



OCX Controls & software technologies
<http://www.precisionocx.com>

Precision Analog Meter

Version 1.1

Overview

Purpose

Precision Analog Meter is a powerful OCX control for your application which displays a value using an indicator on a curved scale that covers up to an angle of 180°.

Optimization

Precision Analog Meter was written entirely in C++ and is composed of strongly optimized code. The only required libraries are the MFC and MSVCRT DLLs, that are shipped with every version of Microsoft Windows. You do not need to add any additional component to your application distribution kit.

Small size

Precision Analog Meter is only 50k in size ! This means that it is very fastly loaded into your application and it does not significantly increase your final application size.

High customisability

Precision Analog Meter has 30 parameters you can freely set to fully customise the graphic appearance and functionality of the control. For example it is possible to set the color of every single graphical element, the font and the format of every written text, the number of divisions, the geometry and the layout of the components, the line thickness and so on.

Graphics

Precision Analog Meter makes no use of fixed-size bitmaps ! Every component you see, is dynamically scaled according to the container window size and to user's choices !

Flicker-free refresh

Precision Analog Meter makes use of a double-buffering technology in order to avoid unpleasant flickering effects: every graphic manipulation is done in memory and only eventually the final result is transferred to the video buffer, using all the available hardware optimizations that the graphic card provides for the BitBlt.

Unicode version available

Even if the standard version of Precision Analog Meter is able to handle DBCS and MBCS to help you creating localized projects under Windows 9X, a unicode version is available for your strongly localized projects under Windows NT. Choose the version of Precision Analog Meter that best fits to your needs !

High speed version available

Are you developing a realtime application ? We could provide you with a high performance, simplified-graphics version of our control (without double-buffering) that can reach an update frequency of 100 Hz and more !

Any special requirement ?

If you are developing an application and found Precision Analog Meter nearly perfect for you needs except for small details, please feel free to contact us: let's talk about it !

Documentation

All the documentation you may need on Precision Analog Meter is on line ! We have prepared a detailed quoted and printable diagram, available in multiple formats, to which you can refer to better exploit the full power of the geometry parameters.

Trial Version & Licensing

A trial version is available: it includes all the functionality with only the following restrictions:

- | a red cross will appear in the middle of the bounding box control;
- | a nag screen will keep you waiting three seconds;
- | it will not be possible to change the control caption, it will instead be fixed to "Trial Version"
- | only the first 33 operations will be performed, every succeeding request will be ignored;

You can freely evaluate the trial version by including it in your projects as if it was the full-functionality version. When you will decide to buy it, you will only have to register the full-functionality version in place of the trial version, with no modifications to your program (you even won't need to recompile it).

A container test project (called *TryAnalogMeter*) is provided in order to let you experiment with some of the control properties.

Once you decide to purchase the full version of the control, a license number will be provided, which can be used to unlock the control at run-time.

Quick start

You can start using Precision Analog Meter incredibly fast: the control default factory parameters are already sensible for a basic use, you have only got to:

- | If you are using the full version (NOT the trial one) you must call the *SetLicense* method passing your license number as argument and make sure it returns *True*. Simply ignore this step if you are testing the trial version.
- | Set the *MinimumValue* and the *MaximumValue* properties to the desired values.
- | Set the *GreenStartValue*, *YellowStartValue* and the *RedStartValue* properties to appropriate values. Set all them to the value assumed by *MaximumValue* if you do not want colored sections.
- | Set your *Value* over and over again.

Now you can take a more accurate look at the properties to fully exploit the power of Precision Level Indicator.

Properties

BackgroundImage

Domain: any picture

Default value: none

Meaning: this is the picture which is drawn on the back plane of the control. If you set this property to an image, the image will be stretched in order to completely fill the bounding box. If you want to completely avoid the slight image degradation due to the stretching, use only images whose sizes are exactly corresponding to control bounding box.

If you set the *ShadedAreaRelativeSize* to zero, the image you select will be fully visible, otherwise borders will be partially covered by the shaded borders which represent the sunken bevel.

If you only want a solid color on the back plane, do not select any image.

