DF9GR's ERC-R Single and Dual Axis Rotor Controller Interface Evaluation

Notes :
- June 20th 2010 initial release.

Type: Pre-assembled PCB Kit, Single and Dual (Axis Azimuth (360 and 450 degrees) **AND/OR** Elevation (45, 90 and 180 Degrees))
Interface: USB
Protocol supported: GS232A-Az and GS232A-Az/Elev or GS232B-Az and GS232B-Az/Elev.
Rotor controllers supported: More then 36 different ones from 5 different manufacturers.
Firmware release tested: Release 1.6.0
Documentation: Specifications, Assembly and Installation
Software tested: HRD Rotator rel.: 2610, Logger32 rel 3.24.0, N1MM-Rotor rel.: 6.11.31, Wintest_Rotor rel.: 1.0, PST_Rotator 5.93 and Nova 2.12B
Rotors Controllers tested: G-800SDX, G-5600B and G-2800DXA.
Softwares supplied with purchase: ERC-R Utility, RC-3D Control, FTDI USB driver and PST-Rotator-Lite
Web Site: http://schmidt-alba.de/English/english.html or www.easy-rotor-control.de
Cost: Not released yet...

Rene's DF9GR ERC-1 as you saw in my February 28th 2010 review (http://forums.ham-radio.ch/showthread.php?t=19140) and ERC-3D in my march 1st Review (http://forums.ham-radio.ch/showthread.php?t=19168) and June 2010 AMSAT-UK "Best of" rotor interface article are both very impressive little unit that really left there mark… And as I said to a lot of you "Keep an eye on this guy he's got more to come..." Well here it is... The ERC-R is the latest in the ERC family of design from Rene DF9GR, It is an impressively small package USB Single/Dual axis rotor interface that can be used in many different Single and dual axis setup.

As much as the first two ERCs were impressive this is even more... Even if it is considered a KIT, it is 95% pre-assembled since all SMD components are already assembled, so most of what is left for the Ham operator to do is assemble the cable(s) going to the rotor(s). The ERC-R uses a more powerful processor of the Atmel family, it supports 39 different rotors from 5 different manufacturers, it still has the auto ranging 0-15vdc reference circuitry, it offers an optional LED/Switch integration that will interrupt application control on front panel operations, it still supports an optional LCD display and all of this in the smallest ever package for a rotor interface.

So yes, in this design Rene DF9GR did drop some of the flexibility of the ERC and ERC-3D by dropping the relays, but by still offering the auto ranging reference voltage (0-15vdc) circuitry it is still support an impressive range of rotor plate-forms.

Kit design, documentation and assembly (9/10):

The ERC-R is SMD based design that is 95% pre-assembled, it is still considered a KIT as such, but the only thing left to assembled is really the cable assembly to the rotor. The PCB is very well designed and of good quality, 10 large solder pads are ready to receive the cable to the rotor controller.

The kit came with ALL parts nothing was missing, again all the way down to screws, nuts and even tie-wraps, new to the ERC-R is that it did come with a plastic enclosure. Parts were found to be of high

quality and pcb was properly protected against ESD. The documentation is very well made and complete, the assembly is done is minutes thanks to well documented images that made assembly a lot easier. The ERC-R with its enclosure can be directly integrated into most rotor controller enclosures or simply held on the back side of most rotor controller.

The ERC-R is designed around a more powerful Atmel Mega644P-20 CPU and an FTDI USB chip set, the feedback sensor circuitry is one of the best designs I have encountered yet! Based around a pair (one Azimuth and the other for Elevation) of 0 to +15v bridged interfaces and the flexibility of the Atmel Mega644P-20, well designed firmware and utility software, the ERC-R uses an automatically selected multi range voltage scheme, that lets the unit select best voltages range up to 15 volts for the rotor you are "**calibrating**"… Again just like with all the ERCs, notice that I did not write "***trying to Calibrate***"… simply put that is because I have tested this unit with MULTIPLE rotors combinations and I did not find one yet that I was unable to calibrate on the FIRST try…

The ERC-R still support a aux relay for Brake/Speed control. The ERC-R still supports mismatched rotor pairs like Yaesu SDX and Create Elevation rotor, and one could wounder when Rene will simply tweak his firmware and start supporting dual Azimuth? will see... brake delays before and after motion request are configurable via the ERC-R utility, like just about everything else in this tiny interface having to do with rotor handling for each axis... Some of the other interesting settings are the overshoot parameters giving you the possibility to control, on older rotor, how much in advance you want to cut the circuit so that your rotor stops in the proper position… Speed control is probably one of the nicest add on that Rene did to the firmware of all his ERC interfaces in the last couple of months, using the AUX relay output, you can now set a delay and number of degrees after which you rotor will go into high speed and this same parameter will also apply just before you get to destination, thus helping rotor precision and ware.

