Antenna Rotator System USB

ARS-USB PST Controller
Calibration guide

Feb/2018   Rev 1.1f

Introduction

This guide will assist you to calibrate the ARS-USB control unit connected to a Prosistel or any rotator that uses a multi-turn potentiometer.

First you must know that the ARS-USB_PST controller is connected to the rotor and it needs 5 wires; the wires have the following number and meaning:

Pin #1: Motor A.

Pin #2: Motor B.

Pin #3: Potentiometer cursor. Position feedback Voltage

Pin #4: Potentiometer End A.

Pin #5: Potentiometer End B.

There are 2 independent parts:

Movement:

Pin #1 and Pin #2 are used for the rotor rotation. When applied +12Vdc (+24Vdc on PST71) the rotor will turn in one direction. If the voltage is inverted, the rotation will turn in opposite direction. When the rotor is stand-by, those Pins are grounded.

Position readout:

Pin #3, Pin #4 and Pin #5 are connected with the multi-turn potentiometer (POT). Pin #5 is ground, Pin #4 is +5Vdc and at Pin #3 we will read a voltage that depends on the rotor position.

The ARS-USB will supply 5Vdc to the Potentiometer (Pin #4 and Pin #5) so in case the rotor uses a 10 turn Pot (i.e. all Prosistel rotors use a 10 turn Pot) every 360⁰ rotation (1 turn) the feedback voltage (Pin #3) will be:

$$360⁰ = 5V / 10 \text{ turns} = 0.5V \text{ peer turn}$$

It means that for a rotation, the feedback voltage will increase 0.5Vdc

Calibration requirements:

You will need the program ARSConf.exe This program will be installed with the ARSVCOM, so before to continue with the calibration of your unit, install the ARSVCOM.

Calibration procedure:

You must know or decide the 2 limits positions (CCW/Left and CW/Right) you wish to be used for the rotator. Those limits will be electronics limits, because the ARS-USB will use them as the rotor limits for the rotor motion. The ARS-USB via Pin #3 will read the voltage feedback of the POT, so will determine the rotor position.

Normally a Prosistel calibrated for a 360⁰ rotation, will use 2.8V (CCW Limit) and 3,3V (CW Limit) but it can be changed from one to other unit. This voltage is measure between Pin #3 and Pin #5 but as those points are wired into the ARS PCB, you can set the voltmeter probe at J4-5 (+) and J4-3 (ground) because surely it's more easy to be measured.

Note: Those limits values (2.8V and 3.3V) are the standard values used by Prosistel and are used in this guide as the limits (CCW/Left and CW/Right limit)

So during this calibration guide we will use those default values but a user could use different values for the limits.
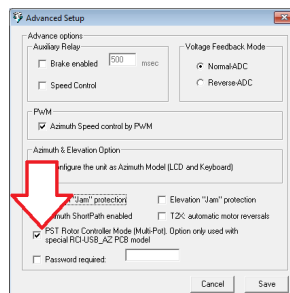
Note: If you know one the voltage limits, you can calculate the other limit voltage. For instance if you want to use 3.3V as CW/Right Limit, after 1 turn or 360º the feedback voltage will be 3.3V - 0.5V = 2.8V
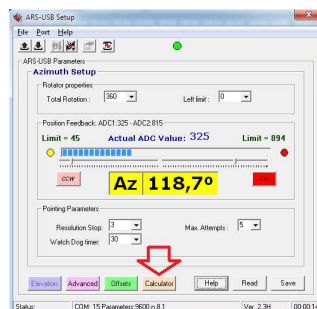
Step 1

- Open the top cover of the ARS-USB and Power On.
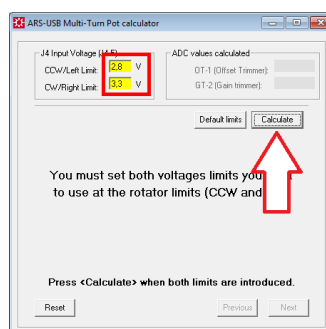- Run **ARSConf** program and Go to Advanced menu.
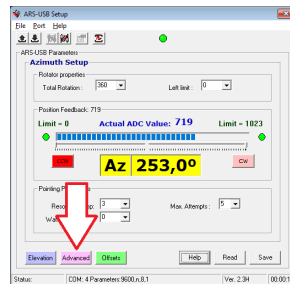
- Now, check that the "PST Rotor Controller Mode (Multi-Pot) is enabled

- Press Save and go back to Main windows.
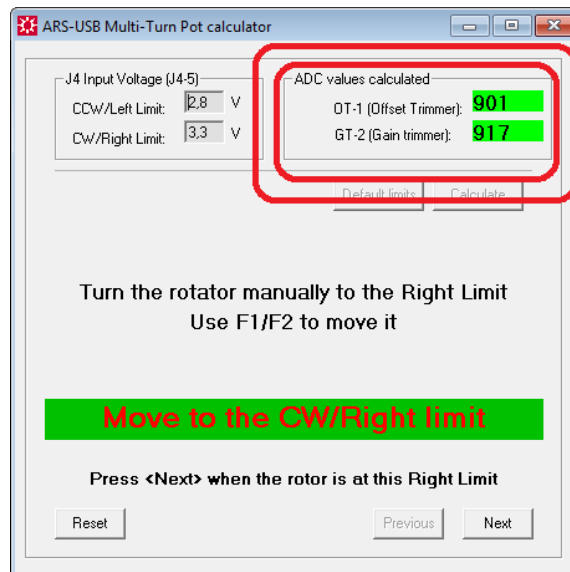- Now press the **Calculator** button:

- Enter those 2 Voltage values for both limits and press **Calculate** button.

