

## Using Variables to control an Array

### Palletizing a Program by Creating A Grid Array

**Overview: Each subject to be discussed in detail below**

1. Determine X and Y offsets of features in the array in Millimeters.
2. Create a program. Set the variables in a program. Create input windows.
3. Create a program with fixed loops. (No Variables)
4. Modify the “adjust position offset” steps to use formulas not fixed values.

#### 1. Preliminary determination of the offsets

To determine the X and Y offsets of an array measure the top left and the bottom right starting points of the proposed array.

Construct a distance between these points.

The X component of the distance is the X position offset.

The Y component of the distance is the Y position offset.

#### 2. Create the program with Operator Inputs

Start recording. Add a light step, magnification step and a teach step. Units are in MM. Skew and zero.

#### Create an Input for the X Variable

Right click program template \ Special steps\ Set variable \ “@Xmove”

Label @XMove  
No formula

Results = Inches/ mm .

Constant = Fixed in MM.

Prompt is “Enter X offset” Enter OK

The screenshot shows a dialog box for setting a variable. The 'Label' field contains '@XMove'. The 'Formula' field is empty. Below the formula field are buttons for 'Fields >', 'Functions >', 'Operators >', and 'Other >'. At the bottom, there are two dropdown menus: 'Result type' set to 'Inch/mm' and 'Constants are' set to 'mm'. The 'Prompt' field contains 'Enter X Offset'. There are 'OK' and 'Cancel' buttons in the top right corner.

#### Create the Y input

Right click program template.  
Choose \ Special steps \ Set variable \  
“@Ymove”

Label @YMove

No formula Results Inches/ mm. Constant  
Fixed in mm.

Prompt is “Enter Y offset” ” Enter OK

The screenshot shows a dialog box for setting a variable. The 'Label' field contains '@YMove'. The 'Formula' field is empty. Below the formula field are buttons for 'Fields >', 'Functions >', 'Operators >', and 'Other >'. At the bottom, there are two dropdown menus: 'Result type' set to 'Inch/mm' and 'Constants are' set to 'mm'. The 'Prompt' field contains 'Enter Y Offset'. There are 'OK' and 'Cancel' buttons in the top right corner.

### 3. Create the Array

To create arrays or loops in QC5000 you create a grid.

Stop recording and measure the first feature to be in the array.

Start recording. Select the feature. Create a grid as follows.

The function path is Tools\ Programming \ Programming Wizard \ create a grid.

X Items: 2  
Y Items: 2  
Z Items: 1  
X offset: 300.025  
Y offset: 250.000  
Z offset: 0.0000

Create the loop with the real values determined prior to recording.

Once the array is created with fixed data, test it. Run from the top. Choose File\ New Run.

X offset: 300.0250  
 Y offset: 0.0000  
 Z offset: 0.0000  
 Add to previous offsets

**Note the Check boxes.**

Each offset dialog box is checked for the axis it alone controls.

### 4. QC5000 Setting Variables to Control an Array.

The formula buttons will reveal the location for the variables created in the beginning of the program using real values

X offset: 0.0000  
 Y offset: 0.0000  
 Z offset: 0.0000  
 Add to previous offsets

Edit the real values of the offsets.  
Set the real value to 0.0  
Replace the offset numbers with a formula, which includes the input variable names

**In the program view pane:**

Double click on the Adjust X position offset program step.

Set number to zero and select the corresponding formula box . Enter” @XMOVE” Click OK and OK.  
Double click on Adjust Y position offset.  
Set number to zero and select the corresponding formula box

X offset: 0.0000  
 Y offset: 0.0000  
 Z offset: 0.0000  
 Add to previous offsets

Formula

@YMove

Fields > OK

Functions > Cancel

Operators > Help

Other >

Result type: Inch/mm Constants are: mm

**Enter “@YMOVE” Click OK and OK  
Run the program entering new values for  
the X and Y moves.**

**A little creative programming here will  
allow you to make your programs flexible  
to a variety of panel sizes and layer  
counts.**

## TIPS

**Use this in conjunction with conditional statements and “Goto Label” steps to create subroutines.**

**The “Goto label” commands exit the main program to enter the labeled subroutine. After the measurements steps the conditional statements then test a program position variable to redirect the subroutine back to the appropriate part of the main program.**

**Avoid reentering offsets, light settings, and delays by using “Goto Label” commands after the inputs are made.**