1. PURPOSE:

This document describes the process followed to update a Tonewinder 1.2 Lite unit to a Tonewinder 1.2 R2, by using the Lite-R2 Upgrade Kit.

Figure 1: Picture of the Lite-R2 Upgrade Kit

2. SCOPE:

This upgrade kit can only be installed in a Tonewinder 1.2 Lite unit:

Figure 2: Tonewinder 1.2 Lite

3. Lite-R2 UPGRADE KIT PARTS:

The Lite-R2 Upgrade kit contains:

- 1x Transport case.
- 1x Gonine 24 Vdc 3A external power supply.
- 1x ESP32 Microcontroller, loaded with the latest version available for R2.
- 1x DRV 8825 control driver (adjusted to 450 mV).
- 1x Fully assembled guide arm. Includes the thread tension sensor.
- 1x Electronics to control the tension sensor.
- 1x Linear actuator with Nema 11 motor (software compatible).
- 1x Wired home sensor (includes support on motor).
- 1x COB LED strip compatible with electronics.
- 1x Necessary screws.

4. SOFTWARE VERSION:

For proper functioning of the winder, you need to have these software versions:

- **Microcontroller ESP32 Software: 10.5 or higher.**
  This version is already installed in the Microcontroller that is supplied with the kit.
- **Touch Screen HMI Software: 10.4 or higher.**
  After installing the new microcontroller you need to update the touchscreen software version to 10.5.

You can download both versions of software ESP32 and HMI from our website, www.tonewinder.es .

5. BACKUP OF THE SLOT MEMORIES:

If you have a low quantity of slot memories that you want to move to the new Microcontroller, you can do it simply by downloading each memory to the computer, and when the new microcontroller is installed you will be able to upload these memories.

If you have a large number of memories and you want to keep them in the new microcontroller, the best way to do it is:

- Update your current Microcontroller installed in your unit to the new software version.
- Run the flasher application that you can find on our website (see FC_09_ESP_Memory_Flasher). This application will make a backup of your actual microcontroller in your computer, including the current software version and memories.

- After that, you can recover this backup file in the new microcontroller using the same application.

After this process, the new microcontroller will be loaded with the new software and also with your presets.

6. INSTALL THE KIT:

Here are the steps to follow to install this new kit:

➢ **STEP 1:** Switch off the unit and disconnect the power supply from the winder. Remove the four screws from the top cover. Then carefully remove the top cover from the winder and place it on the bench, just at the back of the winder, to disconnect the Gaussmeter sensor from the PCB.

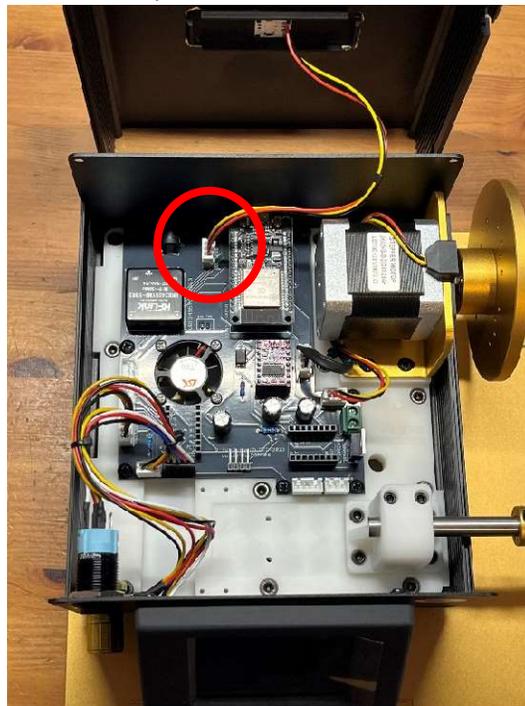Figure 3: Remove the top screws from the front and rear cover (x4).

Figure 4: Remove the Gaussmeter sensor from the PCB.

