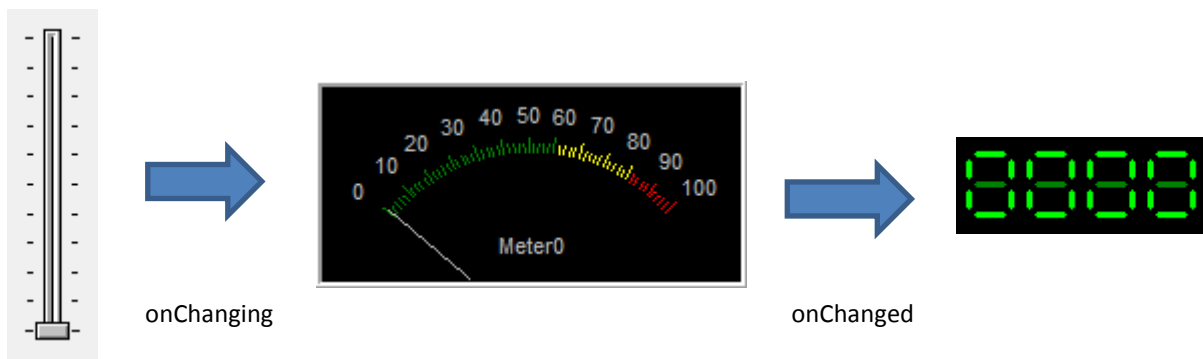
Now, the meter has the event **OnChanged** raised when the meter receives a new value.



An action can be associated to that event to send the value to the **LedDigits0** object:



Summarising:

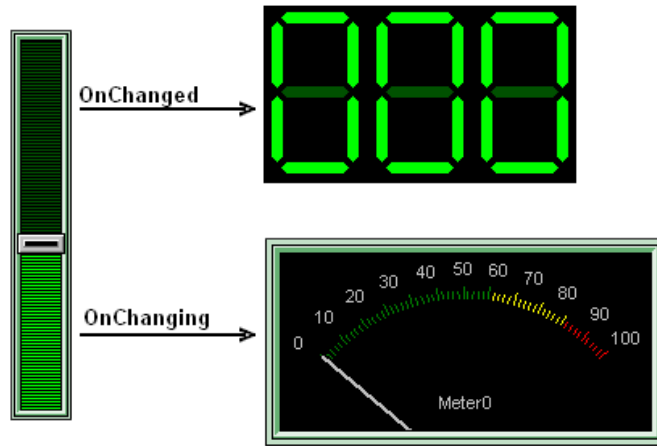


- Moving the track-bar raises the **OnChanging** event, which sends a message to **Meter0** with the value;
- The meter **Meter0** displays the new value and raises the **OnChanged** event, which sends a message to **LedDigits0** with the value.

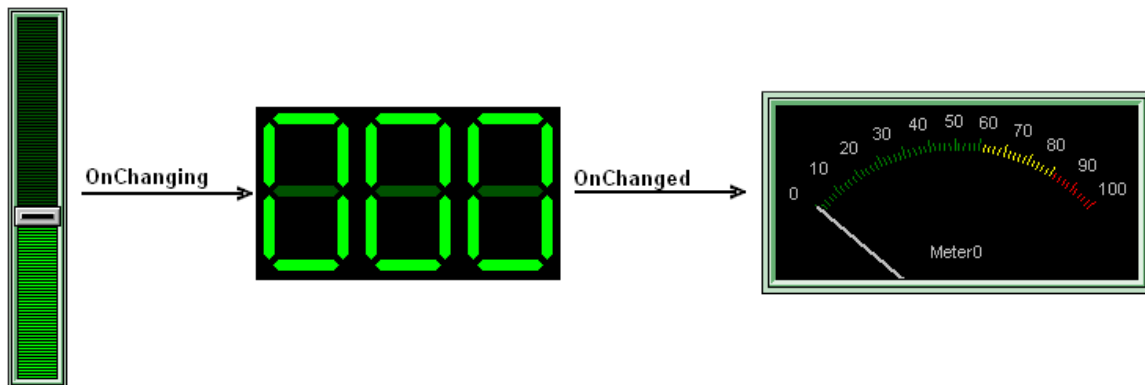
That way, multiple objects can be controlled.

6.4. Chaining Objects

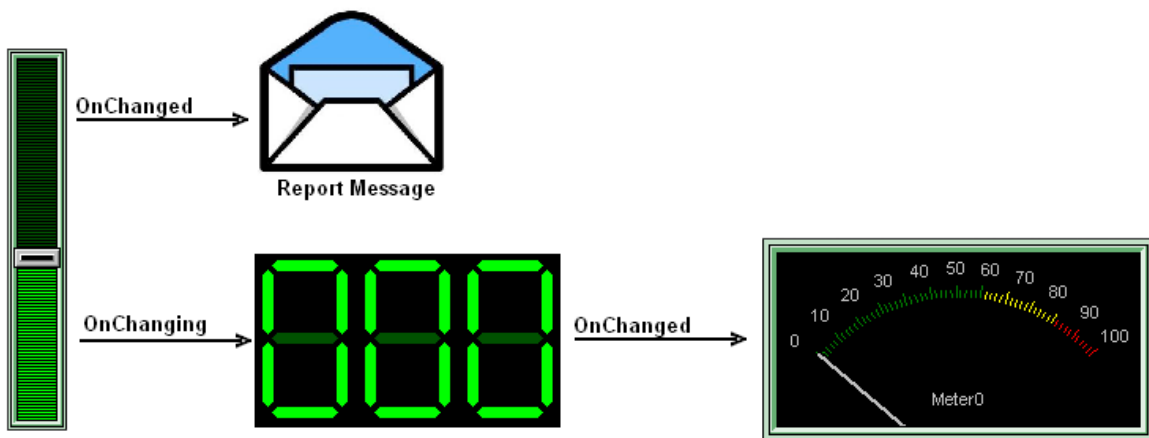
Combining the **OnChanged** and **OnChanging** events with sending messages from one object to another allows multiple configurations:



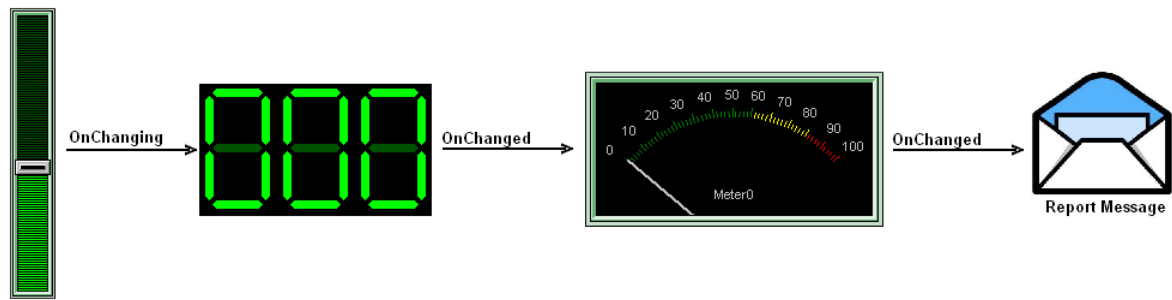
Another configuration with the same result:



A message is sent to the host controller once the track-bar has been released:



Another configuration with the same result:



For more information on the interfacing of ViSi-Genie with a host micro-controller, please refer to the application note 4D-AN-P4010 ViSi-Genie - Connection to a Host with Red-Green-Blue LED Control.

