

Portable Wi-Fi Rotator Controller PWRC

User Manual

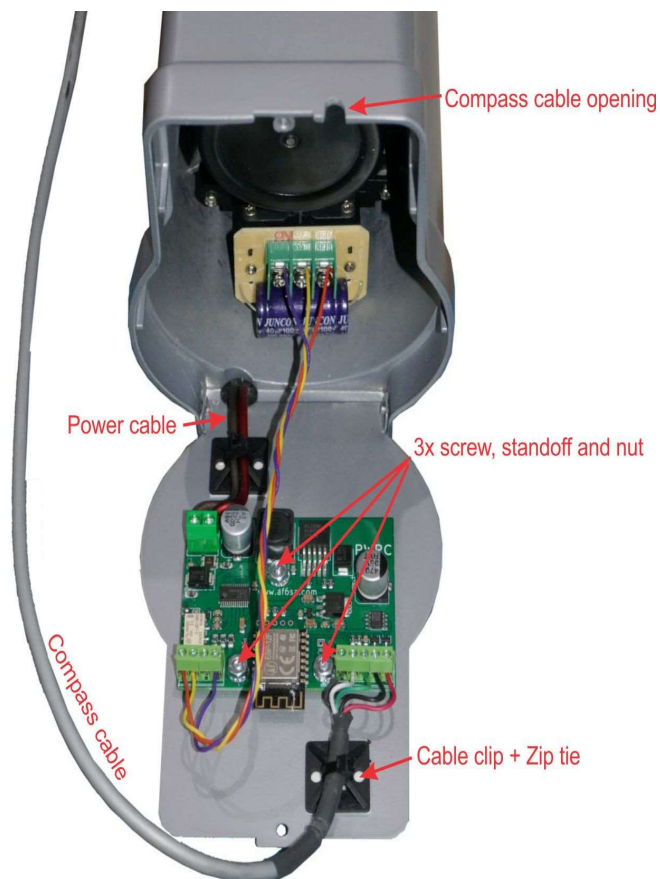


FEATURES

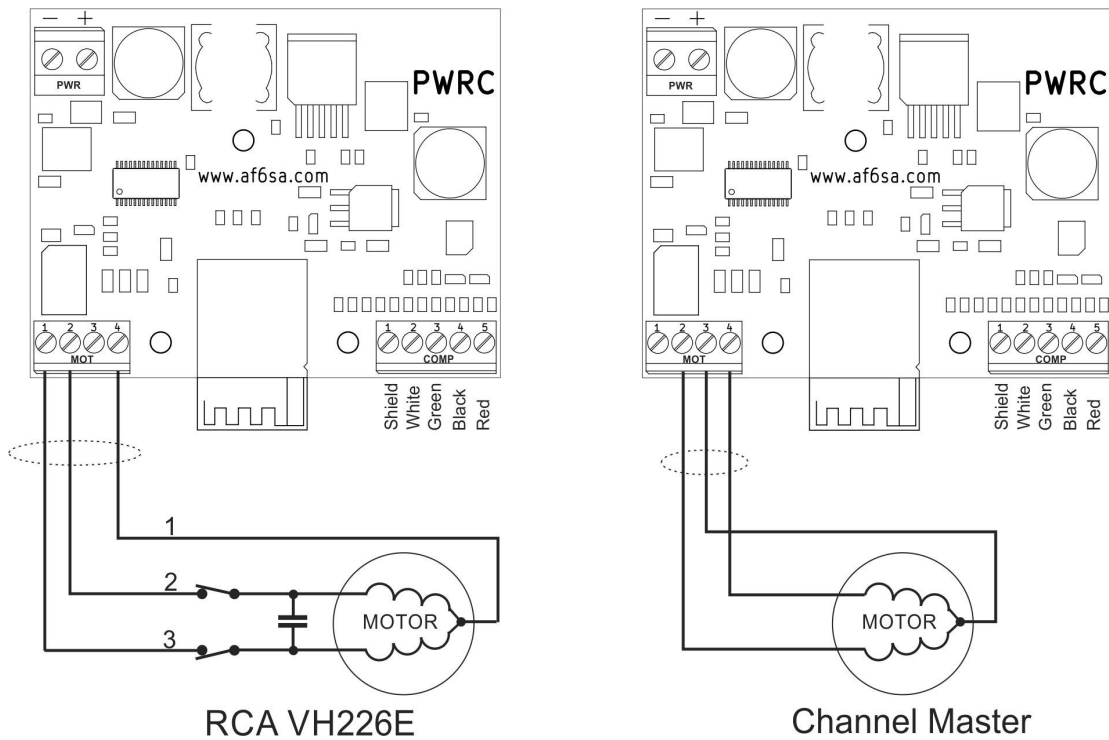
- Mounts inside RCA VH226E or Channel Master antenna rotator.
- Powered by 12VDC. Optimized for battery powered portable rotation.
- Easily rotates HEXbeam, Spiderbeam or Tri-bander.
- Field oriented motor control, Variable Speed Drive 30Hz – 80Hz.
- Acceleration / deceleration velocity profiles.
- Electronic Compass.
- Wi-Fi 802.11n network interface.
- Can be used as Access point or connected to existing Wi-Fi network.
- Web interface for point-and-shoot control.
- Point to QRA grid locator.
- Telnet interface - compatible with PstRotator program.
- UDP packet listener - compatible with N1MM logger and DXLab suite.
- Customizable WEB interface.

