# THE WIZARD

This is the manual for

the Wizard routine in Meter,

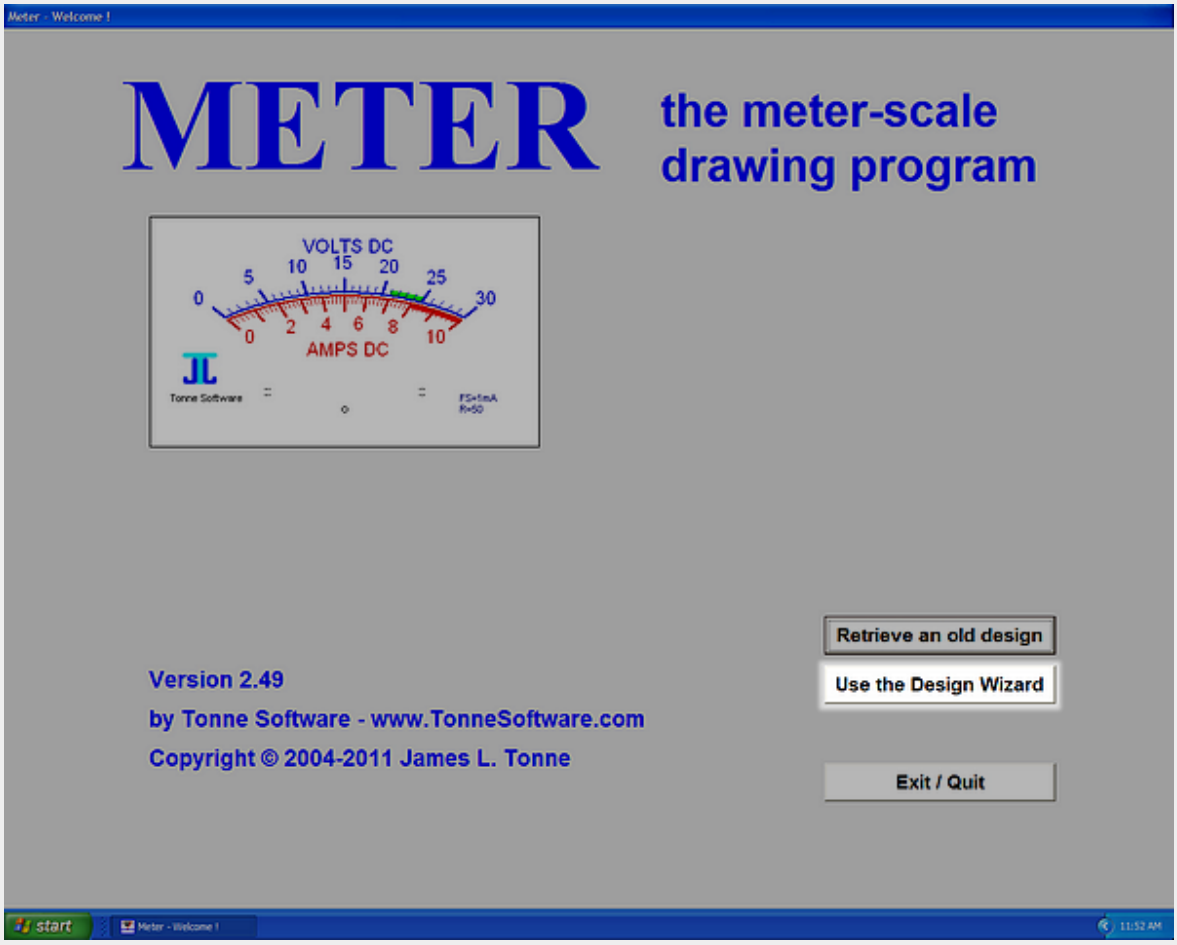
the program to draw scales

for analog meter movements

Last updated 28 September 2011

# Opening

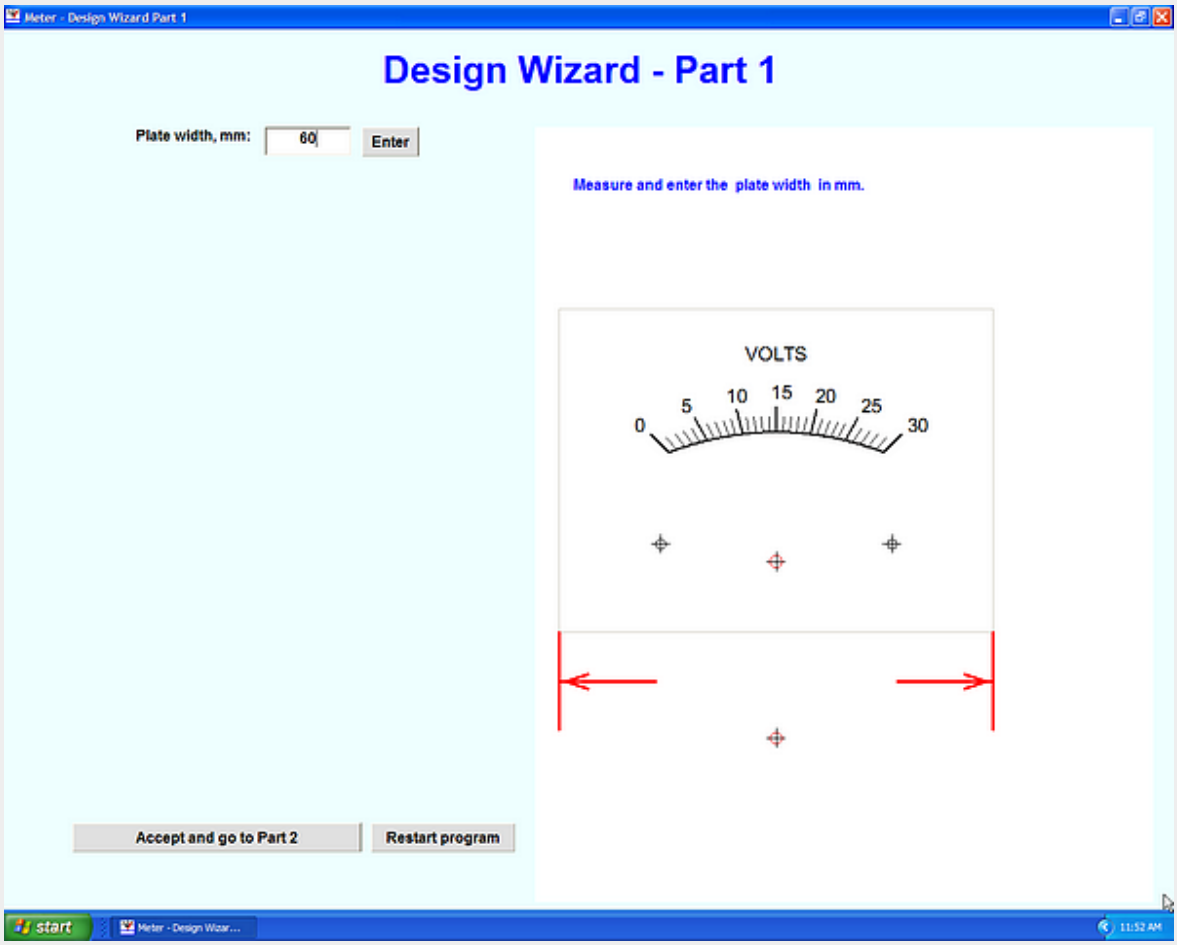
When the program **Meter** is opened, we see the Opening screen:




Clicking on the **Use the Design Wizard** button (shown here highlighted) will take us directly to the Wizard. That routine has been designed to simplify the design process and minimize confusion about the various required entries by asking for only one input at a time. And an illustrative graphic accompanies that input to clarify which item is being requested.

# Plate width

At the start of the Wizard we see this first screen, asking us to enter the width of the plate:




Measure the width of the plate in millimeters, enter that number into the textbox and then click on the **Enter** button.

All entries in the Wizard are run through a series of tests as appropriate when the associaed **Enter** button is pressed. If the entry is deemed satisfactory then it will be written back into the box and the next item in the list of requested entries will be shown.

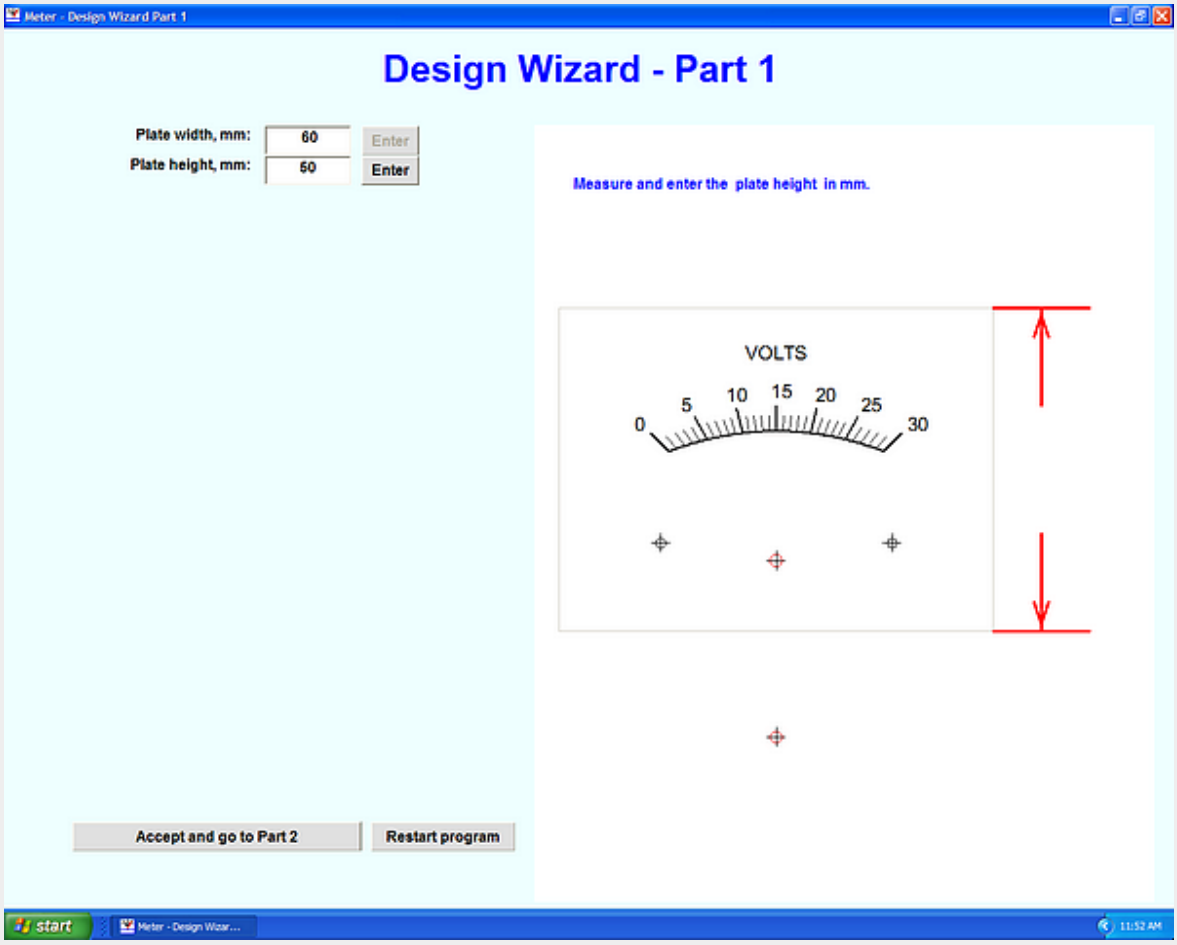
If the entry is *not* satisfactory then a message box will pop up with instructions telling us what to do. The text box will be cleared of the erroneous entry and the program will await a correct entry.