## 7. Objects

ViSi-Genie relies on three groups of objects:

- The **INPUT OBJECTS** produce stimuli data for INPUT type objects or directly to Serial output. The animation for these objects is done under the hood, for example the slider thumb movements, etc. A button press can launch a sub-form or can send out serial data or cause another event to occur.  
*Example: a button.*
- The **OUTPUT OBJECTS** only react to OUTPUT stimuli. The stimulus data can come from the Serial port or an INPUT object. They produce no input data or stimuli. The animation for these objects is performed under the hood, for example incoming serial data can move the needle of the meter, etc. OUTPUTs can be set regardless of whether they are displayed on the current form, when the form containing them is displayed, they are displayed with their current value.  
*Example: a meter.*
- Actually, most objects are **COMBINED OBJECTS** or **INPUT/OUTPUT OBJECTS**. Most input objects can also function as outputs, with the notable exception of Keyboards. Certain objects need both an input stimuli as well as produce an output event. For example, a slider thumb position may need to be remotely controlled from incoming serial data. A button may need to be animated not only using the touch screen but via serial data.  
*Example: a slider.*

Here is the summary of the input, output and combined objects. A combined object is ticked both as input and output.

Pane	Object	Input	Output
<b>Button</b>	Win Button	✓	✓
<b>Digits</b>	Led Digits		✓
	Custom Digits		✓
	Led		✓
	User Led		✓
<b>Gauges</b>	Meter		✓
	Gauge		✓
	Angular Meter		✓
	Cool Gauge		✓
	Thermometer		✓

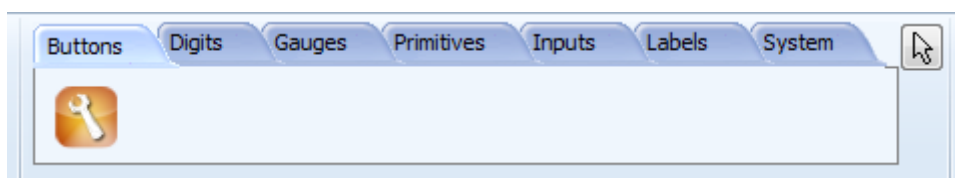
Pane	Object	Input	Output
<b>Primitives</b>	Circle		
	Rectangle		
	Triangle		
	Line		
	Ellipse		
	Panel		

Pane	Object	Input	Output
<b>Inputs</b>	Knob	✓	✓
	Rotary Switch	✓	✓
	Slider	✓	✓
	Track Bar	✓	✓
	Keyboard	✓	
	Dip Switch	✓	✓
	Rocker Switch	✓	✓
<b>Labels</b>	Label		
	Static Text		
	Strings		✓
<b>System / Media</b>	Image		
	Video		✓
	Form		✓
	Sound		✓
	Timer		✓
	String Text		✓
	Control		✓

Each object is presented with its button on the left and an example on the right when used on a form.

Objects are drawn on the display in the order they are created in the Workshop project. If Image objects are to be used for the background and other objects on top, then the image objects must be created and added first. Also note this only applies to non-active Image objects, other active objects should not be added on top of each other.

## 7.1. Buttons Object



The Buttons pane contains only one object: the WinButton.

### 7.1.1. Win Button

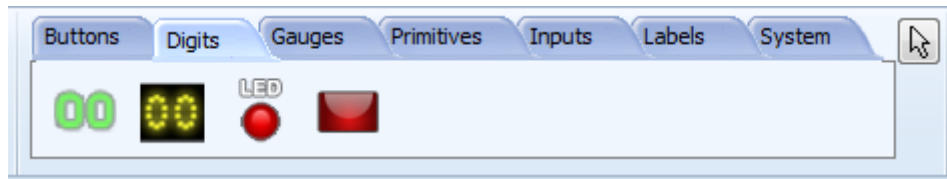


This object has one single event, onChanged.

Buttons can be linked together to form a group through a matrix. When one button of the matrix is pressed, the previous one is released.

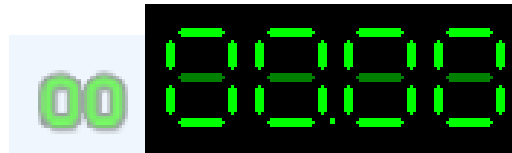
For more information on the Button object, please refer to the application note 4D-AN-P4004 ViSi-Genie – Advanced Buttons.

## 7.2. Digits Objects



The Digits pane contains 4 different displays.

### 7.2.1. LED Digits



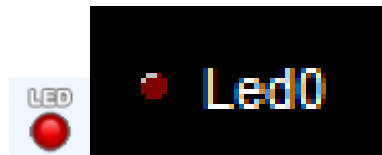
The number of digits, the decimal place, the size, the leading zeros can be customised.  
This object has one single event, `onChanged`, very useful to send the value received.

### 7.2.2. Custom Digits



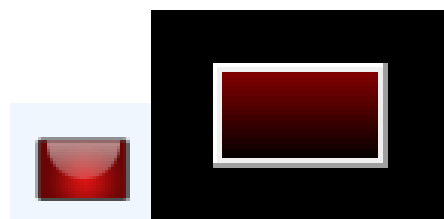
This object offers no customisation.  
This object has one single event, `onChanged`, very useful to send the value received.

### 7.2.3. LED



The size, the label, the font and the colour can be customised.  
This object has one single event, `onChanged`, very useful to send the value received.

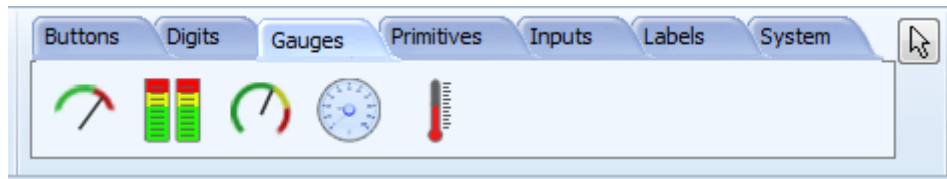
### 7.2.4. User LED



The size and the colour can be customised.  
This object has one single event, `onChanged`, very useful to send the value received.

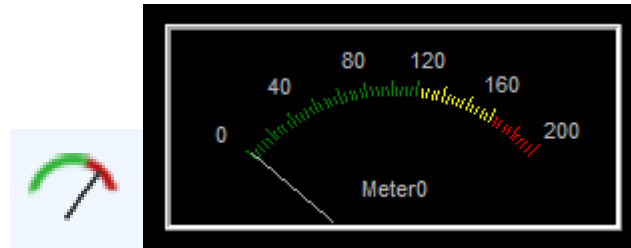
For more information on the Digits objects, please refer to the application note 4D-AN-P4012 ViSi-Genie - Digital Displays.

### 7.3. Gauges Objects



The Gauges pane contains 5 specialised displays:

#### 7.3.1. Meter

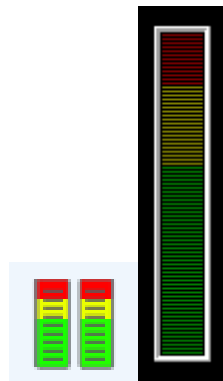


The meter displays a value in a dial. Minimum and maximum, number of intervals and scales, all colours are fully configurable, among other options.

The meter is an output object and can send a message when changed.

This object has one single event, `onChanged`, very useful to send the value received.

