



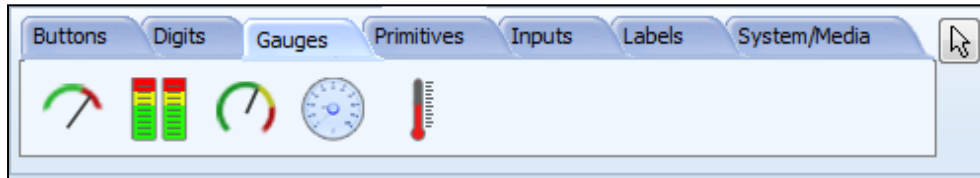
ViSi-Genie Gauges

DOCUMENT DATE: **25th APRIL 2019**
DOCUMENT REVISION: **1.2**



Description

This Application Note explores the possibilities provided by ViSi-Genie for the **Gauges** objects:



This application note requires:

- Workshop4 has been installed according to the document Workshop4 Installation;
- The user is familiar with the Workshop4 environment and with the fundamentals of ViSi-Genie, as described in Workshop4 User Guide and ViSi-Genie User Guide;
- When downloading an application note, a list of recommended application notes is shown. It is assumed that the user has read or has a working knowledge of the topics discussed in these recommended application notes.

Six ViSi-Genie projects are provided as examples to help you along this application note.






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Application Overview

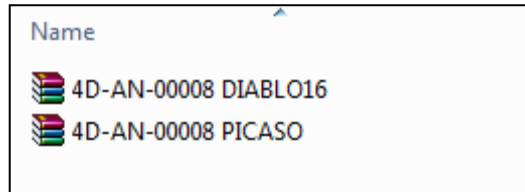
It is often difficult to design a graphical display without being able to see the immediate results of the application code. ViSi-Genie is the perfect software tool that allows the user to see the instant results of their desired graphical layout with this large selection of gauges and meters that can simply be dragged and dropped onto the simulated module display.

-  Meter
-  Gauge
-  Angular meter
-  Cool gauge
-  Thermometer

Each object can have properties edited and at the click of a button, all relevant code is produced in the user program. Each feature of ViSi-Genie will be outlined with examples below.

Setup Procedure

This application note comes with a zip file which contains two ViSi-Genie projects.



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

ViSi Genie Getting Started – First Project for Diablo16 Displays

Create a New Project

Create a New Project

For instructions on how to create a new ViSi-Genie project, please refer to the section “**Create a New Project**” of the application note

ViSi Genie Getting Started – First Project for Picaso

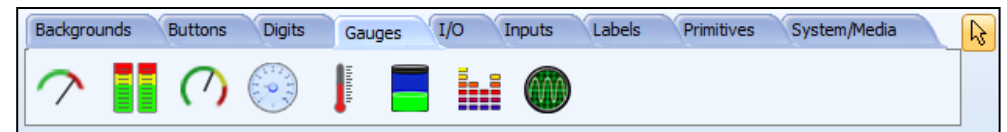
ViSi Genie Getting Started – First Project for Diablo16 Displays

Simulation Procedures

Select the **Home** menu to display the objects:



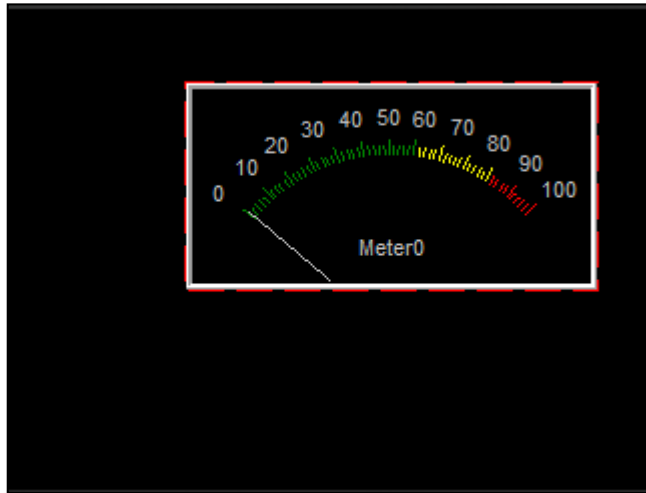
The **Gauges** objects are located on the Gauges pane:



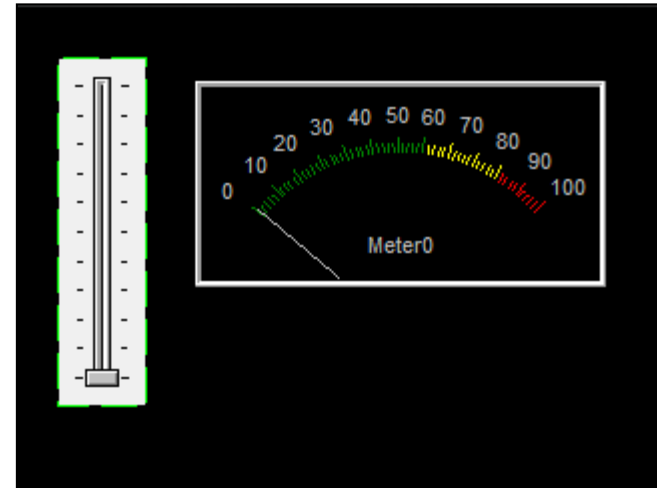
To add an object, first click on the desired icon, here start with the first one, the **Meter**...



...and then click on the WYSIWYG screen to place it.



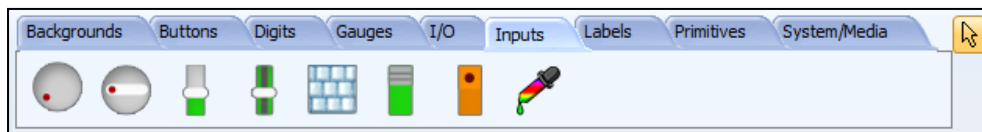
...and place it on the left of the form:



Add a track-bar as input object...



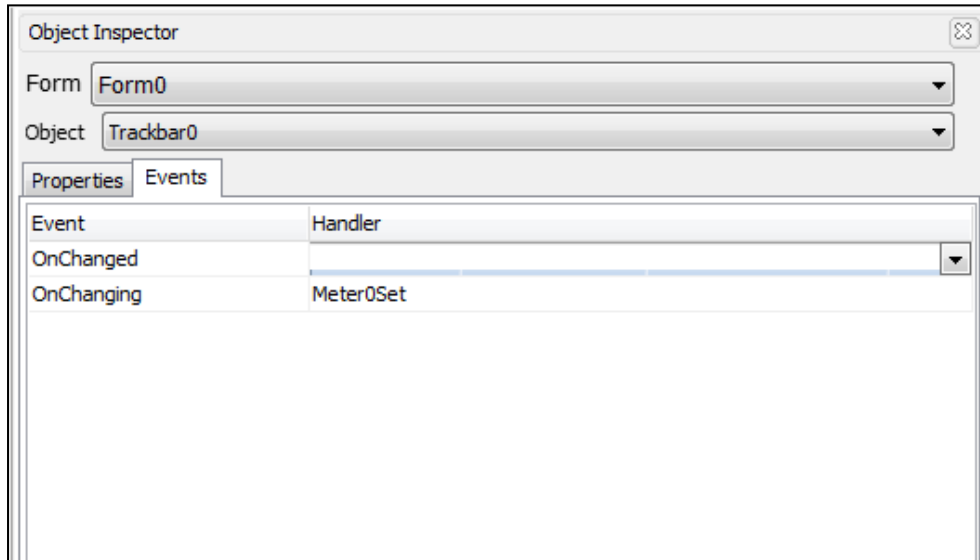
...from the **Inputs** pane...



By default, the track-bar has the following minimum and maximum values:

Maxvalue	100
Minvalue	0

Define the event **onChanging** for the **TrackBar0** as **Meter0Set**:



Each time the cursor on the track-bar is moved, the meter is updated accordingly.

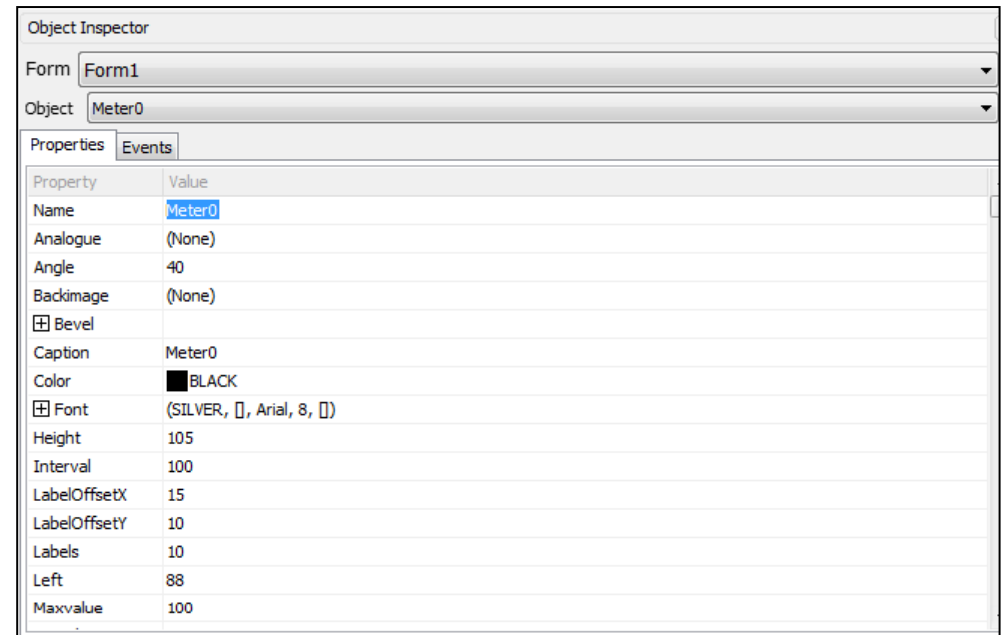
Meter Options

You can load the example...


Example: 4D-AN-00008 PICASO– Meter or 4D-AN-00008 DIABLO16 – Meter

...or follow the procedures described hereafter.

The options are listed on the Object Inspector:



Standard options are font, colour, size, back image... are not going to be discussed here.