Some entries accept the value of zero as being satisfactory and so clicking **Enter** on an empty textbox will simply result in the digit 0 being placed in the box and the next item will be requested.

Here we have entered a plate width of 60 millimeters. Pressing the **Enter** button will take us to the next entry.

# Plate Height

After entering the plate width we next enter the plate height:

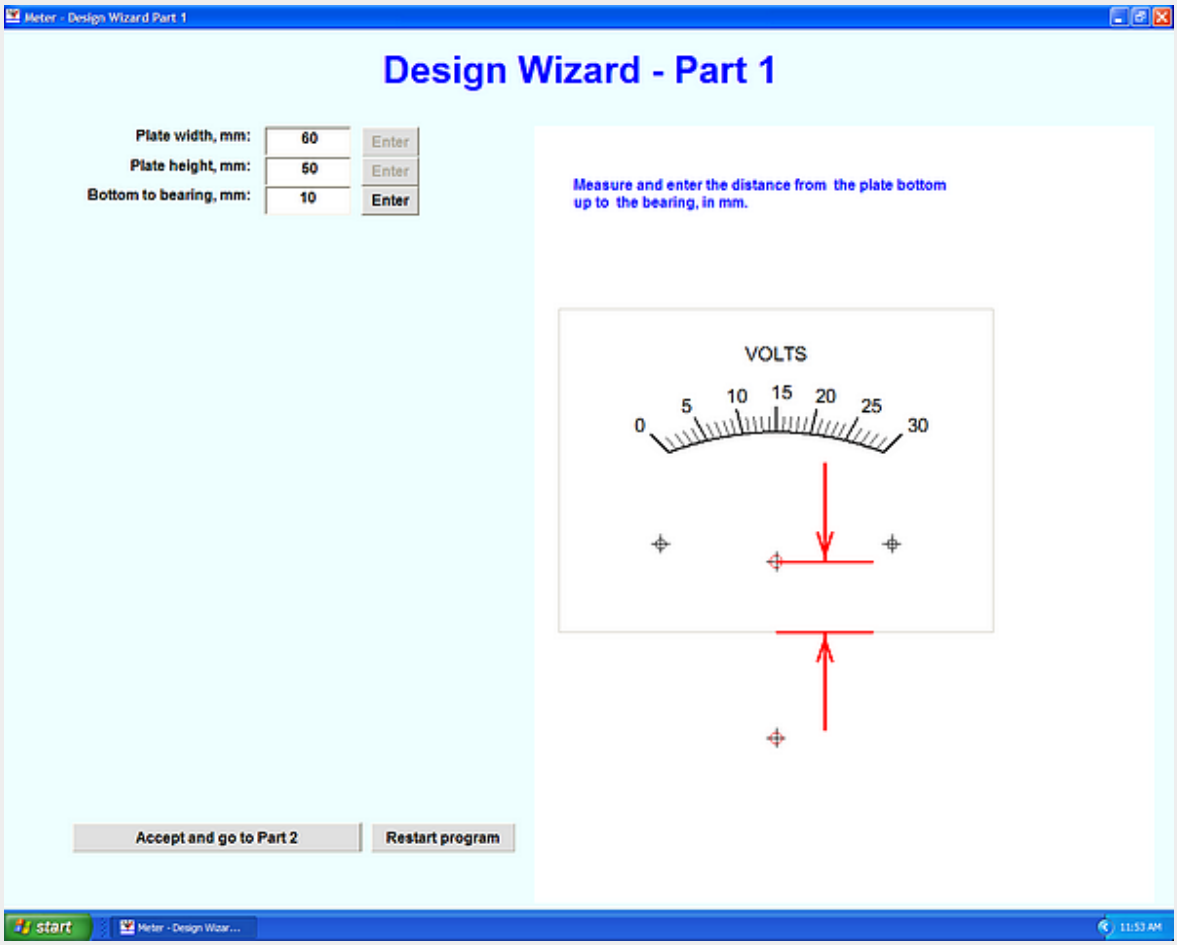



Measure the height of the plate in millimeters, enter that number into the textbox and then click on the **Enter** button.

Here we have entered a plate height of 50 millimeters. Pressing the **Enter** button will take us to the next entry.

# Bottom to bearing

After entering the plate height we next enter the distance from the plate bottom to the bearing:

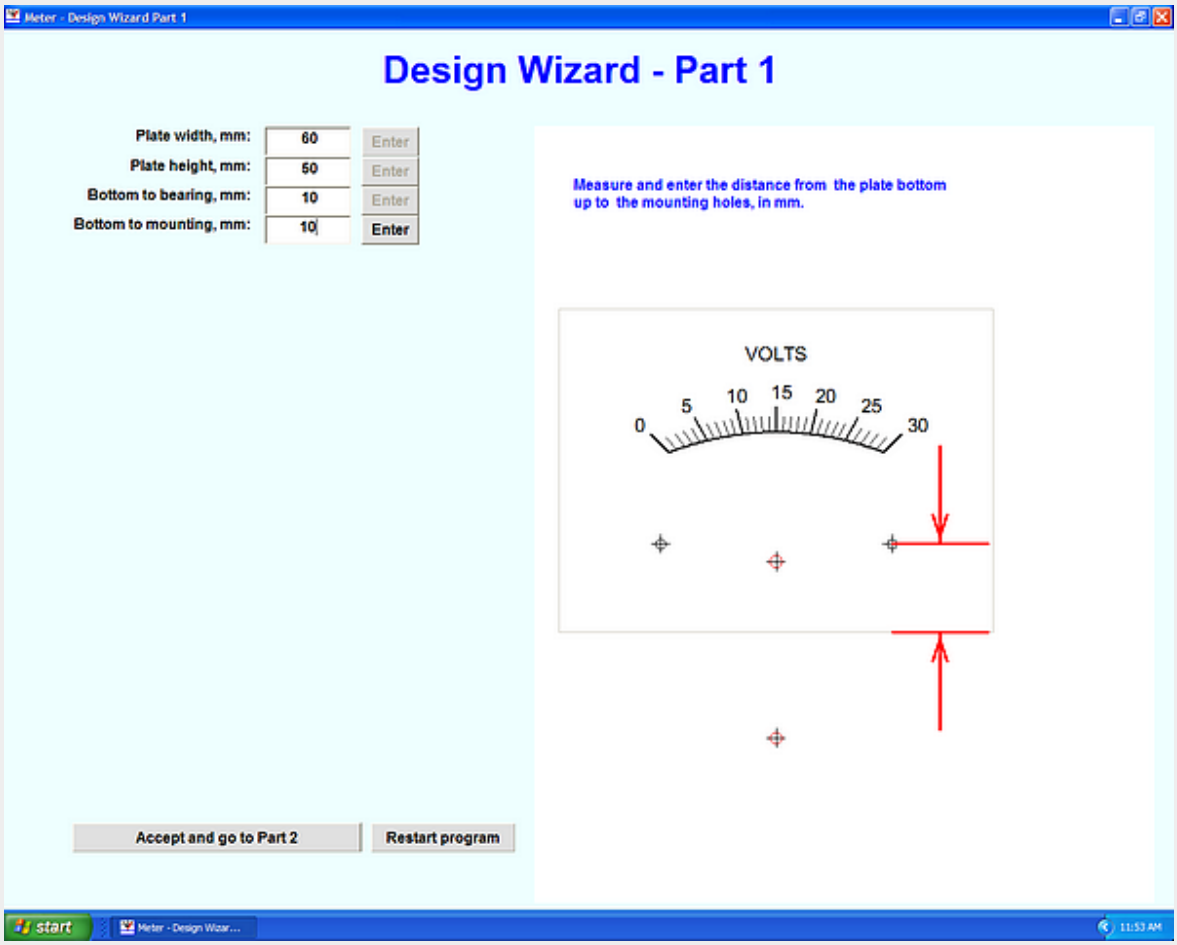



Measure the distance from the bottom of the plate to the bearing in millimeters and enter that number into the textbox and click on the **Enter** button.

Here we have entered a distance of 10 millimeters. Pressing the **Enter** button will take us to the next entry.