#### 7.3.2. Gauge

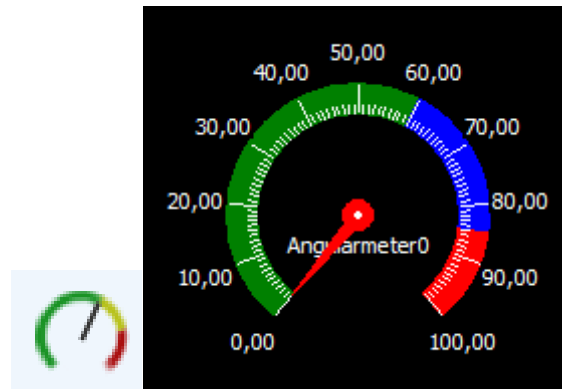


The meter displays a value in a dial. Minimum and maximum, number of intervals, scales and three palettes, all colours are fully configurable, among other options.

The meter is an output object and can send a message when changed.

This object has one single event, `onChanged`, very useful to send the value received.

### 7.3.3. Angular Meter



The meter displays a value in a dial. Minimum and maximum, number of intervals, scales and three zones, all colours are fully configurable, among other options.

The meter is an output object and can send a message when changed.

This object has one single event, `onChanged`, very useful to send the value received.

### 7.3.4. Cool Gauge

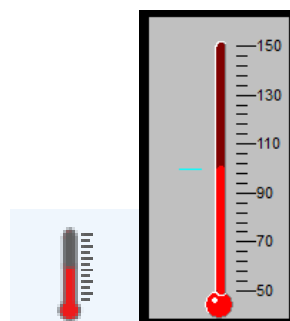


The meter displays a value in a dial. Minimum and maximum, linear or logarithmic scales, all colours are fully configurable, among other options.

The meter is an output object and can send a message when changed.

This object has one single event, `onChanged`, very useful to send the value received.

### 7.3.5. Thermometer



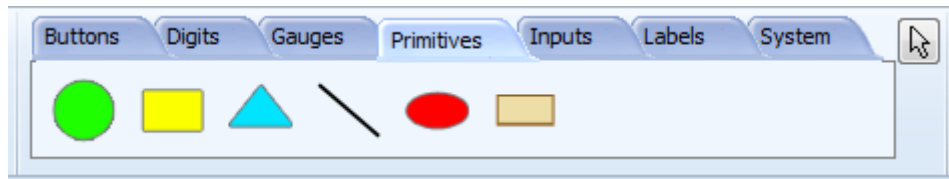
This object offers no customisation.

This object has one single event, `onChanged`, very useful to send the value received.

For more information on the Gauge objects, please refer to the application note 4D-AN-P4008 ViSi-Genie - Gauges.

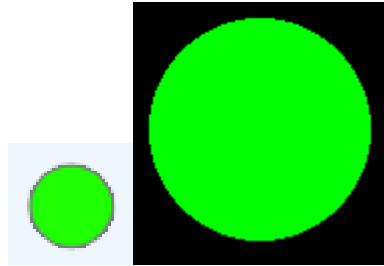


## 7.4. Primitives Objects



The Primitives pane offers standard static drawings.

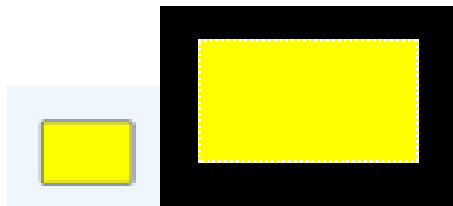
### 7.4.1. Circle



The colour and the option of empty or solid can be customised.

This object has no event.

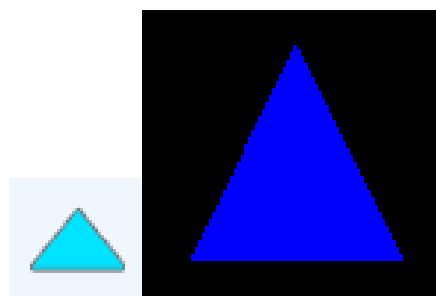
### 7.4.2. Rectangle



The colour, the outline and the option of empty or solid can be customised.

This object has no event.

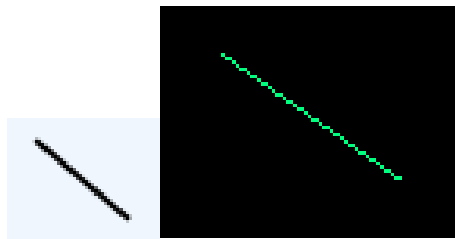
### 7.4.3. Triangle



The colour, the outline and the option of empty or solid can be customised.

This object has no event.

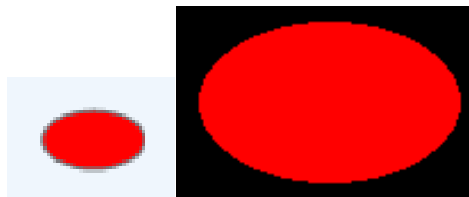
#### 7.4.4. Line



The colour and the pattern can be customised.

This object has no event.

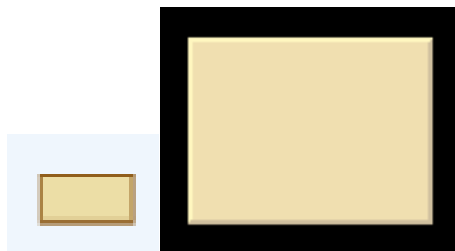
#### 7.4.5. Ellipse



The colour and the option of empty or solid can be customised.

This object has no event.

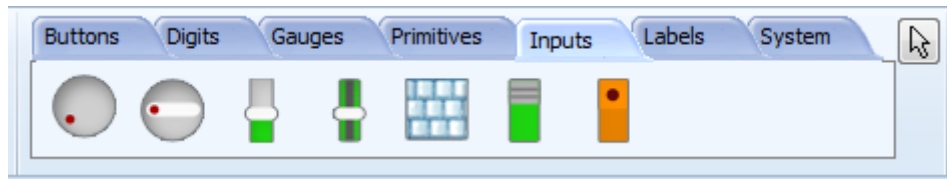
#### 7.4.6. Panel



The colour, the outline, the state lowered or raised can be customised.

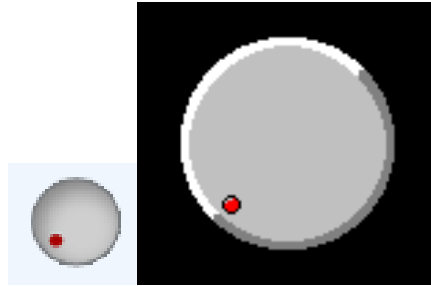
This object has no event.

## 7.5. Inputs Objects



The Inputs pane contains rotary selectors, linear selectors, keyboards and switches.

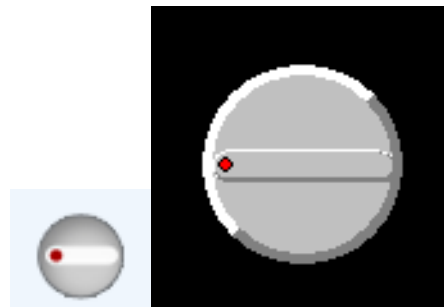
### 7.5.1. Knob



The minimum and maximum angles, the back and the handle can be customised.

This object has two events, **onChanged** and **onChanging**.

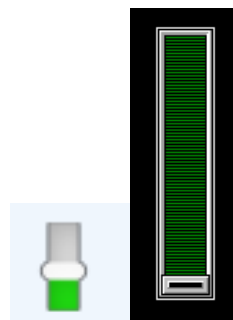
### 7.5.2. Rotary Switch



The minimum and maximum angles, the positions and labels, the switch and the winch colours can be customised.

This object has two events, **onChanged** and **onChanging**.

