



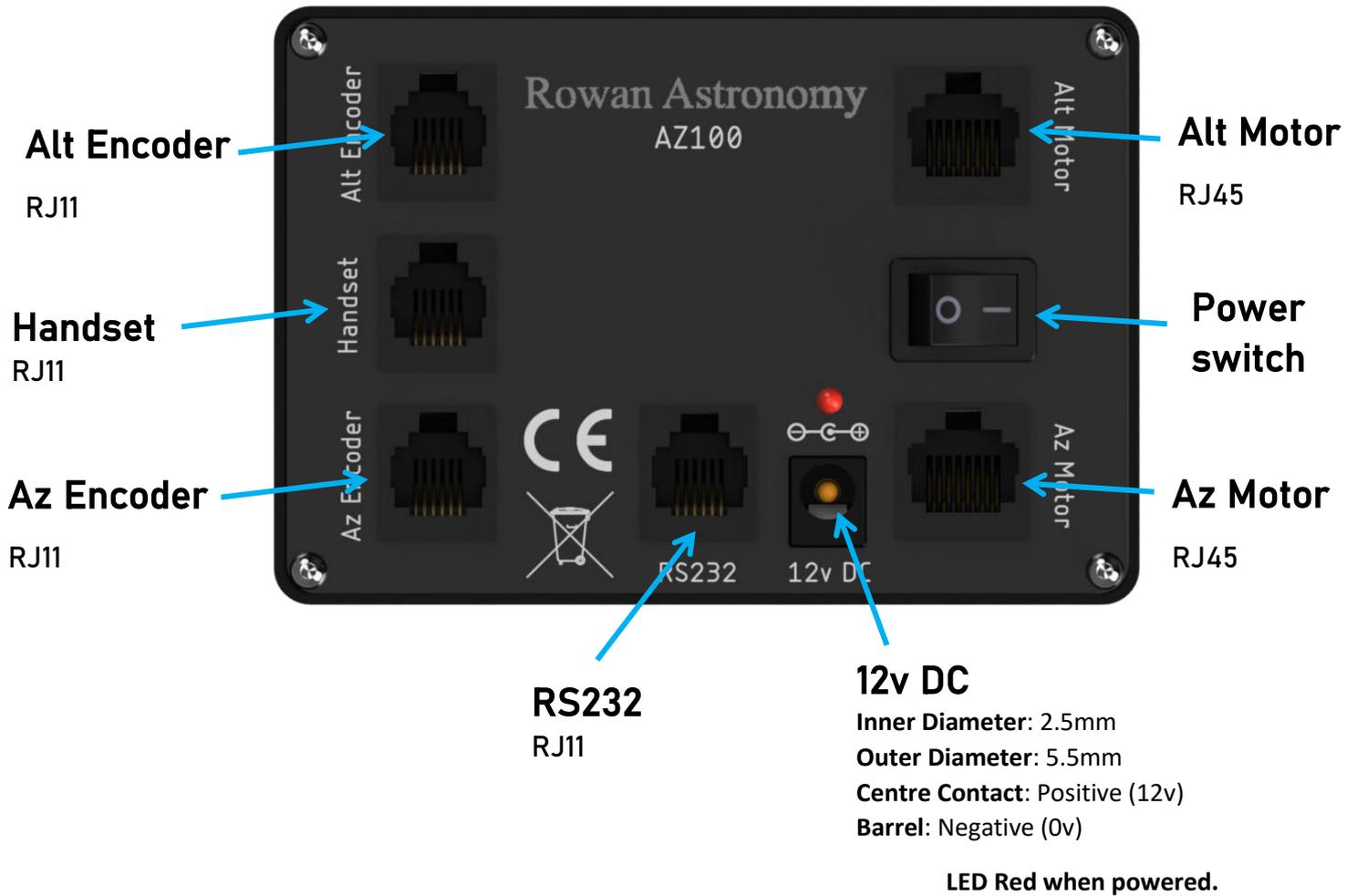
Rowan Astronomy

AZ100 Motor Drive System

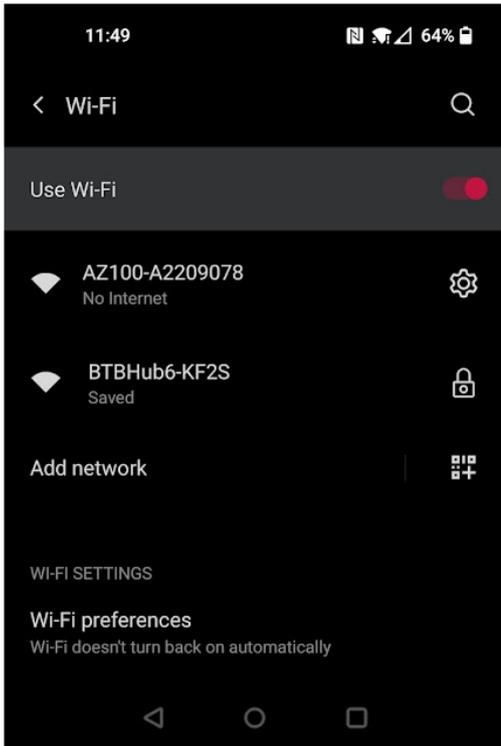
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Connections



Connecting to the AZ100



The AZ100 requires a 12V DC 2 amp power supply (5.5mm x 2.5mm dc barrel connector) Plug in with the power switch off.

Before turning on the power, point the telescope due south and set horizontal to set the initial alignment.

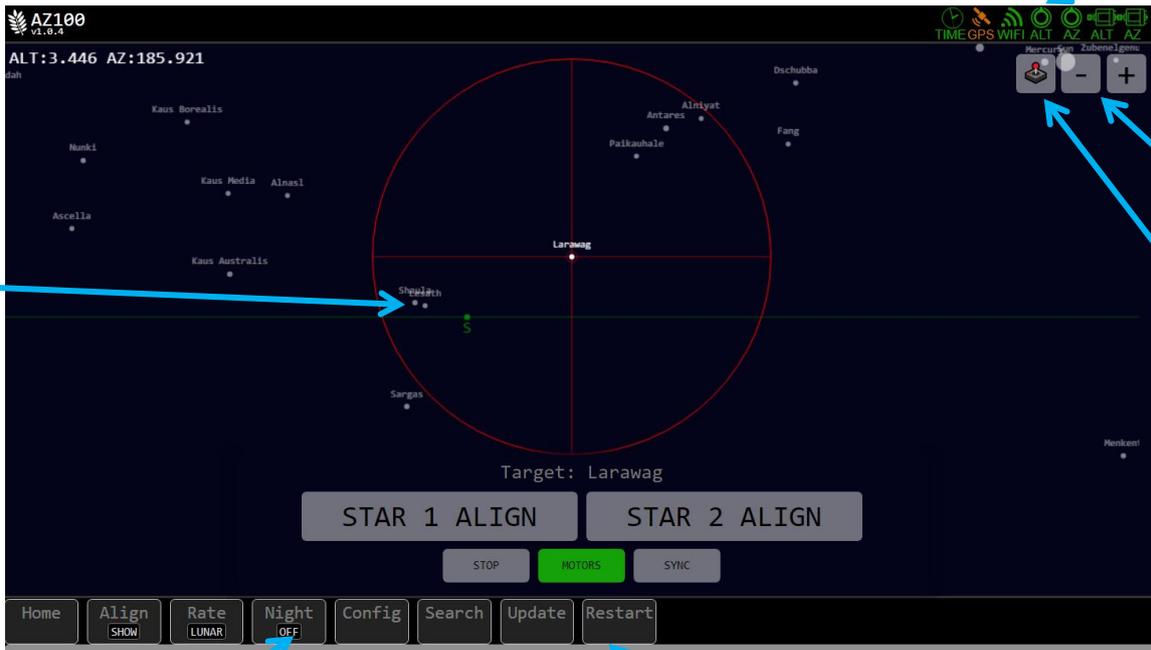
Turn on the power switch, the AZ100 will create a WiFi hotspot which can be connected to using Android, iOS, laptop or computer with a WiFi dongle.

To connect to the AZ100, open the WiFi settings menu on your device and then connect to the AZ100 hotspot.



Open your web browser and type **192.168.4.1** into the address bar. After connecting it should show the AZ100 home page, pictured to the left)

Home screen



Star
Double tap or click to select a star as the target or use the Search button.

Status Icons

Zoom

Joystick
Used to move the telescope. Joystick icon only shown when motors are enabled. Joystick parameters can be set in the configuration.