# Bottom to mounting

After entering the distance from plate bottom to the bearing we next enter the distance from the plate bottom to the plate mounting holes:

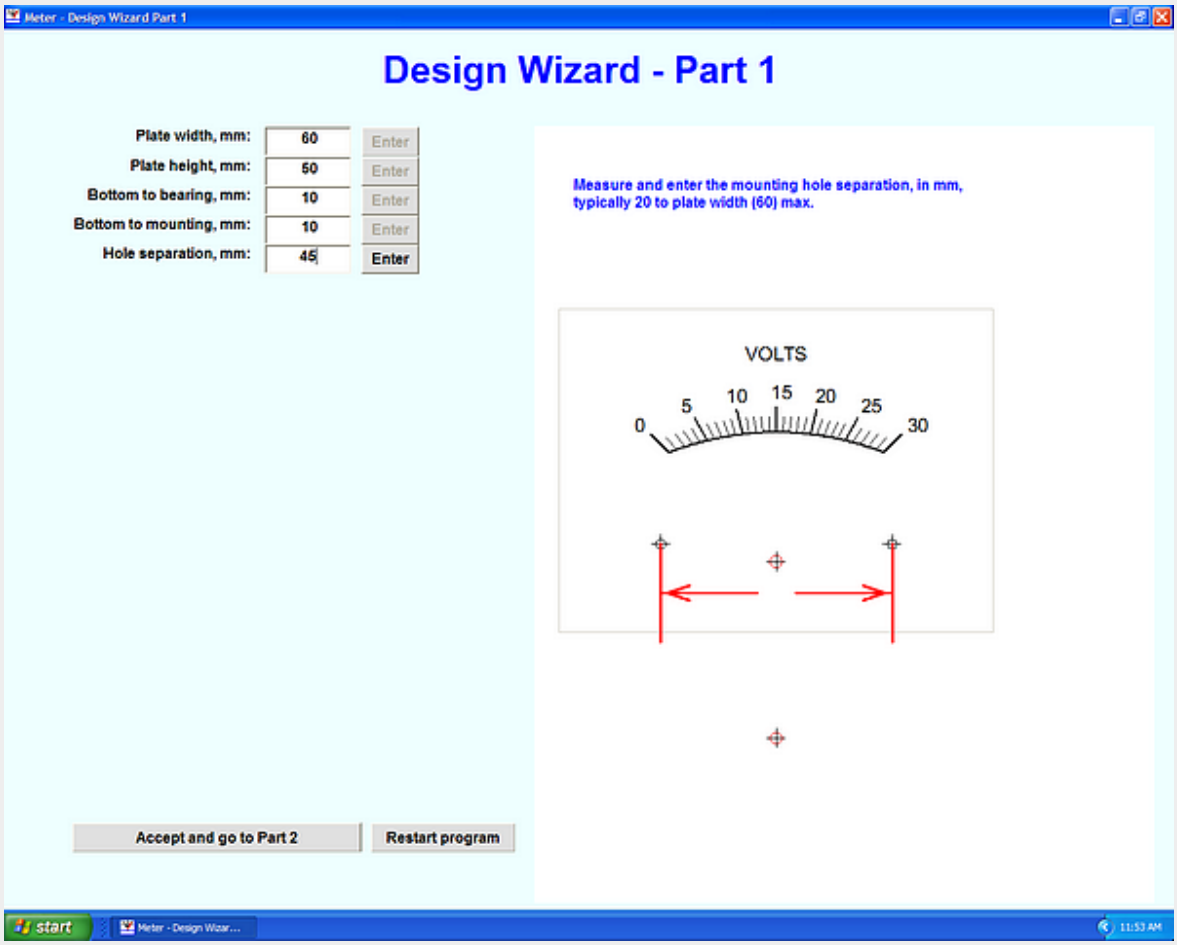



Measure the distance from the bottom of the plate to the mounting holes in millimeters and enter that number into the textbox and click on the **Enter** button.

Here we have entered a distance of 10 millimeters. Pressing the **Enter** button will take us to the next entry.

# Hole separation

After entering the distance from plate bottom to the mounting holes we next enter the distance between the mounting holes:

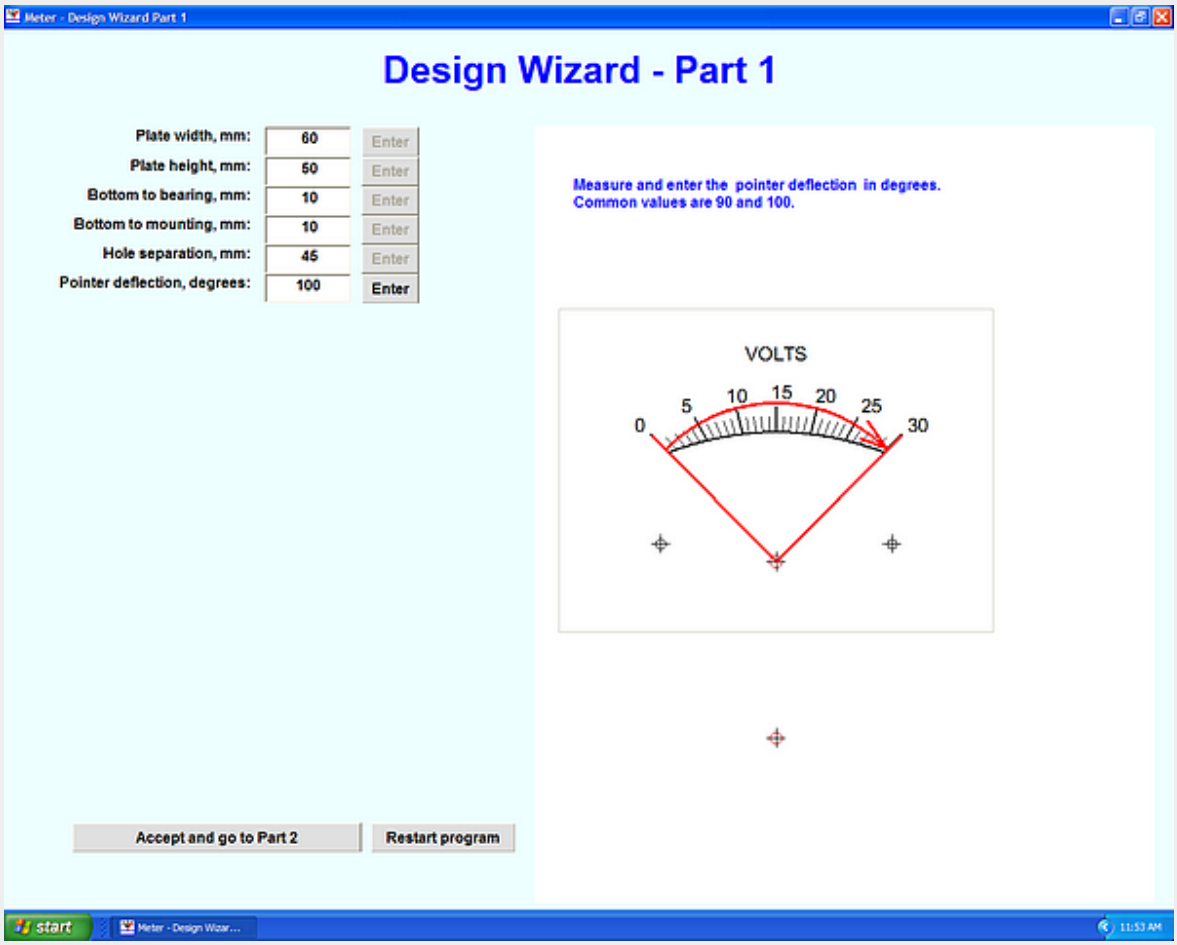



Measure the distance between the two mounting holes, in millimeters, enter that number into the textbox and click on the **Enter** button.

Here we have entered a separation of 45 millimeters. Pressing the **Enter** button will take us to the next entry.

# Pointer deflection

After entering the distance between the two mounting holes we next enter the angular deflection of the pointer:

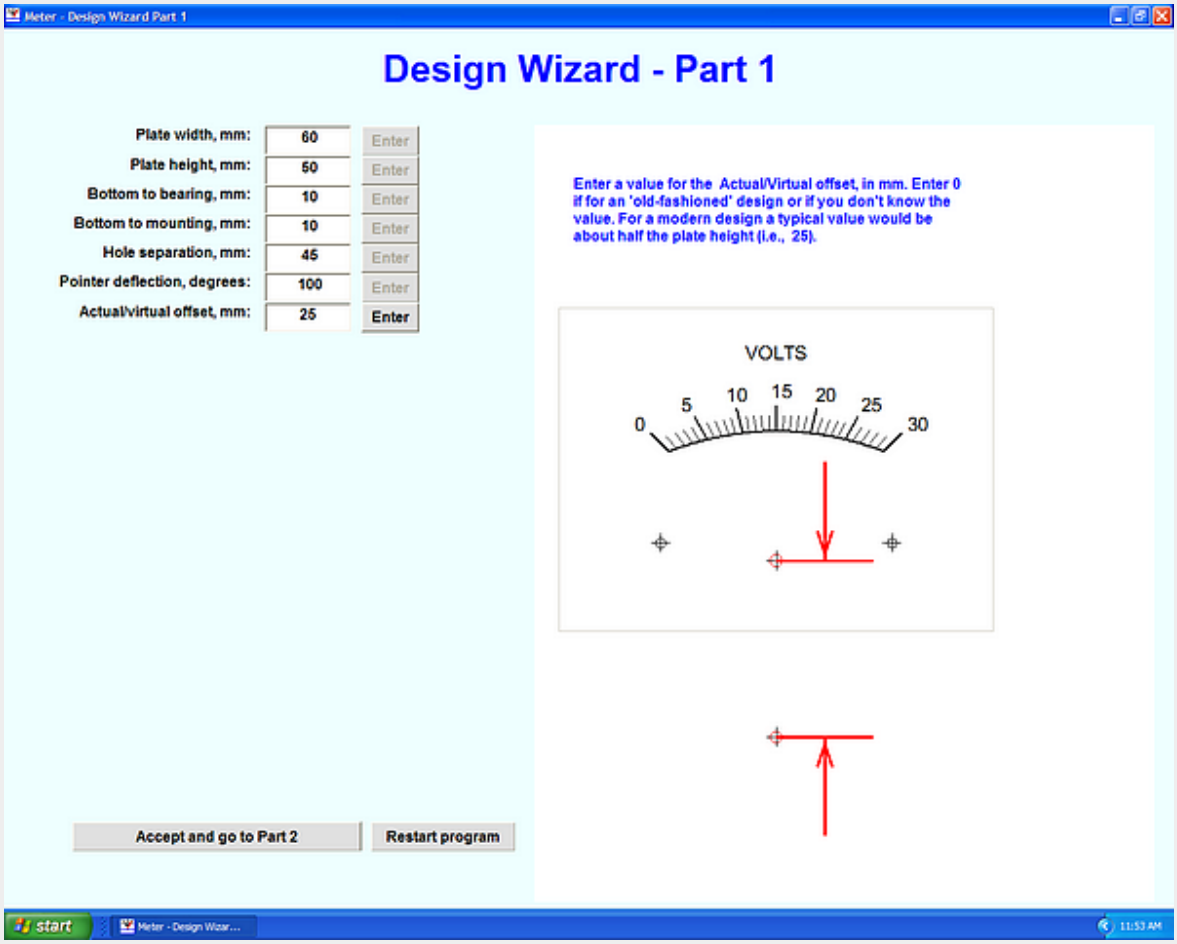



Measure the angular deflection of the pointer, in degrees, and enter that number into the textbox. Typical values are 90 and 100 degrees. Click on the **Enter** button.