For example, the bevel can be full customised. Press the  close on the line **Bevel...**



...to display all the possible options for the bevel:

Property	Value
<input type="checkbox"/> Bevel	
BorderColor	<input type="checkbox"/> dBtnFace
BorderWidth	0
InnerColor	<input checked="" type="checkbox"/> BLACK
InnerHighlight	<input type="checkbox"/> dBtnHighlight
InnerOutline	None
InnerShadow	<input checked="" type="checkbox"/> dBtnShadow
InnerSpace	1
InnerStyle	Lowered
Innerwidth	2
OuterColor	<input type="checkbox"/> dBtnFace
OuterHighlight	<input type="checkbox"/> dBtnHighlight
OuterOutline	Outer
OuterShadow	<input checked="" type="checkbox"/> dBtnShadow
OuterSpace	0
OuterStyle	Raised
Outerwidth	1
Visible	Yes

The font options are under the line **Font...**

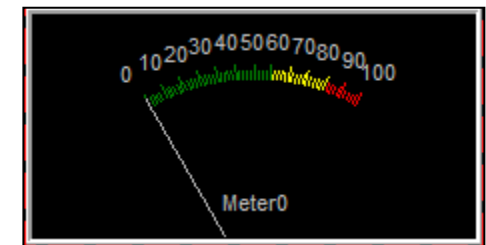
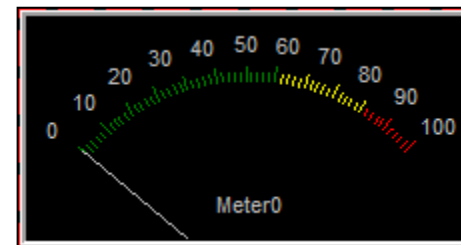
<input type="checkbox"/> Font	(SILVER, <input type="checkbox"/> , Arial, 8, <input type="checkbox"/>)
Color	<input checked="" type="checkbox"/> SILVER
Effects	<input type="checkbox"/>
Name	Arial
Size	8
Style	<input type="checkbox"/>

Angle Option

By default, the angle is set to 40°.



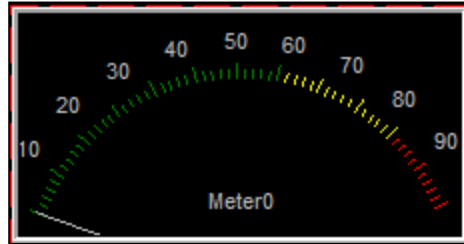
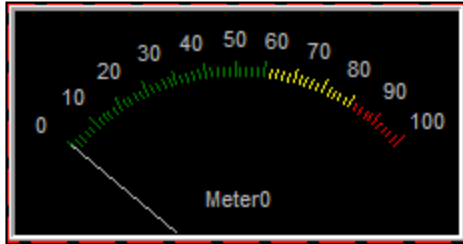
Here is an example with **Angle** set to 60°...



...and to 20°:

Angle	40
-------	----

Angle	20
-------	----



Minimum and Maximum

Minimum and maximum are defined by:

Maxvalue	100
Minvalue	0

Just enter the new values.

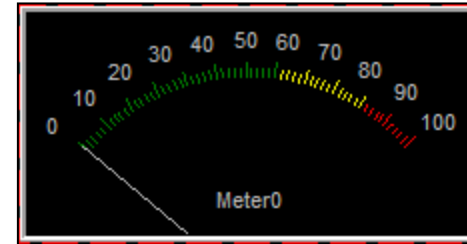
Labels Options

Three options are available:

LabelOffsetX	15
LabelOffsetY	10
Labels	10

The **Labels** value defines the number of labels.

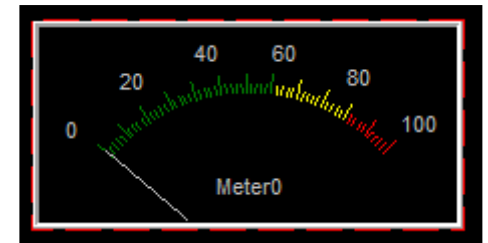
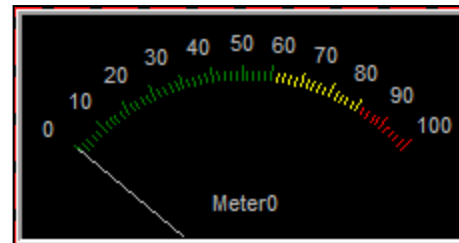
Default value is 10 labels:



Here an example with 5 labels:

LabelOffsetX	15
LabelOffsetY	10
Labels	10

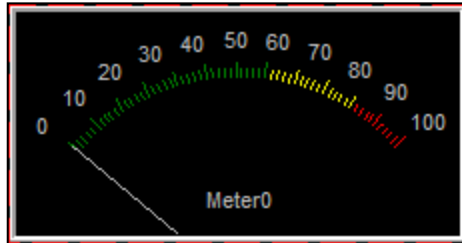
LabelOffsetX	15
LabelOffsetY	10
Labels	5



LabelOffsetX and **LabelOffsetY** define the position of the labels.

Default values are 15 on horizontal axis and 10 on vertical axis:

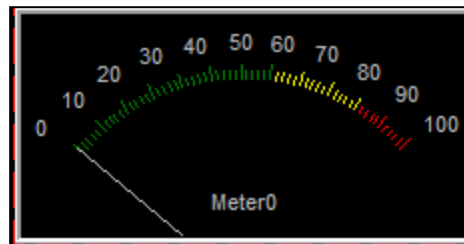
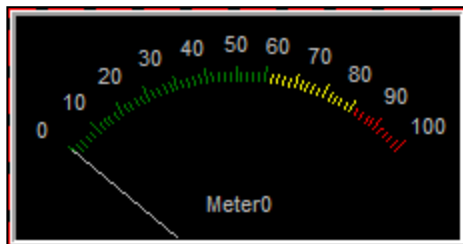
LabelOffsetX	15
LabelOffsetY	10
Labels	10



Setting 20 to **LabelOffsetX** widens the labels on the horizontal axis:

LabelOffsetX	15
LabelOffsetY	10
Labels	10

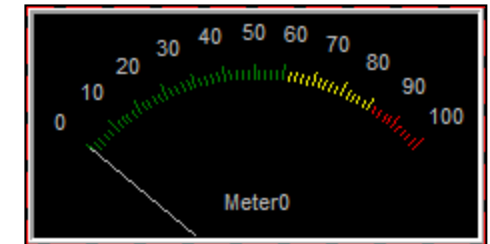
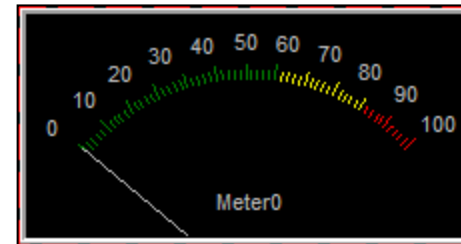
LabelOffsetX	20
LabelOffsetY	10
Labels	10



Setting 15 to **LabelOffsetY** widens the labels on the vertical axis:

LabelOffsetX	15
LabelOffsetY	10
Labels	10

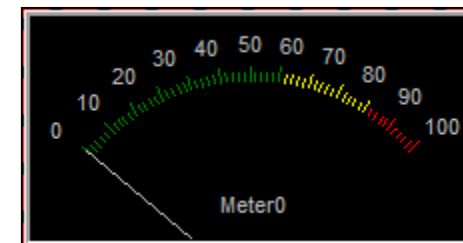
LabelOffsetX	15
LabelOffsetY	15
Labels	10




Needle Options


By default, the needle colour is silver and its width is 1:

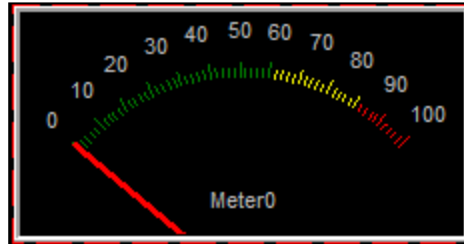
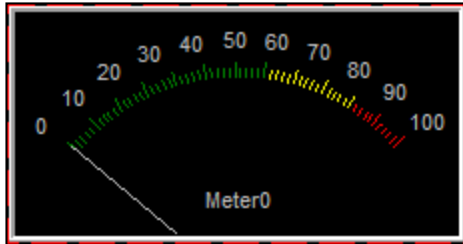
NeedleColor	<input checked="" type="checkbox"/> SILVER
NeedleWidth	1



To increase readability, let's choose red as colour and 3 as width:

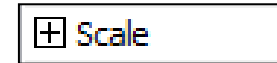
NeedleColor	 SILVER
NeedleWidth	1

NeedleColor	 RED
NeedleWidth	3






Scale Options

The **Scale** options are under the line

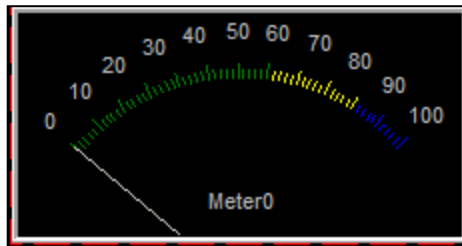


Click on the  to display them:

<input type="checkbox"/> Scale	
Color1	 GREEN
Color2	 YELLOW
Color3	 RED
Enlarge	5
Heightmax	8
Heightmin	5
Percent1	60
Percent2	25
Ticks	61
Visible	Yes

Three areas are available, each one with its colour. Colours can be changed. Here the colour of the last area is set to blue:

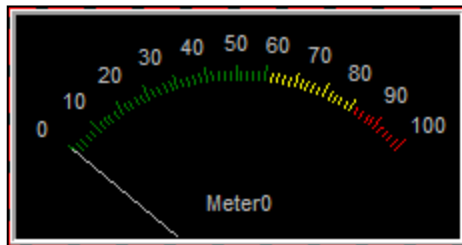
Scale	
Color1	■ GREEN
Color2	■ YELLOW
Color3	■ BLUE



Areas Options

The areas are defined by two values, **Percent1** and **Percent2**:

Percent1	60
Percent2	25



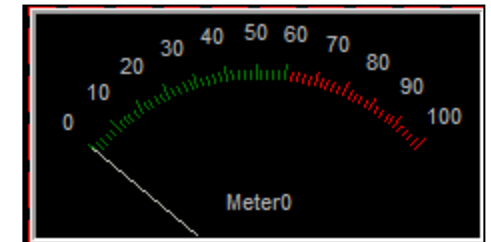
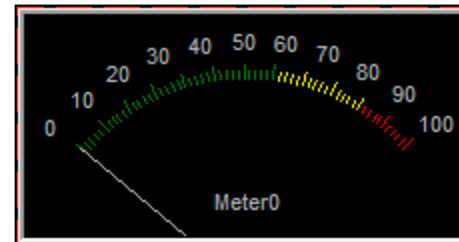
- The first area goes from 0% to **Percent1**, here from 0% to 60%;

- The second area covers additional **Percent2** starting from **Percent1**, here 25% starting from 60%, so from 60% to 85%;
- The third area includes what's left up to 100%, here from 85% to 100%.

