HANDBOX USER REQUIREMENT ISS 2 – corrected from bbrien comment 2020-07-31 - 02:21:37

1) Direction Keys:

Four keys, labeled N, S, E, and W on the hand controller (1), Fig. 14, are used to move, or microslew, the telescope in a specific direction.

When pressing a direction key, the only feedback is the motion of the telescope.

Only one button may be pressed at one time.

Pressing more than one button is a null event.

2) Coordinate System, Motors and Buttons

Right Ascension (R.A.): RA motor; E, W buttons

This celestial version of longitude is measured in units of hours (hr), minutes (min), and seconds (sec) on a 24-hour “clock” (similar to how Earth’s time zones are determined by longitude lines). The “zero” line was arbitrarily chosen to pass through the constellation Pegasus, a sort of cosmic Greenwich meridian. R.A. coordinates range from 0hr 0min 0sec to 23hr 59min59sec. There are 24 primary lines of R.A., located at 15-degree intervals along the celestial equator. Objects located further and further East of the zero R.A.grid line (0hr 0min 0sec) carry higher R.A. coordinates.-

Declination (Dec.): DEC motor; N, S buttons

This celestial version of latitude is measured in degrees, arc-minutes, and arc-seconds (e.g.,15° 27' 33"). Dec. locations North of the celestial equator are indicated with a plus (+) sign (e.g.,the Dec. of the North celestial pole is +90°). Dec. locations South of the celestial equator are indicated with a minus (–) sign (e.g., the Dec. of the South celestial pole is –90°). Any point on the celestial equator (such as the the constellations of Orion, Virgo, and Aquarius) is said to have a Declination of zero, shown as 0° 0' 0".

Speed and rotation settings for motors;

It is assumed these settings are adjusted in the Control Box.

The default settings are;

DEC motor; N = counterclockwise, S = clockwise

RA motor ; E = clockwise, W = counterclockwise

PWM;

32X = 96% PWM

16X = 48% PWM

8X = 24% PWM

2X = 12% PWM

3) Speed:

The SPEED key (2), Fig. 14, is used to adjust the speed at which the telescope moves when pressing one of the direction keys.

The current speed will be indicated by one of four LEDs located next to the SPEED key. An illuminated LED indicates the current speed.

Pressing the SPEED key will cycle the hand controller through the four speed options.

The four speeds are:

32X sidereal rate useful for centering the object in a viewfinder.

16X sidereal rate useful for centering the object in a wide-field eyepiece.

8X sidereal rate useful for centering the object in a high-power eyepiece.

2X sidereal rate useful for guiding during astrophotography.

4) Handbox - Control Panel Protocol and Refresh Rate

The refresh rate for N, S, E, W direction buttons is 50Hz (same as RC protocol)

The refresh rate for Speed button is 1Hz

A 9600 baud serial link is to be used between the Handbox and Control Panel

Speed button pressed; Select current speed by Cycling through the 4 speed options as indicated by local LED.

The following data is to be transmitted for each refresh cycle;

- Value indicating which direction button N, S, E, W was pressed for this cycle. (can be 4 bits).

- Value indicating which speed (4 options) is current. (can be 2 bits)

(One byte could contain the direction and speed information)

- No button pressed = 0

- Speed button pressed = 0

- More than one button pressed = 0

Quote

bbrien

bbrien Posts: 281

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That is more or less correct except in #2, The Dec is North And South.

To digitalBob I tried the2b-3 program but there is no outputting on any of the output pins.

My location is Los Angeles