Graphical user interface (using MEDM)

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- In this tutorial, we are going to build a graphical user interface (GUI) for our epics calculator (built in the previous tutorial)
- Epics can have extensions, MEDM is one of them.
- Use medm reference manual for more information about medm

  http://www.aps.anl.gov/epics/EpicsDocumentation/ExtensionsManuals/MEDM/MEDM.html

- Don't hesitate to send me questions, comments and suggestions.

About extensions

Epics extensions are program that work alongside epics to give it extra functionality.

It is good practice to have a especific folder to store all the extensions we will use.

Go to epics folder:

```
cd /cygdrive/c/epics
```

Download the extensions cofigure files.

http://www.aps.anl.gov/epics/extensions/configure/index.php

Unzip the downloaded file

```
tar -zxvf /cygdrive/c/Users/Carlos\ Galdino/Downloads/extensionsTop_20120904.tar.gz
```

Go to extensions folder and run the make command

```
cd extensions
make
```

Epics folder will have this folder structure:

- epics

  - base

  - extensions

    - src

      - alh (installed extension)

      - medm (installed extension)

  - myCalculator

-VisualDCT

-…

Install Extensions: medm

Download the most stable version of medm.

http://www.aps.anl.gov/epics/extensions/medm/index.php

Go to folder extensions/scr and Unzip the file medm file:

```
cd src
tar -zxvf /cygdrive/c/Users/Carlos\ Galdino/Downloads/medm3_1_9.tar.gz
```

Change the folder name to medm on windows. On linux simply create a link:

```
ln -s medm3_1_9.tar.gz/ medm
```

Now the installation process vary depending on you are building it on linux or windows.

Linux

On linux you might need to download these packages:

```
sudo apt-get install build-essential libmotif-dev
sudo apt-get install x11proto-print-dev
sudo apt-get install libxp-dev libxmu-dev libxpm-dev
sudo apt-get install xfonts-100dpi
```

Download this font file:
http://www.aps.anl.gov/epics/EpicsDocumentation/ExtensionsManuals/MEDM/medmfonts.ali.txt

Just copy and paste the content in a text editor and save it with the name "medmfonts.ali.txt" and run the command:

```
sudo cat medmfonts.ali.txt >> /usr/share/fonts/X11/misc/fonts.alias
```

This command might change depending on your linux distribution. I highly recommend you to read medm webpage, they have extra information about the process - http://www.aps.anl.gov/epics/extensions/medm/index.php

Go to medm folder and compile it.

```
cd medm
make
```

Don't forget to add medm's bin folder in the PATH. To open medm just use the command medm.

```
medm
```

Windows

On windows you must download a prebuilt version of MEDM for WIN32. Go to

http://www.aps.anl.gov/epics/distributions/win32/index.php

and download and install the latest windowsTools file compatible with your OS (32 or 64 bits). In the installation process, do it like the picture below and save it in the path C:\epicsWindowsTolls (do not use spaces).
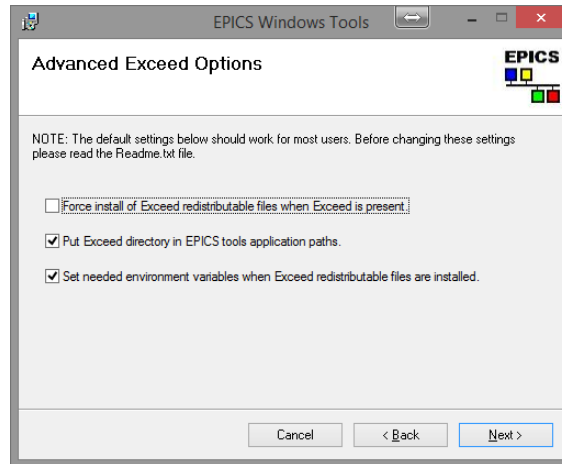
You must also download and install a Windows X Server. I recommend Xming.

