



## Visi Genie Magic: Analog Input

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## Description

This application note demonstrates how to use Analog input of the 4D Display.

Before getting started, the following are required:

### Hardware

- Two of Any [4D Systems display module](#) powered by any of the following processors:
  - DIABLO16
  - PICASO
  - PIXXY-28/44
- One [Programming Adaptor for target display module](#)
- 50k ohm Potentiometer
- 10uF/10V electrolytic Capacitor

### Software

- [Workshop4](#)
- This requires the **PRO** version of Workshop4

This application note comes with one (1) Visi Genie projects:

- Visi-Genie-Analog-Input.4DGenie

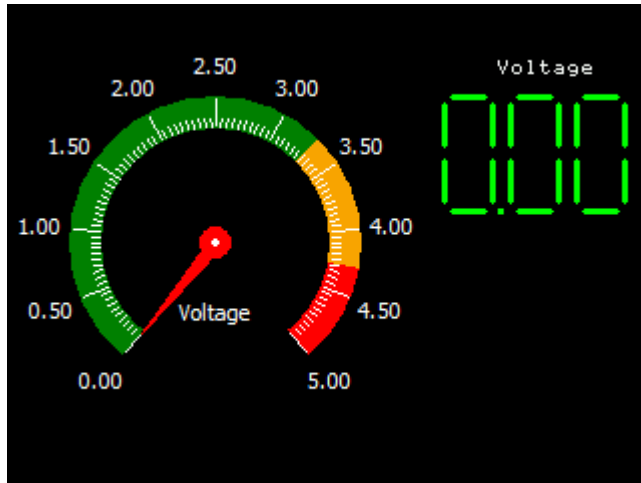
**Note:** Using a non-4D programming interface could damage the processor and void the warranty.

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## Application Overview

Reads the Output Voltage from the potentiometer and display it using Angular Meter Gauge and LED digits.



## Setup Procedure

For instructions on how to launch Workshop4, how to open a ViSi-Genie project, and how to change the target display, kindly refer to the section “**Setup Procedure**” of the application note:

- [ViSi Genie Getting Started – First Project for Picaso Displays](#)
- [ViSi Genie Getting Started – First Project for Diablo16 Displays](#)

## Create a New Project

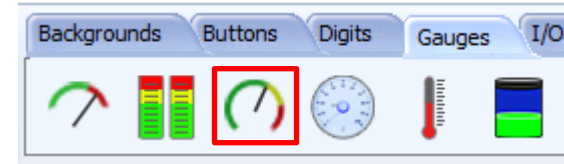
For instructions on how to create a new **Visi Genie** project, please refer to:

- [ViSi Genie Getting Started – First Project for Picaso Displays](#)
- [ViSi Genie Getting Started – First Project for Diablo16 Displays](#)

## Design the Project

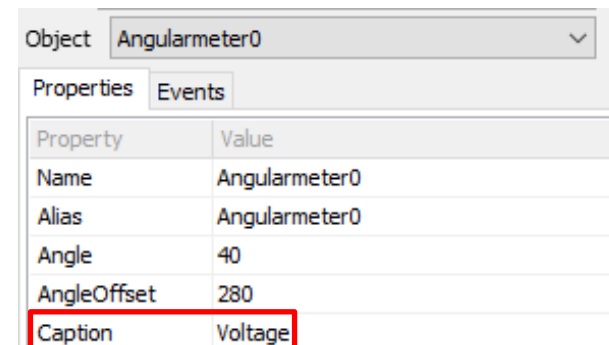
### Add Angular Meter

Go to Gauges tab and add one Angular Meter gauge.



Go to angularmeter0 Properties.




set Caption to Voltage.



Set Max value to 5 and Min value to 0.



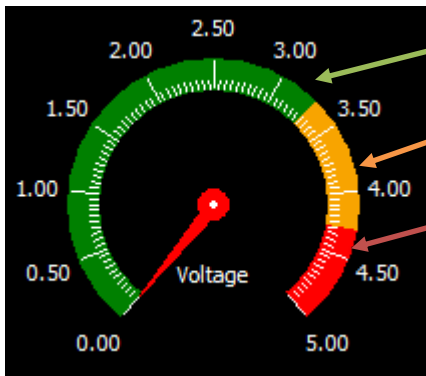
Set ColorZone Colours.

ColorZone1	 dGreen
ColorZone2	 ORANGE
ColorZone3	 dRed

Set Percent1 to 66 and Percent2 to 20.

Percent1	66
Percent2	20

Angular Meter Gauge Image.



ColorZone1 occupies 66%

ColorZone2 occupies 20%

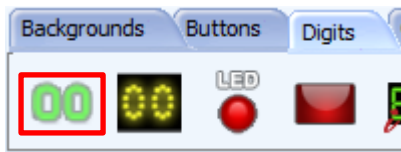
ColorZone3 occupies  $100 - 66 - 20 = 14\%$

Set Ticks to 100 and Ticks enlarge to 10.

Ticks	100
TicksColor	<input type="checkbox"/> dWhite
TicksEnlarge	10

## Add Led Digits

Go to Digits tab and Add one LED digits.