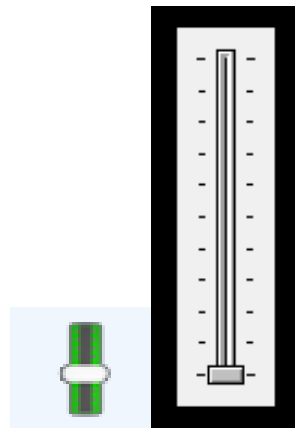
### 7.5.3. Slider



The minimum and maximum values, the vertical or horizontal orientations, the colours can be customised.

This object has two events, **onChanged** and **onChanging**.

### 7.5.4. Track-bar



The minimum and maximum values, the vertical or horizontal orientations, the frequency and ticks, the colours can be customised.

This object has two events, **onChanged** and **onChanging**.

### 7.5.5. Keyboard



ViSi-Genie comes with various defined keyboards:

- QWERTY keyboard, by default,



- Cell-phone keyboard



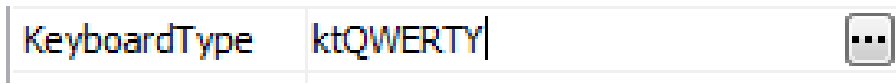
- Numeric keyboard



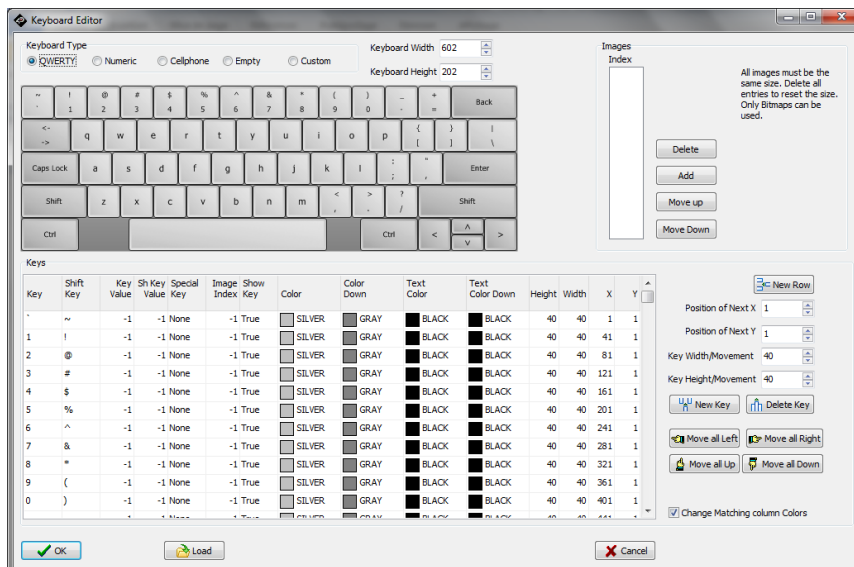
- And even a customised keyboard.

This object has one single event, onChanged, and sends the key pressed.

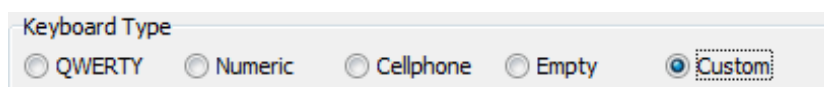
The different keyboards are selected by clicking on the **KeyboardType** property:



Click on the button  to launch the Keyboard Editor:



The Keyboard Editor allows you to select and customise the keyboard:



For more information on the Keyboard object, please refer to the application note 4D-AN-P4003 ViSi-Genie – Customised Keyboard.

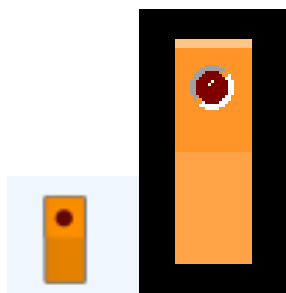
### 7.5.6. DIP Switch



The number of positions of the switch can be specified, 2 as shown or more.

This object has two events, `onChanged` and `onChanging`.

### 7.5.7. Rocker Switch

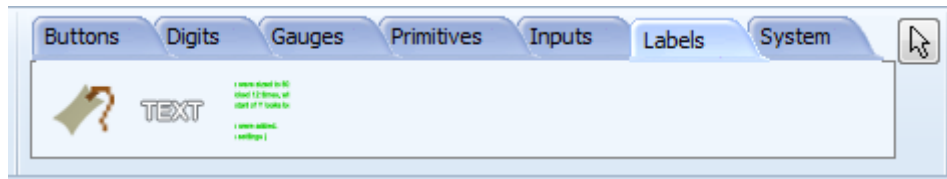


When on, the red LED is turned on.

This object has two events, `onChanged` and `onChanging`.

For more information on the Inputs objects, please refer to the application note 4D-AN-P4009 ViSi-Genie - Inputs.

## 7.6. Labels Objects



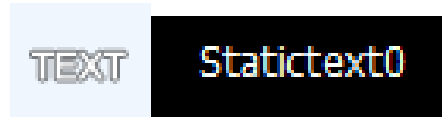
The Labels pane offers three different objects to display text.

### 7.6.1. Label



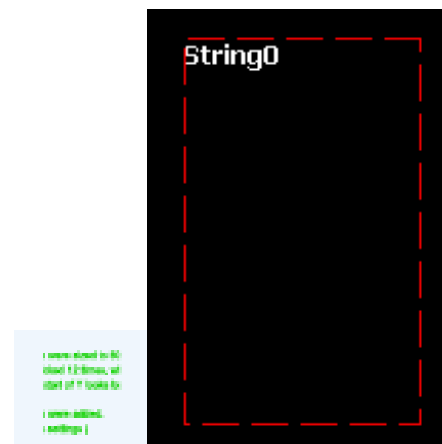
This object has no event.

### 7.6.2. Static Text



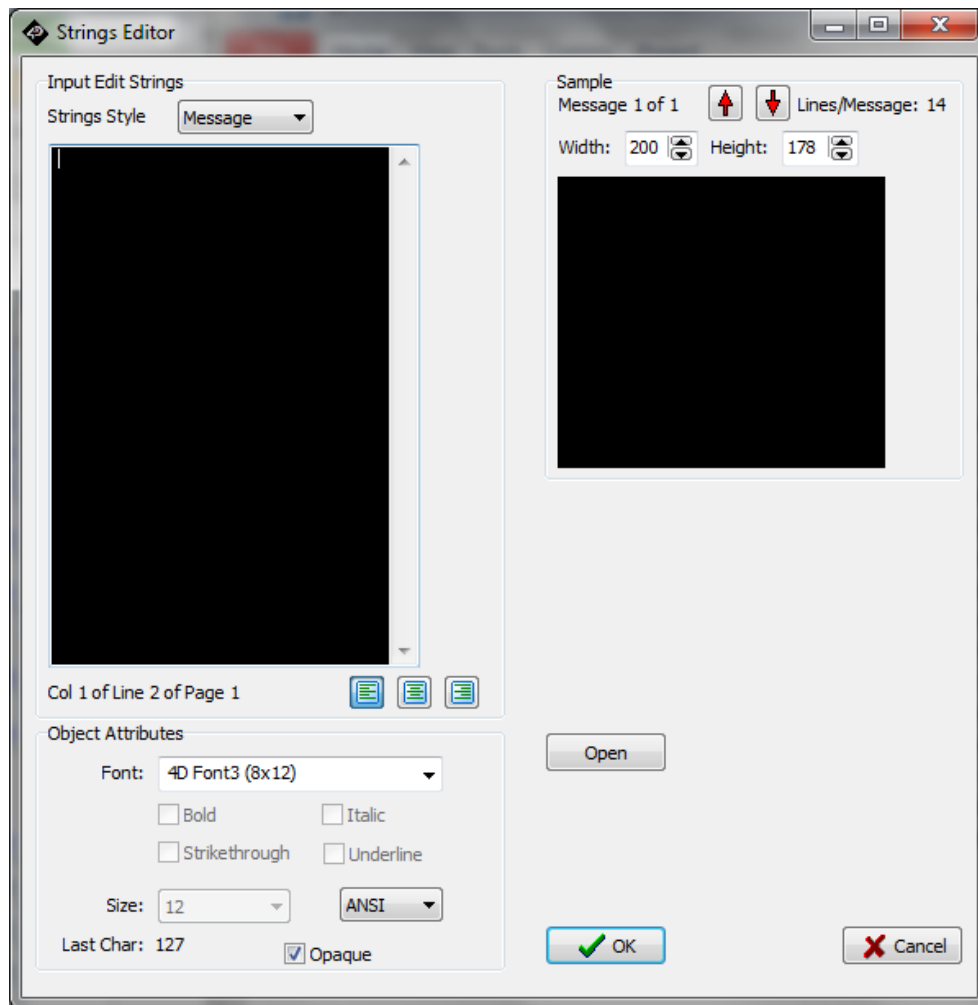
This object has no event.