BottomCoverColor

Domain: any color

Default value: 0x00000000 (black)

Meaning: this is the color used to fill the rectangle which covers the lower part of the control. Warning: if the *BottomCoverRelativeHeight* property is set to zero, the bottom cover rectangle is not visible, and this parameter is ignored.

BottomCoverLabelFont

Domain: any font

Default value: MS Sans Serif, 12, Normal

Meaning: this is the font of the text label which is drawn upon the bottom cover. The text label is centered in the bottom cover, therefore you should choose a value for this property which is appropriate for the current value of *BottomCoverRelativeHeight*, in order not to overfill the bottom cover rectangle.

BottomCoverRelativeHeight

Domain: a real number between 0 and 1

Default value: 0.2

Meaning: this is the ratio between the bottom cover height and the control bounding box height (as you can see on the diagram). If you set this property to zero, the bottom cover will not be visible; if it is set to 0.5 it covers the lower half of the control, and so on.

BottomCoverTextColor

Domain: any color

Default value: 0x00FFFFFF (white)

Meaning: this is the color in which the label text on the on the bottom cover is drawn.

Caption

Domain: any string

Default value: ... (it depends on your development environment)

Meaning: this is the text which is displayed on the middle of the bottom cover.

GreenColor

Domain: any color

Default value: 0x0000FF00

Meaning: this is the actual color used to fill the second section of the instrument bar (which is usually drawn in green in real instruments). This colored section will be actually visible only if the value assumed by the *GreenStartValue* property is less than the value assumed by the *YellowStartValue* and *RedStartValue*.

GreenStartValue

Domain: a real number between *MinimumValue* and *MaximumValue*

Default value: 60

Meaning: this is the starting value for the second section of the instrument bar (which is usually drawn in green, or the color indicated by the *GreenColor* property). If you try to set this property to a value that is out of the *MinimumValue*-*MaximumValue* range, it will be set to the nearest bounding value. This colored section ends at the beginning of the following one or, to be more precisely, at the *YellowStartValue*.

IndexColor

Domain: any color

Default value: 0x000000FF (red)

Meaning: the color used to draw the instrument index (the line which indicates the current value you want to represent).

IndexThickness

Domain: any integer number (small)

Default value: 1

Meaning: this is the thickness of the line which represents the instrument index.

InstrumentBackGroundColor

Domain: any color

Default value:

Meaning: normally this is the color used to fill the back plane of the control. If you select an image into the *BackgroundImage* property, this value is only used as the inner color of the color gradients located at the bounding box borders, which represent the sunken bevel.

MaximumValue

Domain: any real number
Default value:100
Meaning: this is the maximum value that the quantity you want to represent can assume.

MinimumValue

Domain: any real number
Default value:0
Meaning:this is the minimum value that the quantity you want to represent can assume.

NumberOfDivisions

Domain: any integer number (small)
Default value:10
Meaning:this is the number of divisions in which the full range between *MinimumValue* and *MaximumValue* is divided, with the use of measuring marks. Division marks are usually accompanied by text labels, which indicate the corresponding values there assumed by the quantity you want to represent.

NumberOfSubdivisions

Domain: any integer number (small)
Default value:2
Meaning:this is the number of subdivisions in which every division is furtherly divided. Subdivision marks are not accompanied by text labels.

RedColor

Domain: any color
Default value:0x000000FF (red)
Meaning: this is the actual color used to fill the fourth section of the instrument bar (which is usually drawn in red in real instruments). This colored section will be actually visible only if the value assumed by the *RedStartValue* property is less than *MaximumValue*.

RedStartValue

Domain: a real number between *MinimumValue* and *MaximumValue*
Default value:90
Meaning:this is the starting value for the fourth section of the instrument bar (which is usually drawn in red, or the color indicated by the *RedColor* property). If you try to set this property to a value that is out of the *MinimumValue-MaximumValue* range, it will be set to the nearest bounding value. This colored section ends at the value assumed by *MaximumValue*.