Setting **Percent2** to 0 skips the 2nd area. The yellow area has disappeared and the red one starts at 60%:

Percent1	60
Percent2	25

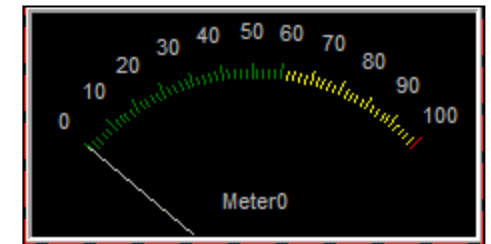
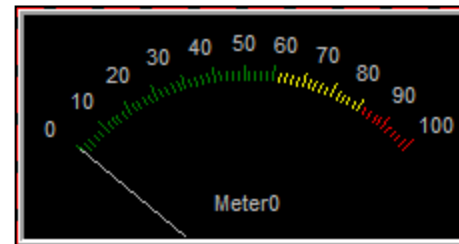
Percent1	60
Percent2	0



Setting **Percent2** to 40 skips the 3rd area. The red area has disappeared and the yellow one goes up to 100%:

Percent1	60
Percent2	25

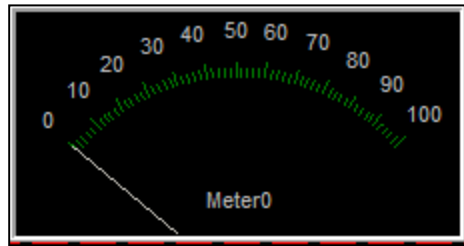
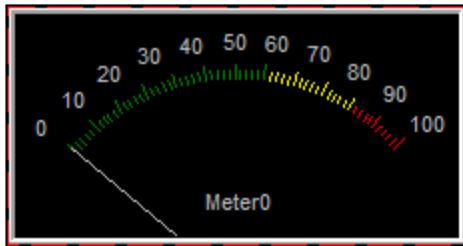
Percent1	60
Percent2	40



Setting **Percent1** to 100% skips the 2nd and 3rd areas. Only the green area is shown, from 0% to 100%:

Percent1	60
Percent2	25

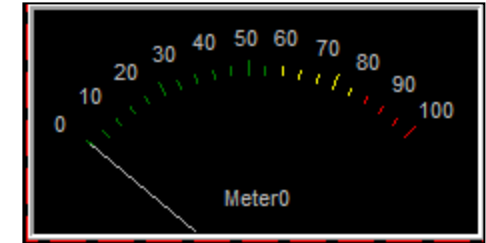
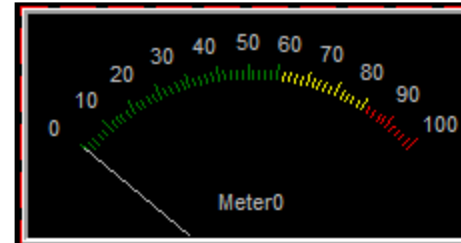
Percent1	100
Percent2	0



The number of ticks is defined by **Ticks**, with default value set to 61 on the left. On the right an example of the same meter with 21 ticks:

Ticks	61
-------	----

Ticks	21
-------	----

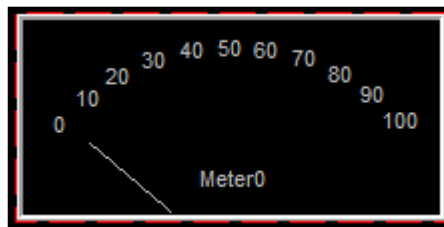


An alternative consists on defining the same colour for different areas.

Ticks Options

The ticks can be hidden by setting **Visible** to **No**:

Visible	No
---------	----



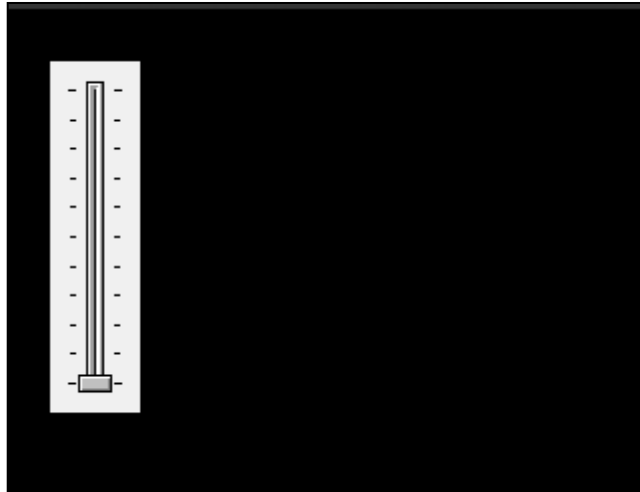
Gauge Options

You can load the example...

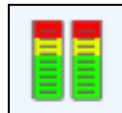
**Example: 4D-AN-00008 PICASO - Gauge or 4D-AN-00008
DIABLO16 - Gauge**

...or follow the procedures described hereafter.

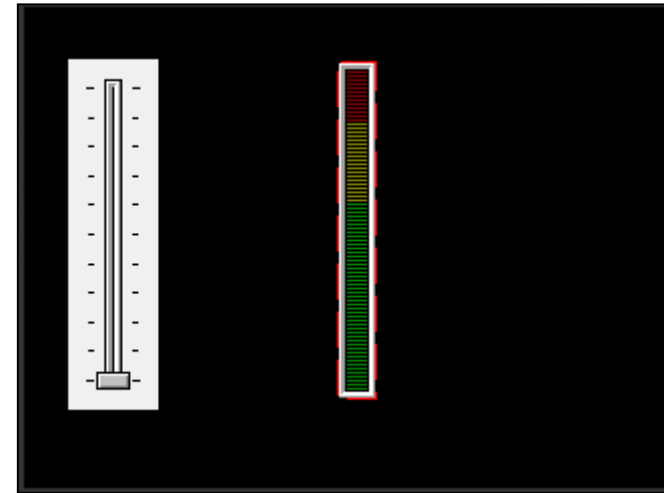
Delete the Meter0 object...



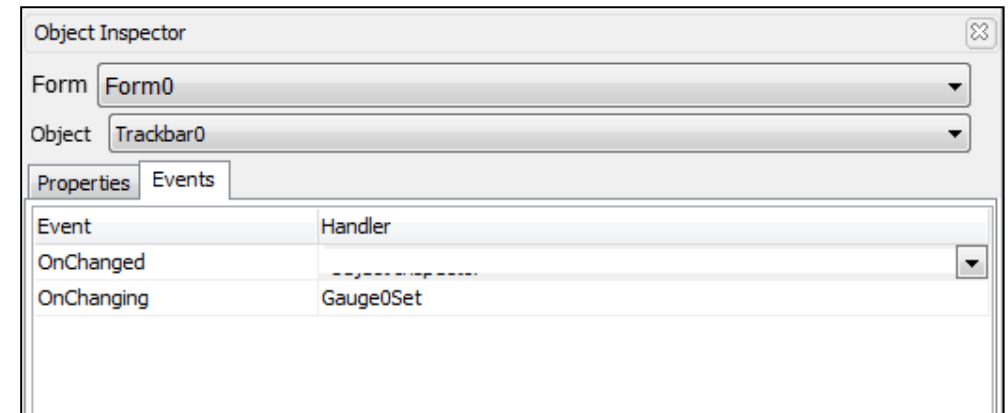
...add a Gauge object...



...to the form...

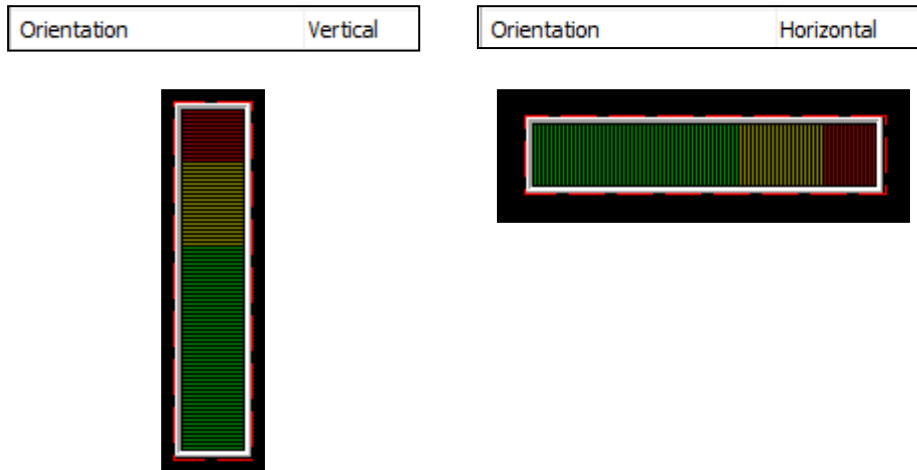


...and update the event **onChanging** for the **TrackBar0** to **Gauge0Set**:



Orientation Options

The gauge can be vertical or horizontal:



Bevel Options

The Bevel properties include all the options:

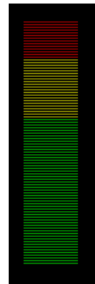


Click on the  to show the list:

Property	Value
<input type="checkbox"/> Bevel	
BorderColor	<input type="checkbox"/> dBtnFace
BorderWidth	0
InnerColor	<input checked="" type="checkbox"/> BLACK
InnerHighlight	<input type="checkbox"/> dBtnHighlight
InnerOutline	None
InnerShadow	<input type="checkbox"/> dBtnShadow
InnerSpace	1
InnerStyle	Lowered
Innerwidth	2
OuterColor	<input type="checkbox"/> dBtnFace
OuterHighlight	<input type="checkbox"/> dBtnHighlight
OuterOutline	Outer
OuterShadow	<input type="checkbox"/> dBtnShadow
OuterSpace	0
OuterStyle	Raised
Outerwidth	1
Visible	Yes

The bevel can be shown or hidden:

Visible	Yes	Visible	No
---------	-----	---------	----



The style of the bevel is selectable among three options:

InnerStyle	Lowered
------------	---------

Lowered

None

Raised



Scale Options

The gauge is divided in three areas:

<input checked="" type="checkbox"/>	Palette1	
<input checked="" type="checkbox"/>	Palette2	
<input checked="" type="checkbox"/>	Palette3	
	Percent1	60
	Percent2	25

Click on the to display the details:

<input type="checkbox"/>	Palette1	
	High	<input checked="" type="checkbox"/> dLime
	Low	<input checked="" type="checkbox"/> dGreen
<input type="checkbox"/>	Palette2	
	High	<input checked="" type="checkbox"/> dYellow
	Low	<input checked="" type="checkbox"/> dOlive
<input type="checkbox"/>	Palette3	
	High	<input checked="" type="checkbox"/> dRed
	Low	<input checked="" type="checkbox"/> dMaroon
	Percent1	60
	Percent2	25

Three areas are available, each one with its colour.