### 7.6.3. Strings



This object displays a text.

The text is defined by:



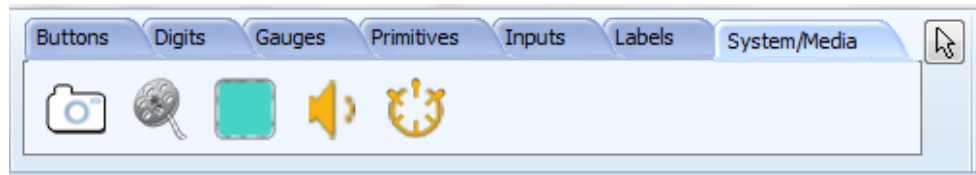
Font, size, ANSI or Unicode can be defined.

This object has no event.

For more information on the Labels objects, please refer to the application note 4D-AN-P4013 ViSi-Genie - Labels, Texts and Strings.



## 7.7. System/Media Objects

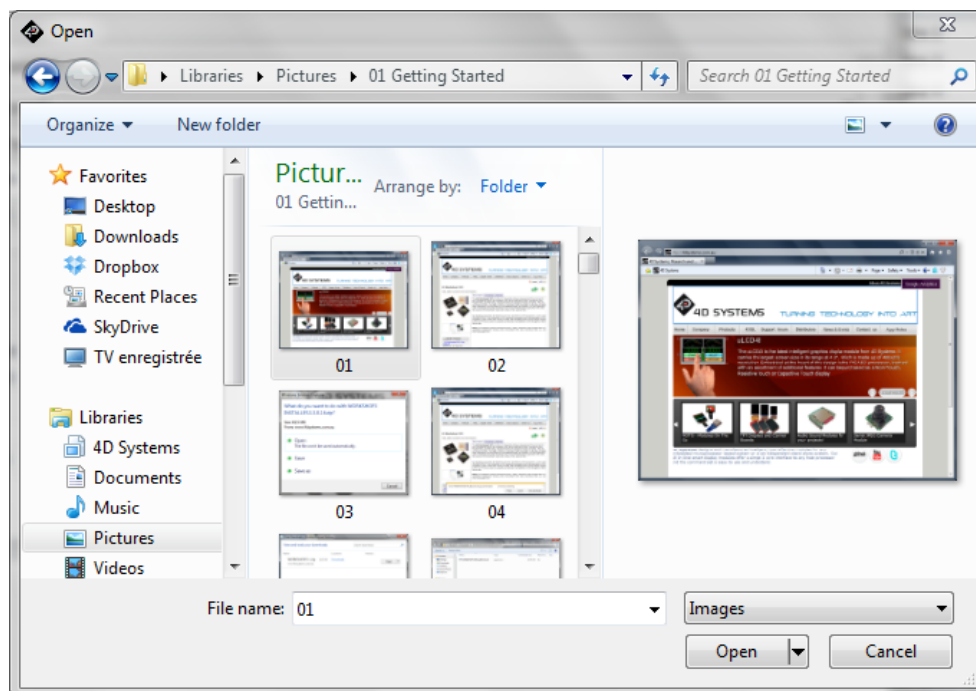


The System pane includes the form, image and video objects and two invisible objects, timer and sound.

### 7.7.1. Image



The image is selected through an Open window:



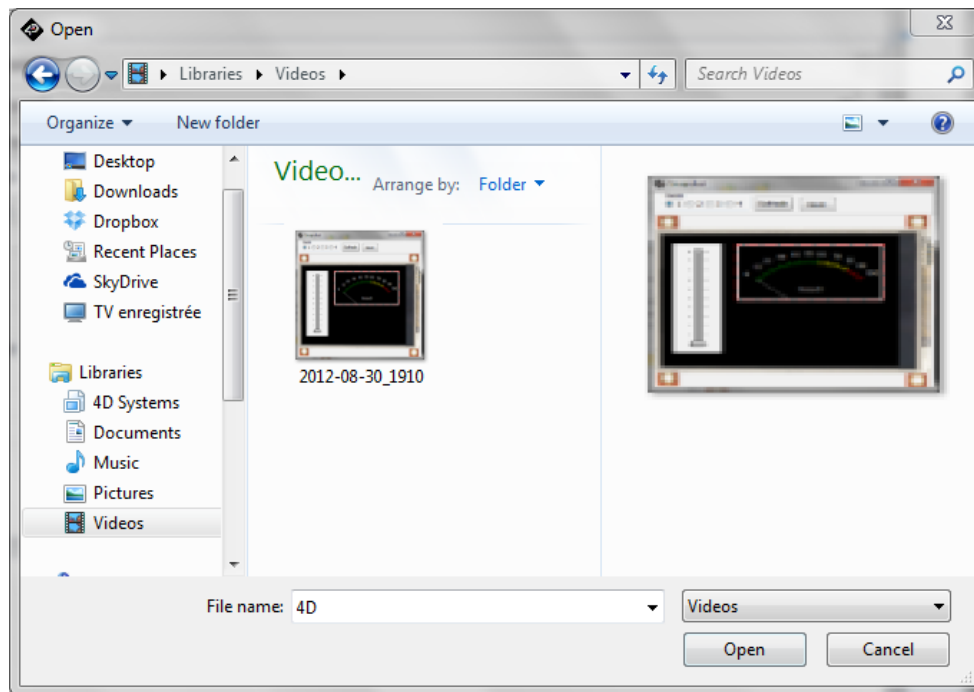
This object has no event.

For more information on the Image object, please refer to the application note 4D-AN-P4005 ViSi-Genie - Show Image.