http://sourceforge.net/projects/xming/?source=typ_redirect

Use the pictures below as a reference in the installation process. I recommend creating a desktop icon (just for now).
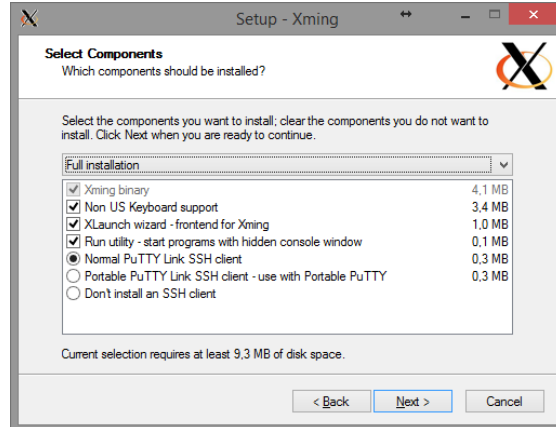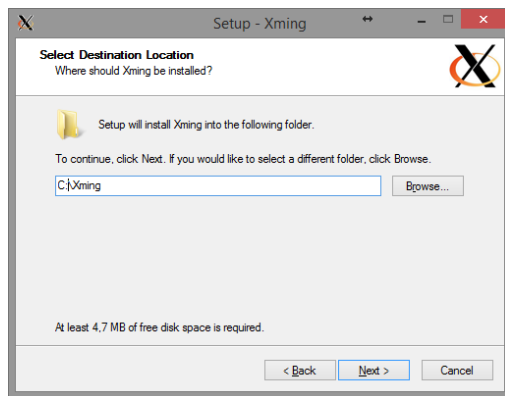
Click in the icon on the desktop to start Xming. Click on the medm.exe (C:\epicsWindowsTools\medm.exe) to start memd.
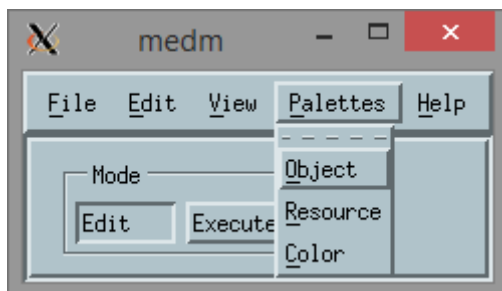
Using medm