1 Installation

1. Open rotator cover.
2. Drill three 3.2mm (1/8") holes and one 1.6mm (1/16") hole using the template.
3. When using the optional compass:
Drill a 6.3mm (1/4") hole into rotator body, close to edge as shown on the picture.
Using small file to form it so the cable can get trough.
4. Mount PWRC board using the provided set of 3x screws, standoffs and nuts.
5. Attach the provided cable clips by removing backing, then firmly press them in place.



6. Motor wiring for RCA rotator with capacitor inside and Channel Master / RadioShack / AR-500



7. Connect power supply cable to the terminal block (-) on the left, (+) on the right.
16AWG Speaker wire is good up to 30ft. Use 14AWG for length up to 60ft.
8. Connect the optional Electronic Compass.
Shield (thick black lead), White, Green, Black and Red (as shown in figures above).
9. Route cables trough the rubber grommet and close the cover.
10. Connect the power supply cable to 10VDC - 16VDC power source capable to provide > 2.5A current.

2 Wi-Fi Setup

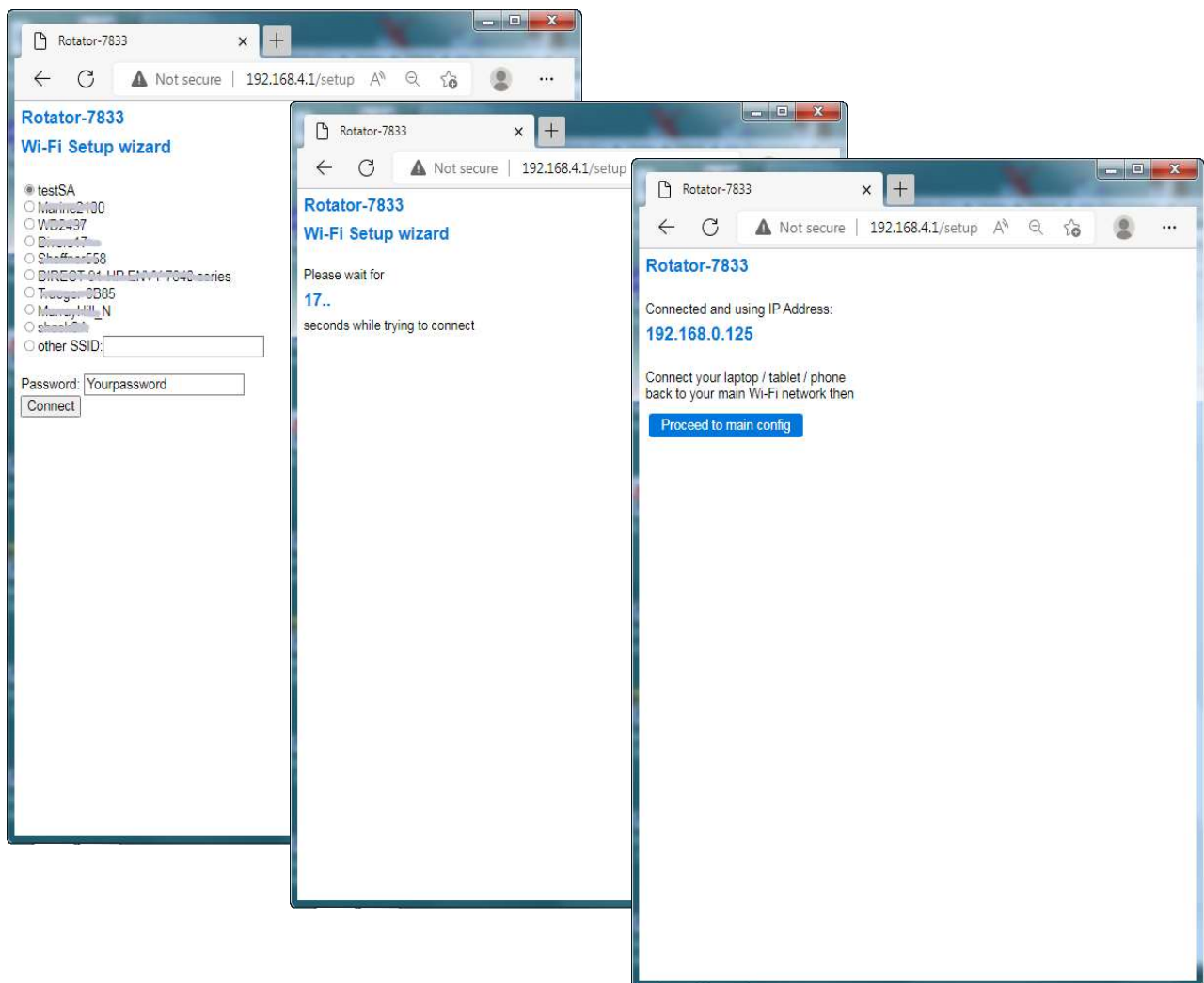
PWRC can be set and operated in two modes:

Access point (AP) mode will provide access to a Wi-Fi network with DHCP for up to 5 devices. You can connect your device (laptop / tablet) to operate while portable or use it to enter credentials to your existing Wi-Fi network. Blue LED blinks once per second.

In **Station (STA)** mode PWRC will connect to an existing 2.4GHz Wi-Fi Access point and network using DHCP or fixed IP address. You need to enter name (SSID) and password (key) of the network you wish to connect. When connected, blue LED blinks twice per second. In case it can't establish the connection, it will switch to **AP** mode, while trying periodically to reconnect.

When started for the first time PWRC will be in **AP** mode. Connect your laptop / tablet / phone to a Wi-Fi network named **Rotator-xxxx**, using password **2config4**, then open a browser and go to IP: 192.168.4.1/setup.

PWRC will scan for Wi-Fi networks and present a list. Select the desired network or write its name, enter the password and press Connect.



After establishing the connection, a page with the new DHCP assigned IP address will be present.

Connect your laptop / tablet / phone back to the same Wi-Fi network and press the button to connect and continue to main configuration page.

Rotator-7833

Home Tools

Main Settings

Host Name:

WEB admin:

WEB password:

Protect /rotor page:

Wi-Fi Connection Settings

Network SSID:

Password:

AP password:

STATIC IP Settings

IP address:

Gateway:

Subnet:

DNS:

Note: Leave all empty for DHCP

Host Name field is used to identify this device into the network. Host name in your network, Network SSID in AP mode and Rotator name in UDP packets. Max. 26 chars, no spaces.

WEB admin and WEB password – locks access to the WEB interface with a username and password. Leave it empty for free access.

Protect /rotor page – the /rotor page can be left unprotected and used without knowing WEB admin account (more info on the /rotor webpage on page 9).

