Scaling

Designer for Windows is capable of scaling data being sent to or being displayed from the controller. Scaling can be done to a field from within the define field dialog box (see Figure 1).

Another feature that parallels with scaling is the ability to use fixed point numbers. This allows the user to display decimal values on the panel. Simply select the *Fixed Point* radio button and enter the number of decimal places to be displayed in the *Placement* box (see Figure 1). *Keep in mind that the decimal point will take up one position in the field (i.e., a field with a width of four and a placement of 1 can display at most the number 99.9).*

The Scaling Equation

The scaling equation is defined as:

$$Y = (A / B) * X + C$$

Where,
Y = Scaled value displayed
X = Controller data value
A,B,C = Scaling operators - these are the three entry boxes located within the scaling equation

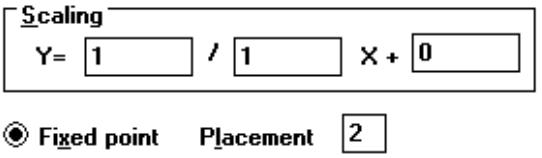

Figure 1

There are two important concepts to understand about scaling. *First and foremost, the scaling operators (A, B, and C) are 16 bit integers. This means that the intermediate result may be 32 bits, which* ***allows the panel to report a more precise result than if it were using only 16 bits.***

Secondly, ***the maximum and minimum fields refer to the scaled value****, not the value that is in the controller.*

Two examples of using scaling follow. The first is an example in which a user has a Celsius temperature in the controller and wishes to display a Fahrenheit temperature on the UniOP panel. The second is an example in which a user has a controller memory location that can range in value from 0 to 4095. Depending upon the value in the controller, the user wishes to display that value as a percentage of the maximum possible value on the panel.

Example 1:
Assume a user has a controller that is displaying the temperature of a motor in Celsius. The person operating the panel is only familiar with temperature readings in the Fahrenheit scale. By using scaling, the user is capable of having the Celsius temperature from the controller appear as a Fahrenheit temperature on the display panel.

1. Create a numeric field and reference it to the address in the controller that is reporting the temperature. For this example, assume the address is DM155. Once the numeric field is created, the define field dialog box will appear.

2. We know that to convert a value from Celsius to Fahrenheit, we need to multiply the Celsius temperature by 9/5 and add 32 to the result.

3. Consider the scaling equation again : Y = (A/B) * X + C. Since X is the Celsius temperature in the controller, this is the value we want to multiply by 9/5. To implement this, we would need to set A equal to 9 and B equal to 5.

4. Adding 32 to this value can be accomplished by setting C equal to 32.

5. Clicking on OK will confirm this operation. The value displayed on the panel will be in Fahrenheit, while the controller data will be in Celsius. The dialog box should look similar to the one shown below in Figure 2.