Colours can be changed. Here, the Palette3 is set to blue:

☐ Palette1	
High	dLime
Low	dGreen
☐ Palette2	
High	dYellow
Low	dOlive
☐ Palette3	
High	LIGHTBLUE
Low	DARKBLUE



The areas are defined by two values, **Percent1** and **Percent2**:

Percent1	60
Percent2	25



Setting **Percent2** to 0 skips the 2nd area. The yellow area has disappeared and the red one starts at 60%:

Percent1	60
Percent2	25



Percent1	60
Percent2	0



Setting **Percent2** to 40 skips the 3rd area. The red area has disappeared and the yellow one goes up to 100%.

- The first area goes from 0% to **Percent1**, here from 0% to 60%;
- The second area covers additional **Percent2** starting from **Percent1**, here 25% starting from 60%, so from 60% to 85%;
- The third area includes what's left up to 100%, here from 85% to 100%.

Percent1	60
Percent2	25



Percent1	60
Percent2	40



Percent1	60
Percent2	25



Percent1	100
Percent2	0



An alternative consists on defining the same colour for different areas.

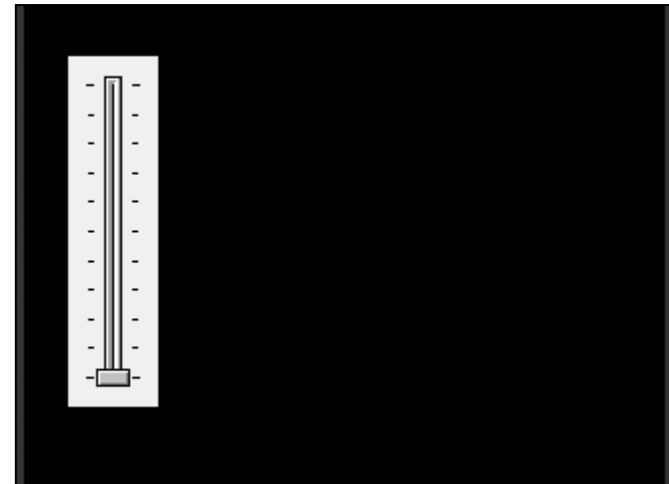
Angular Meter Options

You can load the example...

Example: 4D-AN-00008 PICASO – Angular Meter or 4D-AN-00008 DIABLO16 – Angular Meter

...or follow the procedures described hereafter.

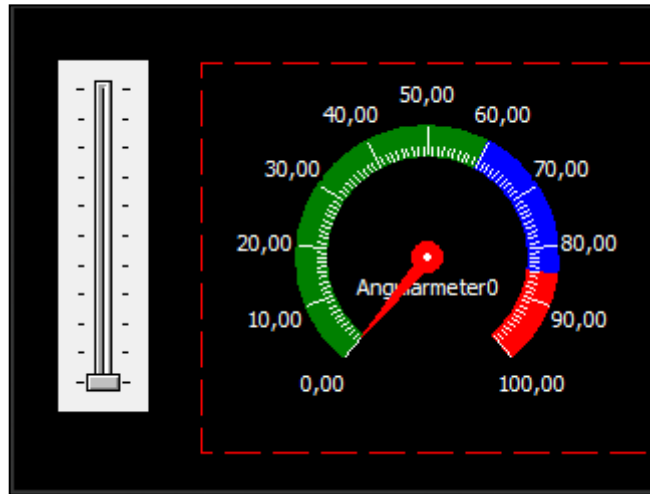
Delete the Gauge0 object...



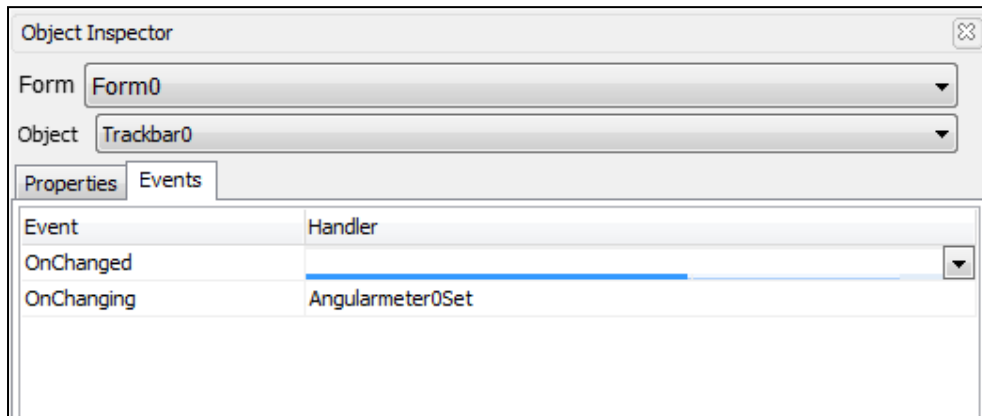
...add an Angular Meter object...



...to the form...



...and update the event **onChanging** for the **TrackBar0** to **AngularMeter0Set**:



Angle Option

By default, the angle is set to 40° and the offset to 280°.

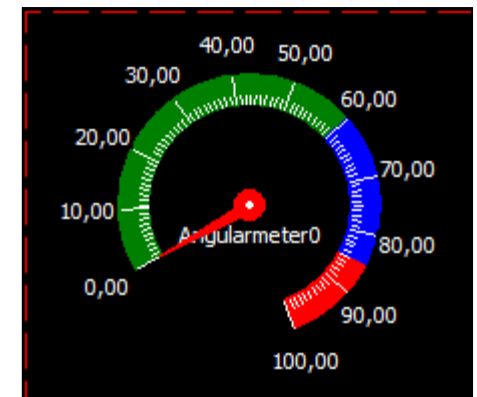
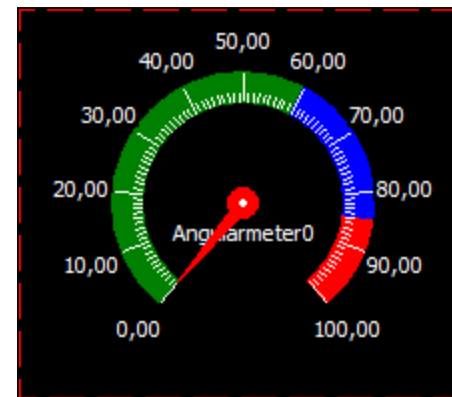
Angle	40
AngleOffset	280

Both parameters are linked.

Here is an example with **Angle** set to 60° but **AngleOffset** unchanged...

Angle	40
AngleOffset	280

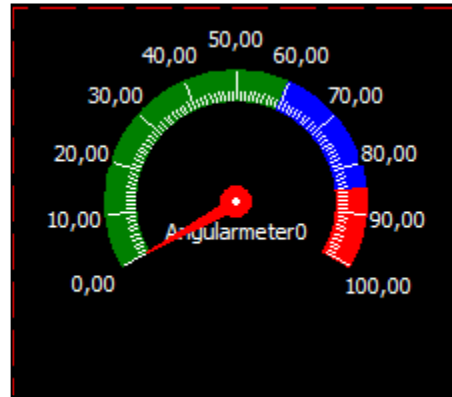
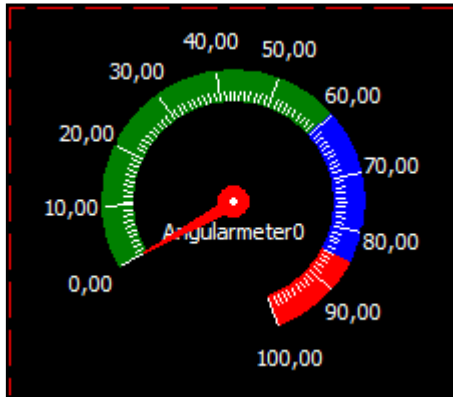
Angle	60
AngleOffset	280



... **AngleOffset** changed to 240°:

Angle	60
AngleOffset	280

Angle	60
AngleOffset	240



Minimum and Maximum

Minimum and maximum are defined by:

Maxvalue	100
Minvalue	0

Just enter the new values.

Labels Options

Three options are available:

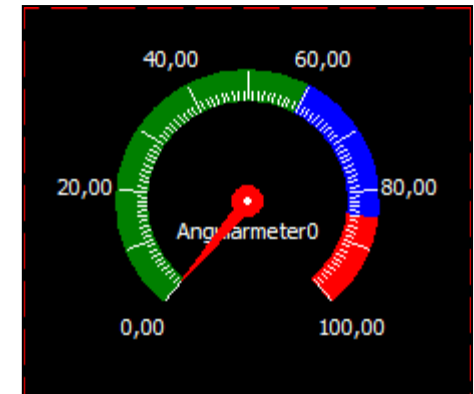
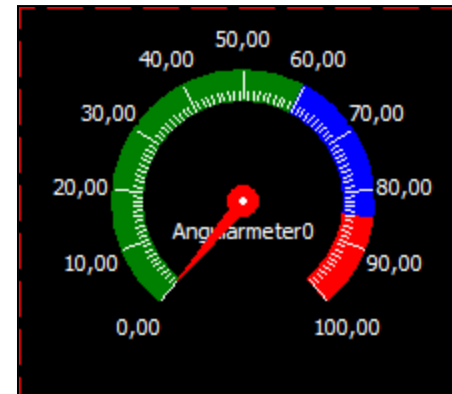
Labels	10
<input type="checkbox"/> LabelsFont	(dWhite, [], Tahoma, 8, [])
Color	<input type="checkbox"/> dWhite
Effects	[]
Name	Tahoma
Size	8
Style	[]
LabelsOffset	30

The **Labels** value defines the number of labels, with default value 10 labels.