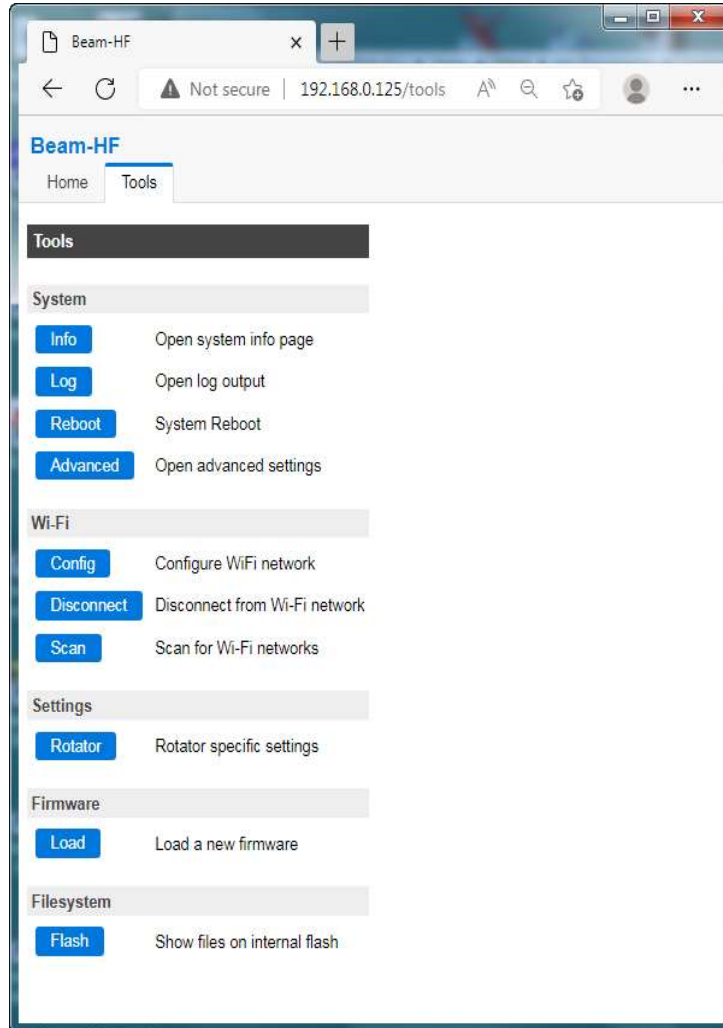
Network SSID – name of the network to connect to in STA mode. Leave it empty for AP mode.

Password – STA mode password (key). Minimum 8 chars.

AP password – access point mode password. Default is **2config4**. Minimum 8 chars.

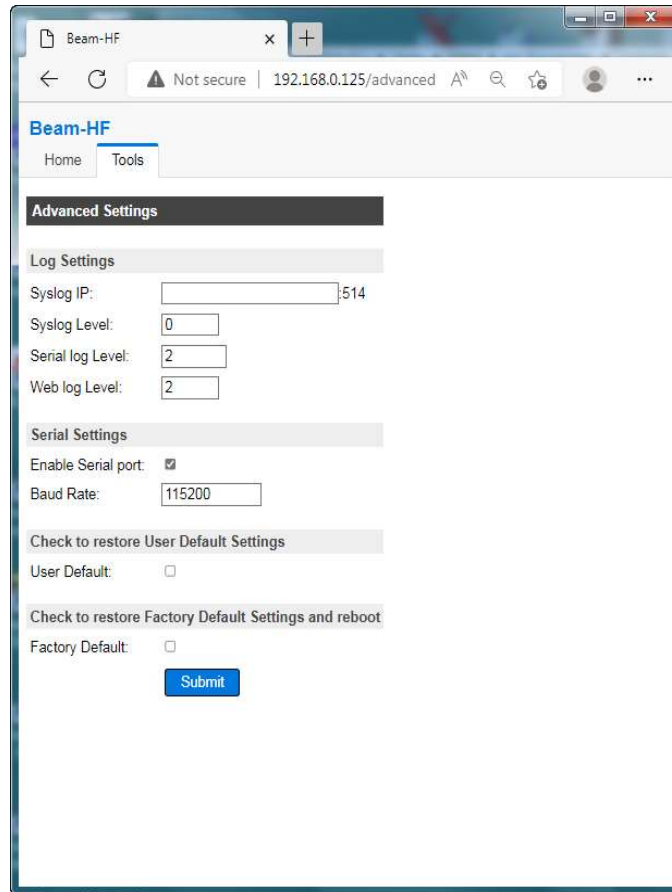
Static IP Settings – fill-out this section to use fixed IP address and restart. Leave it empty to use DHCP dynamically assigned IP address.

Tools tab reveals access to other pages and settings.



Firmware can be updated by uploading it through WEB interface. Suspend other communications (UDP and telnet) before starting the update. Major updates can clear User Settings to their defaults.

Files can be stored the internal flash file system and downloaded trough the WEB interface.



Syslog IP – UDP log messages can be send to this address on port 514

Syslog Level – [0..4] 0 – no messages send

Serial log Level – [0..10] Serial port messages level: 1= only errors, 2= +info, 3= +debug1 4= +debug2

Web log Level – [0..4] Web interface Tools→Log messages level.