Menu buttons

Command buttons

- Align**
Toggle display of the alignment buttons
- Rate**
Telescope tracking rate, LUNAR, SIDERAL and SOLAR
- Night**
Toggles a red filter over the screen.
- Config**
Opens AZ100 configuration screen – see page 7
- Search**
Search for a star, once a star is clicked in the search menu, it will be selected as the target
- Update**
Opens AZ100 firmware update screen – see page 8
- Restart**
Restarts the software, Wi-Fi network and telescope position.

- STAR 1 ALIGN & STAR 2 ALIGN**
These are used to precisely set the telescope alignment.
- SYNC**
Sync is used to reset the telescope pointing position
- GOTO/STOP**
The GOTO/STOP button moves the telescope to the selected target. The telescope will only move when the motor button is green (i.e. motors enabled).
- MOTORS**
Click the button to toggle the motors ON or OFF,

Status icons

 <p>Green when a valid time source (either from GPS or your system time)</p>	 <p>Green when location is valid, orange when using a previously saved location and red when no position. If red wait until this turns green before using the webpage.</p>	 <p>Web page has an active connection to AZ100.</p>	 <p>Green when encoder has moved at least 0.1 degrees from initial starting point</p>	 <p>Green when motors are connected, and no error reported from stepper drivers.</p>
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Alignment



SYNC

Sync is used to reset the telescope pointing position to match the object position in the planetarium screen. After a Goto the object may not be exactly centered in the eyepiece. Use the joystick or manually push the telescope to centre the object. Then press Sync. Goto's to nearby objects will be more precise.

You can use Sync as a quick 1-star alignment. The pointing accuracy using a 1-star alignment will depend on how accurately the tripod is leveled.

You can use Sync before the 2-star alignment procedure. ie, Sync on a bright star or planet first. This will help acquiring the optimum stars for a 2-star alignment.

STAR 1 ALIGN & STAR 2 ALIGN

The telescope should be set horizontally and pointing South before applying power to the mount. Select the first object in the planetarium screen and move the telescope to this object or issue a Goto. Centre in eyepiece using the joystick or manually move and then click STAR 1 ALIGN, Select a second object in the planetarium screen and move the telescope to this object and centre in eyepiece Press STAR 2 ALIGN. The mount is now aligned.

Ideally for best pointing results the 2 objects should be spaced at least 90 degrees apart in Azimuth and 30 degrees in Altitude.

Config

Latitude	Manually enter your latitude in decimal format
Values:	-90.0000 to +90.0000
Default:	0.0000
Longitude	Manually enter your longitude in decimal format
Values:	-180.0000 to +180.0000
Default:	0.0000
Max Motor Speed	The maximum stepper pulses per second
Values:	1000 to 16000
Default:	14000
Motor Acceleration	Use higher values for smaller or lighter telescopes.
Values:	1000 to 16000
Default:	6000
Magnitude Filter	Filter stars on the AZ100 planetarium
Values:	-1.5 to 12.6
Default:	3.5
Joystick speed	Adjustment for joystick speed, higher is faster
Values:	1 to 100
Default:	30
Joystick Az Direction	Invert the direction when moving the joystick in azimuth direction
Values:	0 = Default or 1 = invert joystick direction.
Default:	0
Joystick Alt Direction	Invert the direction when moving the joystick in altitude direction
Values:	0 = Default or 1 = invert joystick direction
Default:	0
Joystick Deadband	How far the joystick needs to be moved from centre before the mount moves.
Values:	0 to 100
Default:	0
Default Motor State	The initial state of the motors, 0 = off and 1 = on
Values:	0 or 1
Default:	0
Star Font Size	Font size of the stars in pixels
Values:	10 to 30
Default:	16
Initial Alt Position	Startup position for Altitude
Values:	-90.00 to +90.00
Default:	0
Initial Az Position	Startup position for Azimuth
Values:	0 to 360.00
Default:	180
Push Track Window	How many degrees to move until the telescope starts tracking the new position
Values:	0.1 to 0.5
Default:	0.1
Readout Rate	How often the AZ100 planetarium requests the position per second
Values:	1 to 30
Default:	10
WiFi Channel	
Values:	1 to 11 (Recommended channels are 1, 6 and 11)
Default:	11

