Setting up auto-tracking with SDR-Console and the FoxDelta ST2-USB Interface

This note describes how I successfully setup Az/El auto-tracking at my satellite ground station.

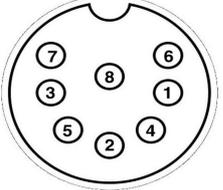Rotator in use: G-5400B from Yaesu
Tracking software: Satellite tracking with SDR-Console
Rotator interface: Fox Delta ST2-USB

Please ensure that your G-5400B has been setup and operates normally with manual tracking before you attempt to add tracking automation to your setup. It is assumed that you have successfully installed SDR-Console and have configured it with the SDR that you use and have configured satellite tracking successfully.

Step 1: Connecting the ST2-USB to the G-5400B controller unit

- The G-5400B has a DIN-8 socket on the rear panel. The signals on each pin are as follows:

DIN 8 Pin Layout	Pin #	Signal
	1	Elevation
	2	Right
	3	Up
	4	Left
	5	Down
	6	Azimuth
	7	+VE
As seen on the back panel	8	Ground

*** IMPORTANT ***
Please check your connections. Incorrect connections can damage your Controller and/or Interface unit

Step 2: Connecting the ST2-USB to your shack PC/Laptop

- Please follow the instructions on Dinesh's foxdelta.com website to install the driver https://www.foxdelta.com/products/ST2-0417/CH341SER.zip
- Once the drivers are successfully installed, connect the USB cable from the ST2-USB to your PC/Laptop. (Your "Devices" menu on Windows will show you the COM port assigned to this USB connection)
- Power on the G-5400B controller and follow the instructions in the tutorials on Dinesh's website (https://www.foxdelta.com/products/st2-0417.htm) to calibrate and setup the ST2-USB for the first time
- You can power down the G-5400B controller after the calibration is complete
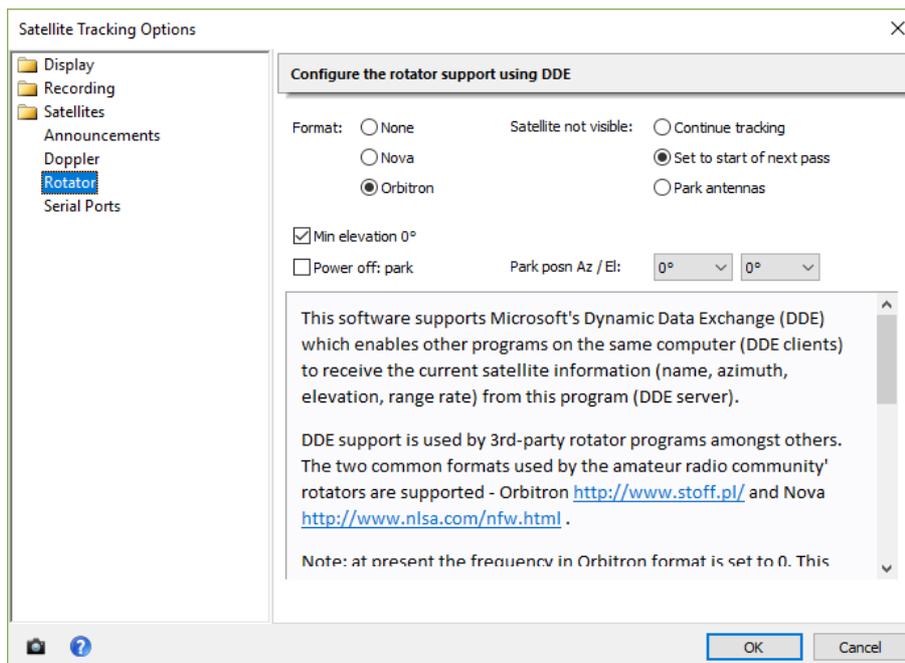
Step 3: SDR-Console configuration

- Start SDR-Console
- In the "View" tab, click on "Satellites" to open the satellite tracking window

- Click the little gear icon on the top-right of the satellite tracking window to open the "Satellite Tracking Options" window

- In the left pane, select "Rotator"

- In the "Configure the rotator support using DDE" section, select the following:
  - o Format: Orbitron (optionally, Nova works too, but the corresponding change should be made in WispDDE settings in the next section)
  - o Satellite not visible: Set to start of next pass (This seems to be the best option for me)
  - o Tick the box for "Min elevation 0 deg
  - o I don't use "Power off park, so it was left unticked
- Click "Ok" to confirm your selections