Go to the Leddigits0 properties.

Set Decimals to 2 and Digits to 3.

Object	Leddigits0
Properties	Events
Property	Value
Name	Leddigits0
Alias	Leddigits0
Color	BLACK
Decimals	2
Digits	3

Open the Palette and Set Low Colour to BLACK.

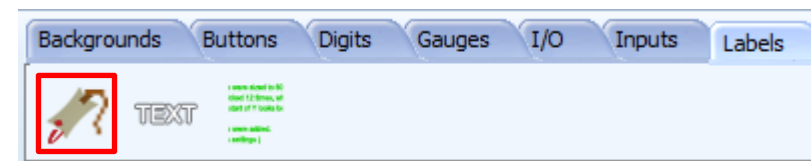
<input type="checkbox"/> Palette	
High	dLime
Low	BLACK

LED digits image.

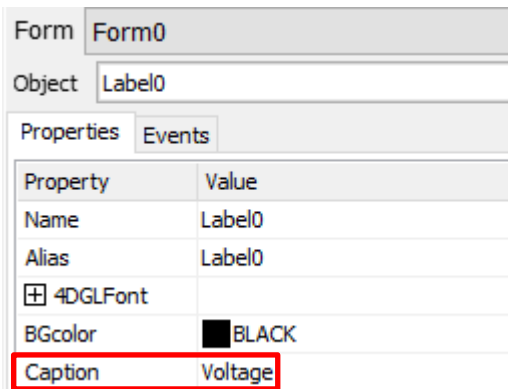


## Add Label

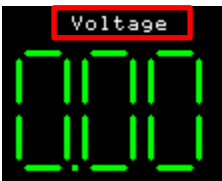
Go to Labels Tab and add one label.



Go to Label0 Properties and set Caption to Voltage.

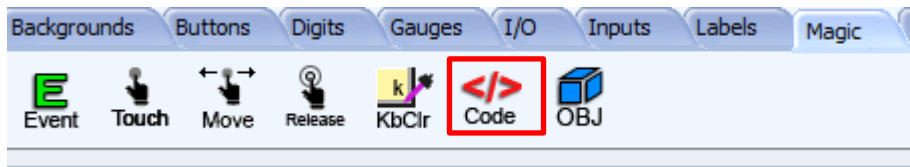


Position the label above the LED digits.

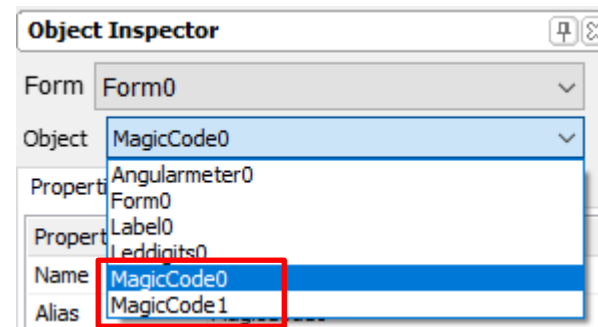


## Add Magic Code

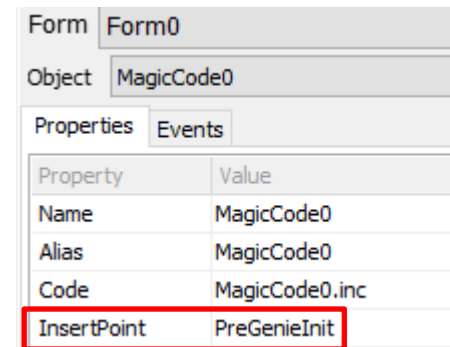
Go to Magic tab and click magic code two times to create two Magic Codes.



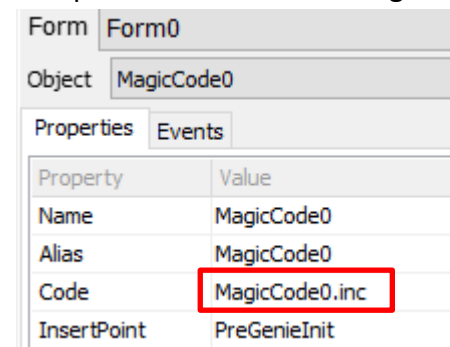
Go to object inspector and you must see two Magic Codes: MagicCode0 and MagicCode1.



Go to MagicCode0 properties and Set InsertPoint to PreGenieInit.



To open the code for the MagicCode0 click the MagicCode0.inc.



The variable pot\_val is use to store the analog input value, set PA3 as the analog Input then start the count down timer from 50 ms using TIMER5.

```

MagicCode0.inc
1 var pot_val; //variable for
2 pin_Set(PIN_ANAVG, PA3); //
3 sys_SetTimer(TIMER5, 50); //

```

Go to MagicCode1 properties and Set InsertPoint to MainLoop

Property	Value
Name	MagicCode1
Alias	MagicCode1
Code	MagicCode1.inc
InsertPoint	MainLoop

To open the code for the MagicCode1 click the MagicCode1.inc.