## 7.7.2. Video



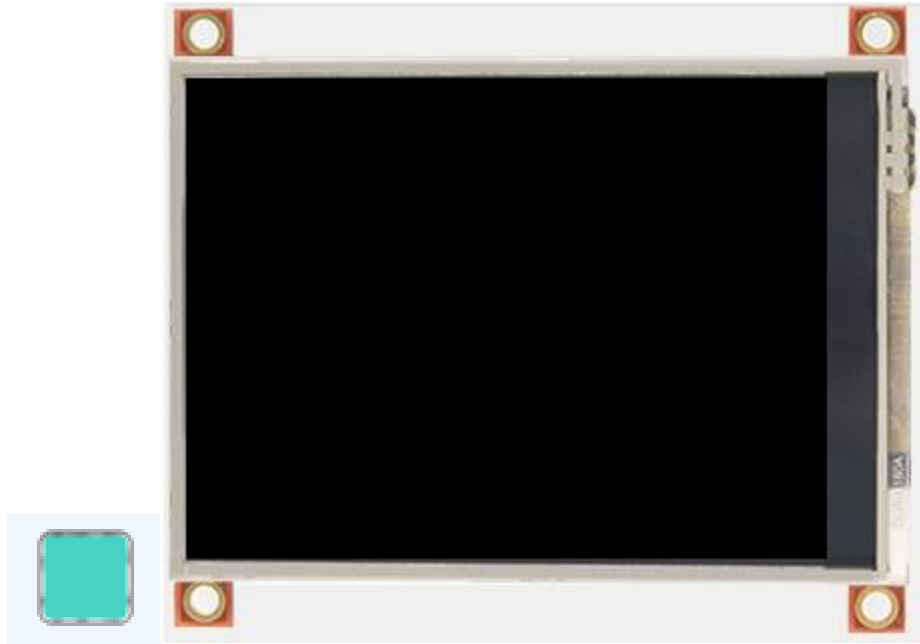
The video is selected through an Open window:



This object has one single event, onChanged.

For more information on the Video object, please refer to the application note [4D-AN-P4007 ViSi-Genie - Play Video](#).

### 7.7.3. Form



The Form creates a new empty form and adds it to the project.

This object has one single event, onActivate.

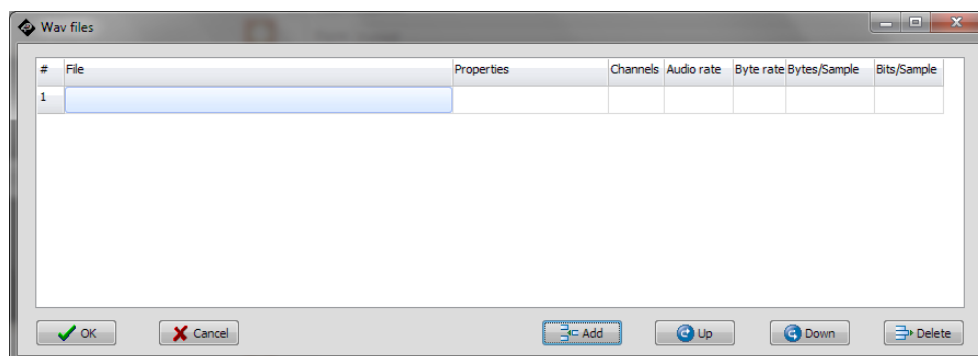
### 7.7.4. Sounds



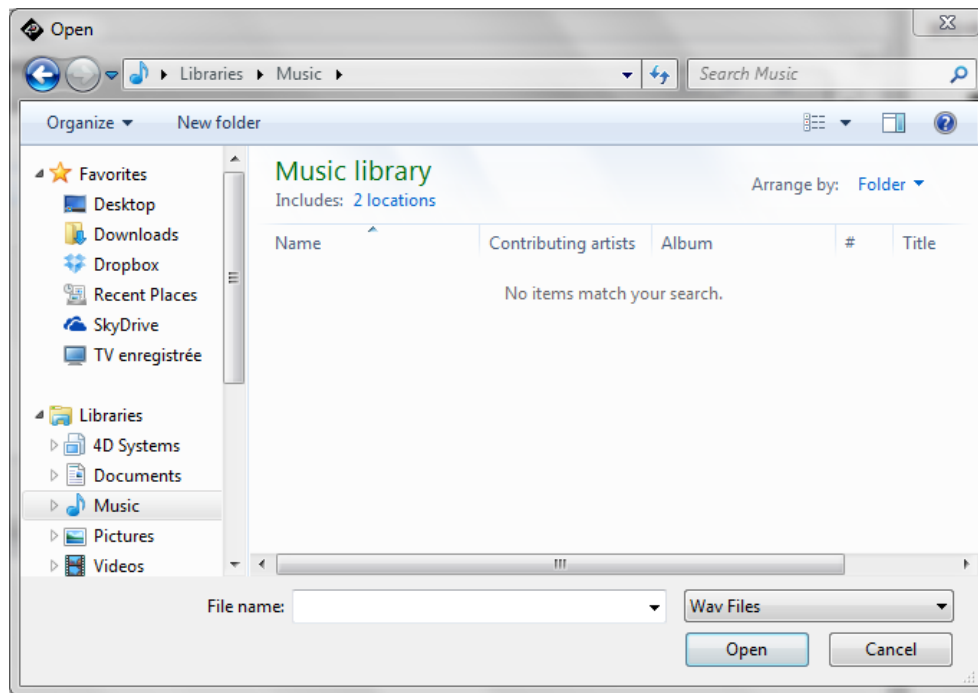
Sound is an invisible object.

This object has two events, onPlayingChanged and onVolumeChanged.

The Sound object contains a list of sound files:

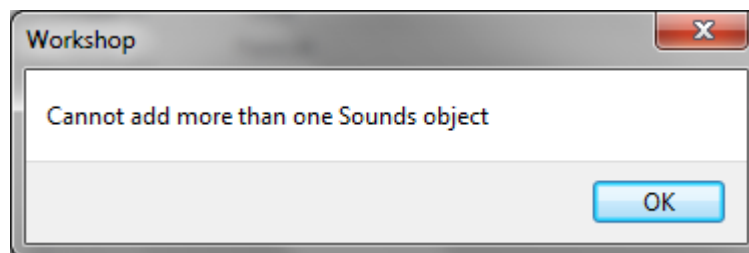


To add a sound file, click on **Add**: the sound file is selected through an Open window:



Files can be sorted by clicking on **Up** or **Down** and removed by clicking on **Delete**.

Only one Sound object can be added per project, but this sound object can contain multiple sound files.



For more information on the Sound object, please refer to the application note 4D-AN-P4006 ViSi-Genie - Play Sound.

### 7.7.5. Timer



Timer is an invisible object. It raises an event, here every 1000 ms.

Interval | 1000

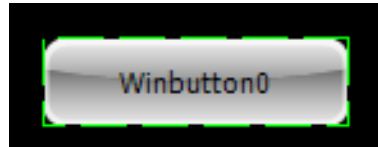
This object has one single event, onTimer.

## 7.8. Selection Tool



The arrow is used to deselect and object.

To select an object, just click on it: green or red dotted lines appear.



To deselect an object, just click again: the dotted lines disappear.



## 8. ViSi-Genie Communications Protocols

The ViSi-Genie display platform offers a serial communications protocol called the **Genie Standard Protocol**. The protocol provides access to a majority of the display's features and gives the host detailed information on the current state of all the objects used in the display application.

The **Genie Standard Protocol** provides a simple yet effective interface between the display and the host controller and all communications are reported over this bidirectional link. The protocol utilises only a handful of commands and is simple and easy to implement.

Serial data settings are:

**8 Bits, No Parity, 1 Stop Bit.**

The baud rate for the display is selected from the Workshop Genie project. The user should match the same baud rate on the host side.

**Note:** RS-232 handshaking signals (i.e., RTS, CTS, DTR, and DSR) are not supported by the ViSi-Genie protocols. Instead, only the RxD (received data), TxD (transmitted data), and signal ground are used.

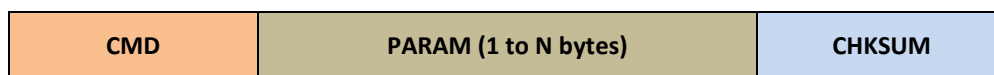
Objects are drawn on the display in the order they are created in the Workshop project. If Image objects are to be used for the background and other objects on top, then the image objects must be created and added first. Also note this only applies to non-active Image objects, other active objects should not be added on top of each other.