Here we have entered an angle of 100 degrees. Pressing the **Enter** button will take us to the next entry.

# Actual-virtual offset

After entering the pointer deflection we enter an arbitrary number we call the 'Actual-virtual offset'. This sets the shape of the arc and may be adjusted from zero up to perhaps the height of the plate.

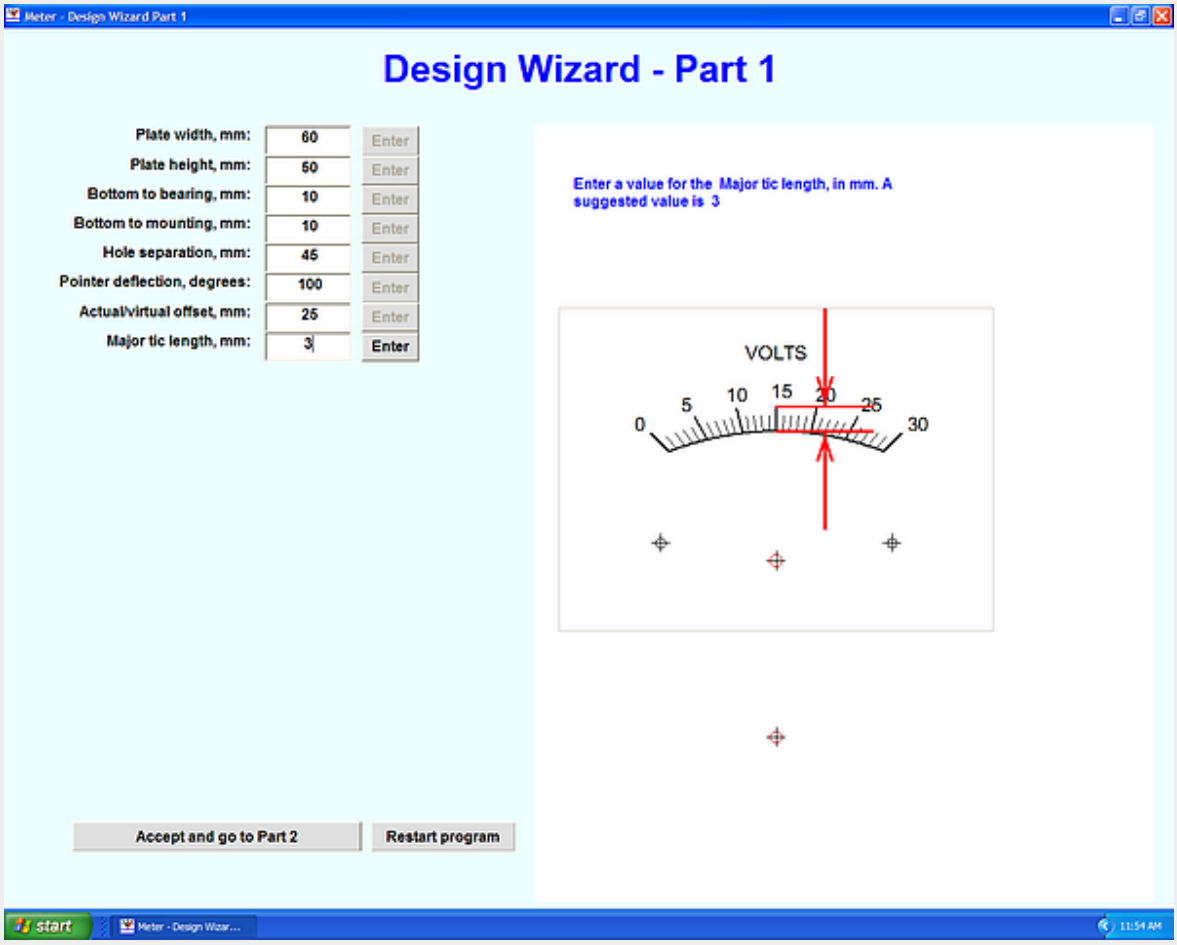



Enter a value of 0 for an 'old style' meter or some value on up to a maximum of the plate height, as shown in the suggested-value information, for a 'modern' design. This is in fact the distance in millimeters from the actual bearing down to an imaginary center for the arc as shown in the illustration. Typical values are about .4 to .8 times the plate height. Enter your value (it can be changed later) and then click on the **Enter** button.

Here we have entered a value of 25. Pressing the **Enter** button will take us to the next entry.

# Major tic length

After entering the actual-virtual offset we enter the length of the major (longer) ticmarks:

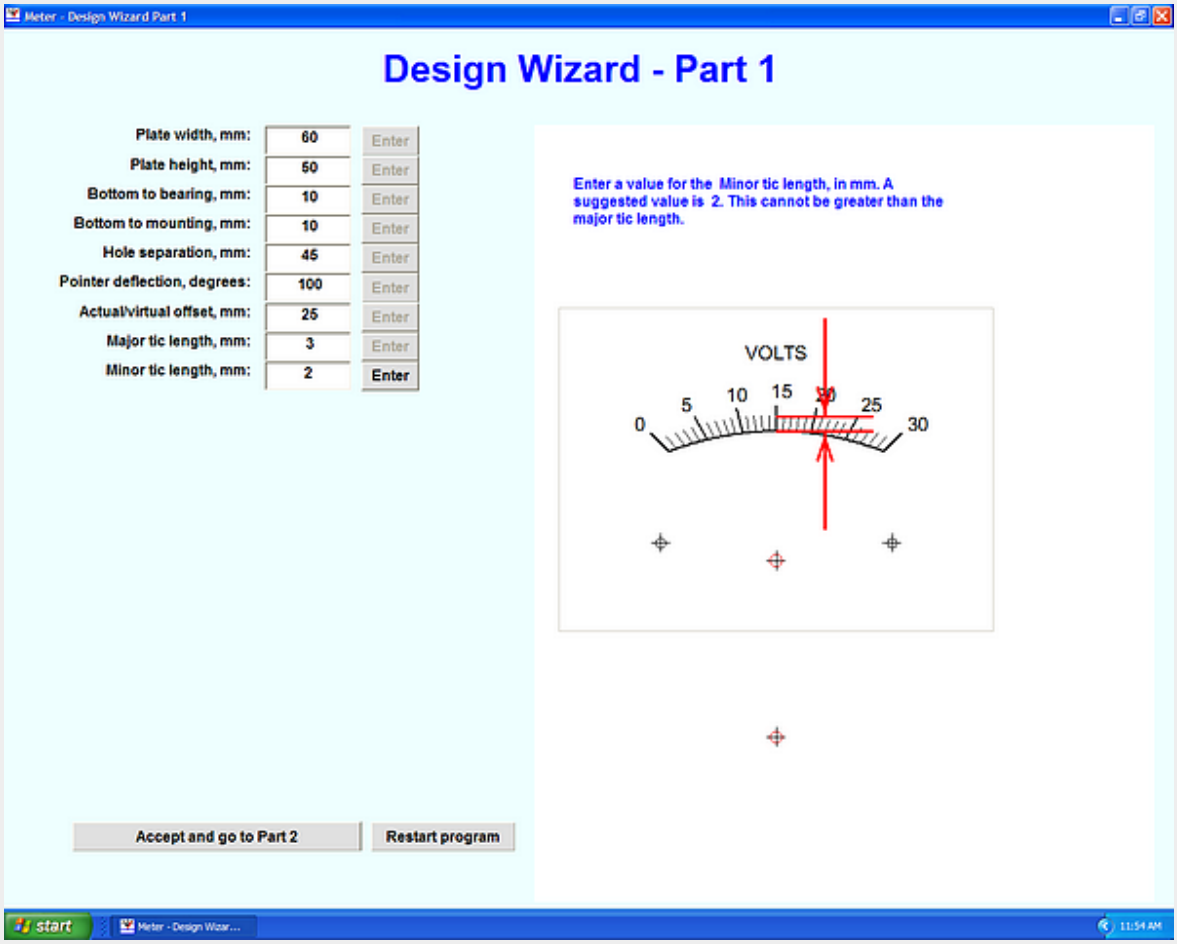



Enter the length of the major ticmarks in millimeters and then click on the **Enter** button.

Here we have entered a value of 3; decimal fractions are allowed. Pressing the **Enter** button will take us to the next entry.

# Minor tic length

After entering the major tic length we enter the length of the minor (shorter) tics:



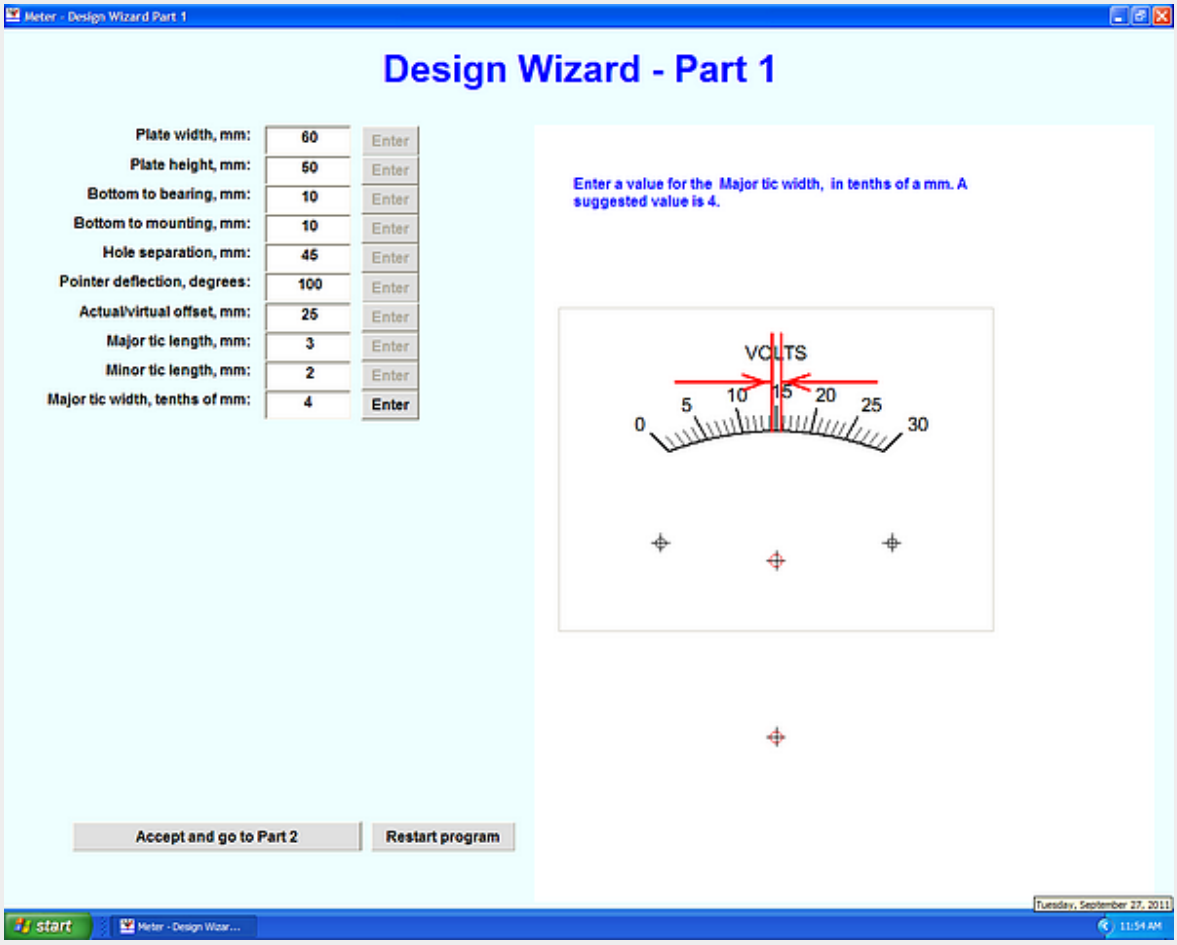

Enter the length of the minor tics in millimeters and then click on the **Enter** button.

Here we have entered a value of 2. The length of these tics must be equal to or less than the major tics.

Press the **Enter** button to go to the next entry.

# Major tic width

After entering the minor tic length we enter the width of the major tics:



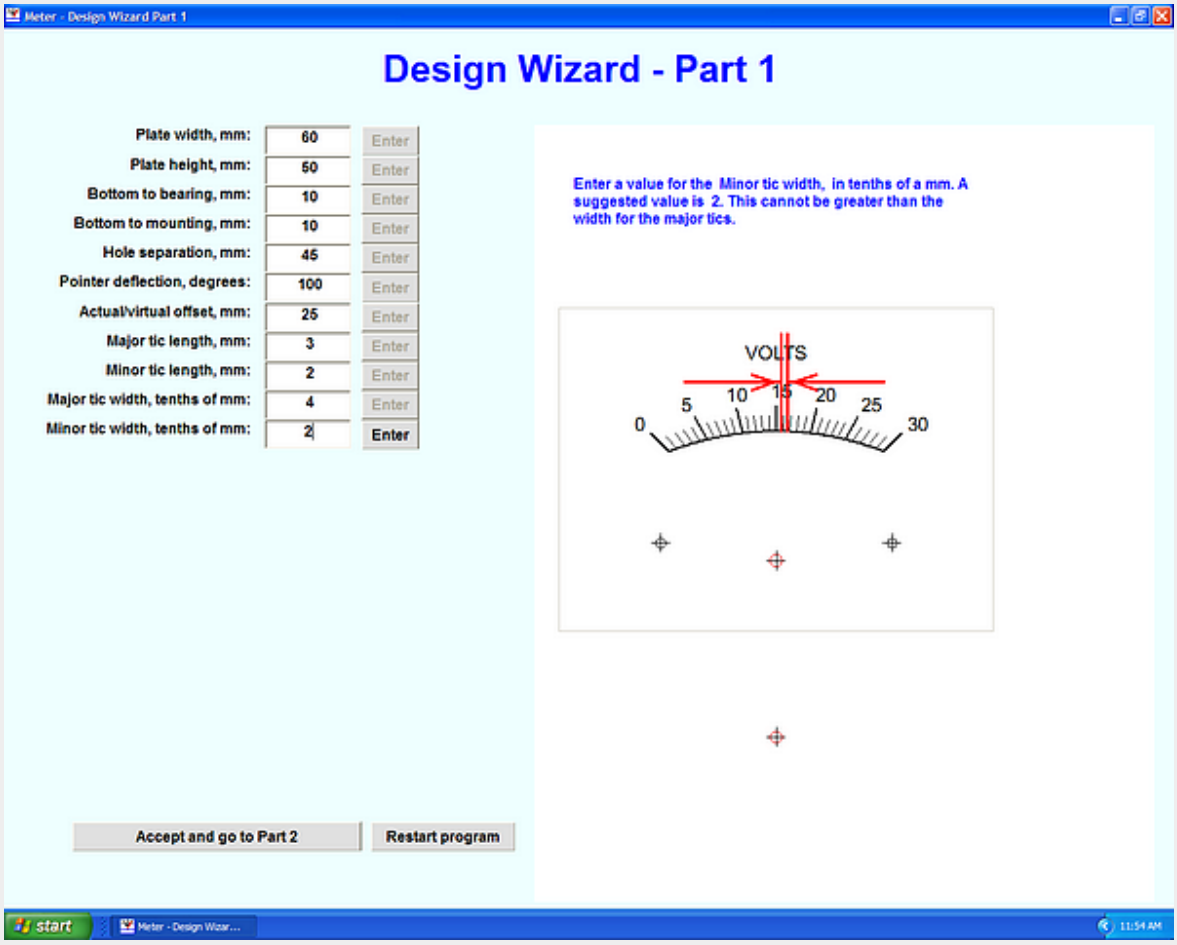

Enter the width of the major tics in tenths of millimeters and then click on the **Enter** button.

Here we have entered a value of 4 (this is tenths of a mm).

Press the **Enter** button to go to the next entry.

# Minor tic width

After entering the major tic width we enter the width of the minor tics:



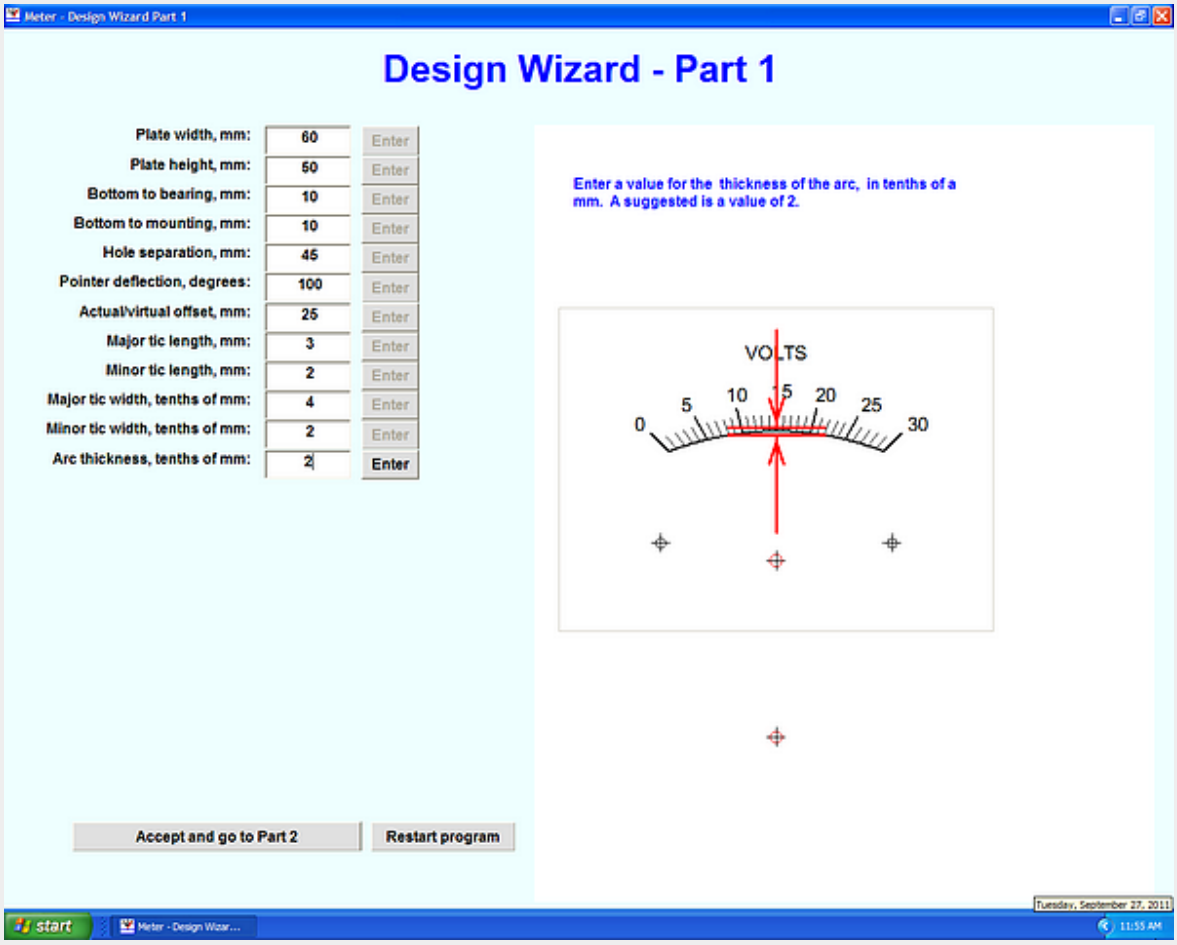

Enter the width of the minor tics in tenths of millimeters and then click on the **Enter** button.

Here we have entered a value of 2 (tenths of a mm).

Press the **Enter** button to go to the next entry.