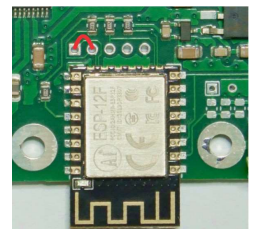
Enable Serial port – output program status and debugging information at specified **Baud Rate**.

User Default – restore all user settings to their defaults and rotor.html file. Will not disconnect or change Wi-Fi network name and password.

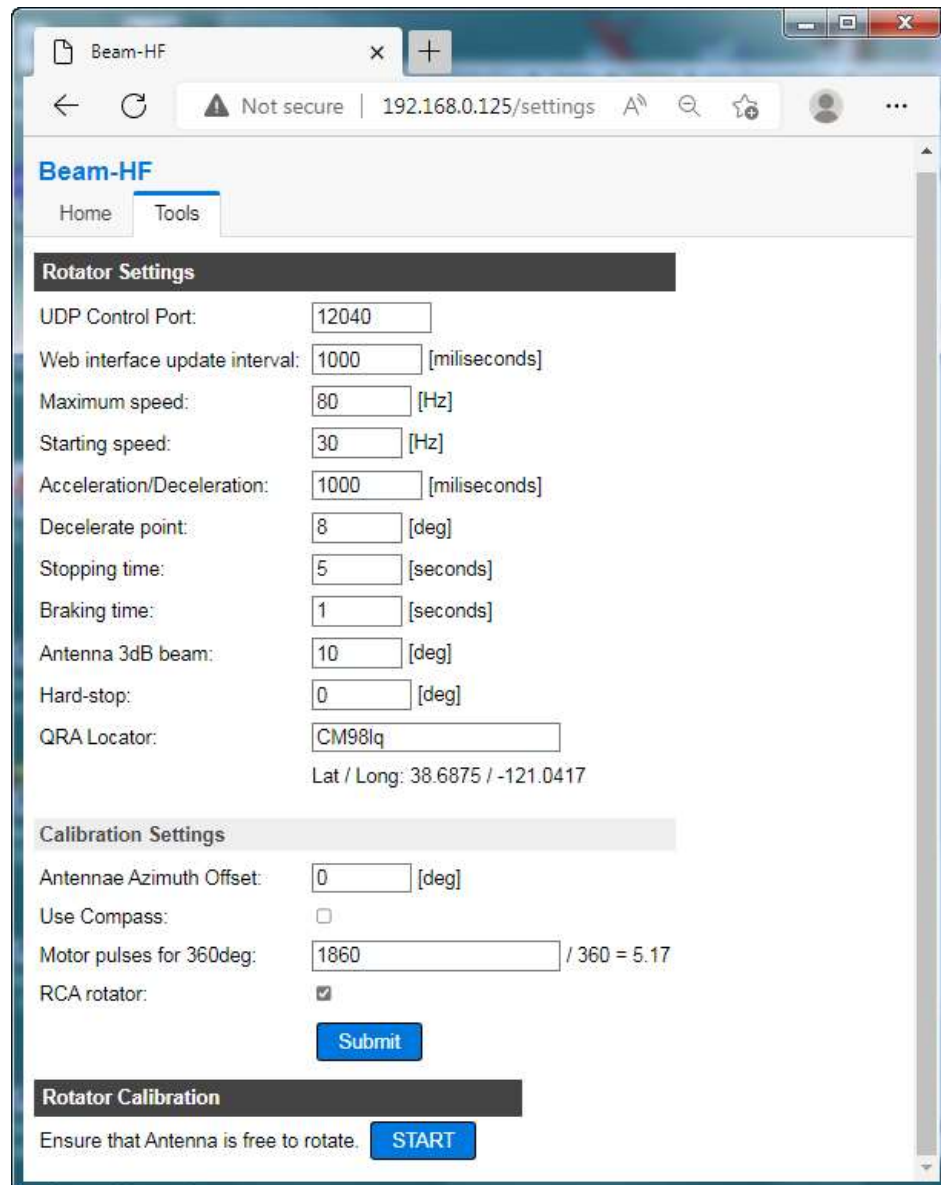
Factory Default – restores all User Default settings, re-formats file system and clears Wi-Fi network name and password. System will reboot in Wireless Access Point mode.

If WEB interface is not accessible, factory defaults can be restored with a jumper:

- turn off rotor power and place a jumper between two pads as shown
- turn power on. When the blue LED starts to rapidly blink remove jumper
- wait about 30-40 sec, the LED should begin to slowly blink
- Rotor is reset and ready in Wireless Access Point mode.