We will create a graphical user interface for our calculator (built in a previous tutorial). In medm click on File >> New
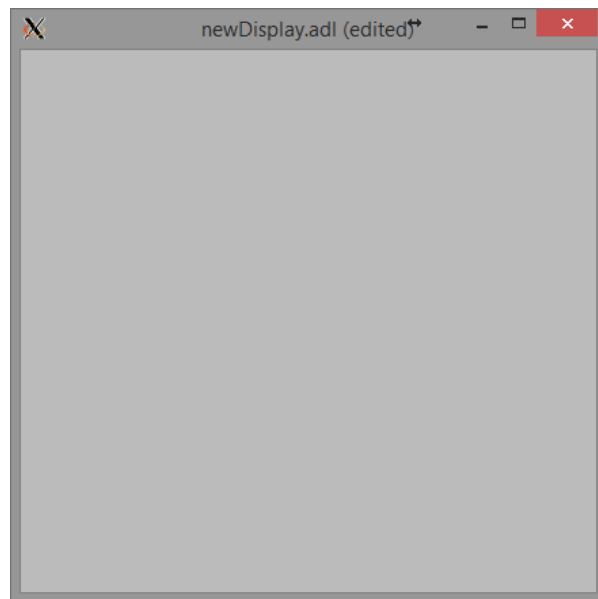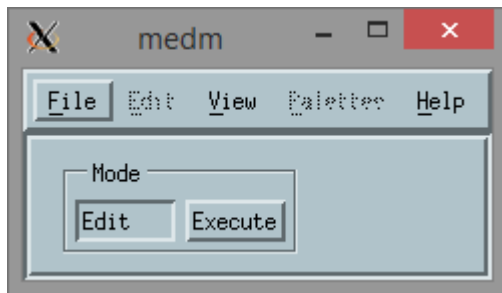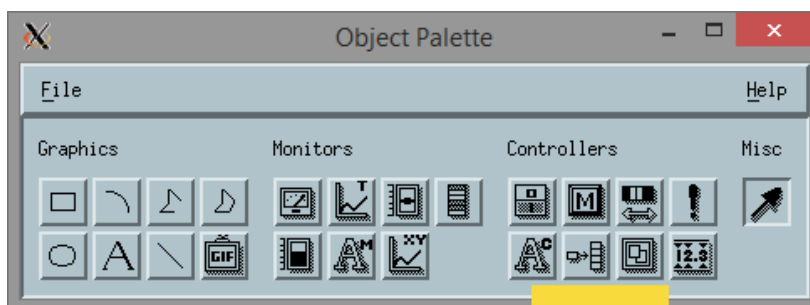
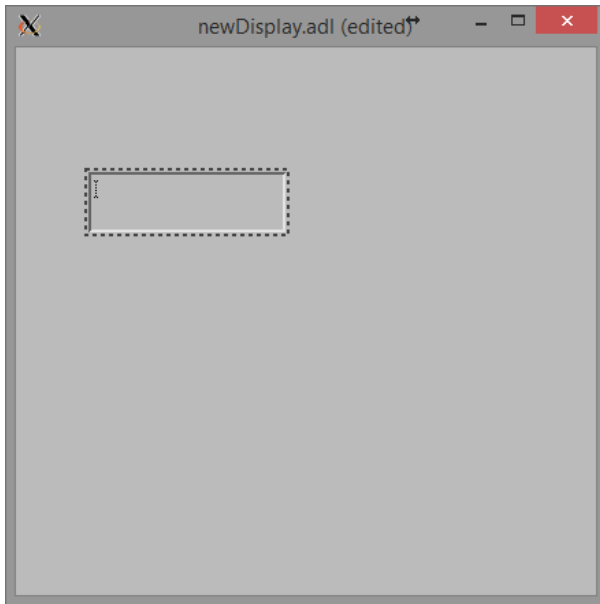Remember we have 3 records: number1, number2 and number3.

Let's create a input field for number1. Click on Pallets >> Objects

Select the Text Entry (under Controllers).

Use click and drag functionality to build a field:

Another window will open. It's the Resource Palette and it holds all the parameters of the text entry field we just did. If you close it, just double click over a object, and the resource palette related to that object will open up.
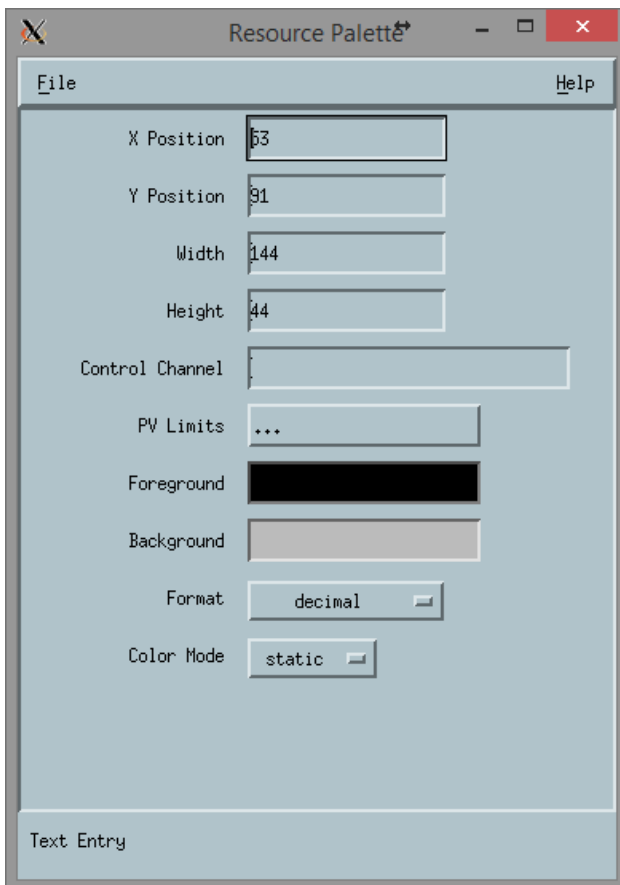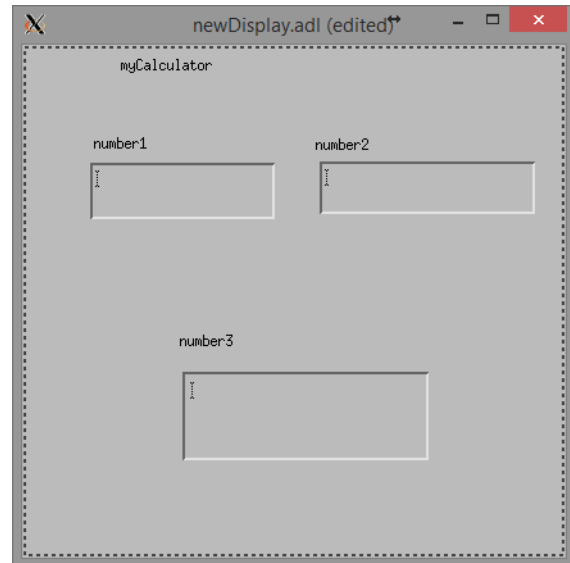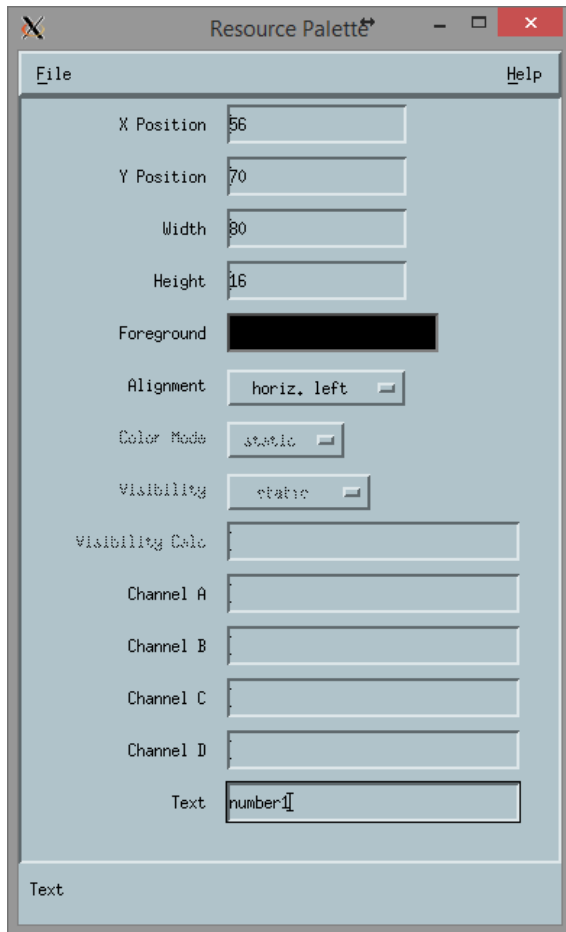

In the control channel field write number1.VAL and press ENTER (don't forget to press enter).