In this case, 2.8 and 3.3V have been used

Step 2

The program will calculate 2 parameters that will be used later for the potentiometer adjustment (POT1 and POT2). Those parameters are **OT-1** and **GT-2**.


OT1 is 901 and GT-2 is 917

Step 3

Turn the rotator by means of the **F1** (CCW) or **F2** (CW) and stop the rotor at the point you want to be used as a Stop **Right Limit** or CW Limit (usually 360º or 180º). This is the CW Limit you want to be used. In this example, the CW limit was at 3.3V

Step 4

With the rotor at this CW Limit position, adjust **POT1** (Gain trimmer) untill **ADC-2** was as close as possible to the value calculated for **GT-2** (any value in the range 912-922 is OK).
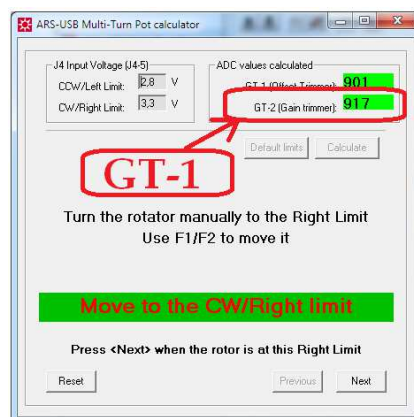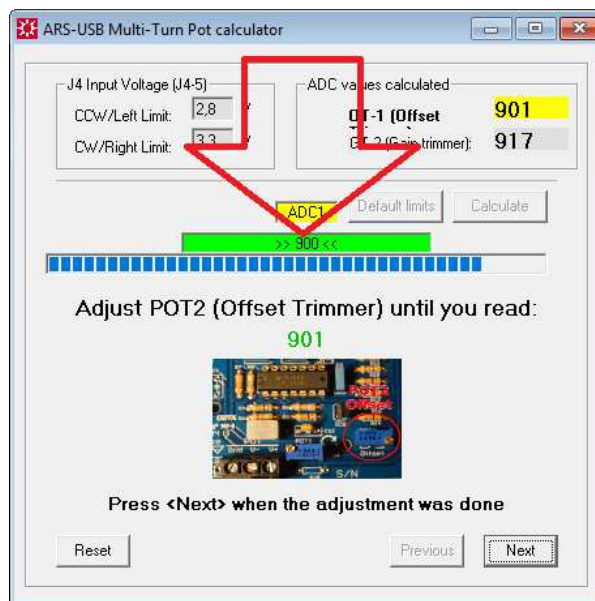
This ADC-2 value is displayed at the ARSConf program.
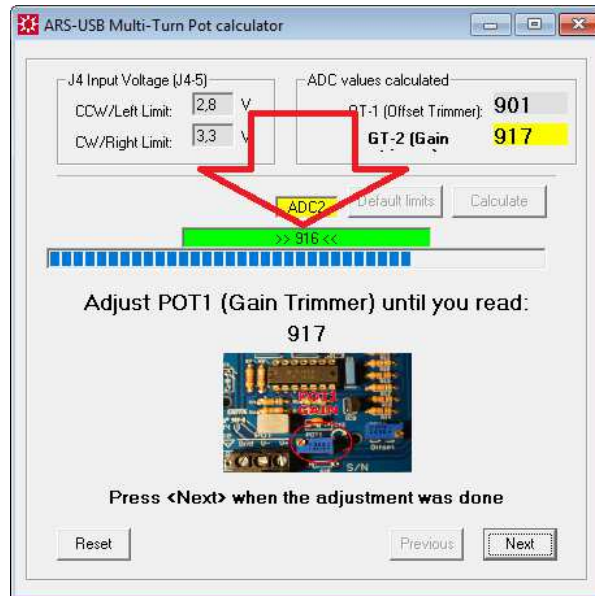
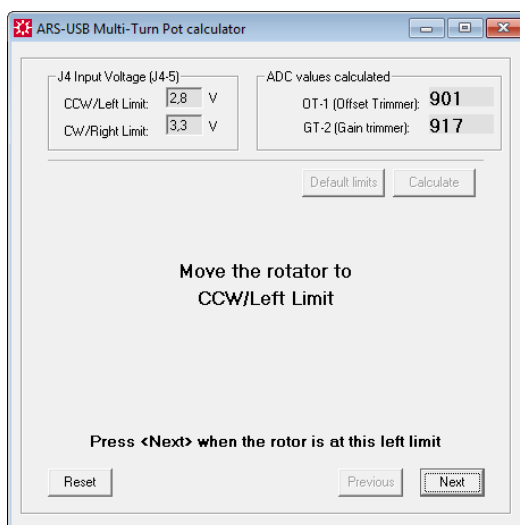**ADC2 is 916, so POT1 is adjusted**

Step 5

Now adjust **POT2** (Offset trimmer) untill **ADC-1** was as close as possible to **GT-1**.