### 8.1. Genie Standard Protocol

This section describes the Genie Standard Protocol in detail.

#### 8.1.1. Protocol Definitions

The commands and parameters are sent and received using a very simple messaging structure. The message consists of a command byte, command parameters, and a checksum byte. The checksum ensures some the integrity of the message. The following figure shows the organisation of the message.



- **CMD:** This byte indicates the command code. Some commands will have more parameters than others. The table below outlines the available commands and their relevant parameters.
- **PARAM:** Parameter bytes (variable); a variable number of parameter bytes (between 1 to N) that contains information pertaining to the command. Refer to the command table below.
- **CHKSUM:** Checksum byte; this byte is calculated by taking each byte and XOR'ing all bytes in the message from (and including) the CMD byte to the last parameter byte. Then, the result is appended to the end to yield the checksum byte.

**Note:** If is correct, check byte plus the sum of all the other bytes in the message will give a result of 0.

## 8.1.2. Command and Parameters Table

Command	Code	Parameter 1	Parameter 2	Parameter 3	Parameter 4	Parameter N	Checksum
READ_OBJ	0x00	Object ID	Object Index	-	-	-	Checksum
WRITE_OBJ	0x01	Object ID	Object Index	Value (msb)	Value(lsb)	-	Checksum
WRITE_STR	0x02	String Index	String Length	String (1 byte chars)			Checksum
WRITE_STRU	0x03	String Index	String Length	String (2 byte chars)			Checksum
WRITE_CONTRAST	0x04	Value	-	-	-	-	Checksum
REPORT_OBJ	0x05	Object ID	Object Index	Value (msb)	Value(lsb)	-	Checksum
REPORT_EVENT	0x07	Object ID	Object Index	Value (msb)	Value(lsb)	-	Checksum

### 8.1.3. Command Set Messages

The ViSi-Genie Reference Manual provides detailed information intended for programmers of the Host Controller. It contains the message formats of the commands that comprise the ViSi-Genie protocol. New commands may be added in future to expand the protocol.

### 8.1.4. Acknowledgement Bytes Table

<b>ACK</b>	Acknowledge byte (06hex); this byte is issued by the Display to the Host when the Display has correctly received the last message frame from the Host. The transmission message for this is a single byte: 06hex
<b>NAK</b>	Not Acknowledge byte (15hex); this byte is issued by the receiver (Display or Host) to the sender (Host or Display) when the receiver has not correctly received the last message frame from the sender. The transmission message for this is a single byte: 15hex

### 8.2. Genie Advanced Protocol

Genie advanced protocol allows managing multiple screens will be released soon.



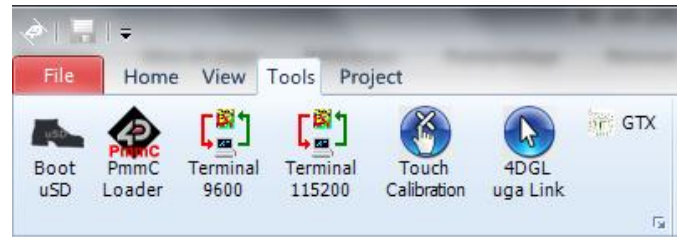
## 8.3. Object Types Table

Object	Type	Input	Output	Notes
DipSwitch	0 (0x00)	✓	✓	
Knob	1 (0x01)	✓	✓	
RockerSwitch	2 (0x02)	✓	✓	
RotarySwitch	3 (0x03)	✓	✓	
Slider	4 (0x04)	✓	✓	
TrackBar	5 (0x05)	✓	✓	
WinButton	6 (0x06)	✓	✓	
AngularMeter	7 (0x07)		✓	
CoolGauge	8 (0x08)		✓	
CustomDigits	9 (0x09)		✓	
Form	10 (0x0A)		✓	Used to set the current form
Gauge	11 (0x0B)		✓	
Image	12 (0x0C)			Displayed as part of form, no method to alter
Keyboard	13 (0x0D)	✓		Keyboard inputs are always single bytes and are unsolicited
Led	14 (0x0E)		✓	
LedDigits	15 (0x0F)		✓	
Meter	16 (0x10)		✓	
Strings	17 (0x11)		✓	
Thermometer	18 (0x12)		✓	
UserLed	19 (0x13)		✓	
Video	20 (0x14)		✓	
StaticText	21 (0x15)			Displayed as part of form, no method to alter
Sound	22 (0x16)		✓	
Timer	23 (0x17)		✓	

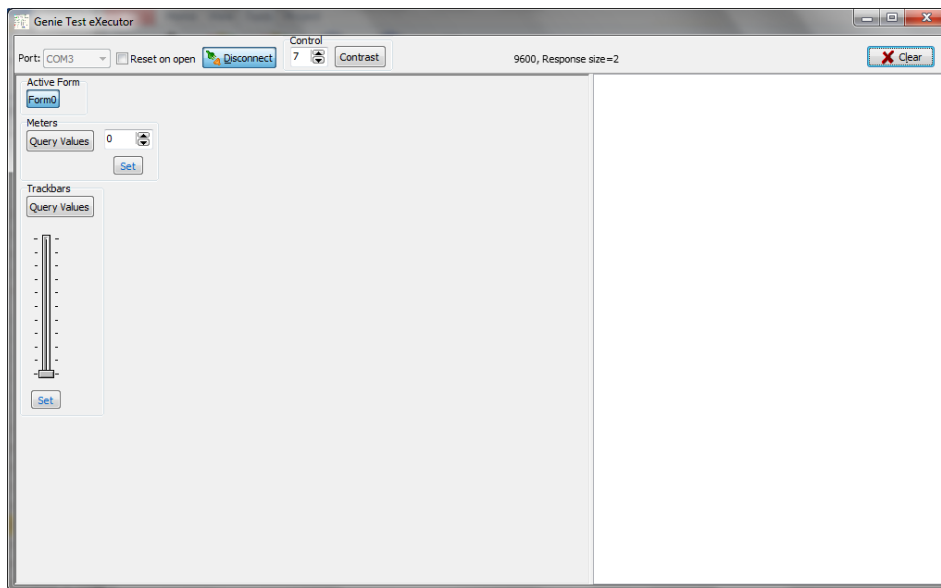
## 9. Integrated Debugger

The integrated debugger of Workshop 4 is called **Genie Test Executor** or GTX.

To launch the debugger, click on the **GTX** button available on the menu **Tools**.

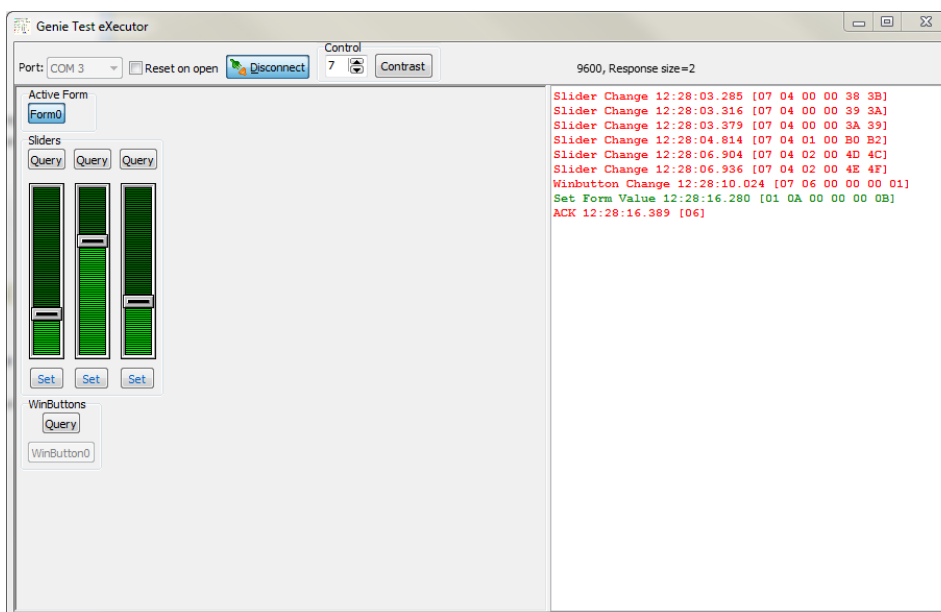


A new screen appears, with the form and objects we have defined previously:



Just try to move the track-bar and press Set: the value is sent to the screen.