➢ **STEP 2:** Remove the front cover by removing 2 screws from the bottom and disconnecting the three connectors corresponding to the power button, the potentiometer, and the touch screen.
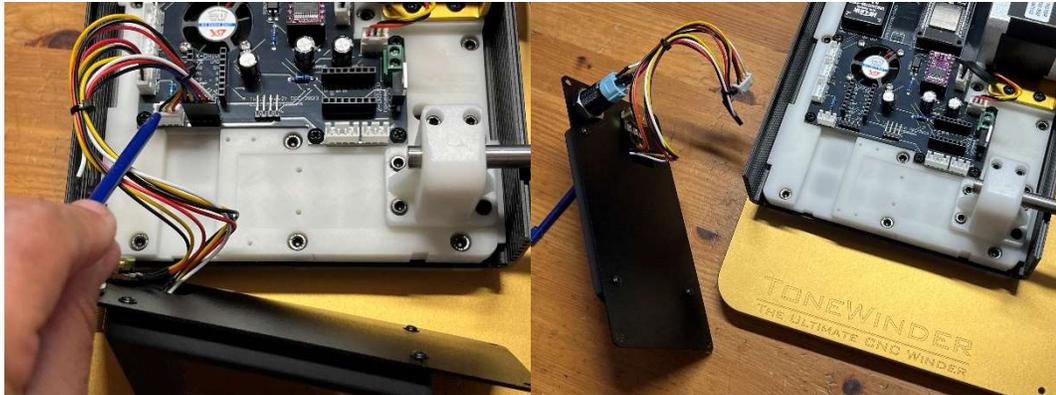

Figure 5: Remove the front cover connectors from the PCB.

➢ **STEP 3:** Remove the back cover by unscrewing the two screws on the 24 Vdc connector and then the other two screws holding the back cover, by using a 2 mm Allen key and Phillips screwdriver.

Figure 6: Remove all screws from the rear cover.

➢ **STEP 4:** Remove the adapter from the metal bar by unscrewing the four screws on the base by using a 3 mm Allen key.
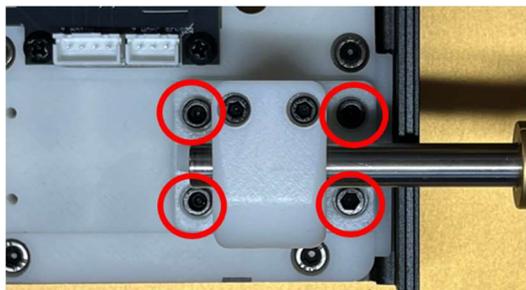

Figure 7: Remove the four screws.

➢ **STEP 5:** Remove the ten screws that connect the white inner base to the aluminum base by using a 3 mm Allen key. Also remove the white inner base with all the electronics mounted, including the motor, and the lower part of the black aluminum box. Only the methacrylate piece will remain on the aluminum base.
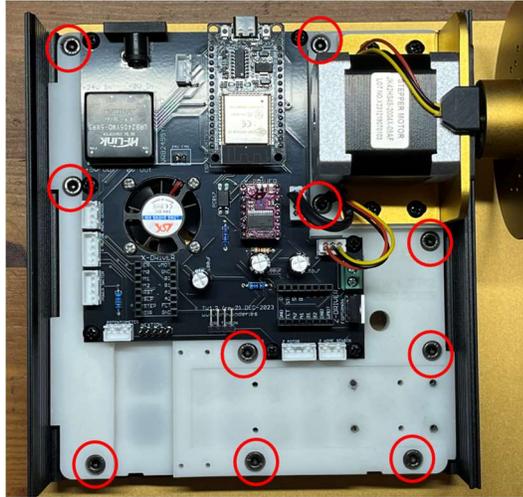

Figure 8: Remove all screws from the inner white base.

➢ **STEP 6:** Install the light strip supplied in the kit, leaving the tip of the wires in the circular hole, so that the strip should cover 100% of the hole. Start with the wire-free end in the position shown in the picture and continue inserting the strip until it reaches the circular hole. It is not necessary to remove the adhesive tape.

Figure 9: Insert the light strip in the acrylic base.

➢ **STEP 7:** Reinstall the lower base of the aluminum box and the white base inserting the cables of the ED strip in the hole. Tighten the 10 screws by hand so that they are securely tightened. Machine tightening is not recommended.
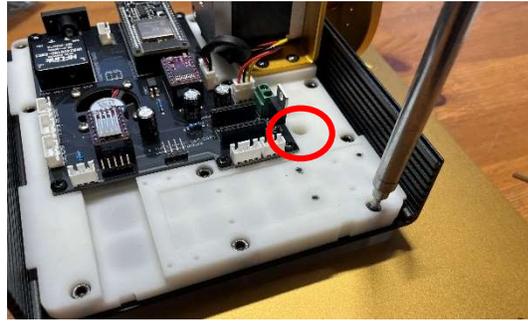
Figure 10: Hole in the inner white base.