# Arc thickness

After entering the minor tic width we enter the thickness (width) of the arc:



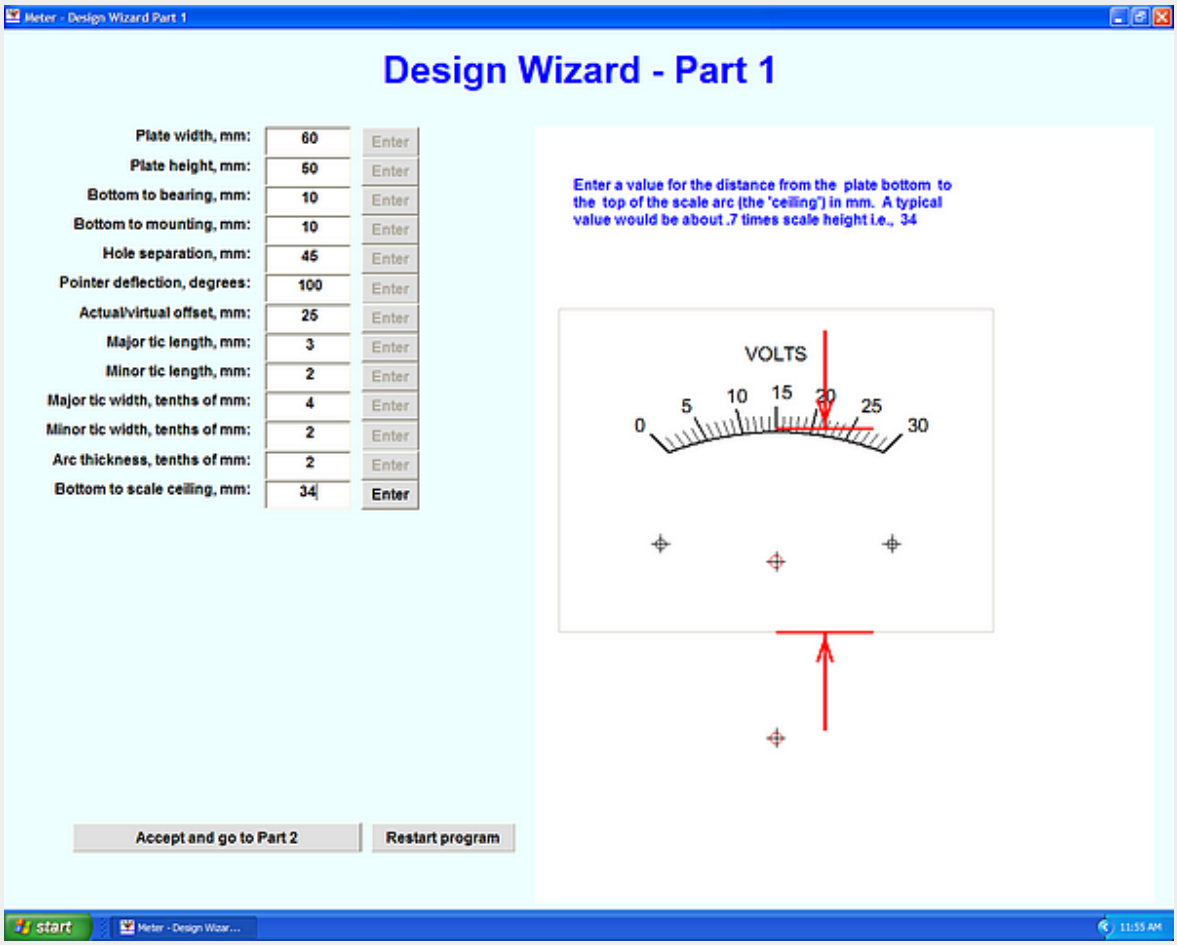

Enter the thickness of the arc in tenths of millimeters and then click on the **Enter** button.

Here we have entered a value of 2 (tenths of a mm).

Press the **Enter** button to go to the next entry.

# Bottom to scale ceiling

After entering the arc thickness we enter the distance from the plate bottom to the top of the scale arc (the ceiling):



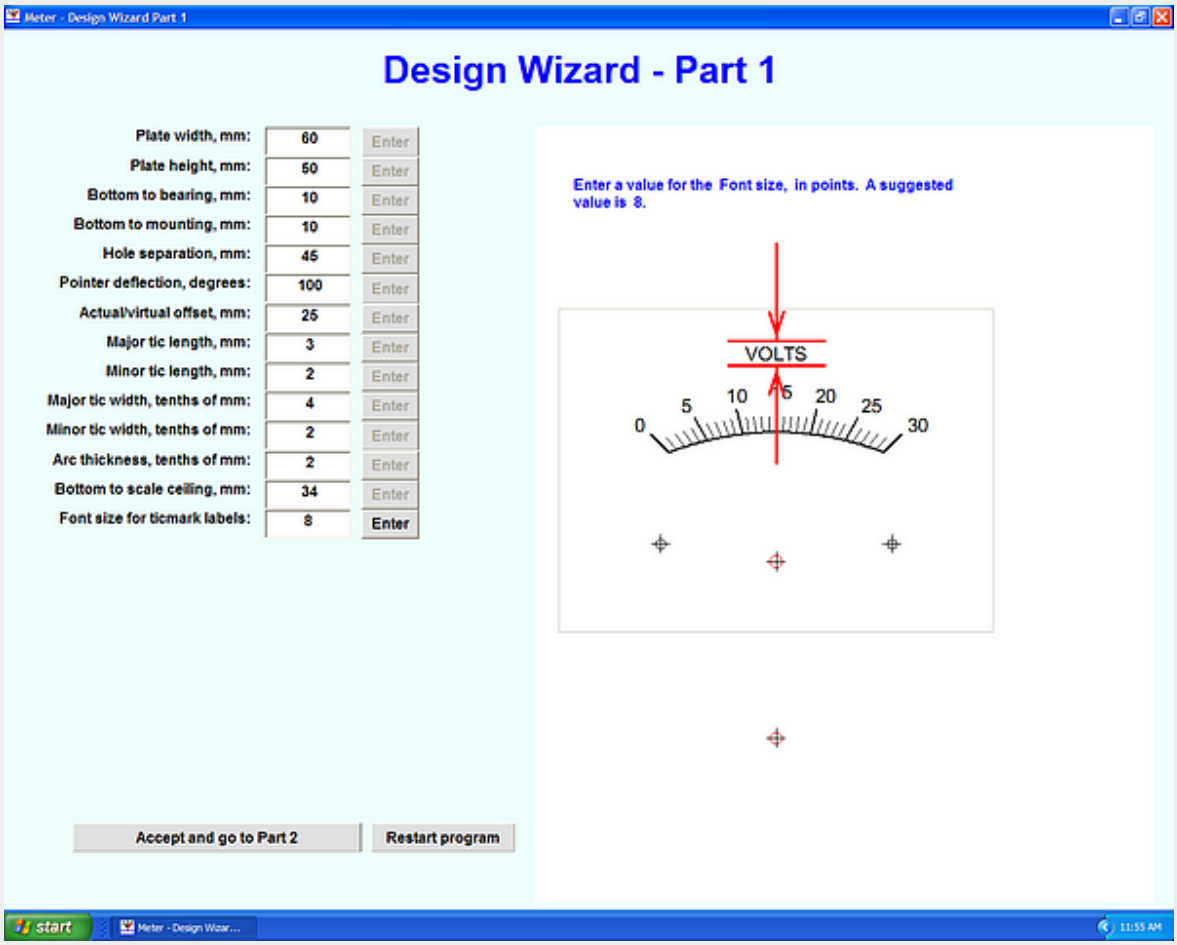

Enter the distance from the plate bottom to the top of the scale arc in millimeters and then click on the **Enter** button.

Here we have entered a value of 34.

Press the **Enter** button to go to the next entry.

# Font size

After entering the distance from the scale bottom to the arc ceiling we enter the size of the font:



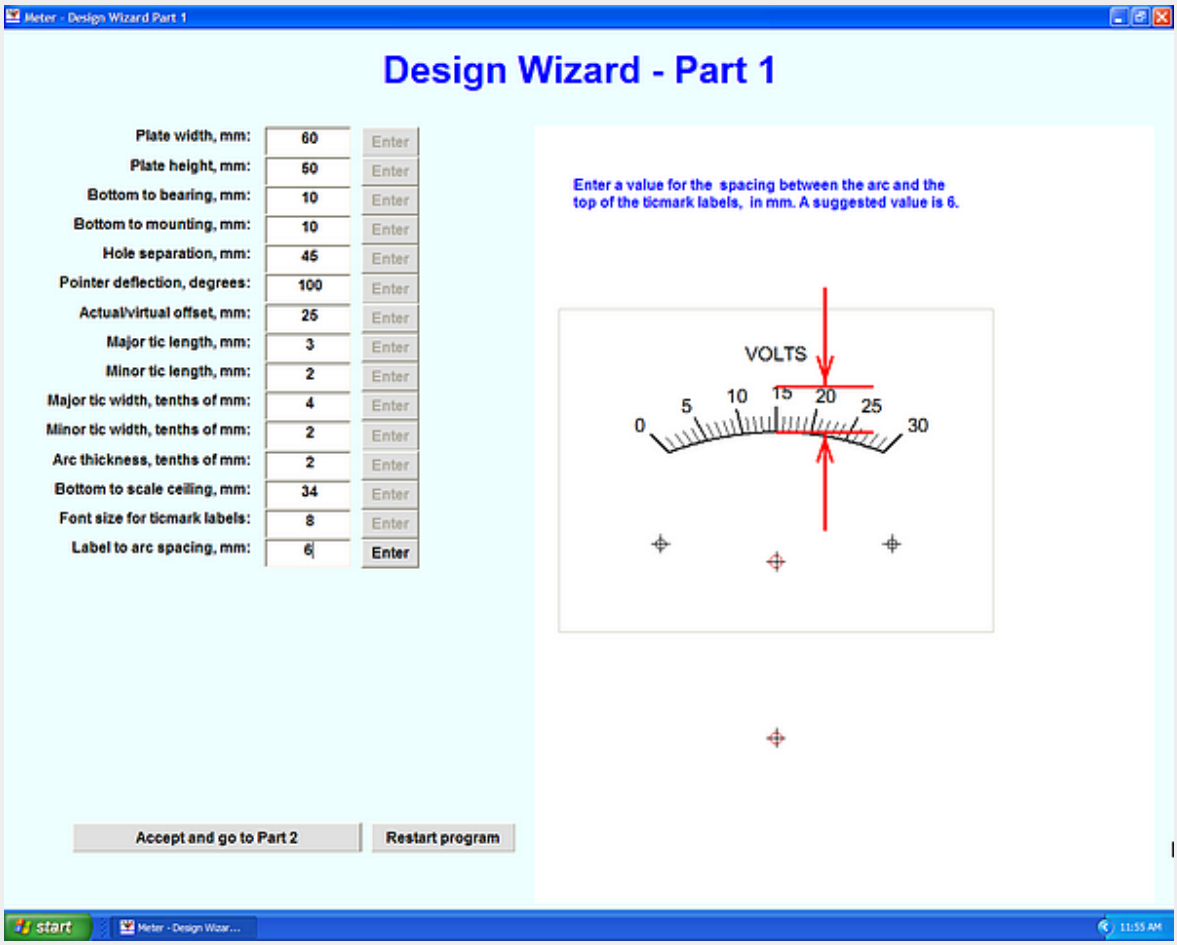

Enter the font size (this is approximately in 'points') and then click on the **Enter** button.

