

# Motion Coordinator Application Note

Number:MC-1015, Revision 1, 2/28/2007

Subject: Registration on cycle machines

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**Q: Why does the REG\_POS or DPOS returned from an axis exceed REP\_DIST ? (Or go negative in REP\_OPTION=1 mode) ?**

**A: The controller moves all the positions on an axis after testing MPOS. If MPOS exceeds the REP\_DIST the axis parameters MPOS, DPOS, and ENDMOVE are moved relative to their previous value. REG\_POS is NOT shifted. The following example shows how these numbers can be outside the REP\_DIST range.**

**Example 1: Unexpected DPOS:**

Suppose REP\_DIST=100, REP\_OPTION=ON

Servo Cycle x: MPOS=98  
DPOS=93 (due to following error)

Servo Cycle x+1: MPOS=101 (this is never read by BASIC)  
DPOS= 96  
the repeat distance subtraction now occurs so:  
MPOS=1  
DPOS=-4

**Example 2: Unexpected REG\_POS:**

Suppose REP\_DIST=100, REP\_OPTION=ON

Servo Cycle x: MPOS=90

Servo Cycle x+1: MPOS=96  
hardware position latch triggers at 97

Servo Cycle x+2: MPOS=102 (this is never read by BASIC)  
hardware latch recorded as -5 from MPOS  
the repeat distance subtraction now occurs so:  
MPOS=2  
REG\_POS=-3

Similar effects allow the DPOS and REG\_POS to exceed REP\_DIST.

**Q: How can I allow for these unexpected values in my program ?**

**A: These unexpected values can be easily allowed for in BASIC programs. Two common situations arise when performing registration when REP\_DIST is the product length and REP\_OPTION=ON.**

One common situation is the need to register at (or near) the end of the product.

**Example 3:**

REP\_DIST=100  
REP\_OPTION=ON

Suppose an eye sensor is set to register around the end of the product. An adjustment movement is calculated from the registered position. Suppose the axis is set up each cycle with REGIST(3)

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The valid values recorded by a machine if asked to PRINT REG\_POS *could* be:

0  
2  
1  
99  
98  
102  
-3

The values around 100 have been recorded at the end of the product. These values should be converted prior to being used in the compensation:

```
target=0
x1=REG_POS-target
x2=x1-REP_DIST
IF ABS(x2)<ABS(x1) THEN x1=x2
```

*x1* will now hold a distance away from the target position. The sequence of values above would be converted to:

0  
2  
1  
-1  
-2  
2  
-3

*x1* can be used in the adjustment move calculation.

Note that if the target was range 50..100 in the program above. The alternative distance *x2* would need to be calculated to be:  
 $x2=x1+REP\_DIST$ .

A second common situation arises when registering near the end of a product. Suppose you want to setup a window for the registration. If the target position is the end of the product. Valid recorded positions will be in 2 sections at the beginning and end of the product.

#### Example 4:

A window of 5 is to be used either side of the target position.

```
REP_DIST=100
REP_OPTION=ON
OPEN_WIN=5
CLOSE_WIN=95
REGIST(3+768)'      Set exclusive window, this excludes values 5..95
```

Note that if the target position could be any value the program would have to calculate if an inclusive or exclusive window is required.