The ARSConf program includes a bar that works like a wizard and assists to facilitate the adjustment.
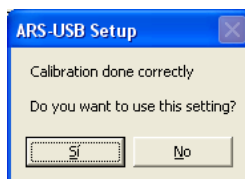
Step 6

Now, press **NEXT** button and move the rotor the Left/CCW Limit

Step 7

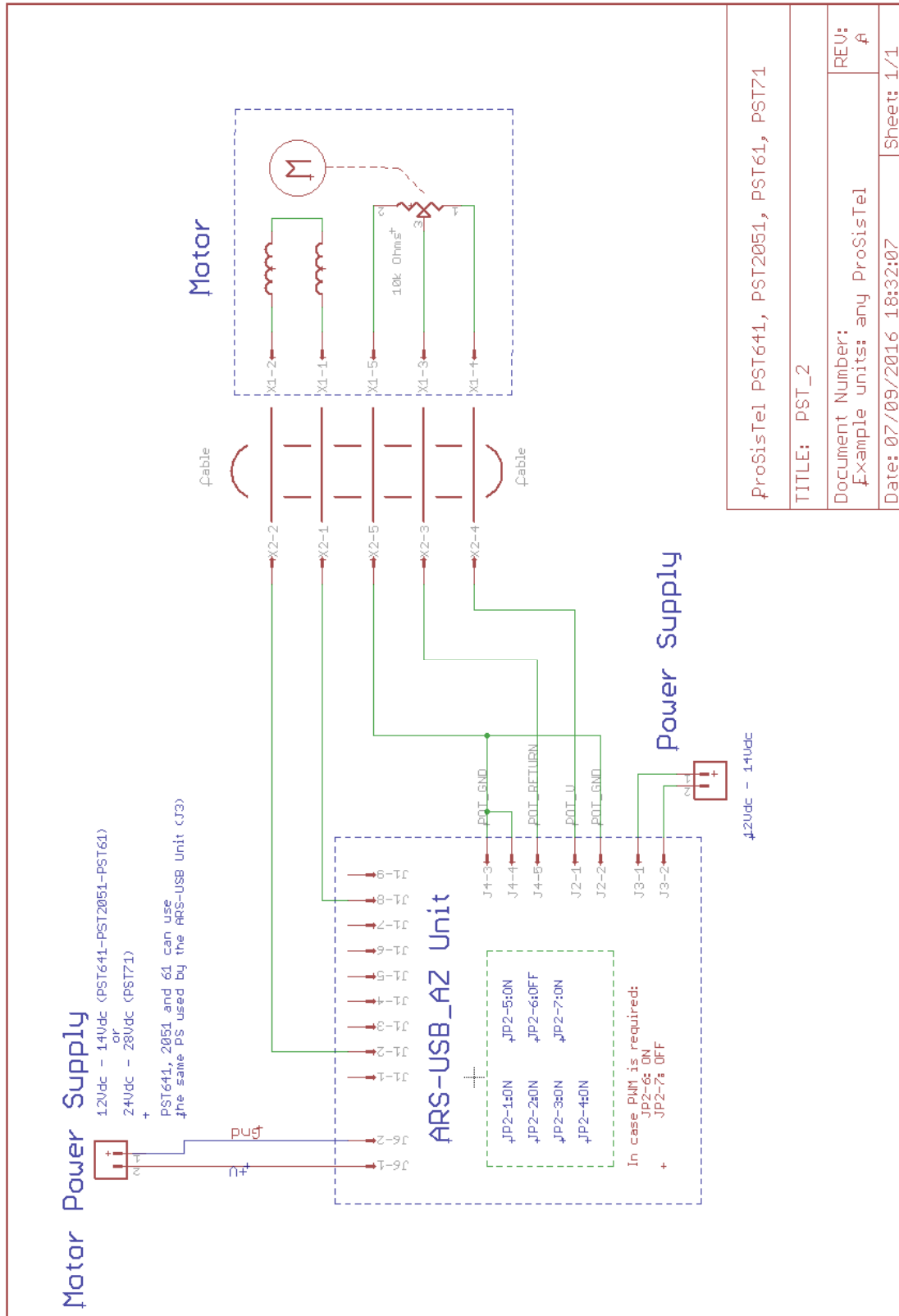As soon as you get the CCW/Left limit, press **NEXT** and the **calibration** will be finished.

Step 8

The rotor is already calibrated, so you can now press the "**Save**" button on the **ARSConf** main window and the configuration will saved permanently on the Flash.

The ARS-USB unit is ready!

Wiring Schematic