Here we have entered a value of 8.

Press the **Enter** button to go to the next entry.

# Label to arc spacing

After entering the font size for a scale we next enter the spacing between the arc and the ticmark labels:



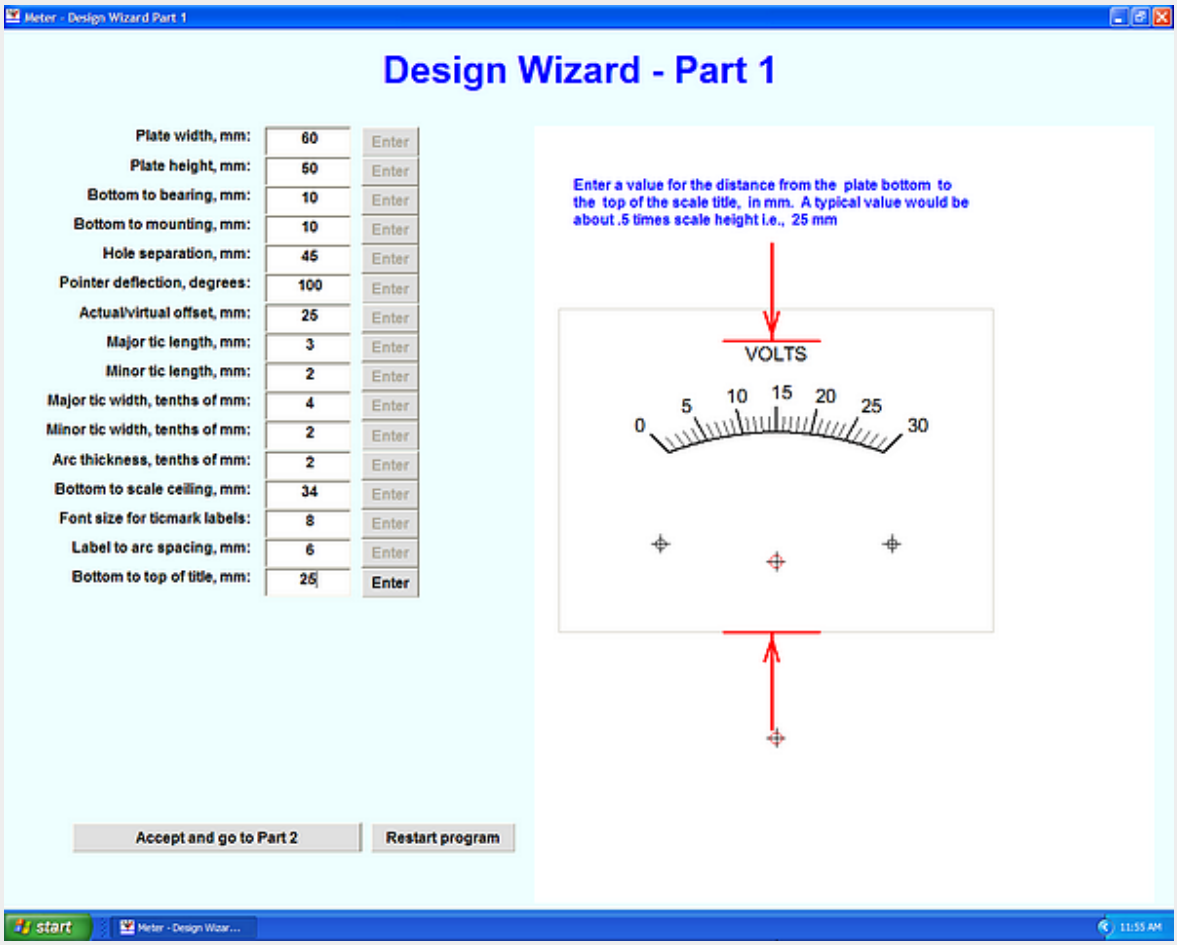

Enter the spacing between the arc and the top of the ticmark labels, in millimeters, and then click on the **Enter** button.

Here we have entered a value of 6 as suggested.

Press the **Enter** button to go to the next entry.

# Bottom to top of title

After entering the spacing between the arc and the ticmark labels, we next enter the distance between the bottom of the plate and the top of the title:




Enter the spacing between the bottom of the plate and the top of the title, in millimeters, and then click on the **Enter** button.

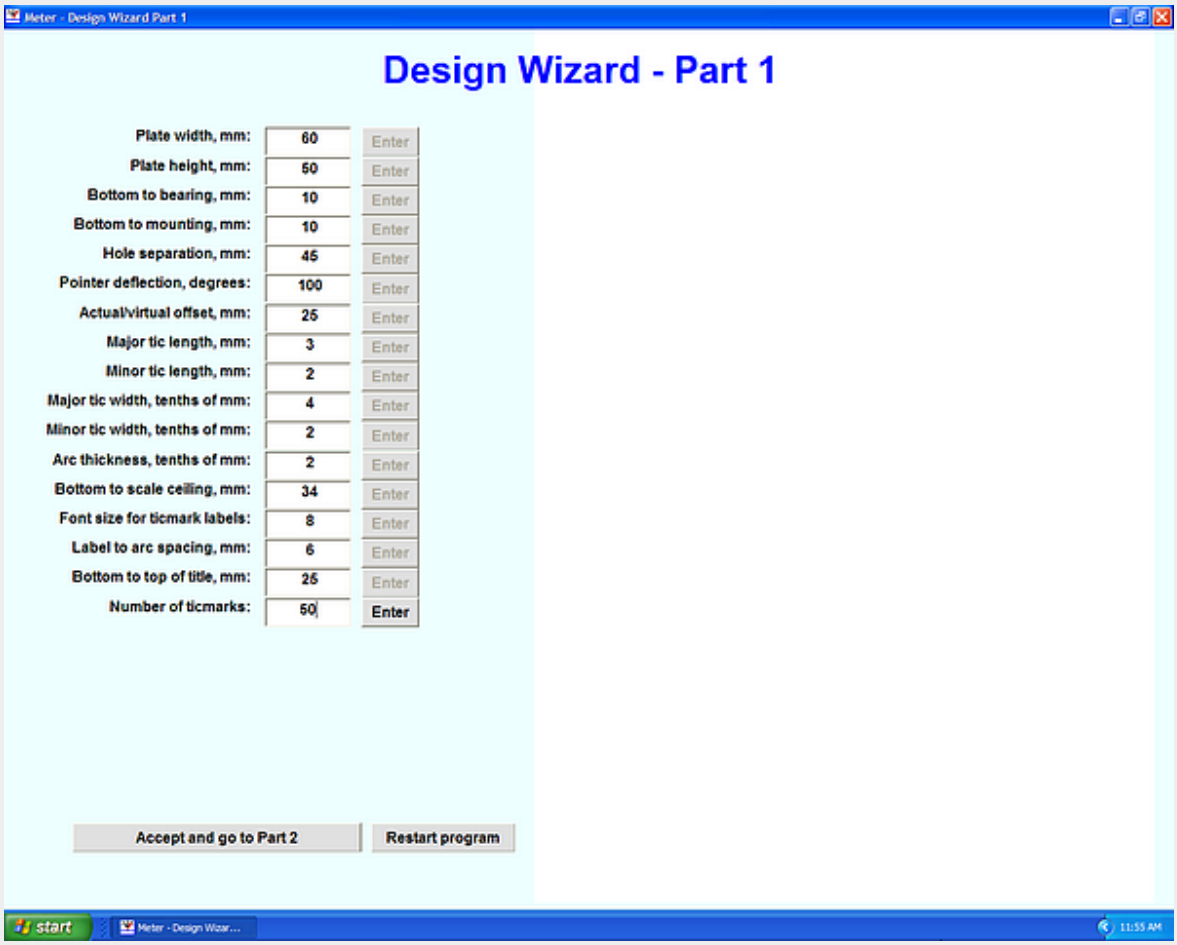
Here we have entered the suggested value of 33 as suggested.

The title may be placed beneath the arc and ticmarks or above them.

Press the **Enter** button to go to the next entry.

# Number of ticmarks

After entering the spacing between the plate bottom and the top of the title, we next enter the number of ticmarks (there is no graphic for this entry):