The new LED/Switch PCB is a better star style design that really shows the operator what he is doing, now fully integrates switch control into the firmware gives you command interrupt on switch activity, this means if you touch ANY keys while the application was controlling the rotor these get interrupted by the front panel activity... and the LEDS are a lot BRIGHTER (I still love BIG BRIGHT LEDS!)… The ERC-R also has five SMD mounted LEDs on the ERC-R pcb itself used for testing during installation. The hook up is extremely simple, simply plug the ERC-R cable into the rotor controller. The LED/Switch and LCD pcbs are optional the ERC-R can be used without them hidden in the back of your rotor controller, but myself I like the added functionality of the LED/Switch and LCD pcbs...

Protocol compatibility and software supported (9/10):

The ERC-R was designed around The GS232A-Az, GS232B-Az,GS232A-AZ/Elev and GS232B-AZ/Elev protocols and this opens up the software compatibility. The ERC-R firmware automatically detects command sets sent to him by the application and switches automatically from AZ to AZ/Elev modes, to change between GS232A and GS232B this must be done using the ERC-R utility because these two protocols are to similar. I made extensive tests using ERC-R Release 1.6 firmware with HRD Rotator (GS232A-Az, GS232A-Az/Elev , GS232B-Az, GS232B-Az/Elev), Logger32 (GS232A-Az and GS232B-Az), N1MM_Rotor (GS232A-Az), ERC Control-3D, PstRotator-Lite (GS232A-Az, GS232A-Az/Elev, GS232B-Az and GS232B-Az/Elev) and Nova (GS232B-Az/Elev) while monitoring the communication port for proper protocol responses or handling issues and no anomalies were detected. Both GS232 series of protocols are widely used and supported protocols that makes this unit easy to use with most rotor control software.

Installation, Calibration and Operations (10/10):

Again, Rene's well prepared documentation featuring 39 rotor controllers from five manufacturers was really helpful to understand and properly install the unit into most Rotor controllers. He uses a colour/numeric coded scheme that's simple enough to understand and almost foul proof… Yes I know, it worked with me!

Calibration is so easy with these units it was just incredible, The ERC family are just the easiest unit I have encountered yet as far as calibration is concerned… Simply start the ERC-R Utility Software that was sent with the unit, select the correct serial port according to your USB configuration, select the Azimuth calibration and follow a few simple steps (5 or so, a couple more from 450 degree rotors)! Do the same process with the Elevation and you are done! And if you're concerned your rotor sensor may not be linear, when you get to the end of the calibration process, you can exit or select extra calibration steps every 30 degrees in Azimuth mode or 15 degrees in Elevation mode… No more miniature pots that change values when you release the screw driver or when they get oxidized…

Now that your unit is calibrated, operating is as simple as starting HRD Rotator selecting between GS232A-Az, GS232A-Az/Elev, GS232B-Az or GS232B-AZ/Elev, proper speed (9600 bps for the ERC-R), the proper serial port and you're done… you should not even have to worry about setting up offsets since this was corrected during calibration... ERC-R Single/Dual Axis interface is fully supported in all Ham Radio rotor control application that I have tested.

Remember my G-800SDX from past reviews, like many hams I push to tomorrow stuff that I really should do today (Yes Dear!), and when we installed my G-800SDX almost 25 years ago, the antenna was not lined up properly, it was sitting somewhere around 330 degrees for a 0 (North) indicator on the controller, being that the needle can EASILLY be moved to proper position what did I do, I took off the needle and moved it to 000 Degrees… Then came the day, years later when I automated my G-800SDX, I found my self offset by 30 degrees (360-330 = 30) and after many tests and conversations with the supplier of the interface, I was told that they expect the antenna to either North centered or South centered for this to work and I was not… So I ended up having to use the OFFSET feature of HRD to fix this issue at that worked fine. Well, with the ERC family of interfaces I don't have to worry about this anymore because the Calibration process takes lazy hams like myself into consideration and fixes my problems, since it doesn't care if your beam is properly lined up or not, they support CW and CCW overlap during the calibration process, it steps you through pointing to beam to set positions and then stores these into the interface… Thus no more offset settings to think about in the different applications I use… Nice… Very nice!

Support 10/10:

Rene DF9GR support is getting to be very well known within his user group, he goes overboard to help and make certain 100% of his users are operational... I have tested this unit back and forth and found the ERC-R Rel.: 1.6 firmware to be fully operational and stable.

ERC Also has a Yahoo support group which gives a community oriented support for exchange and more simple issues…

Conclusion 9.5/10:

Again Rene DF9GR is showing us why we need to keep eye on what this guy will come up with next…

Just like the other menbers of the ERC family the new ERC-R is an impressive Single/Dual Axis plug ready interface. And yes, I would still recommend the ERC-R anytime…

73, Richard VE2DX