Property	Value
Name	MagicCode1
Alias	MagicCode1
Code	MagicCode1.inc
InsertPoint	MainLoop

Inside the MainLoop Function. If TIMER5 reaches 0 then start reading analog input PA3, the analog reading is divided by 8 because our total ticks is 500 therefore  $4095/8 \sim 511$ . The pot\_val can reach up to 511 so limit it to 500 so that our meter will not get an error. Then input the readings to the

angular meter and LED digits using the function WriteObject(object name, index, value). Then start the countdown timer again from 50 ms.

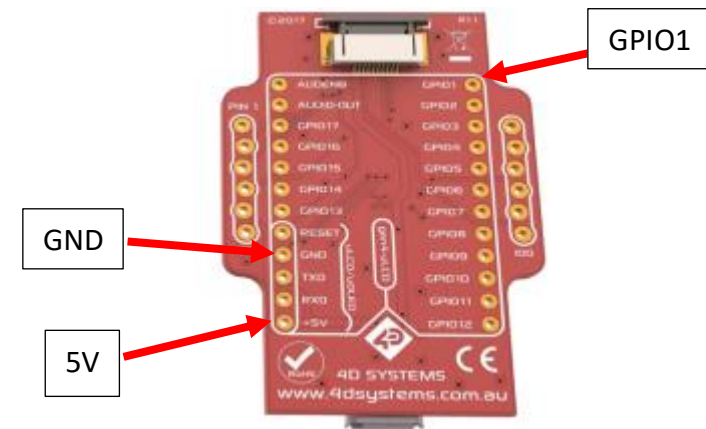
```

MagicCode1.inc
1 if(! sys_GetTimer(TIMER5)) //reads alaog in
2   pot_val:=pin_Read(PA3); //read analog i
3   pot_val:=(pot_val/8); // our ticks is 1
4   if(pot_val>500) //limit it to 500
5     pot_val:=500;
6   endif
7   WriteObject(tAngularmeter, 0, pot_val); //
8   WriteObject(tLeddigits, 0, pot_val); //i
9   sys_SetTimer(TIMER5, 50); //start count
10 endif

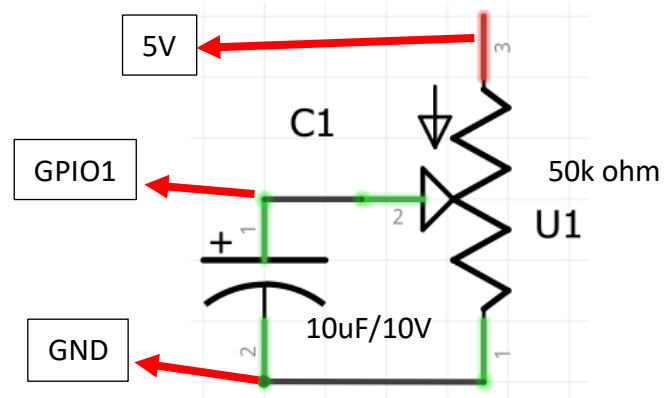
```

## Hardware Connection

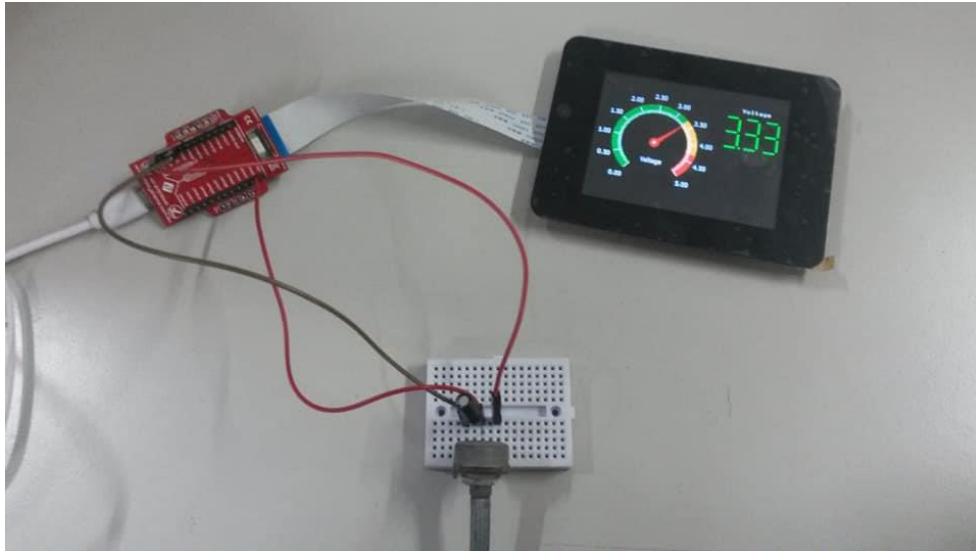
GND , 5V and GPIO1 location in the 4D-UPA board. GPIO1 is the PA3 of the DIABLO16.



Potentiometer and Capacitor circuit.



Hardware connections.



## Run the Program

For instructions on how to save a **Visi-Genie** project, how to connect the target display to the PC, how to select the program destination, and how to compile and download a program, please refer to the section “**Run the Program**” of any of the following application notes:

- [ViSi-Genie Getting Started - First Project for Diablo16 Display Modules](#)

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