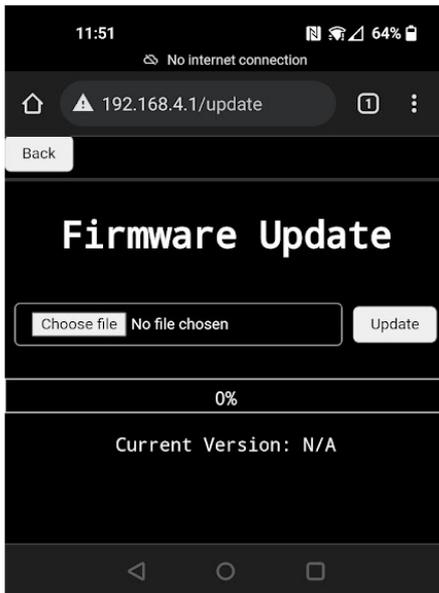
Update



To get the latest firmware .bin file, with an internet connection go to the following website:

<https://rowanastronomy.com/AZ100Update/>

Download the latest version which will be highlighted in bold.

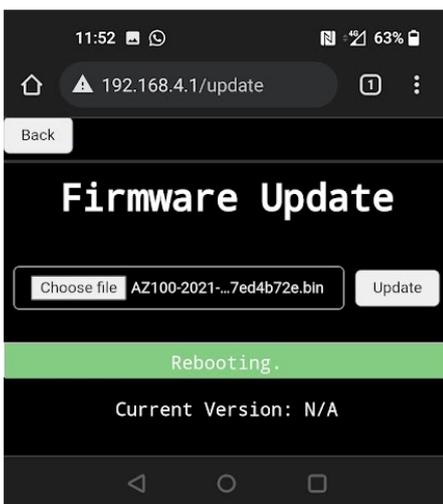


Next, connect to the AZ100 WiFi hotspot and navigate to 192.168.4.1/update or click the Update button at the bottom of the AZ100 home screen.

Then, click choose file and select the .bin file you downloaded from rowanastronomy.com.

After selecting the update file, click update and the progress bar should go from 0% to 100%

Wait until the progress bar displays Rebooting...



The mount will reboot, and once your device connects back to the AZ100 you will be redirected to the AZ100 home screen.

You may need to manually re-connect to the AZ100 WiFi hotspot again if your device automatically connects a different WiFi hotspot such as your home internet.

SkySafari Connection Settings

SkySafari 6 Plus is required which can be purchased through Google Play or the Apple App Store.

Open SkySafari and click Settings at the bottom of the window, then under Telescope Setup and enter the following values:

Equipment Selection

Scope Type – Meade LX200 Classic.

Mount Type – Alt-Az. GoTo

Communication Settings

Connect via WiFi

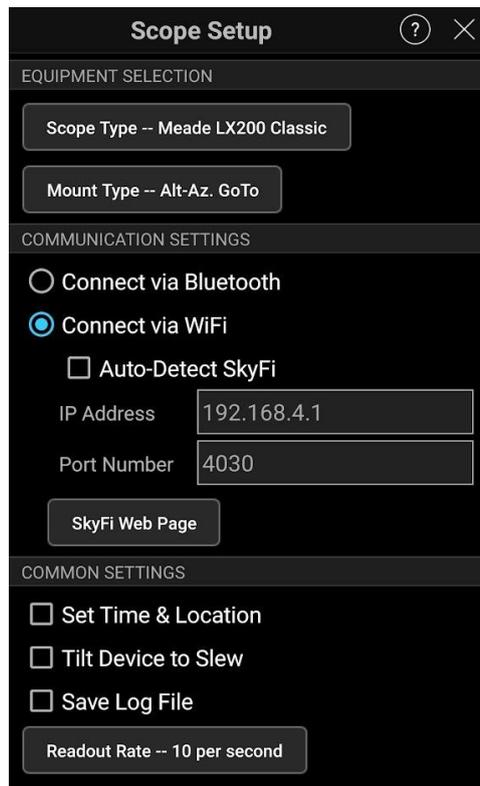
IP Address – 192.168.4.1

Port Number – 4030

Common Settings

Untick “Set Time & Location”, “Tilt Device to Slew” and “Save Log File”

Readout rate – 10 per second



Go back to the main Planetarium screen and click the Scope icon and click Connect.