RelativeIndexLength

Domain: any real number
Default value:1.1
Meaning: this is the ratio between the index length and the radius of the scaled circle (refer to the diagram).

RelativeTextRadius

Domain: any real value
Default value:0.96
Meaning: this is the ratio between the text circle radius and the scaled circle radius. The text circle is the circle on which all the centers of the division mark text labels are positioned. This property is set by default to a value slightly less than 1 in order to place text just inside the scaled circle.

ScaleColor

Domain: any color
Default value:0x00000000 (black)
Meaning: this is the color used to draw the instrument bar and the division and subdivision marks.

ScaledCircleRelativeDiameter

Domain: any real value
Default value: 1.2
Meaning: this is the ratio between the scaled circle diameter (refer to the diagram) and the maximum side of the control bounding box. You will have to reduce this value if you want to make the instrument cover 180 degrees, and increase it if you want to make the instrument seem a linear scale (if this value is **really** big (> 100), the circle sector which represent the visible scaled circle will tend to a line, its radius will tend to infinity and the covered angle will tend to zero).

ScaledCircleRelativeShifting

Domain: any real value

Default value: 0.2

Meaning: multiplying this value by the minimum side of the bounding box you can obtain the scaled circle shifting (towards the bottom of the instrument), as reported on the diagram.

ScaleRelativeWidth

Domain: any real value

Default value: 0.06

Meaning: this quantity is the width of the instrument bar (and therefore the length of the division measuring marks) expressed as a ratio with respect to the scaled circle radius. Putting this value to 0.06 means that the distance between the two circle sectors which constitute the instrument bar is 6 percent of the bar internal circle radius.

ScaleThickLineWidth

Domain: any integer number (small)

Default value: 2

Meaning: this is the thickness (in pixels) of the lines which constitute the instrument bar: the internal circle sector, the external circle sector, the two segments which join the extreme points of these two sectors.

ScaleThinLineWidth

Domain: any integer number (small)

Default value: 1

Meaning: this is the thickness (in pixels) of the lines which represent division and subdivision measuring marks.

ShadedAreaRelativeSize

Domain: any real number (recommended between 0 and 0.5)

Default value: 0.1

Meaning: this is the ratio between the shaded area width and bounding box minimum size (refer to the diagram). The border is filled with a color gradient going from the *InstrumentBackgroundColor* to black (or white, according with the simulated light direction) and simulates the highlight and the shadow due to a sunken bevel. Increase this value to make the control seem deeper; decrease it to achieve opposite effects.

SmallScaleFont

Domain: any font

Default value: Arial, 6, Normal

Meaning: this is the font used to draw the text labels corresponding to division measuring marks.

StepValue

Domain: any real number (recommended less than or equal in modulus to the difference between *MaximumValue* and *MinimumValue*).

Default value: 1

Meaning: this is the increment value added to *Value* every time the *StepIt* method is invoked. You can set a negative increment, thus causing a decrement every time *StepIt* is called.

Value

Domain: any real number (recommended between *MaximumValue* and *MinimumValue*).

Default value: 0

Meaning: this is the actual value you want to represent with the control. This value **can** be greater than *MaximumValue* and less than *MinimumValue*: in this cases the instrument index will slightly move out of the instrument bar, in order to show overflow or underflow conditions.

ValueFormatString

Domain: any appropriate format string (see below)

Default value: `%.1f`

Meaning: : this string tells to the control how to format the text inside the labels located near the division measuring marks; this is a standard C "*printf*()-style" format string, but do not worry if you do not know C programming language, every information you will need is hereby given.

- 1 If you do not want a text label on your control, you can simply set this property to an empty string.
- 1 If you want to specify a simple text string (constant), set this property to the desired string (strings are replicated many times unchanged).
- 1 Otherwise, you can use a format string composed by a preceding text, then the placeholder for the value and a following text. The placeholder itself is composed of
 - i a leading percent sign, followed by

- i an (optional) padding size indicator (the number of total characters which compose the number representation, including digits, spaces and punctuation); if you put a zero "0" before this indicator, the padding character is the zero, otherwise the space is used;
- i an (optional) precision indicator, preceded by a dot (the number of digits after the decimal point; set it to 0 if you want integer values);
- i and an "f" character, which stands for "floating point value".