Step 4: WispDDE setup

SDR-Console cannot communicate directly with the ST2-USB interface. This is why we need an intermediate software like WispDDE. You will need WispDDE version 4.3.2. I downloaded the WispDDE executable from http://ok1dx.cz/constructions/avrot/wispdde/wispdde.zip

- Extract the files into a temporary folder and run setup.exe and follow on-screen instructions
- Run wispdde.exe and you will see the following screen
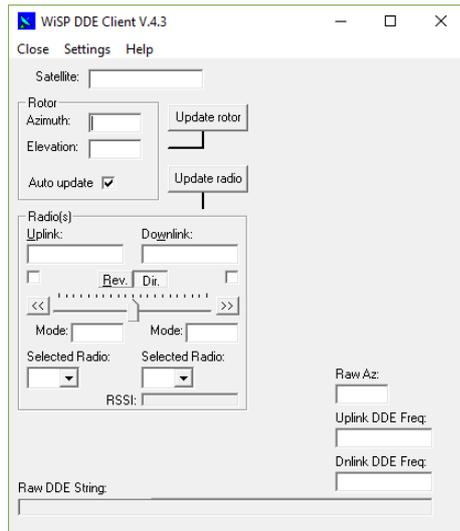
- Select "Settings->Rotor" and you will see the following screen
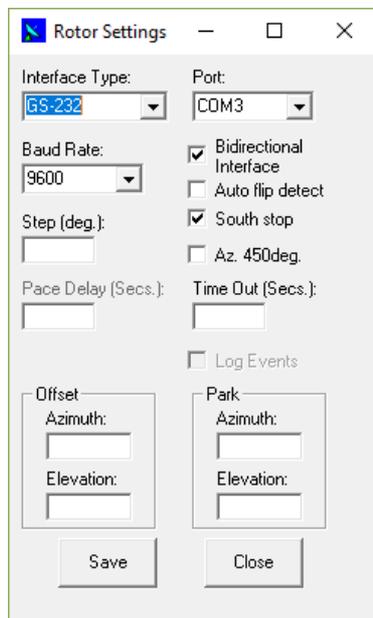
- Set the following parameters:
  - o Interface type: GS232
  - o Port: (select the COM port associated with the USB connection from the ST2-USB)

- o Baud rate: 9600
- o Tick "Bidirectional interface"
- o Tick "South stop" (if relevant to you)
- o You may tick "Auto flip detect" if you want WispDDE to manage rotator direction flip on high elevation passes
- o You may tick "Az. 450deg" if your rotator supports 450 degree azimuth rotation

  I have left all other options blank on this screen.
- "Save" and "Close" this screen
- On the main WispDDE screen, select Settings->DDE Link. You will see a screen as shown below:
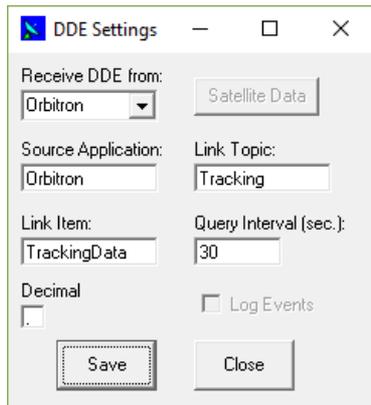
- Set the following parameters:
  - o Receive DDE from: Orbitron (If you have chosen Nova in the setup of SDR-Console, you need to replace Orbitron with Nova
  - o You will see that the parameters for "Source Application", "Link Topic" and "Link Item" will be auto-filled
  - o Query Interval (sec): 30 (the default is 1 sec, but this is too small and makes my G-5400B "hunt" back and forth. I have found a refresh interval of 30 seconds is sufficient for me track LEO satellites fairly well. You may experiment with a setting that suits your equipment)
- "Save" and "Close"
- I have not enabled any features on the Settings->Radio screen
- Shutdown WispDDE (for now)

That's it! All you need to do is test the setup!

Getting it all to work
- Run SDR-Console (if not already open)
- On the Satellite Tracking screen, select the satellite that you would like to track and have your rotator align the antennas to
- Power on the G-5400B controller. You should see Azimuth and Elevation information on the ST2-USB display indicating the where the antennas are pointed

- Run WispDDE. After the "Query Interval" you have set, you will see the WispDDE screen refresh itself with the current azimuth and elevation information from SDR-Console and you will also see your rotator controller being activated and antennas aligned to the data from SDR-Console

That's all there is to it! Have fun!

If you have any queries on this note, I'll do my best to answer them. Please mail your queries to vu2lbw@gmail.com