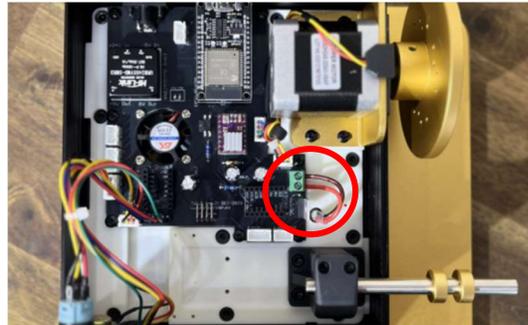➢ **STEP 8:** Connect the wires of the LED strip to the green connector on the PCB.

Figure 11: Connect cables. Make sure the polarity is correct (as shown).

➢ **STEP 9:** Install the driver for the actuator/motor (Motor X). Please take care of the orientation of the driver. The driver goes adjusted to 400/450 mV, so you won't need to adjust it.

Figure 12: Driver orientation in the PCB.

> ➢ **STEP 10:** Remove the existing ESP32 and fit the new one. Be careful with the pin alignment.
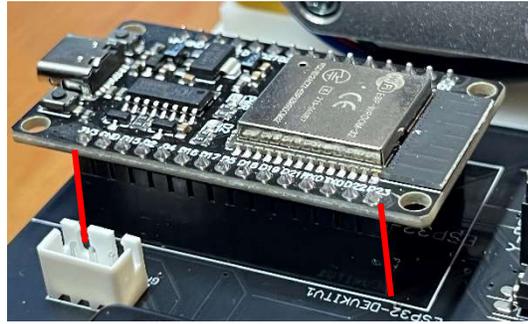

Figure 13: Install the new loaded ESP32.

> ➢ **STEP 11:** Fit the tension sensor electronics and solder the pins being careful not to intercommunicate.
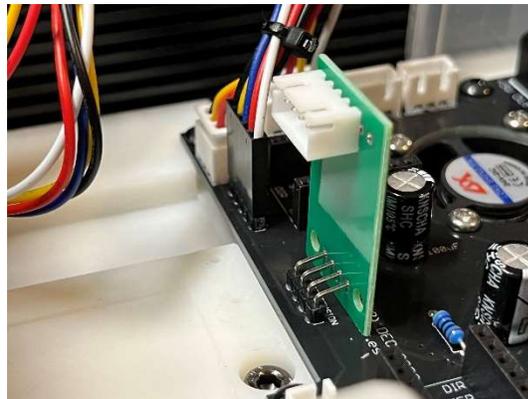

Figure 14: Install and solder the tension sensor electronics.

> ➢ **STEP 12:** Place the Guider Arm Assembly in position (the four screws on the white base should match the existing ones on the motor. Fit the four screws and tighten them firmly by hand. Connect the motor to the PCB.

Figure 15: Install and connect Guider Arm Assembly.

➤ **STEP 13:** Install the bracket with the included home sensor by placing 4 screws on the legs of the bracket. Connect the sensor to the PCB. To ensure good homing accuracy, it is recommended to glue the bracket to the motor by using a drop of glue here after installing it:
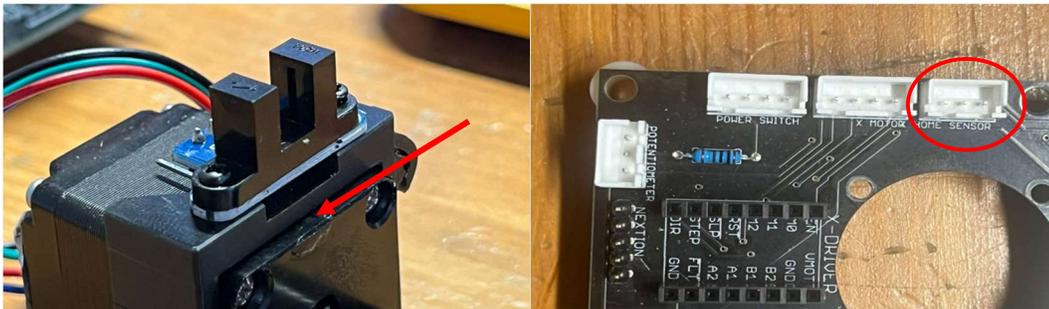

Figure 16: Home sensor assembly. Drop of glue in this point (see arrow).