Examples are provided in the following table. Since the percent character is used to indicate the placeholder, if you want to represent the percent sign itself, you will have to use two percent signs.

Format string	Result
%f	50.000000
value=%f	value=50.000000
value=%1f	value=50.0
%.2f percent	50.00 percent
%06.2f	050.00
%.0f %%	50 %
blah %3.0f blah	blah 50 blah

VisibleScaleRelativeSize

Domain: any real number

Default value: 1.2

Meaning: this is the ratio between the visible scale size (as shown on the diagram) and the bounding box width; since this quantity could not appear much intuitive, we suggest you to make some trials and observe the effect of its variation.

YellowColor

Domain: any color

Default value: 0x0000FFFF (red)

Meaning: this is the actual color used to fill the third section of the instrument bar (which is usually drawn in yellow in real instruments). This section will be actually visible only if the value assumed by the *YellowStartValue* property is less than *RedStartValue* and less than *MaximumValue*.

YellowStartValue

Domain: a real number between *MinimumValue* and *MaximumValue*

Default value: 75

Meaning: this is the starting value for the third section of the instrument bar (which is usually drawn in yellow, or the color indicated by the *YellowColor* property). If you try to set this property to a value that is out of the *MinimumValue*-*MaximumValue* range, it will be set to the nearest bounding value. This colored section ends at the beginning of the following one or, to be more precisely, at the *RedStartValue*.

Methods

SetLicense(long LicenseNumber)

Parameters: *LicenseNumber*, a long integer number which represent your license number.

Return value: a boolean value that represents the result of the authentication.

Meaning: this method is used to activate the full-version control. You should call this method before calling any other method, passing the license number you obtained at purchase time as *LicenseNumber* parameter, otherwise the control will not draw itself on the screen.

Attention: you do not need to use this method using the trial version of the control.

StepIt()

Parameters: none

Return value: none

Meaning: calling this method, you cause the increment of the *Value* property by *StepValue*.

Version History

Version 1.1

Fixed a variable initialization bug which, under certain development environments, caused a crash the second time the control is initialized.