Here an example with 5 labels:

Labels	10
--------	----

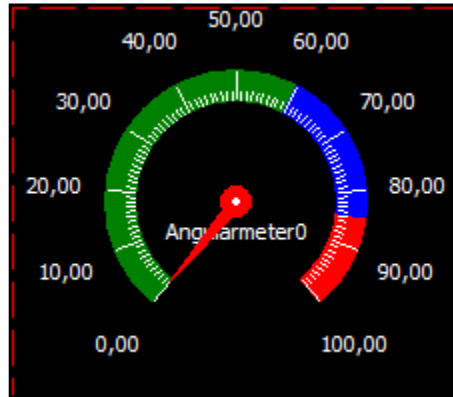
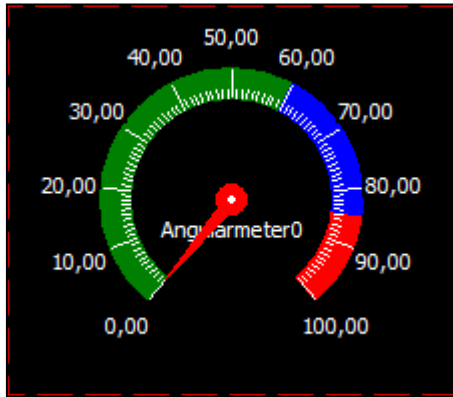
Labels	5
--------	---



Setting 40 to **LabelOffset** widens the labels:

LabelsOffset	30
--------------	----

LabelsOffset	40
--------------	----

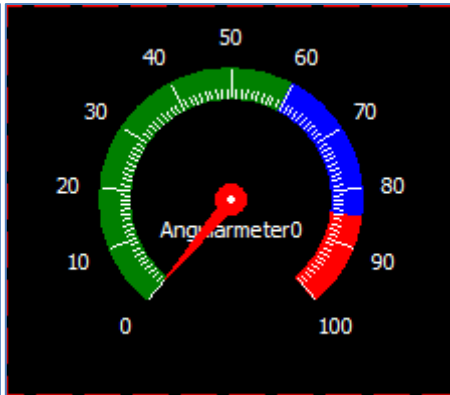
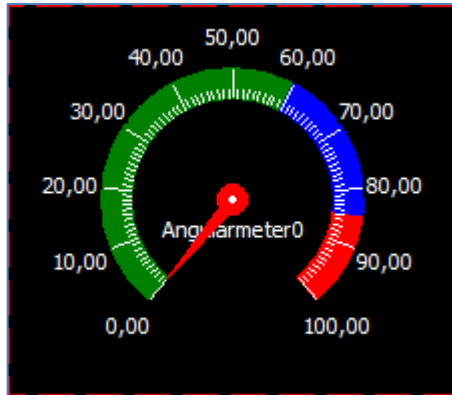


Decimal Places

Decimals defines the number of decimal, with default value 2.

Decimals	2
----------	---

Decimals	0
----------	---



Needle Options

By default, the needle colour is red and its length is automatic with the value set to -1:

NeedleBasewidth	8
NeedleColor	<input checked="" type="checkbox"/> dRed
NeedleLength	-1

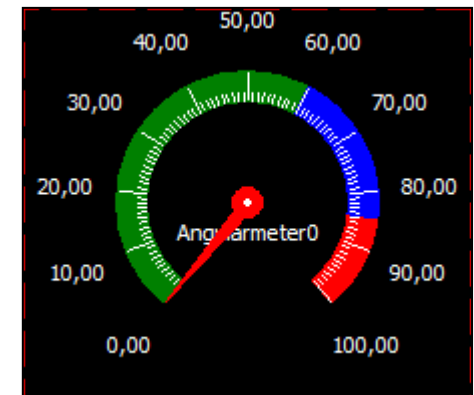
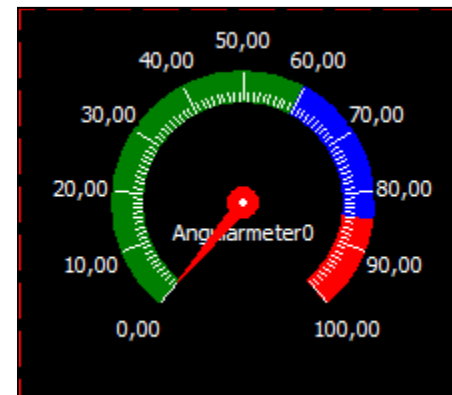
The dot at the centre is white with a size of 2:

CenterDotColor	<input type="checkbox"/> dWhite
CenterDotWidth	2

To increase readability, let's choose 65 as length for the needle:

NeedleBasewidth	8
NeedleColor	<input checked="" type="checkbox"/> dRed
NeedleLength	-1

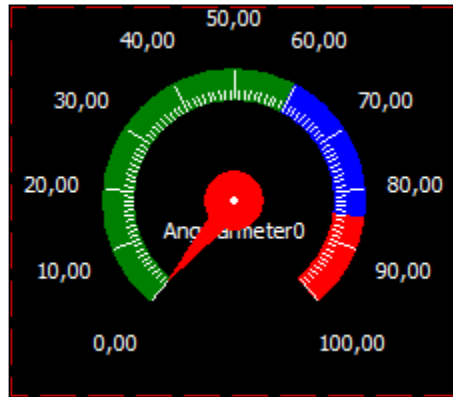
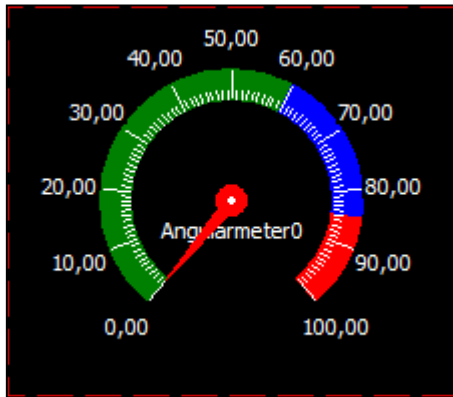
NeedleBasewidth	8
NeedleColor	<input checked="" type="checkbox"/> dRed
NeedleLength	65



Let's change the width of the base and set it to 15:

NeedleBasewidth	8
NeedleColor	dRed
NeedleLength	-1

NeedleBasewidth	15
NeedleColor	dRed
NeedleLength	-1

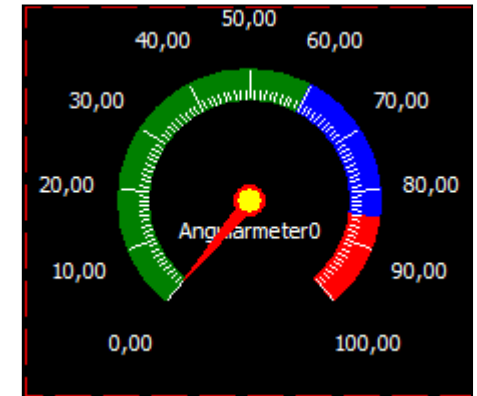
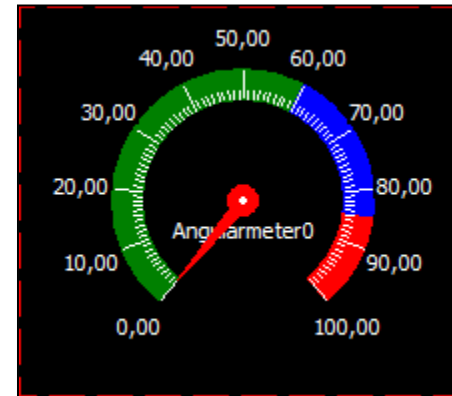


Centre Dot Options

The dot in the centre can also be customised:

CenterDotColor	dWhite
CenterDotWidth	2

CenterDotColor	YELLOW
CenterDotWidth	6



Zone Options

The logic for the zones for the **AngularMeter** object is the same as the scale for the **Meter** object.

Three zones are available, each one with its colour...

ColorZone1	dGreen
ColorZone2	dBlue
ColorZone3	dRed

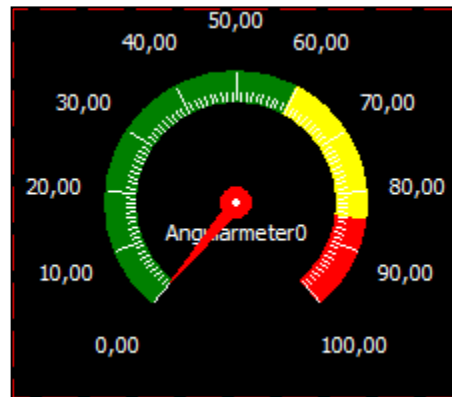
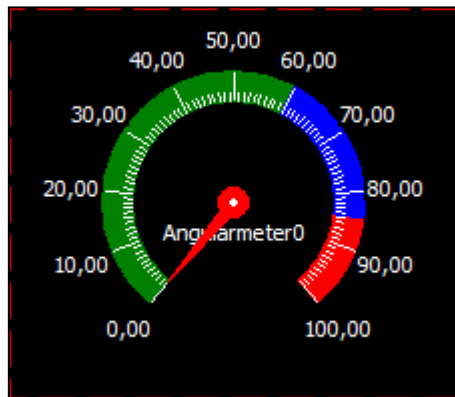
...and the zones are defined by two percentages:

Percent1	60
Percent2	25

Colours can be changed. Here the colour of the area in the middle is set to yellow:

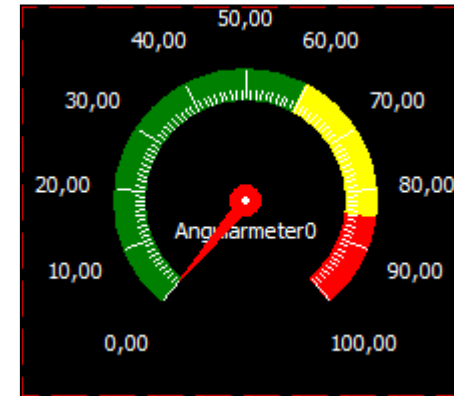
ColorZone1	dGreen
ColorZone2	dBlue
ColorZone3	dRed

ColorZone1	dGreen
ColorZone2	YELLOW
ColorZone3	dRed



The areas are defined by two values, **Percent1** and **Percent2**:

Percent1	60
Percent2	25

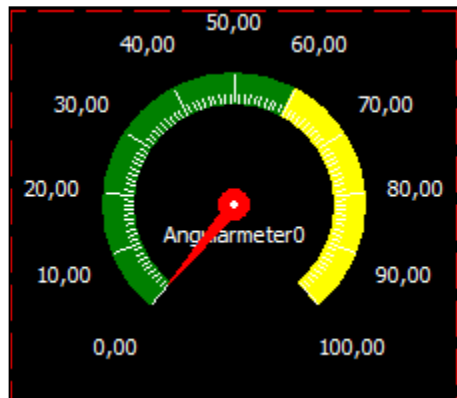
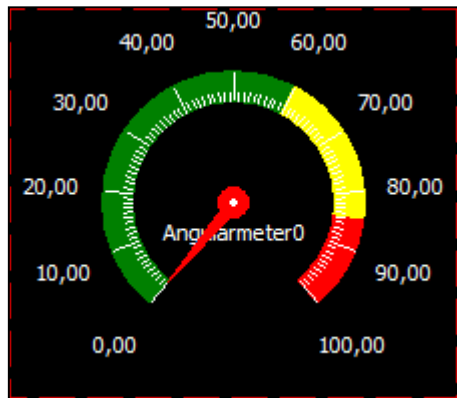


- The first area goes from 0% to **Percent1**, here from 0% to 60%;
- The second area covers additional **Percent2** starting from **Percent1**, here 25% starting from 60%, so from 60% to 85%;
- The third area includes what's left up to 100%, here from 85% to 100%.
- Setting **Percent2** to 0 skips the 2nd area. The yellow area has disappeared and the red one starts at 60%:

Setting **Percent2** to 40 skips the 3rd area. The red area has disappeared and the yellow one goes up to 100%:

Percent1	60
Percent2	25

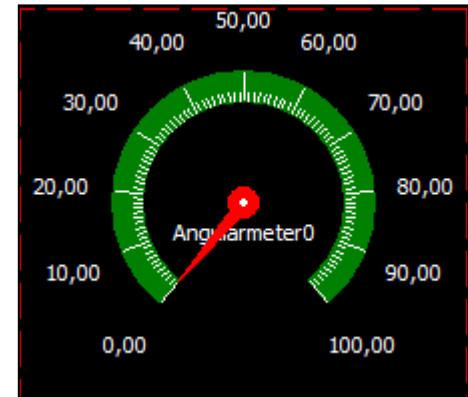
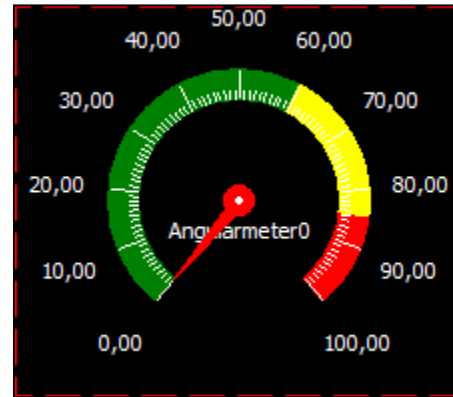
Percent1	60
Percent2	40



Setting **Percent1** to 100% skips the 2nd and 3rd areas. Only the green area is shown, from 0% to 100%:

Percent1	60
Percent2	25

Percent1	100
Percent2	0



An alternative consists on defining the same colour for different zones.

Ticks Options

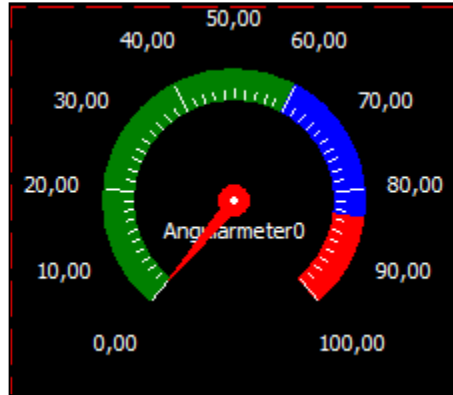
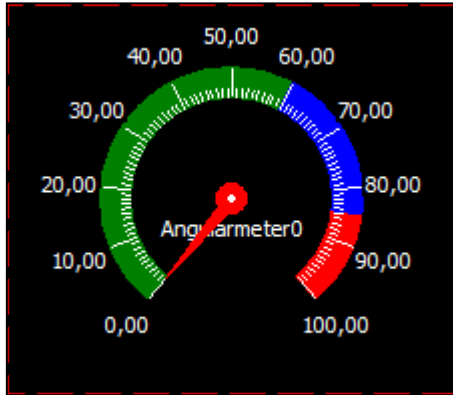
The ticks can be hidden and resized:

Ticks	100
TicksColor	<input type="checkbox"/> dWhite
TicksEnlarge	10
TicksMax	14
TicksMin	5

The number of ticks is defined by **Ticks**, with default value set to 100 on the left. On the right an example of the same meter with 50 ticks:

Ticks 100

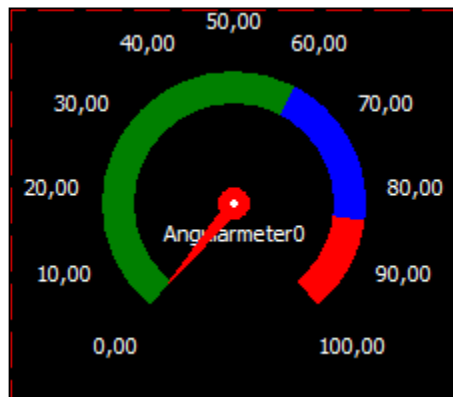
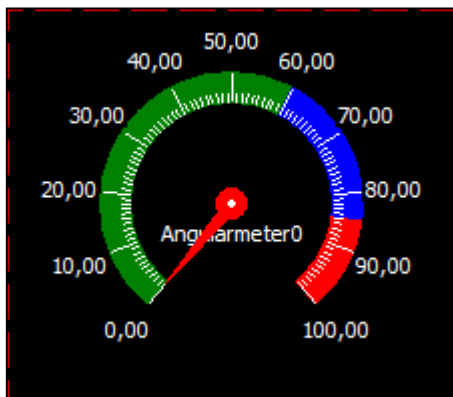
Ticks 50



To hide the ticks, just set **Ticks** to 0:

Ticks 100

Ticks 0

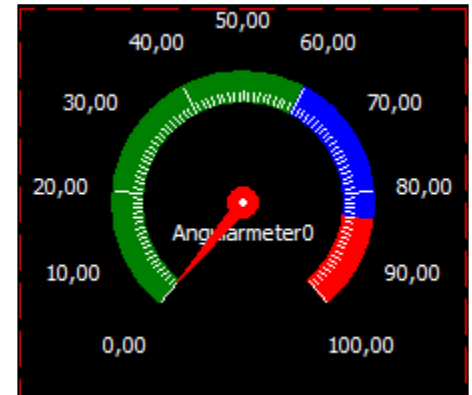
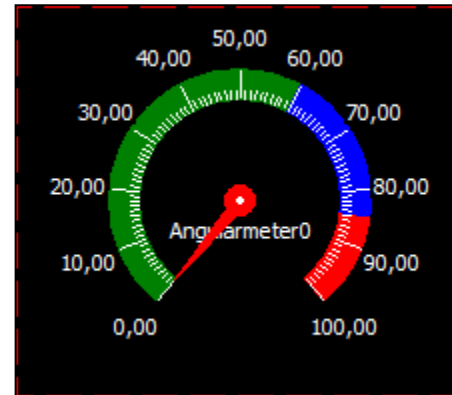


There two kinds of ticks, large and small. A large tick is shown every **TicksEnlarge**-tick.

On the left, default is every 10th; on the right, set to every 20th:

TicksEnlarge 10

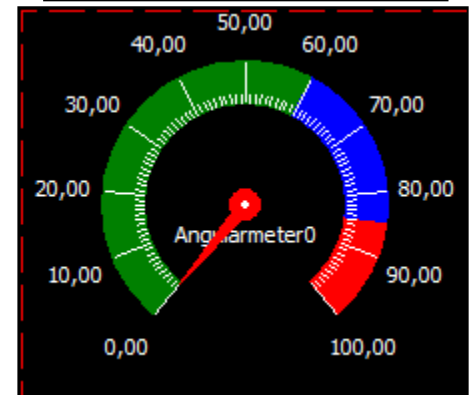
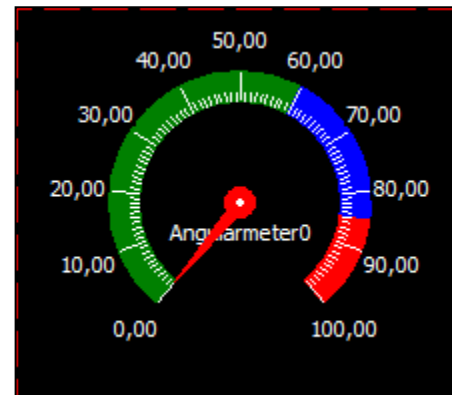
TicksEnlarge 20



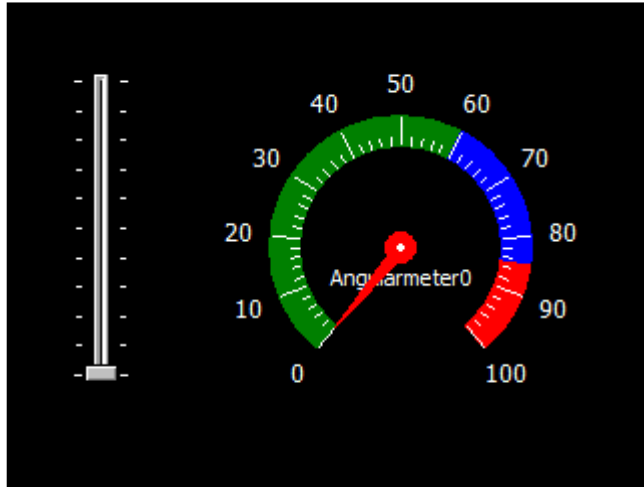
The size of the ticks can be customised by changing **TicksMax** and **TicksMin**:

TicksMax 14
TicksMin 5

TicksMax 20
TicksMin 5



Combining different options produce this result, proposed as example:



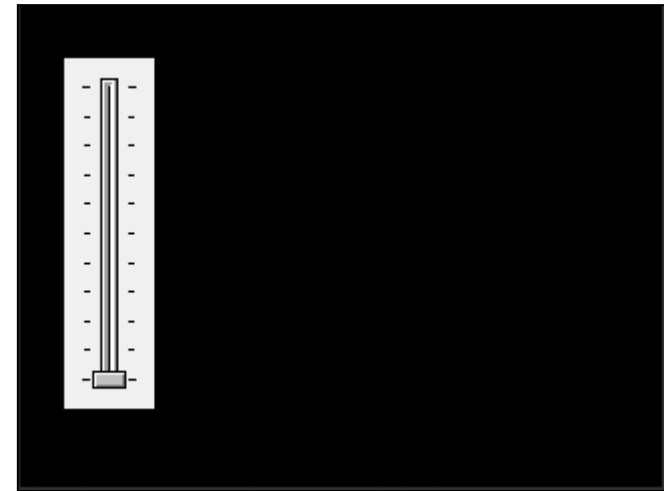
Cool Gauge Options

You can load the example...