3 Rotator Setup



The screenshot shows a web browser window titled "Beam-HF" with the address bar displaying "192.168.0.125/settings". The page has two tabs: "Home" and "Tools". The main content is divided into two sections: "Rotator Settings" and "Calibration Settings".

Rotator Settings

UDP Control Port:	<input type="text" value="12040"/>
Web interface update interval:	<input type="text" value="1000"/> [milliseconds]
Maximum speed:	<input type="text" value="80"/> [Hz]
Starting speed:	<input type="text" value="30"/> [Hz]
Acceleration/Deceleration:	<input type="text" value="1000"/> [milliseconds]
Decelerate point:	<input type="text" value="8"/> [deg]
Stopping time:	<input type="text" value="5"/> [seconds]
Braking time:	<input type="text" value="1"/> [seconds]
Antenna 3dB beam:	<input type="text" value="10"/> [deg]
Hard-stop:	<input type="text" value="0"/> [deg]
QRA Locator:	<input type="text" value="CM98Iq"/>
Lat / Long: 38.6875 / -121.0417	

Calibration Settings

Antennae Azimuth Offset:	<input type="text" value="0"/> [deg]
Use Compass:	<input type="checkbox"/>
Motor pulses for 360deg:	<input type="text" value="1860"/> / 360 = 5.17
RCA rotator:	<input checked="" type="checkbox"/>

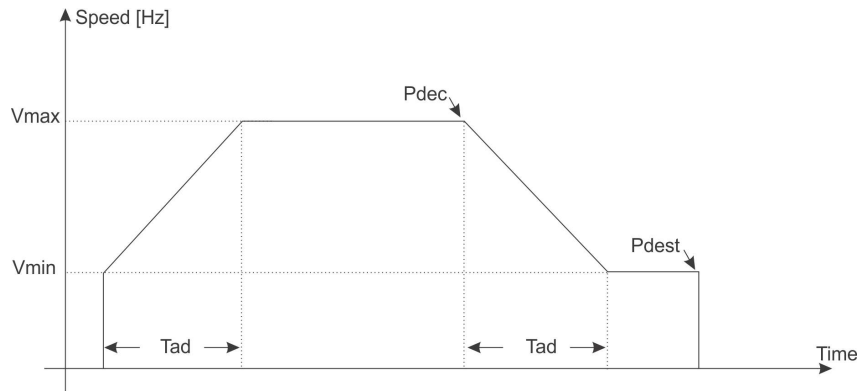
Rotator Calibration

Ensure that Antenna is free to rotate.

UDP Control port is where N1MM and DXLabs sends rotator data. Default 12040.
See [N1MM Rotator Control](#) page how to setup.

Web interface update interval defines how fast the Web page is updated. Default is 1 second.

PWRC uses Variable Speed Drive to control the rotor speed. Rotation starts with **Starting speed** (V_{min}) setting, accelerating to **Maximum Speed** (V_{max}) for defined **Acceleration/Deceleration** (T_{ad}) time. Deceleration will start at **Decelerate point** (P_{dec}) degrees before desired azimuth (P_{dest}). Rotor will rotate with V_{min} to destination point for no more than **Stopping time** setting. PWRC will wait **Braking time** before starting new rotation.



Antenna 3db beam is used to prevent up to a minute of unnecessary ~ 360 deg rotation if the new target is inside the antenna beam, but on the other side of the rotor hard-stop.

Hard-stop heading is calculated using the Compass during calibration or it can be set manually when Compass is not used.

Antennae Azimuth Offset [deg] is the difference between the Antennae heading and Compass readings or Hard-stop when Compass is not used.

Use Compass must be checked to use the optional electronic compass. Reboot and calibration is needed after enabling it.

Motor Pulses for 360deg Number of pulses needed for a single turn. Default for Chanel Master TV rotor is 1860. Used In calibration process and to dynamically calculate the Hard-stop when using Compass and the whole system is rotated.

Set your **QRA Locator** in 4 or 6 letter format to calculate bearing and distance to another grid entered.

RCA rotator selects the rotator type and motor wiring.

4 Calibration

Calibration procedure with optional Compass

Calibration should be performed after installing all antennae and rising to operating position. While during portable / rover operation, calibration should be made on every new location.

