

Command:ERROR (E)

Motorized axis

MS2000 or RM2000 syntax

Shortcut	E
Format	ERROR [axis] = [position in mm]...
Units	Millimeters
Remembered	Using SS Z

Tiger syntax

Shortcut	E
Format	ERROR [axis] = [position in mm]...
Units	Millimeters
Type	Axis-Specific
Remembered	Using [addr#]SS Z

This command sets the Drift Error setting. This setting controls the crossover position error (in millimeters) between the target and position at which the controller considers an axis to be too far out of position when resting. When this limit is reached, the controller will re-attempt to move the axis back within the Finish Error (PC) limit. The current value for this setting can be viewed using the INFO command or by placing a ? after the axis name. Entries of zero value, e.g., ERROR X=0 are ignored.

Example

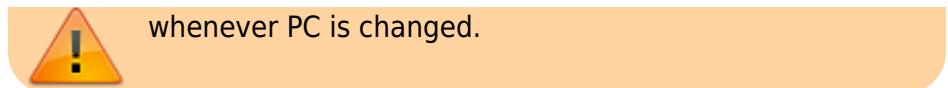
```
E X=0.0004
:A
e x?
:X=0.000400 A
```

Input values equal to or less than zero are acknowledged by :A , but ignored.

The command in this example would cause the controller to consider a difference between the target and the current position greater than 400nm to be too large. If this large of an error were detected, the controller would re-engage the move algorithm to place the position error back inside of the Finish Error (PC) limit.

WARNING: Make sure that the drift error **ERROR (E)** value is significantly larger than the value for **PCROS (PC)**. Otherwise an landing might initially be considered complete but then afterwards lead to drift correction moves.

For firmware built after Aug 2023 (v3.42 for Tiger) the E value is automatically set to at least 1.2x the PC value



whenever PC is changed.

TGPMT card

Shortcut	E
Format	ERROR [axis]=[0 to 5]...
Units	integer code
Type	Axis-Specific
Remembered	Using [addr#]SS Z

On a TGPMT card, ERROR command has a different purpose and function. ERROR command sets the [ADC averaging's sample size](#). Its a card wide setting, that affects both the PMT tubes. This only affects the value reported with the [RDADC](#) command. The Analog signal output on the BNC isn't affected.

ERROR [axis]= Simple Moving Average sample size	
0	1 Avg routine disabled, reports RAW reading
1	2
2	4
3	8
4	16
5	32

Example

If TGPMT card axis is **m**

```
e m=2
:A
```

Sets the ADC averaging routine sample size to 4.

```
e m?
:M=2.000000 A
```

Query the TGPMT card for ADC averaging routine sample size, 2 is reported, hence sample size is 4.

MicroMirror card

Shortcut	E
Format	ERROR [axis]=[correction in %]...
Units	integer code
Type	Axis-Specific
Remembered	Using [addr#]SS Z

On a Micromirror card ERROR command has a different purpose and function. It sets the amount of bow correction applied to the axis. It is specified in units of percent deflection of the paired

axis when the specified axis is at full deflection. The sign indicates whether a positive or negative deflection will be applied to the paired axis. It was introduced in Tiger firmware v3.18 along with the bow correction described below.

Bow is an optical effect where the motion of a scanned beam takes on a slightly curved shape whenever the axis of the moving mirror's rotation is not orthogonal to the plane formed by input and output beams. Because the MEMS mirror inside the ASI scanner tilts in two dimensions, at least one axis will be subject to this effect. In a typical ASI light sheet scanner, the motion of the "fast axis" (e.g. the axis that is scanned to make a light sheet) will deflect slightly in the slow axis during scanning, whereas the motion of the slow axis is unaffected by the bow phenomenon. To counteract this optical effect, starting in firmware v3.18 the firmware applies a small opposite correction to the slow axis as the fast axis moves, and the magnitude of this correction is specified by the ERROR command. The correction is quadratic relative to the displacement from the center of the mirror range (generally position 0), so maximum correction is applied at the edge of the mirror range.

The default is -2% for the "fast axis" and 0.0 for the "slow axis" in each axis pair because this seems to be about right for a typical ASI scanner. This means that the slow axis position will be adjusted as the fast axis moves but not vice versa. The bow correction is applied during regular commanded moves, during single axis commands, and during the SPIM state machine. In the SPIM state machine it is assumed that only the fast axis has a non-zero bow correction coefficient.

The allowable range of correction is between -6.22% to +6.22%.

Tunable Lens Card

Shortcut	E
Format	ERROR [axis]=[DPT to DAC coefficient]...
Units	float
Type	Axis-Specific
Remembered	Automatically

On a Tunable card ERROR command has a different purpose and function. It sets the relation between the DAC(current) and Tunable lens's Diopter. Its used to compensate for temperature drift. [More info here](#)

[commands](#), [tiger](#), [ms2000](#), [tgpmt](#), [micromirror](#), [tlens](#)

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