➤ **STEP 14:** Connect the load cell to the electronics you have just installed. Secure the wire to the special hook on the home bracket you have just installed. You must fix the cable at a point that allows the arm to advance to its most extreme position, without tension on the cables.
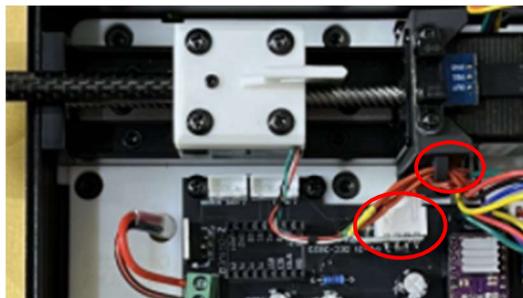

Figure 16: Connect the sensor to the electronics, and fix the cable.

> ➤ **STEP 15:** Install the back cover and fit the two screws on the bottom and the two screws on the 24vdc connector.

> ➤ **STEP 16:** Install the front cover using the two lower screws. Remember to connect the Power button, the potentiometer, and the display.
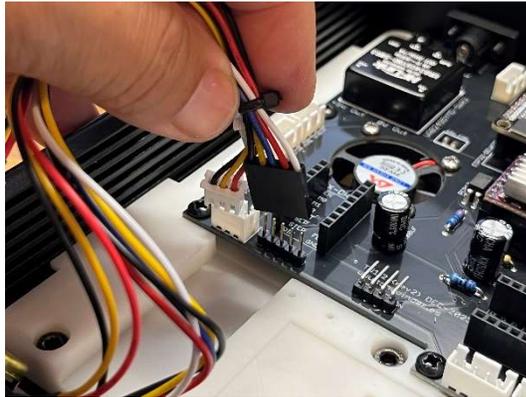

Figure 17: Connect the touch screen (color code).

> ➤ **STEP 17:** Move the top cover into position, and connect the Gauss sensor. Then, adjust it to its final position and tighten the 4 screws (two on the front and 2 on the back cover) to fix it.

> ➤ **STEP 18:** Install the wire stabilizer, by gluing the felt disc on the base (it has two side tape), and then fit the stabilizer screw as shown:

Figure 18: Stabilizer screw installation.

> ➤ **STEP 19:** Connect the winder to the new power supply provided, but do not switch it on.

➢ **STEP 20:** Download the latest version of the Touchscreen from the website, and load it onto a Micro SD card (32 Gb or less). It is recommended to format the card beforehand (FAT32). For this step you must use a computer with Windows OS, otherwise, there may be incompatibilities with the formatting of the card and the file to be recorded.

➢ **STEP 21:** Install the SD card in the winder (see Tonewinder 1.2 R2 manual, 6.5.6.7 Touch Screen Software Update) and switch on the winder. The firmware on the display should update automatically. Once the process is finished and the firmware upgrade is verified, turn off the winder and remove the card.

➢ **STEP 22:** Turn the winder back on, and if everything is connected correctly, the guiding arm motor will perform the homing process and then show you the installed software versions. Sometimes, after updating the firmware on the display, it is necessary to reset (turn off/on) the winder a couple of times. This means that the kit is apparently installed correctly.

Figure 19: Correct initialization screen.

7. VERIFY THE INSTALLATION:

Once the Lite-R2 upgrade kit has been installed, the following items must be checked to ensure that the winder is working properly:

➢ **CHECK 1:** Switch on the winder and verify that the light does the correct blinking sequence. It should flash twice at maximum intensity and then remain fixed at half intensity.

➢ **CHECK 2:** Verify that the basic parameters have been loaded correctly. To do this, access the Basic parameters screen (MAIN MENU>SETTINGS>BASIC PARAMETERS) and verify that all fields are non-zero (default parameters must be loaded).
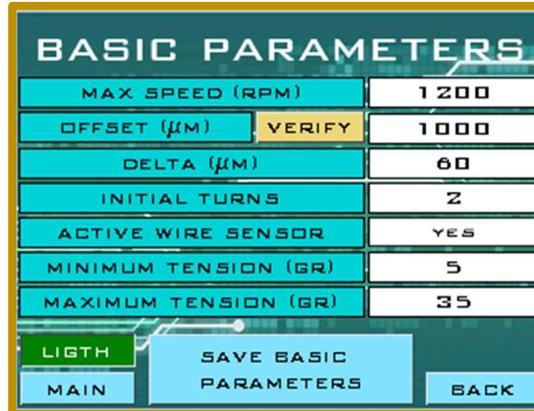

Figure 20: Basic Parameters screen.