**Example: 4D-AN-00008 PICASO – Cool Gauge or 4D-AN-00008
DIABLO16 – Cool Gauge**

...or follow the procedures described hereafter.

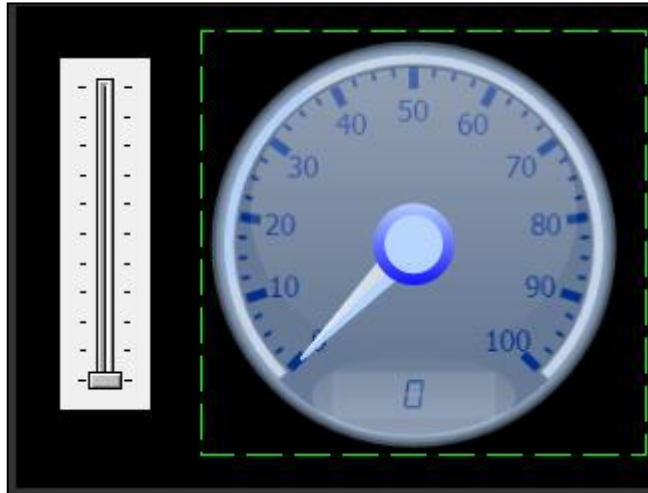
Delete the Angular Meter object...



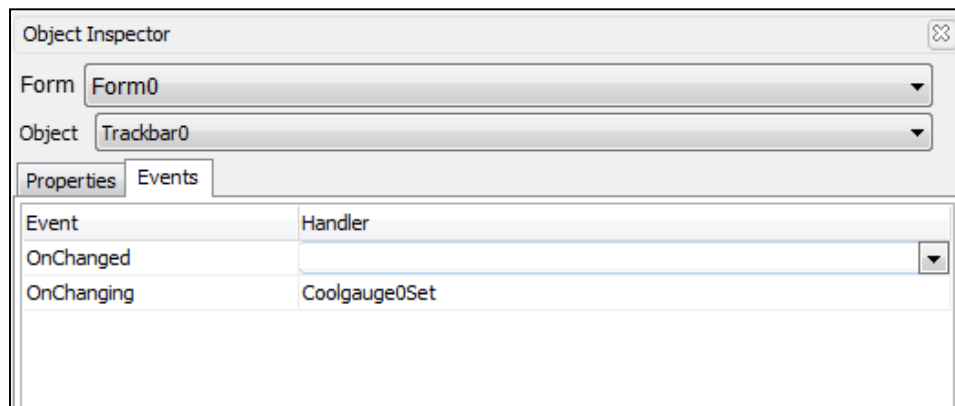
...add a Cool Gauge object...



...to the form...



...and update the event **onChanging** for the **TrackBar0** to **CoolGauge0Set**:



The **CoolGauge** object combines a needle and a display in a rich graphical interface.

Arc and Threshold Option

By default, the arc of the dial starts at 135° and stops at 405°. The threshold is defined by a **StartAngle** and a **SweepAngle**.

Property	Value
[-] Arc	
Color	<input type="color" value="#0xFFE0E0"/>
Opacity	200
StartAngle	130
StopAngle	410
[-] Threshold	
Center	25
Color	<input type="color" value="#0xFFD0AF"/>
EndValue	100
Opacity	200
Span	25
StartAngle	130
StartValue	0
SweepAngle	280
ThresholdKind	Angle

Both parameters are linked.

Property	Value
<input type="checkbox"/> Arc	
Color	<input type="color" value="#0xFFFEFE0"/>
Opacity	200
StartAngle	130
StopAngle	410
<input type="checkbox"/> Threshold	
Center	25
Color	<input type="color" value="#0xFFD0AF"/>
EndValue	100
Opacity	200
Span	25
StartAngle	130
StartValue	0
SweepAngle	280
ThresholdKind	Angle

Property	Value
<input type="checkbox"/> Arc	
Color	<input type="color" value="#0xFFFEFE0"/>
Opacity	200
StartAngle	150
StopAngle	390
<input type="checkbox"/> Threshold	
Center	25
Color	<input type="color" value="#0xFFD0AF"/>
EndValue	100
Opacity	200
Span	25
StartAngle	150
StartValue	0
SweepAngle	240
ThresholdKind	Angle

Minimum and Maximum

Minimum and maximum are defined by:

Maxvalue	100
Minvalue	0

Just enter the new values.

Logarithmic Option

Linear and logarithmic scales are selectable, with the base for the later:

Logarithmic	No
LogarithmicBase	10
MaximumValue	100
MinimumValue	0

Logarithmic	Yes
LogarithmicBase	2
MaximumValue	10
MinimumValue	0



Display Options

The values on the dial can be displayed or hidden.

ShowValues	Yes
------------	-----

ShowValues	No
------------	----



The same option exists for the digits:


<input checked="" type="checkbox"/> Digit	
Alignment	Center
BackColor	0xFFEFE0
BackGroundOpacity	30
Color	0x902F00
Visible	Yes

<input type="checkbox"/> Digit	
Alignment	Center
BackColor	0xFFEFE0
BackGroundOpacity	30
Color	0x902F00
Visible	No



Divisions Options

There are two kinds of divisions. Count, width and colour are selectable:

SubDivisionColor	 0x902F00
SubDivisionCount	3
SubDivisionWidth	2

SubDivisionColor	 0x902F00
SubDivisionCount	1
SubDivisionWidth	5



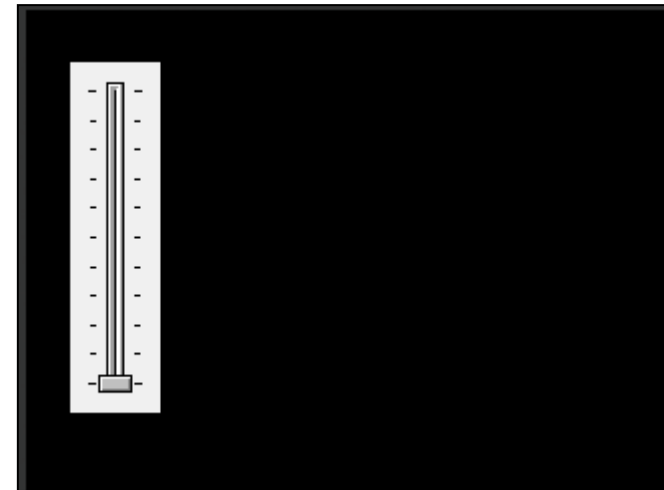
Thermometer Options

You can load the example...

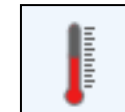
Example: 4D-AN-00008 PICASO – Thermometer or 4D-AN-00008 PICASO Thermometer

...or follow the procedures described hereafter.

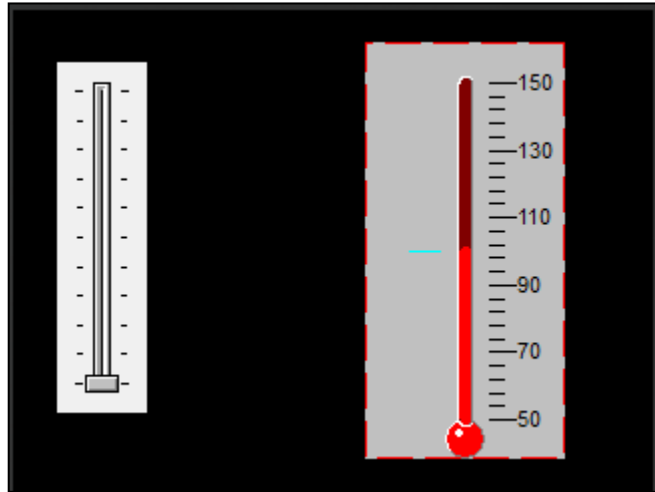
Delete the Cool Gauge object...



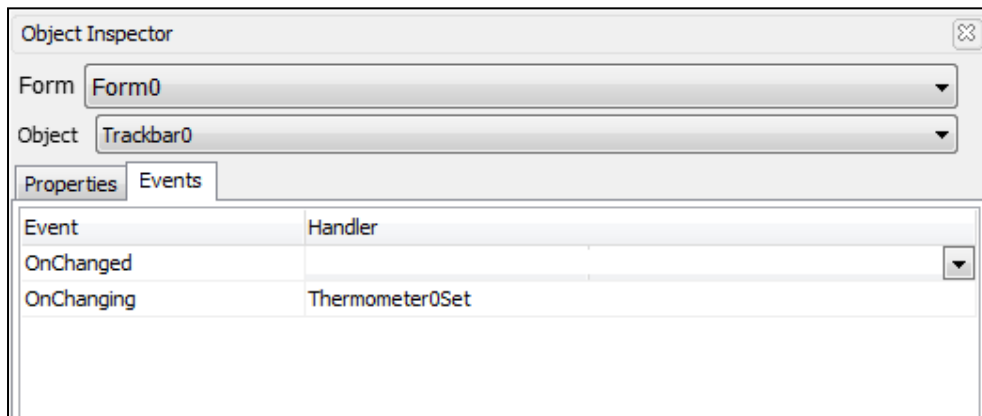
...add a Thermometer object...



...to the form...