Control Channel number1.VAL
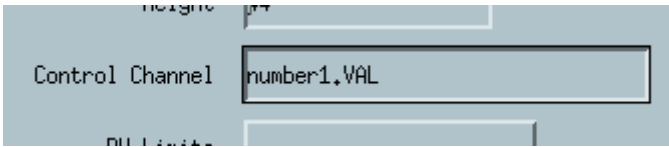
Close the resource palette and do the same for number2 and number3.
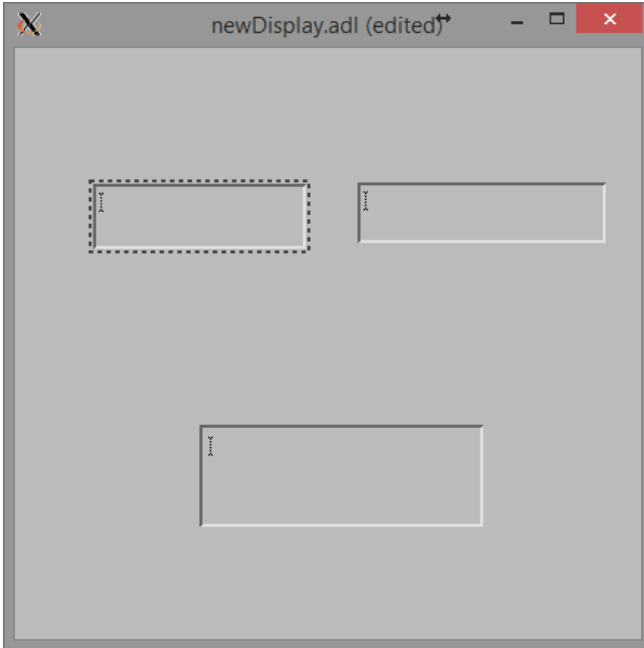
Put some labels over the fields using Text under Graphics.

I think you may already notice that you can change the size of objects, color, etc… I will not run through these features because they are self-explanatory, take a time to edit your GUI.

Saving the GUI

To save the GUI, I recommend you to create another folder inside the IOC folder to place the GUI's related to that IOC. Go to App folder inside the ioc folder make two new folders (Op and then adl inside Op).

```
cd /cygdrive/c/epics/myCalculator/myCalculatorApp
mkdir Op
cd Op
mkdir adl
```

Setting you folder structure like this is just good pratice, but you can place your gui files anywhere you want.

Now in the medm window, click on File >> Save and save the gui in the adl folder we created. Use the name myCalculator.adl.

Testing the GUI

Start the ioc using the terminal (see build a calculator tutorial for information) and then click Execute on medm window to start the gui.
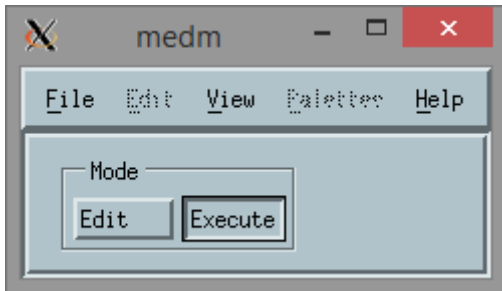
Edit the filed to see what happens. Notice you need to have your mouse pointes over the field you are editing all the time, and when you finish editing it, don't forget to press enter.
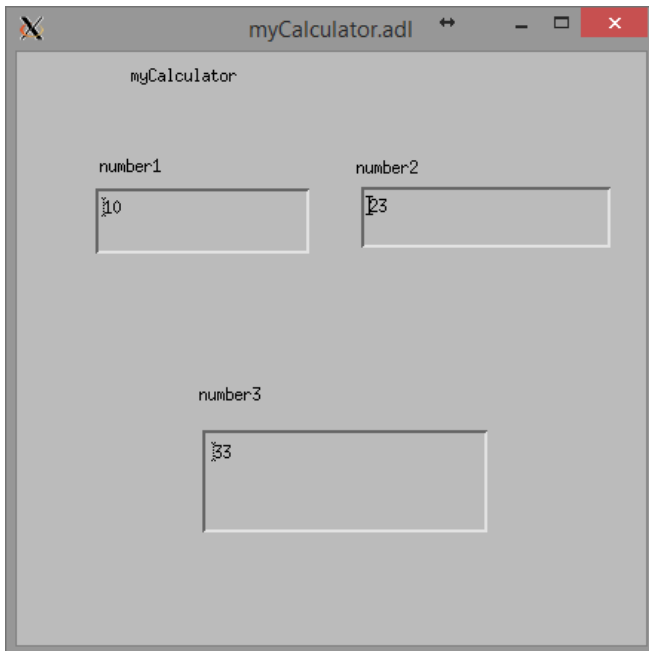
You can go back to edit mode and change the Precision of the field. Also use the terminal and the commands – dbl, dbpr and dbpr – to check that the GUI and epics are communicating.