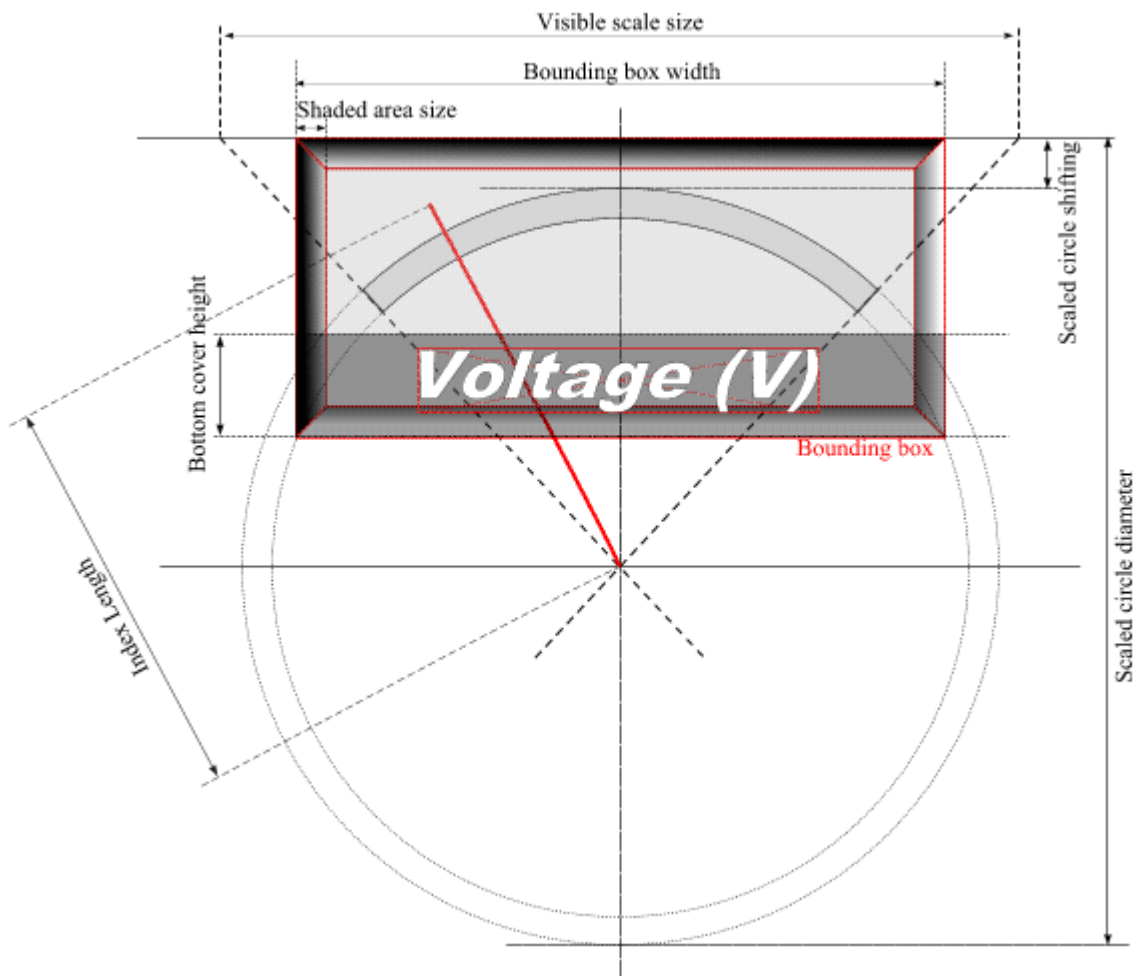
Version 1.0

Initial release.

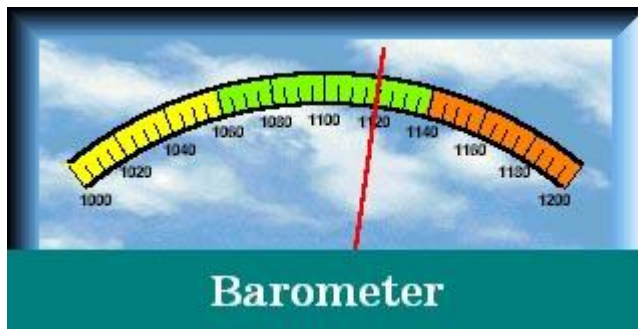
Geometry diagram

Here is given a technical representation of every graphic element of which the control is made. You can download this diagram from our site also in the following formats:

- | CorelXara .XAR
- | Adobe Illustrator .EPS
- | High resolution .GIF

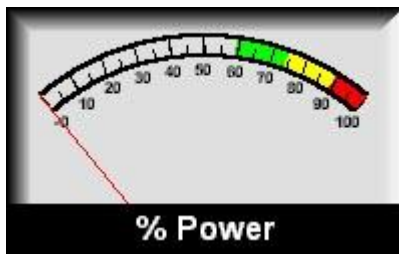


Art Gallery



BackgroundImage	(Bitmap)
BottomCoverColor	0x00808000
BottomCoverLabelFont	News701 BT
BottomCoverRelativeHeight	0.25
BottomCoverTextColor	0x00FFFFFF
Caption	Barometer
GreenColor	0x0000FFFF
GreenStartValue	1000
IndexColor	0x000000FF
IndexThickness	2
InstrumentBackGroundColor	0x00F9B571
MaximumValue	1200
MinimumValue	1000
NumberOfDivisions	10
NumberOfSubdivisions	4
RedColor	0x000080FF
RedStartValue	1140
RelativeIndexLength	1.15
RelativeTextRadius	0.96
ScaleColor	0x00000000
ScaledCircleRelativeDiameter	1.2
ScaledCircleRelativeShifting	0.3
ScaleRelativeWidth	0.08
ScaleThickLineWidth	2
ScaleThinLineWidth	1
ShadedAreaRelativeSize	0.1
SmallScaleFont	Arial
StepValue	1
Value	1120
ValueFormatString	%0f
VisibleScaleRelativeSize	1.2
YellowColor	0x0000FF80
YellowStartValue	1060