...and update the event **onChanging** for the **TrackBar0** as **Thermometer0Set**:

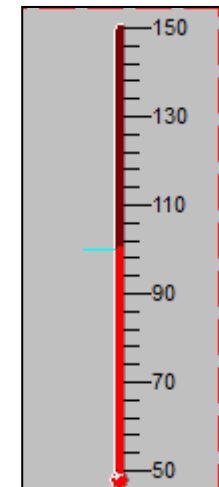
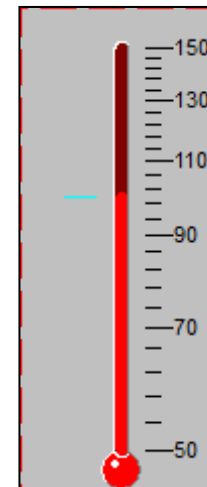


Scale Options

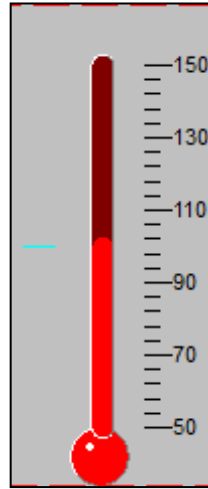
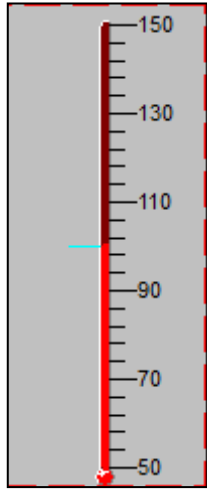
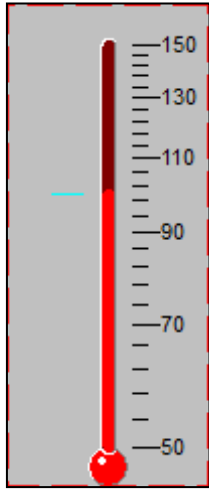
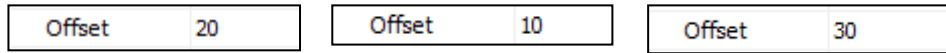
The options for **Scale** are under the line **Scale**:

Scale	
Color	BLACK
Decimals	0
Heightmax	14
Heightmin	8
Max	150
Min	50
Offset	20
Position	After
ScaleType	Linear
SmallStep	4
Step	20
Visible	Yes

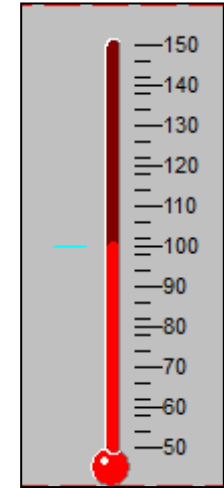
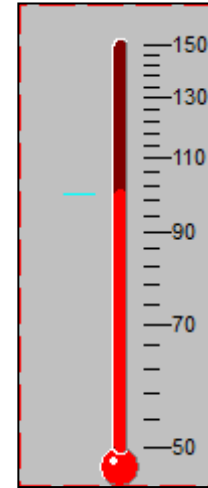
The scale can be set to linear or logarithmic:



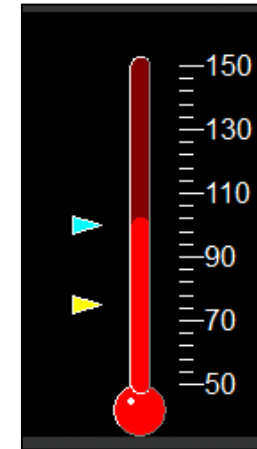
Offset can be adjusted, with 20 as default:




The size of the **step** can be adjusted:




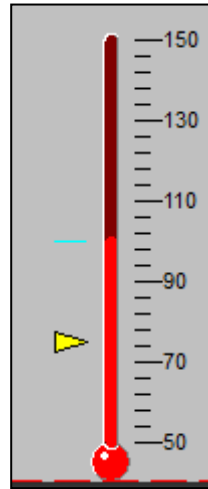
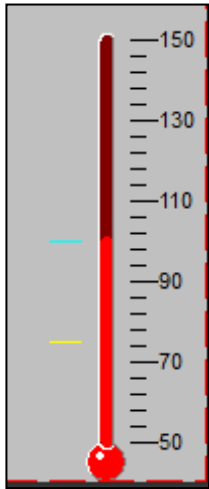
Combining different options produce this result:




Here is the result with a yellow triangle:


Setpoint	
Bitmap	(None)
Color	 YELLOW
Shape	Line
Value	75
Visible	Yes

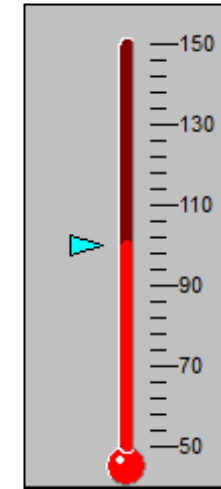
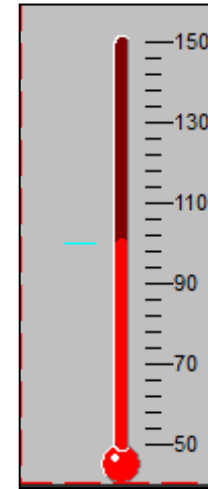
Setpoint	
Bitmap	(None)
Color	 YELLOW
Shape	Triangle
Value	75
Visible	Yes



Here is the result with an aqua triangle:

Value	
Bitmap	(None)
Color	 cAqua
Shape	Line
Value	100
Visible	Yes

Value	
Bitmap	(None)
Color	 cAqua
Shape	Triangle
Value	100
Visible	Yes



Value Options

Colour and shape can be changed, under the line **Value**:

Build and Upload the Project

For instructions on how to build and upload a ViSi-Genie project to the target display, please refer to the section “**Build and Upload the Project**” of the application note

ViSi Genie Getting Started – First Project for Picaso

ViSi Genie Getting Started – First Project for Diablo16 Displays

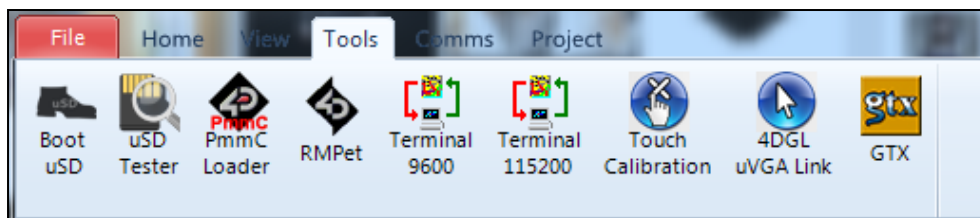
The uLCD-32PTU and/or the uLCD-35DT display modules are commonly used as examples, but the procedure is the same for other displays.

Debugger Output

Setting the handler to Message sends the values to the debugger, **Genie Test Executor** or GTX.

Launch the Debugger

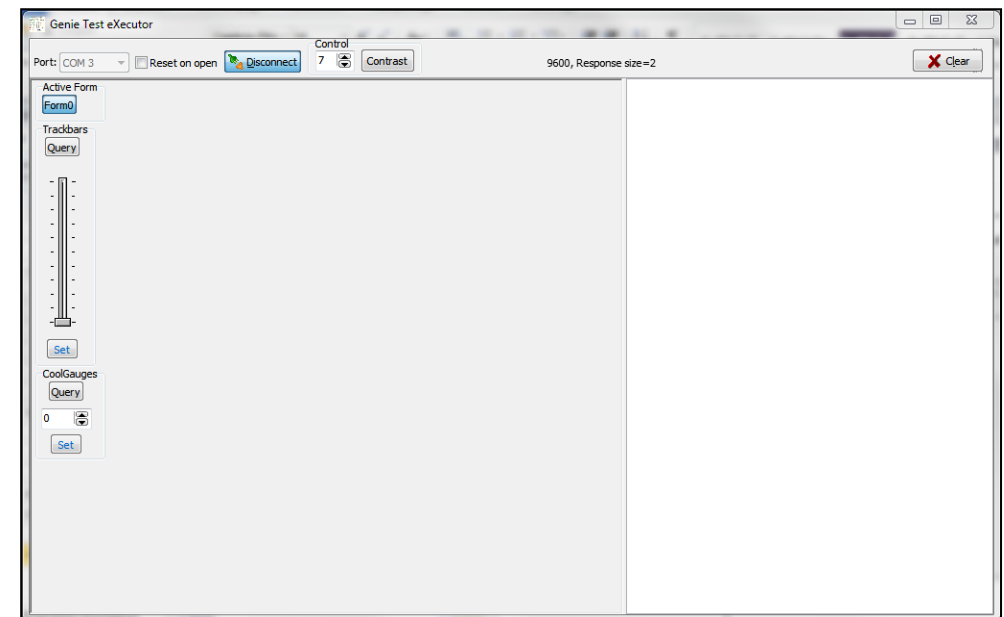
To launch the **Genie Test Executor** or GTX, select the **Tools** menu...



...and then click on the **GTX** button.




A new screen appears, with the form and objects we have defined on the cool gauge example previously:



Use the Debugger

To set a value for the track-bar, move the slider...




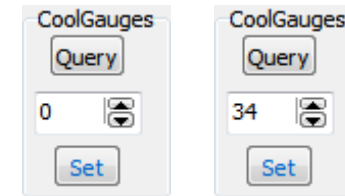
...and then click on . The screen module redraws the track-bar and the cool gauge with the new value.

The right part of the GTX window displays the command sent and the acknowledgement **06**:

```
Set Trackbar Value 14:25:38.295 [01 05 00 00 27 23]
ACK 14:25:38.342 [06]
```

Reading the Value from the Cool Gauge

To read the value from the cool gauge, click on  on top of the CoolGauges area:

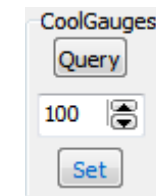



The right part of the GTX window displays the command sent and the answer, here **0022** corresponding to 34 in decimal:

```
Request Coolgauge Value 14:28:08.402 [00 08 00 08]
Coolgauge Value 14:28:08.433 [05 08 00 00 22 2F]
```

Setting the Value to the Cool Gauge

To set a value to the cool gauge, enter a value in the box, here 100...



...and click on . The cool gauge is updated on the screen module.

The right part of the GTX window displays the command sent with value **64** or 100 in decimal and the successful acknowledgement **06**:

```
Set Coolgauge Value 14:29:32.655 [01 08 00 00 64 6D]
ACK 14:29:32.764 [06]
```

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