

# Motion Controller RS232: Homing to Hard Stop

## Operation

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The Home or “0” position of a drive can be reset at a hard stop.

A flow program is defined that allows the motor to find a home position by performing a sequence to look for a hard stop. The motor current is monitored while a homing motion profile is executed and when the current exceeds a defined limit the controller will stop and set the position counter to “0”.

In this homing sequence a reference travel limit switch is not needed.

## Applies To

FAULHABER Motion Controllers of generation V2.5 with RS232 interface.

## Limitations

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- Problems may occur in drive systems with a gearhead. The current rises slowly in this configuration. The gearhead can act like a mechanical spring and take some time to wind up. This causes a slow current rise in the motor. Due to the slow rise the homing point for the system may not be consistent.
- Binding in the gearhead can cause the homing sequence to terminate prematurely, resulting in homing position error.
- This sequence is not recommended for motors with low power consumption because of the inaccuracy of the current measurement for motor currents less than 100mA.

## Explanation

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Continuous and peak current are set to the same value. This should be greater than 100 mA to detect the hard stop safely. Care should be taken to keep the current below the maximum continuous current (LCC) of the motor. See the datasheet of the motor for maximum continuous current ratings.

After movement is initiated in the direction of the expected hard stop, the program flow goes into a continuous loop. When the motor reaches the hard stop, causing the current to increase to its maximum permitted value, a current error will occur. The current error generates an interrupt, leaving the continuous loop for an interrupt service routine.

The service routine for the interrupt then stops the motion and resets the position counter to “0”.

The current limit values must be increased after motion stops and the position resets. This must be done as it may require a higher torque to leave the blocked position due to tension in the mechanical system.

## Example Program

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; Homing sequence preparation:
LPC XXX      ; Set the maximum peak current (Limits Above)
LCC XXX      ; Set the maximum continuous current (Limits Above)
DCE1         ; Set the time for the current to exceed the defined
              ; limit. In this example 10msec.
ERI2         ; Activate the overcurrent error interrupt
              ; Jump to address 2 (A2) on interrupt
V100         ; Set speed to 100RPM clockwise

A1           ; (Label for address 1)
JMP1        ; Jump to address 1 (A1. When the current error
              ; occurs the controller will jump to A2

; Hard Stop detected, motion is stopped and position counter is set to 0
A2           ; (Label for address 2)
DIERI       ; ERI command is deactivated to prevent
              ; additional interrupts
V0          ; set speed to 0 RPM to stop motion
HO          ; set the position counter to 0

; Current settings returned to normal operating values:
LPC YY      ; set the maximum peak current (YYY > XXX)
LCC ZZ      ; set the maximum continuous current using the
              ; motor data sheet values
; Exiting from the home routine move the motor off the blocked position
LR -200     ; Move to a position in the opposite direction of the
              ; hard stop to reduce tension due to system wind up
M          ;
```

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