# Motor Command Set - README

This document provides a comprehensive guide to the motor command set and their corresponding responses. The commands are sent via UDP and follow a specific format with different prefixes. Use this guide to understand the available commands and their expected responses.

## Command Set Guidelines

### 1. Position Commands (P)

* Commands:
* P:? - Query current position
* P:VEL,<value> - Set default velocity (>0)
* P:ABS,<pos>,<vel> - Move to absolute position with optional velocity
* P:REL,<pos>,<vel> - Move relative position with optional velocity
* Response examples:
* - P: 1000 (current position)
* - Default velocity set to 5.0
* - Moving to absolute position 2000 at velocity 5.0
* - Moving relative position 500 at velocity 3.0

### 2. Velocity Commands (V)

* Commands:
* V:? - Query current velocity
* V:PRF,<vel>,<acc>,<dec> - Set velocity profile with acceleration/deceleration
* V:<value> - Set velocity directly
* Response examples:
* - V: 5.0 (current velocity)
* - Set velocity profile: V=10.0 A=50.0 D=50.0
* - Set velocity to 15.0

### 3. Homing Commands (H)

* Commands:
* H - Start default homing
* H,<method>,<offset>,<speed> - Custom homing configuration
* Response examples:
* - H:I{1} (starting homing for motor ID 1)
* - Starting homing method 1

### 4. Brake Commands (B)

* Commands:
* B - Normal stop
* B,1 - Quick stop with deceleration
* B,2 - Fast quick stop
* B,3 - Immediate stop
* Response examples:
* - QB 1 (quick brake motor ID 1)
* - Brake type 2 applied

### 5. Status Commands (S)

* Commands:
* S - Basic status
* S,DETAIL - Detailed status information
* Response examples:
* - 1234|1234 (status codes)
* - Detailed status showing running state, errors, position reached, and homing status

### 6. Mode Commands (M)

* Commands:
* M - Query current mode
* M,1 - Position mode
* M,3 - Velocity mode
* M,6 - Homing mode
* Response examples:
* - Current mode: 1
* - Set to Position mode

### 7. Additional Commands

* Commands:
* A:<acc>,<dec> - Set acceleration/deceleration
* Q,<type> - Quick stop (1=decel, 2=fast, 3=immediate)
* Z - Set current position as zero
* Z:OFS,<offset> - Set zero with offset
* R - Reset motor
* I - Get motor information
* X - System reset
* Response examples:
* - Set Acc: 50.0 Dec: 50.0
* - Quick stop type 1 executed
* - Position set to zero
* - Motor reset complete
* - Detailed motor information including position, velocity, mode, and status

## Error Responses

* Invalid position command
* Invalid velocity command
* Invalid mode
* Invalid acceleration command

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