



## Tune – up Instructions

Version 1.0 September 2020



HELZEL Messtechnik GmbH  
Carl-Benz-Strasse 9  
24568 Kaltenkirchen, Germany  
[www.helzel.com](http://www.helzel.com)  
e-mail: [wera@helzel.com](mailto:wera@helzel.com)  
Tel.: +49 (0) 4191 - 95 20 - 0  
Fax: + 49 (0) 4191 - 95 20 - 40

## 1. Calculate the maximum permitted output power of the power amplifier

The radiated HF power must be kept below the defined maximum radiation power for Ocean Radar of  $50 \text{ W}_{\text{ERIP}}$  (47 dBm).

Please note that the WERA power amplifier is capable to provide up to 49 dBm to compensate for cable losses for cases with the Tx antenna system installed in a distance of several 100 Meters.

The maximum permitted output power for a specific installation can be calculated:

$$\text{max PA output level} = \text{max radiation} - \text{antenna gain} + \text{cable loss}$$

If the radiation can't be measured in the field, the antenna gain should be assumed as best case which is 6 dB.

The cable loss depends on the cable length and the attenuation of the used cable type. Please contact the manufacturer to get the according value for your site specific set-up.

## 2. Adjust the output power of the power amplifier

The output power can be set in steps of 3 dB and must always be adjusted to be below the calculated permitted radiation level.

The output power of the power amplifier, see picture below (Fig. 1), is normally adjusted via remote control. If for any reason the remote control is not available the power can be adjusted manually by means of the black knob at the front. This manual setting is accessible when removing the plastic cover at the front.



**Figure 1:** Power Amplifier

Please ensure that the Tx antennas are tuned correctly and all cables are connected.

It is strongly recommended to start the tune-up procedure with lowest output power.

The output power can be adjusted manually or via remote access. The remote access is the preferred option. It is accessible via the “Remote Control” program, the window below (Fig. 2) will show up and gives the user access to the settings and displays the measured values.

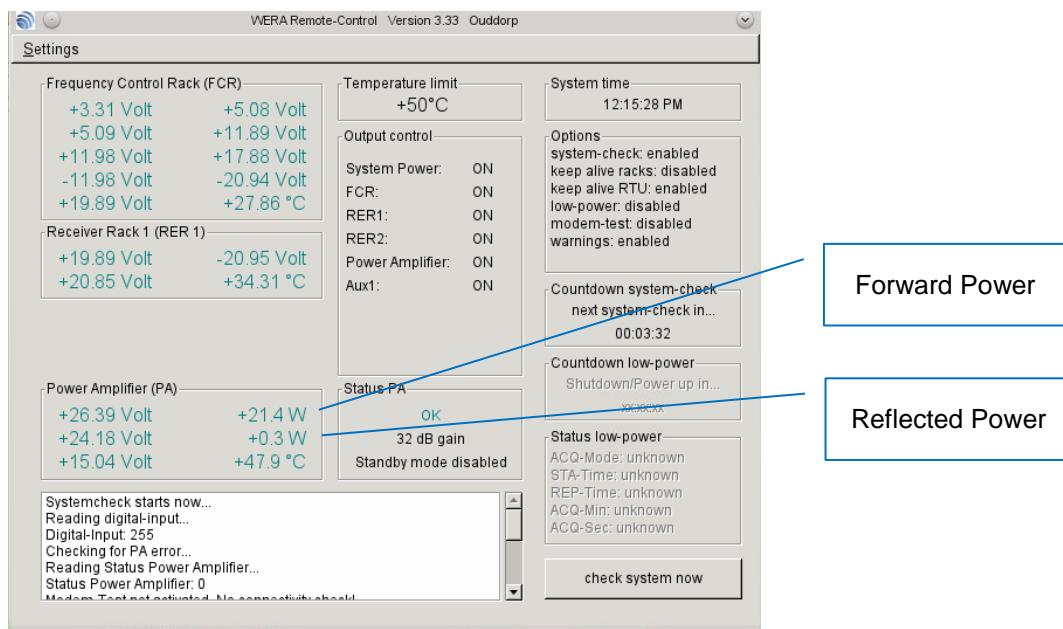


Figure 2: Remote Control Interface

Please click on “Settings” to access the “PA” window, see figure 3.

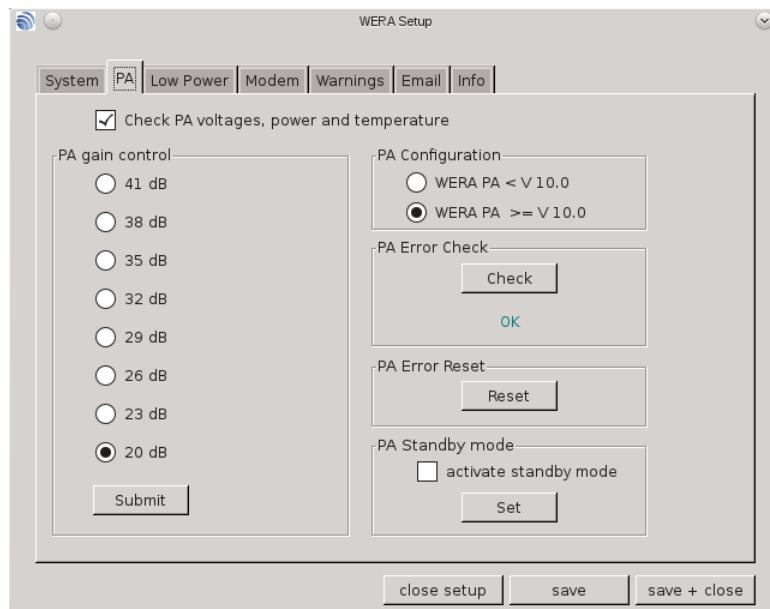


Figure 3: PA setup window

As a first step the output power need to be adjusted to a minimum, that means the PA gain should be set to 20 dB. Click on “Submit” and “save + close” to active the setting and return to the initial window (fig. 2).

- Now run a **short calibration measurement (80 Hz frequency offset)**.
- Click on “check system now” to get the power amplifier output power reading.
- Check the results using “Plott\_WERA\_Cal\_Isq” according to the description of chapter 11.7 of the Quick Installation Guide.
- All “rms voltages” are expected to be below 7 Volts
- Increase the gain by one step using the PA setting window and run a calibration again.

**Attention:** Always check the output power value to ensure that the **level is kept below** the calculated **max PA output power** limit.

- If no antenna has reached the 7 volts limit the gain (=power) can be increased by one step again.

The **optimum is reached** as soon as one Rx antenna voltages reaches a value **close to the 7 Volts limit**.

- If this optimum output power is more than 4 dB lower as the calculated max PA output power, the receiver sensitivity can be reduced, please refer to chapter 7.1.5 of the Quick Installation Guide.
- After increasing the “Receiver Attenuation” by 4 dB the power can be increased by another step and the output power and the rms voltages should be checked again.

**This procedure can be repeated until the Receiver Attenuation reached a value of 12 dB.**

**Attention:** Always check that at the PA no **red LED** is on.  
In that case reset the PA before the next calibration cycle is started.