iOptron Mount Special Mode Command Language
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Primary axis is the right ascension axis of equatorial mount, or the azimuth axis of altitude-azimuth mount.

Secondary axis is the declination axis of equatorial mount, or the altitude axis of altitude-azimuth mount.

Although we provide 0.01 arcsecond resolution for position commands, but the real performance will be limited by mount itself.

In special mode, any values you get from transmission is in real-time. The estimate communication time for a pair of send and receive command is about 30 milliseconds.

Currently this command language is only applied for the following mounts:

AZ Mount Pro

HAZ31

HAZ46

HAE29 AA Mode with limited support

HAE43 AA Mode with limited support

Baud rate for all models: 115200

Switch Modes

In regular operation mode, send ":ZZZ#" to switch to special mode and vice versa. Operation mode will be remembered during power cycle.

After switch, send ":MountInfo#" to confirm switch complete:

In regular operation mode, AZ Mount Pro will get a "5035" response, in special mode, AZ Mount Pro will get a "9035" response.

In regular operation mode, HAZ31 will get a "0035" response, in special mode, HAZ31 will get a "8035" response.

In regular operation mode, HAZ46 will get a "0052" response, in special mode, HAZ46 will get a "8052" response.

In regular operation mode, HAE29 in AA mode will get a "0033" or "0034" response, in special mode, HAE29 will get a "8033" or "8034" response.

In regular operation mode, HAE43 in AA mode will get a "0050" or "0051" response, in special mode, HAE43 will get a "8050" or "8051" response.

All the following commands only works in special mode.

Position

Command: ":P0#", ":P1#"

Response: "+nnnnnnnnn#"

These commands get the current position of primary axis or secondary axis. The resolution is 0.01 arcsecond. The range will be -64,799,799 to 64,800,000.

For example, you received response "-032,400,000" after you sent ":P0#".

Command: ":P2#"

Response: "+nnnnnnnnn+nnnnnnnnn#"

This command combines the response of ":P0#" and ":P1#". The response of ":P0#" is first, followed by the response of ":P1#", then the end character "#".

Note: HAE series mount with AA mode do not support this command.

Command: ":S0+nnnnnnnnn#"

Response: "1"

This command synchronizes the primary axis to specified value. The resolution is 0.01 arcsecond. The range will be -64,799,799 to 64,800,000. It is strongly recommended to use this command when primary axis is stationed.

Command: ":S1+nnnnnnnnn#"

Response: "1"

This command synchronizes the secondary axis to specified value. The resolution is 0.01 arcsecond. The range will be -64,799,799 to 64,800,000. It is strongly recommended to use this command when secondary axis is stationed.

Motion

Command: ":M0+nnnnnnn#"

Response: "1"

This command specifies the movement speed of the primary axis and takes effect immediately. The resolution is 0.01 arcsecond. The maximum rate for AZ Mount Pro is 8 degree per second.

For example, if you want to let primary axis moves at 5 degrees per second with negative direction, you should send ":M0-1800000#".

Command: ":M1+nnnnnnn#"

Response: "1"

This command specifies the movement speed of the secondary axis and takes effect immediately. The resolution is 0.01 arcsecond. The maximum rate for AZ Mount Pro is 6 degree per second.

Command: ":M2+nnnnnnn+nnnnnnn#"

Response: "1"

This command combines the ":M0" and ":M1", but if you specify a character other than "+" and "-" at the 4th and 12th in the command, the following 7 digits will be ignored.

For example, if you send ":M2*1234567-0012345#", will have the identical effect as send ":M1-0012345#", the first part will be ignored.

Note: HAE series mount with AA mode do not support this command.

Command: ":Q0#", ":Q1#"

Response: "+nnnnnnn#"

These commands get the current movement speed of primary axis or secondary axis. Note: The mount might not reach the desired movement rate instantly. This command could be used to monitor if the desired movement rate has been reached.

Command: ":T0+nnnnnnnnn#"

Response: "1"

This command slews the primary axis to specified position by using maximum speed. The resolution is 0.01 arcsecond. The range will be -64,799,799 to 64,800,000.

Command: ":T1+nnnnnnnnn#"

Response: "1"

This command slews the secondary axis to specified position by using maximum speed. The resolution is 0.01 arcsecond. The range will be -64,799,799 to 64,800,000.