Rotator will make counter-clockwise rotation until hard-stop is reached. Lastly a full CW rotation will be made to calibrate the Compass. In the case that antenna is not aligned with the Compass, subtract its reading from the actual antenna heading and enter it as **Antennae Azimuth Offset**.

Calibration without Compass

Rotator will make counter-clockwise rotation until hard-stop is reached. Enter actual antenna heading as **Antennae Azimuth Offset**. This calibration needs to be performed after every power-up or reboot.

5 Operating

WEB interface can be accessed by **Home** tab or at <http://xxxxx/rotor> address, same features, but without the menu tab and it can be left unprotected by the WEB admin password.

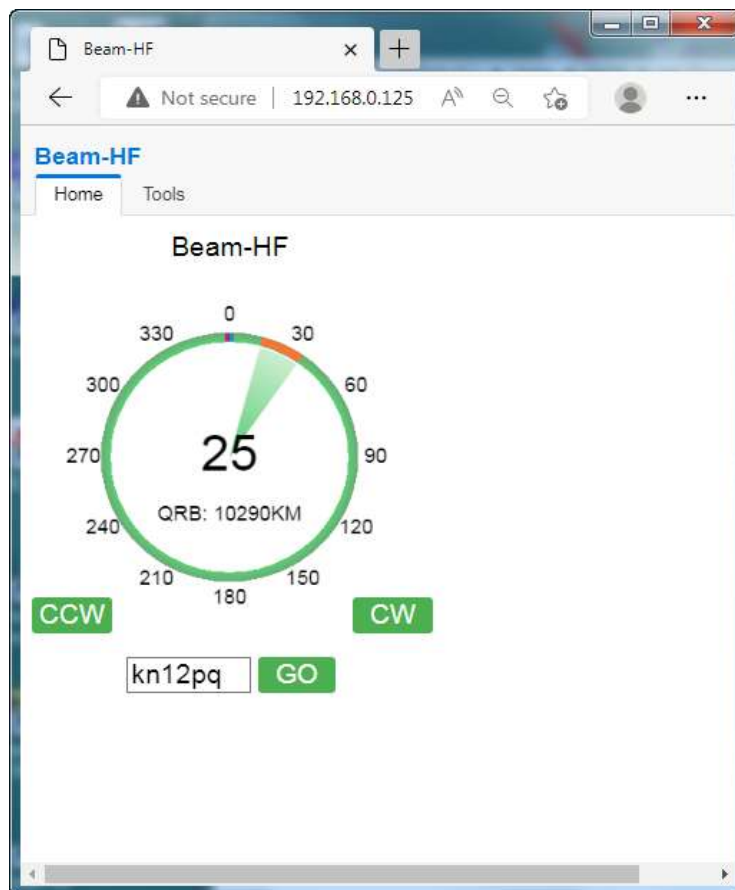
Red marker shows the rotator hard-stop. Green sector shows antenna heading and it will change color while rotating. Orange section shows target heading. Distance to target in kilometers will be displayed when target was selected using QRA grid locator.

Click / tap around the green circle to point-and-shoot. Click / tap and hold on the arrows to rotate, release to stop.

Enter target heading in degrees or a QRA grid locator and click GO or press ENTER.

Click / tap on center to stop rotation.

WEB interface can be completely customized by downloading, modifying and uploading file: *rotor.html* from the internal flash filesystem.