➢ **CHECK 3:** Offset calibration. Follow the instructions in the manual, in section '6.4.1 Verify "Offset Position", on page 39.

➢ **CHECK 4:** Verify guide arm distance of 10 mm. Make sure that the X arm is traveling accurately as per the adjusted distances.
   1. Go to Offset/Verify/Adjust Screen, then push "CHECK & SAVE CHANGES". The arm will move to "3250 microns" in this case, or the value shown on your screen.

Figure 21: VERIFY/ADJUST OFFSET screen

   2. Place the caliper (or a drawing ruler) to measure the distance between the Wire Guider aluminum block and the black box as in the below screens.

Figure 22: Placing the caliper

Figure 23: Placing the caliper (2)

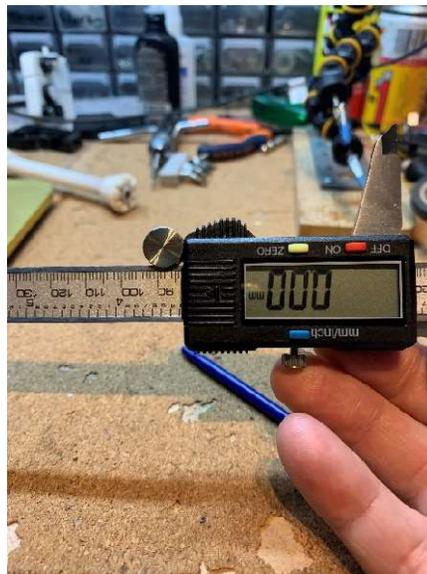3. Set the caliper to cero, or take note of the value.

Figure 24: Setting caliper to cero.
To read put the Picture with the head facing down

4. Then increase by 10.000 microns the Offset value by pushing repeatedly the right "500 um" button, It will be "13.250 microns" in this example

Figure 25: Adding 10.000 microns to offset value.

5. Once you have increased the Offset value, push the "CHECK & SAVE CHANGES" again. The arm should move right by 10.000 microns (10mm/one cm).

6. Measure the distance with the caliper, it should match perfectly with a difference of no more than a 1%.

Figure 26: Measuring 10.000 microns offset value
To read put the Picture with head facing down

7. Once verified that the distances are correct, return the offset value to its previous value, push "CHECK & SAVE CHANGES", and then leave the verify screen.

➢ **CHECK 5:** Verify the operation of the Gaussmeter. Follow the instructions in the manual, in section '6.5.6.2 Calibrate Gaussmeter", on page 71.

➢ **CHECK 6:** Check the operation of the tension sensor. To do this, go to make a manual coil (NEW BOBBIN>MANUAL MODE) and enter the following parameters:
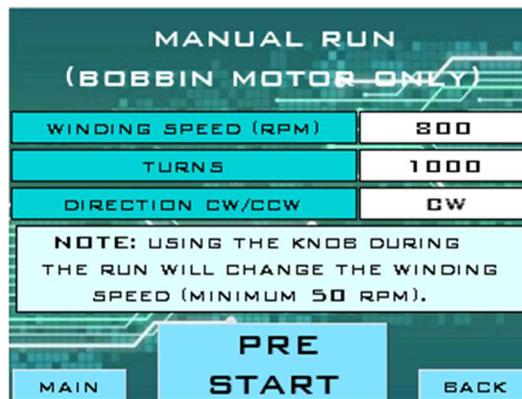

Figure 27: Manual Run Screen

Once you start to make the coil, press lightly with your finger on the top of the guide arm:

Figure 28: Point where you should press lightly.

After pressing lightly on the Guider arm you should see changes in the wire tension reading.

➢ **CHECK 7:** Make a dry test coil, by loading one of the pickups that are saved in the library.

8. **CONTACT FOR SUPPORTING:**

If you face any kind of problem during the installation of this kit, please contact us by email:

<p align="center">info@tonewinder.com</p>