Dynamic Attributes

This Technical Notes describes the current implementation of Dynamic Attributes handling in Designer 5.06 and Firmware V4.23 and greater.

Contents

1. Dynamic Color Attributes 1
2. Dynamic Monochrome Attributes 2

1. Dynamic Color Attributes

This chapter refers to all panels equipped with color displays.

All UniOP color panels support a type of dynamic attribute field that will allow the user to dynamically control the color of an area on the display.
The color attributes have been introduced as an extension to the existing monochrome dynamic attributes (blink, reverse and highlight).

The word in the controller memory referenced by the dynamic attribute will be interpreted as shown in the table below.

Bit	15 14 13 12	11 10 9 8	7	6	5	4	3	2 1 0
	F0-F3	B0-B3					C	M0-M2
	Foreground color	Background color						Monochrome attribute

Table 1

C is the bit that enables the color attribute mode:

C	Color attributes
0	Disabled
1	Enabled

Table 2

The Monochrome attributes are interpreted in the conventional way. See table below.

M2	M1	M0	Numeric value	Attribute
0	0	0	0	Normal
0	0	1	1	Blinking
0	1	0	2	Highlight
1	0	0	4	Reverse

Table 3

The Color attributes are interpreted according to the table below.

Bit				Numeric value	Color
3	2	1	0		
0	0	0	0	0	Black
0	0	0	1	1	Dark Red
0	0	1	0	2	Dark Green
0	0	1	1	3	Dark Yellow
0	1	0	0	4	Dark Blue
0	1	0	1	5	Dark Magenta
0	1	1	0	6	Dark Cyan
0	1	1	1	7	Dark Gray
1	0	0	0	8	Light Gray
1	0	0	1	9	Red
1	0	1	0	10	Green
1	0	1	1	11	Yellow
1	1	0	0	12	Blue
1	1	0	1	13	Magenta
1	1	1	0	14	Cyan
1	1	1	1	15	White

Table 4

Note that the Foreground color and the Background color can be independently controlled.
UniOP firmware 4.20 or later is required to support dynamic color attributes.

2. Dynamic Monochrome Attributes

In addition to dynamic color attributes, starting from Firmware V4.23 and greater, a new dynamic attributes handling is also added to all the monochrome graphic display starting from ¼ VGA display size.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	F0-F3				B0-B3								C	M0-M2		
	Foreground color				Background color									Monochrome attribute		

Table 5

C is the bit that enables the dynamic monochrome attribute mode:

C	Monochrome attributes
0	Disabled
1	Enabled

Table 6

Once the dynamic attributes handling is enabled for background and foreground color, it is possible to set the F0..F3 and B0..B3 bits.
The monochorome diplay pixels have only two status: ON and OFF.
If at leat one bit of background area control is set, the backgrond area will appear as black.
If at least one bit of foregroung area control is set, the foreground are will appear as black.
Because each pixel of a monochrome display has only two states it is not important which is the bit involved.

If for instance one variable has to be hidden, the bit C should be set to enable the dynamic attributes handling for foreground and backgorund are control and at least one bit from F0..F3 and one bit from B0..B3 has to be set to one.