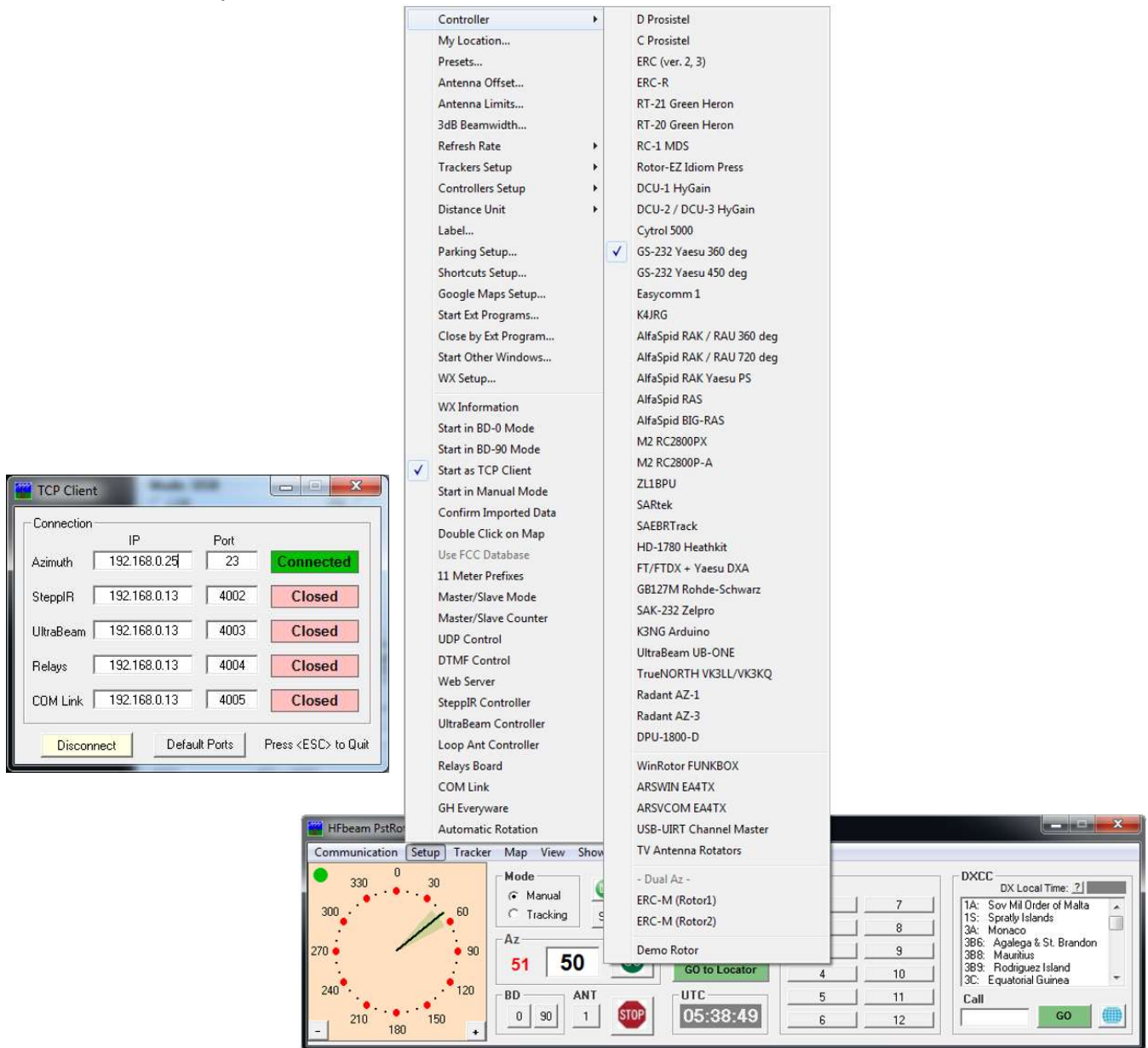


N1MM logger setup

Follow the [N1MM Rotator Control](#) page how to setup and use it.

Use the **Host Name** (*Beam-HF* in this example) in Config >Configure Ports, Antennas tab>**Rotor Description** field.

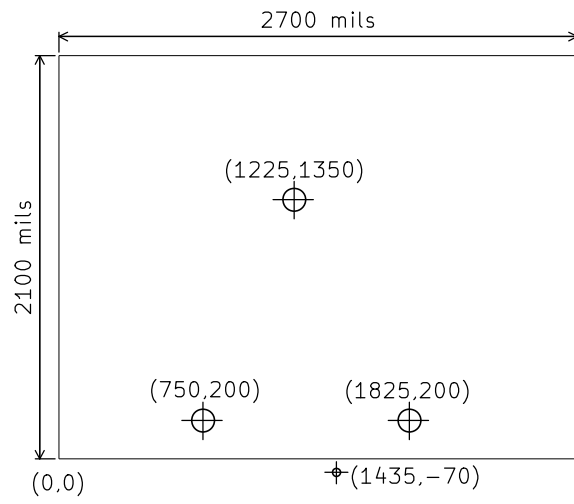
PstRotator setup



Download and install [PSTRotatorAz](#)

Open Setup > Controller and check **GS-232 Yaesu 360 deg** as communication protocol.

Open Communication > TCP Client menu and set the Azimuth connection by entering the rotator IP address and port (23 is default), then press Connect.



PWRC Dimention and drill template