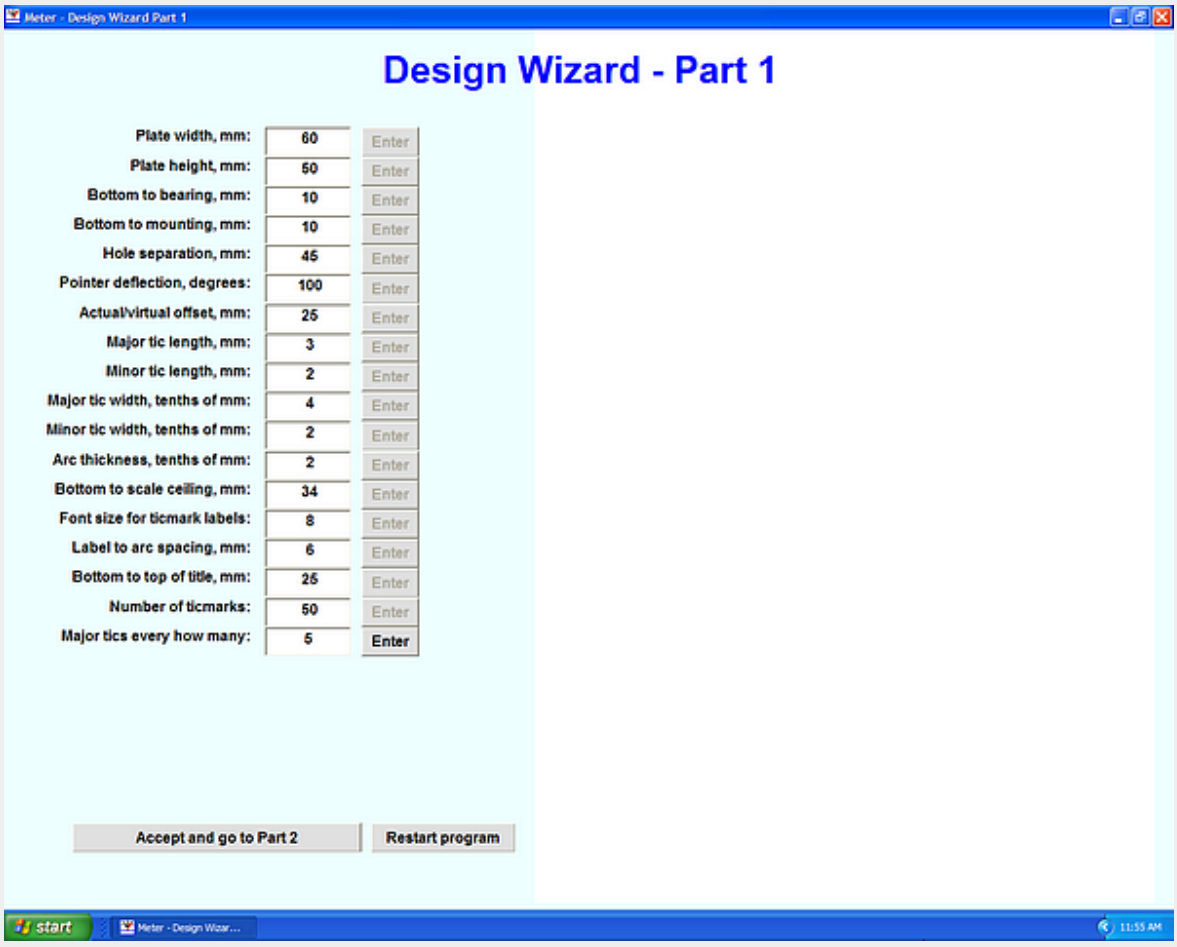

Enter the number of ticmarks. Suggested values will be a minimum of 20 to a maximum of 60. Then click on the **Enter** button.

Here we have entered a value of 50.

Press the **Enter** button to go to the next entry.

# Major tics every how many

After entering the number of ticmarks we must decide how often those ticmarks are to be changed to the major (large) type. (There is no graphic for this entry):



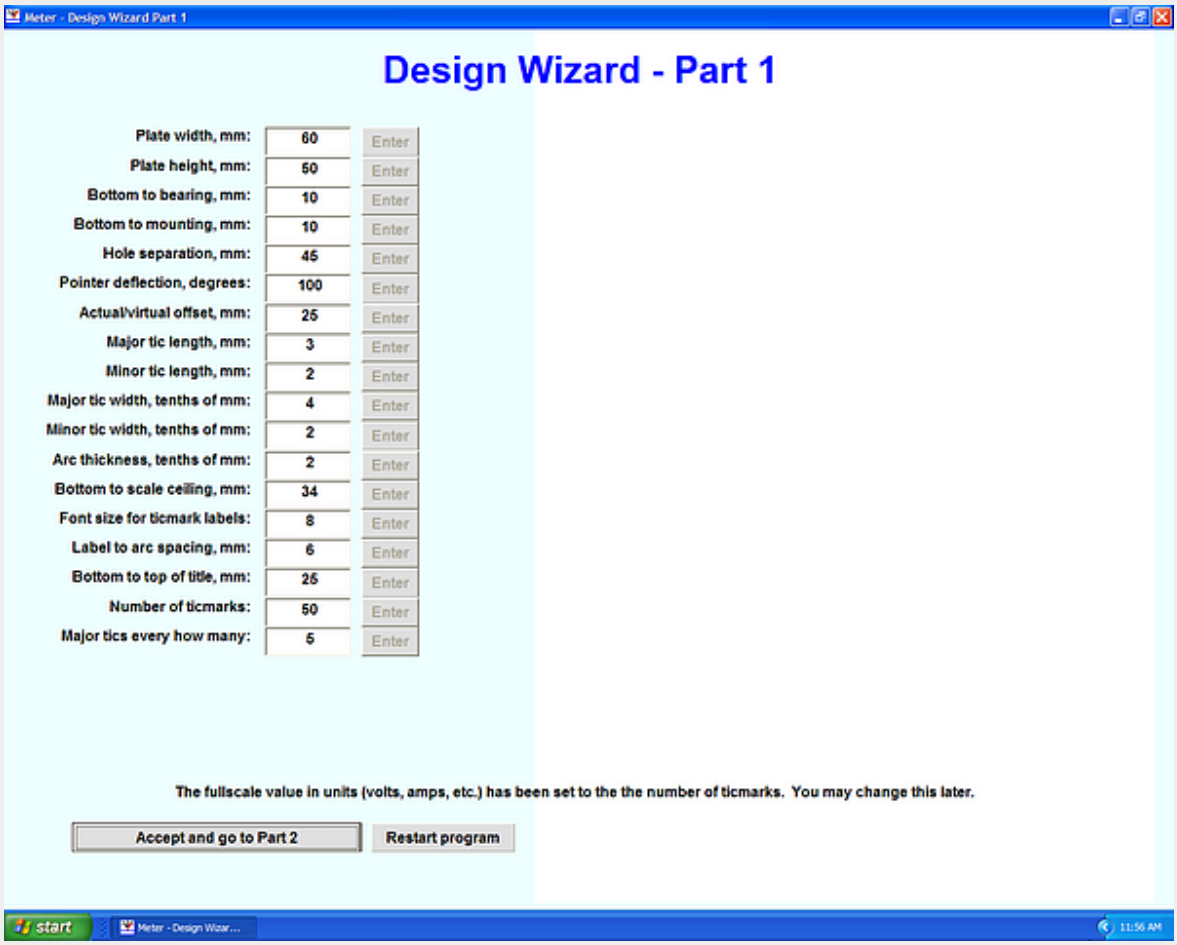

Enter how often the ticmarks are changed from minor (small) to major (large). Suggested value is 5 (every fifth ticmark will be a major type). Then click on the **Enter** button.

Here we have entered a value of 5.

Press the **Enter** button to go to the next entry.

# Accept the entries

You have entered all of the items needed for a basic scale design and this is the appearance of the screen:

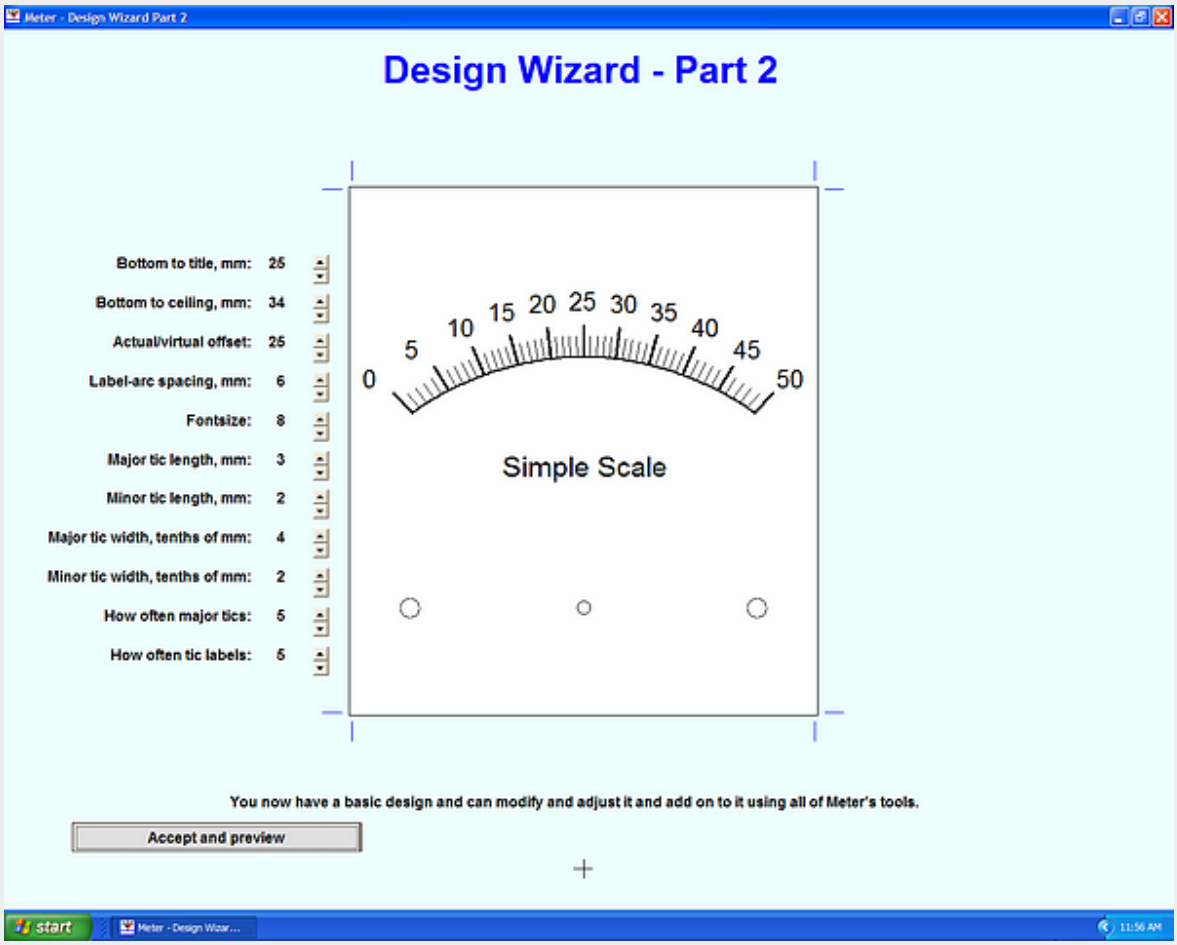



If you see an entry which was accepted by the program but you want to change it at this time, go ahead and place the new entry in the appropriate textbox. These boxes will be read once again when you click on the "Accept and go to Part 2" button. The various "Enter" buttons will remain greyed out.

Press the **Accept and go to Part 2** button when it appears that the entries are reasonable.

## Now at Part 2

You are now in the "tuning" phase of the Wizard and this is the appearance of the screen:




Most of your entries are shown at the left along with associated buttons with up and down arrows. Clicking on (or holding down) one of the arrows will step the associated entry up or down according to which arrow you pressed.

This is a fine time to use the Wizard to quickly see how various items behave or interact. Do this by simply clicking on the buttons to see what happens. The feedback is essentially instantaneous and so you can quickly gain a feel for the various items.

Some items, however, are not adjustable. Examples are the dimensions of the plate, the positions of the mounting holes and the location of the bearing. These are not negotiable and so don't have tuning buttons.

Press the **Accept and preview** button when you have adjusted these items to your satisfaction. This takes you to the main part of the program at which point you can make use of the toolbox in Meter to enhance this startup scale.