AN OVERVIEW OF MEDM*

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Abstract

MEDM, which is derived from Motif Editor and Display Manager, is the primary graphical user interface to the EPICS control system and has also been used for other control systems. MEDM has two modes of operation, EDIT and EXECUTE. In its EDIT mode it provides the drawing tools needed to design control screens for operator interfaces. In its EXECUTE mode it manages those screens to communicate with the control system. MEDM provides a set of interface objects that falls into three main categories: (1) Monitors, such as text, meters, and plots; (2) Controllers, such as buttons, menus, and sliders; and (3) Drawing Objects, such as lines, rectangles, and images. Each of these objects has many options, allowing for the development of screens ranging from simple to quite sophisticated. MEDM has been developed over the last decade, primarily at Argonne National Laboratory, and is a large, well tested, extensively used program. It runs on most flavors of UNIX, VMS, and Windows 95/98/NT. It has been used to design thousands of control screens, such as the one shown in Fig. 1, at the Advanced Photon Source and other sites around the world. This paper presents an overview of MEDM and its features.

1 INTRODUCTION

This paper assumes the reader is familiar with the Experimental Physics and Industrial Control System (EPICS). Further information on EPICS and MEDM may be found in the extensive online and printed EPICS documentation [1]. MEDM is an X Windows program that uses Motif, a standard collection of widgets. (Widgets are X Windows interface objects.) Its attractive look and feel is derived from the three-dimensional appearance of Motif. MEDM has been designed for UNIX systems but will run on VMS as well. It will run as native code on Windows 95/98/NT, provided the Exceed X Server and X libraries [2] are used. MEDM has extensive help, both menu-driven and context-sensitive, as well as a comprehensive reference manual. The interactive help utilizes Netscape [3], which can be controlled from within MEDM.

2 MEDM OBJECTS

MEDM supports a relatively small number of objects, which are used as its building blocks in designing control screens. These screens are also called displays. The MEDM objects are listed in Table 1. In addition, there are two special objects, the Display itself and the Composite, which is a group of MEDM objects defined either by grouping the objects in EDIT mode or by

![Figure 1: Advanced Photon Source status display.](image-url)

Table 1: MEDM Objects

<table>
<thead>
<tr>
<th>Graphics</th>
<th>Monitors</th>
<th>Controllers</th>
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</thead>
<tbody>
<tr>
<td>Arc</td>
<td>Bar Monitor</td>
<td>Choice Button</td>
</tr>
<tr>
<td>Image</td>
<td>Byte Monitor</td>
<td>Menu</td>
</tr>
<tr>
<td>Line</td>
<td>Cartesian Plot</td>
<td>Message Button</td>
</tr>
<tr>
<td>Oval</td>
<td>Meter</td>
<td>Related Display</td>
</tr>
<tr>
<td>Polygon</td>
<td>Scale Monitor</td>
<td>Shell Command</td>
</tr>
<tr>
<td>Polyline</td>
<td>Strip Chart</td>
<td>Slider</td>
</tr>
<tr>
<td>Rectangle</td>
<td>Text Monitor</td>
<td>Text Entry</td>
</tr>
</tbody>
</table>

The Frame Object is a Motif window object set to animate or to have a particular size on the display. The Frame Object may be set to animate or to have a particular size on the display, and the animated frames are drawn or not.) The Frame Object is also used for ENUM process variables. The Frame Object is also used for ENUM process variables.

The Line Object is a Motif line widget that is used to draw lines on the display. The line can be drawn in any of several colors, and the line width can be specified.

The Image Object is a Motif image widget that is used to display a graphical image on the display. The image can be a GIF file, or it can be a Motif window.

The Text Object is a Motif text widget that is used to display text on the display. The text can be any text, and it can be formatted in any way.

The Rectangle Object is a Motif rectangle widget that is used to draw rectangles on the display. The rectangle can be drawn in any of several colors, and the rectangle can be filled.

The Oval Object is a Motif oval widget that is used to draw ovals on the display. The oval can be drawn in any of several colors, and the oval can be filled.

The Polygon Object is a Motif polygon widget that is used to draw polygons on the display. The polygon can be drawn in any of several colors, and the polygon can be filled.

The Polyline Object is a Motif polyline widget that is used to draw polylines on the display. The polyline can be drawn in any of several colors, and the polyline can be filled.
The Resource Palette, shown in Fig. 3 for a Meter, is used to change the properties of the object. What appears in the Resource Palette for a particular object depends on what properties the object supports. The property choices may be specified through text boxes, menus, a color selector, or buttons that bring up dialog boxes.

![Resource Palette](image1)

Figure 3: Resource Palette displaying the choices for a Meter.

The color selector brings up the Color Palette, shown in Fig. 4. MEDM has a colormap consisting of 65 colors. There is a default colormap, but each display may have its own colormap, defined in its display file or specified by the name of a separate colormap file.

![Color Palette](image2)

Figure 4: Color Palette showing the default colors.

4 EXECUTE MODE

In EXECUTE mode MEDM manages the connections to all the process variables associated with all the objects in all of the displays that it has open and also keeps the MEDM objects updated with the latest values. It handles user input to change the values of the process variables and interact with any of the MEDM objects.

MEDM can manage one hundred or more displays at the same time, depending on the complexity of the displays and the power of the workstation on which it is running. There is a command line option that allows new invocations of MEDM to pass their displays to an already-running MEDM, then exit, avoiding a proliferation of executables and providing efficiency. It also makes it easier to write scripts that bring up all the necessary displays to operate a particular device such as an accelerator ring.

There is a popup menu of options for the user in EXECUTE mode. The user can print or close the display and can obtain extensive information about the process variables associated with an MEDM object that is selected with the cursor. The resulting dialog box for doing this is shown in Fig. 5. The user can set the limits of objects, such as the Meter or Bar Monitor, for which limits are appropriate or set the precision (number of decimal places) of numbers displaying in the object. The user can obtain a list of all the currently managed displays and can access an optional, configurable submenu of custom commands.

![PV Info dialog box](image3)

Figure 5: PV Info dialog box.

5 REFERENCES


[3] Netscape is a product of Netscape Communications Corporation, Mountain View, CA.