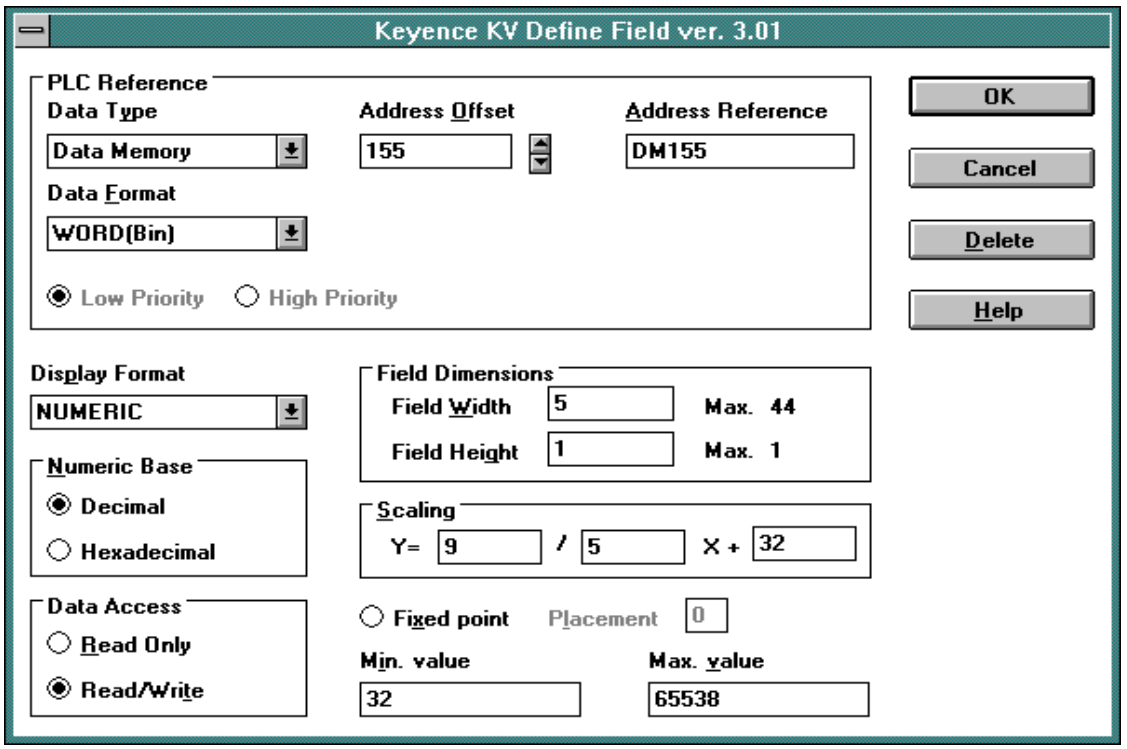

Figure 2

Example 2:
Assume a user has a controller memory location whose numeric value can range from 0 to 4095. The user wants to display the actual value in the controller as a percentage of the maximum value.

1. Create a numeric field and reference it to the address in the controller that is reporting the value. For this example, assume the address is V2040. Once the numeric field is created, the define field dialog box will appear.

2. Since the user wishes to display the actual value in the controller as a percentage of the maximum value, we need to use scaling. If the actual value in the controller is 0, then the panel should display a 0. If the actual value in the controller is 4095, the panel should display a 100.

3. This can be accomplished by using the following method. Simply divide the value in the controller by the maximum possible value and multiply this result by 100 to turn it into a percentage. To do this we need to set A=100, B=4095, and C=0. The dialog box should be similar to the one shown in Figure 3.

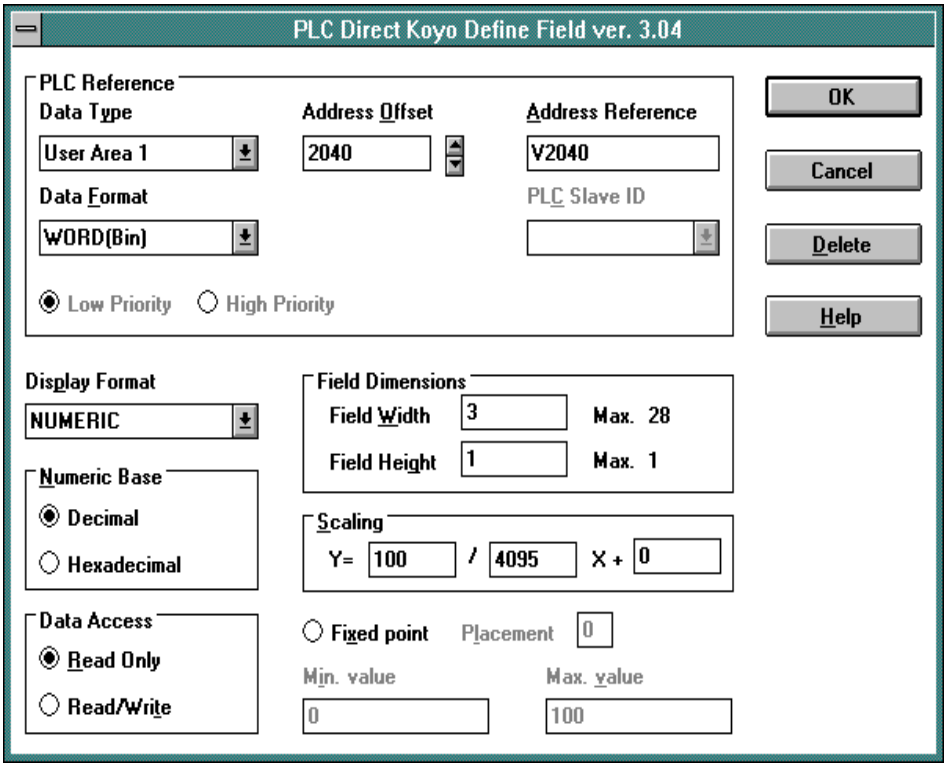

Figure 3

Technical assistance may be obtained :
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In Europe EXOR Italy at +39 045 - 8779068