Pressing **Query Values** reads the value from the screen's track-bar.



The white area on the right displays:

- In **green** the messages sent to the screen;
- And in **red** the messages received from the screen:

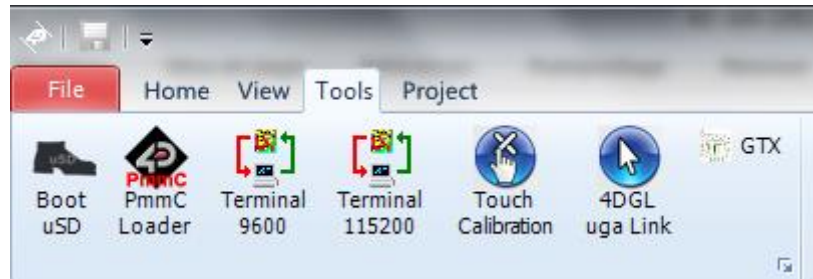
```
Slider Change 12:28:03.285 [07 04 00 00 38 3B]
Slider Change 12:28:03.316 [07 04 00 00 39 3A]
Slider Change 12:28:03.379 [07 04 00 00 3A 39]
Slider Change 12:28:04.814 [07 04 01 00 B0 B2]
Slider Change 12:28:06.904 [07 04 02 00 4D 4C]
Slider Change 12:28:06.936 [07 04 02 00 4E 4F]
Winbutton Change 12:28:10.024 [07 06 00 00 00 01]
Set Form Value 12:28:16.280 [01 0A 00 00 00 0B]
ACK 12:28:16.389 [06]
```

All values are in hexadecimal.

## 10. Communication Terminal

An alternative to the debugger is the Terminal.

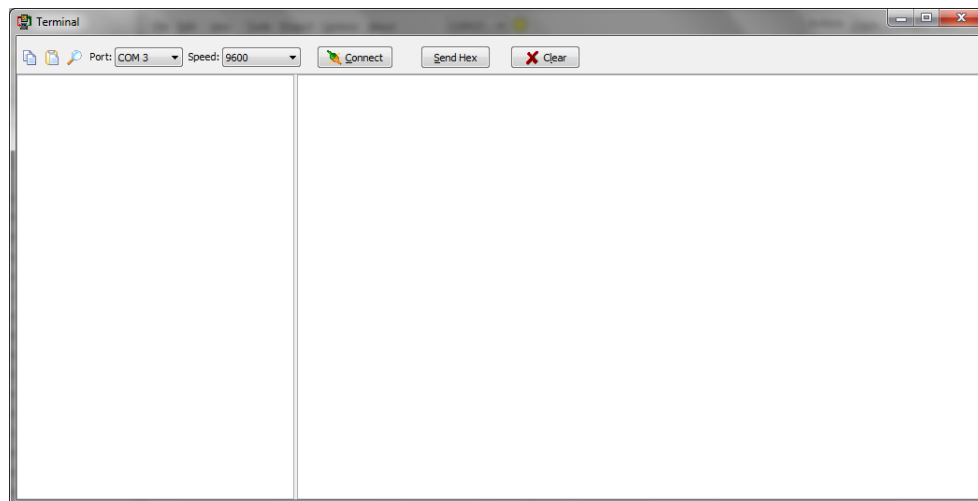
To launch the Terminal, select the **Tools** menu...



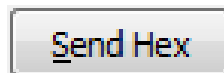
...and

- Click '**Terminal connect 9600**' to open the currently selected com port at 9600 baud in the Terminal program.
- Click '**Terminal connect 115200**' to open the currently selected com port at 115200 baud in the Terminal program.

A new screen appears:



To send the commands on hexadecimal format, press

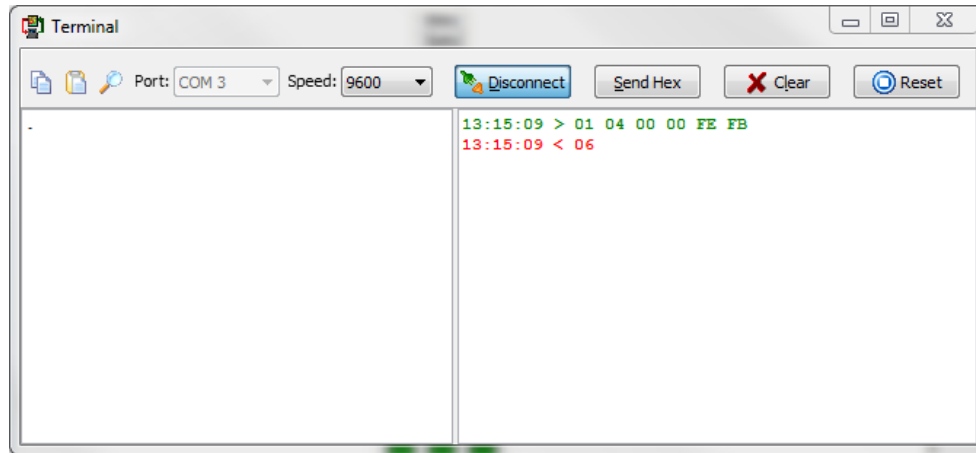


The commands sent by the host and the messages sent by the screen are the same as with the **Genie Test Executor** debugger.

The white area on the right displays

- In **green** the messages sent to the screen;
- And in **red** the messages received from the screen:

Here, the command *Set Slider0 to value 0x17* is sent, or **04 00 17** displayed in green on the terminal window.



And the screen answers with the **0x06** successful acknowledgement, displayed on red on the terminal window.

## 11. Application Notes

For a more detailed presentation of the objects with examples, please refer to the corresponding application notes:

Reference	Content
4D-AN-P1001	Getting Started — First Project with ViSi-Genie
4D-AN-P1002	ViSi-Genie – onChanging and onChanged Events
4D-AN-P1003	ViSi-Genie – Customised Keyboard
4D-AN-P1004	ViSi-Genie – Advanced Buttons
4D-AN-P1005	ViSi-Genie - Show Image
4D-AN-P1006	ViSi-Genie - Play Sound
4D-AN-P1007	ViSi-Genie - Play Video
4D-AN-P1008	ViSi-Genie - Gauges
4D-AN-P1009	ViSi-Genie - Inputs
4D-AN-P1010	ViSi-Genie - Connection to a Host with Red-Green-Blue LED Control
4D-AN-P1011	ViSi-Genie - Using Combined Objects
4D-AN-P1012	ViSi-Genie - Digital Displays
4D-AN-P1013	ViSi-Genie - Labels, Texts and Strings

For an exhaustive reference on ViSi-Genie objects, please refer to the ViSi-Genie Reference Manual.

## 12. Revision History

Revision	Revision Content	Revision Date
1.0	First Release	Nov 19, 2012
1.1	Fixed protocol information which was incorrect	Mar 21, 2013

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