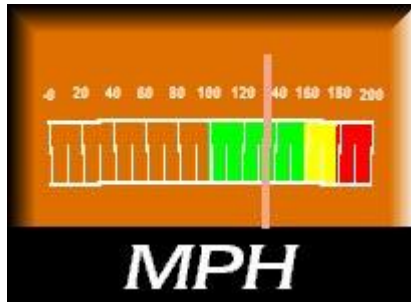
BackgroundImage	(None)
BottomCoverColor	0x00000000
BottomCoverLabelFont	Arial
BottomCoverRelativeHeight	0.2
BottomCoverTextColor	0x00FFFFFF
Caption	% Power
GreenColor	0x0000FF00
GreenStartValue	60
IndexColor	0x000000FF
IndexThickness	1
InstrumentBackGroundColor	0x00E0E0E0
MaximumValue	100
MinimumValue	0



NumberOfDivisions	10
NumberOfSubdivisions	2
RedColor	0x000000FF
RedStartValue	90
RelativeIndexLength	1.1
RelativeTextRadius	0.94
ScaleColor	0x00000000
ScaledCircleRelativeDiameter	1.2
ScaledCircleRelativeShifting	0.2
ScaleRelativeWidth	0.08
ScaleThickLineWidth	2
ScaleThinLineWidth	1
ShadedAreaRelativeSize	0.1
SmallScaleFont	Arial
StepValue	1
Value	0
ValueFormatString	%.0f
VisibleScaleRelativeSize	1.2
YellowColor	0x0000FFFF
YellowStartValue	75



BackgroundImage	(None)
BottomCoverColor	0x00BFBFBF
BottomCoverLabelFont	
BottomCoverRelativeHeight	0
BottomCoverTextColor	0x00FF0000
Caption	
GreenColor	0x000000FF
GreenStartValue	-40
IndexColor	0x0000FFFF
IndexThickness	3
InstrumentBackGroundColor	0x00FF5050
MaximumValue	100
MinimumValue	-40
NumberOfDivisions	7
NumberOfSubdivisions	2
RedColor	0x000000FF
RedStartValue	70
RelativeIndexLength	1.25
RelativeTextRadius	0.84
ScaleColor	0x00FFE0E0
ScaledCircleRelativeDiameter	0.8
ScaledCircleRelativeShifting	0.2
ScaleRelativeWidth	0.12
ScaleThickLineWidth	2
ScaleThinLineWidth	1
ShadedAreaRelativeSize	0.1
SmallScaleFont	Arial
StepValue	1
Value	55
ValueFormatString	%.0f°
VisibleScaleRelativeSize	20
YellowColor	0x00FF5050
YellowStartValue	-10



BackgroundImage	(None)
BottomCoverColor	0x00000000
BottomCoverLabelFont	Newtext Rg
BottomCoverRelativeHeight	0.25
BottomCoverTextColor	0x00FFFFFF
Caption	MPH
GreenColor	0x0000FF00
GreenStartValue	100
IndexColor	0x009BA7F9
IndexThickness	4
InstrumentBackGroundColor	0x000070DF
MaximumValue	200
MinimumValue	0
NumberOfDivisions	10
NumberOfSubdivisions	2
RedColor	0x000000FF
RedStartValue	180
RelativeIndexLength	1.02
RelativeTextRadius	1.015
ScaleColor	0x00FFFFFF
ScaledCircleRelativeDiameter	30
ScaledCircleRelativeShifting	0.6
ScaleRelativeWidth	0.01
ScaleThickLineWidth	2
ScaleThinLineWidth	1
ShadedAreaRelativeSize	0.1
SmallScaleFont	Arial Narrow
StepValue	1
Value	135
ValueFormatString	%.0f
VisibleScaleRelativeSize	0.8
YellowColor	0x0000FFFF
YellowStartValue	160