DF9GR's ERC-M Single/Dual Axis Rotor Controller Interface Evaluation REVISITED

Date : May 9th 2014

Notes :
Type: Pre-assembled SMD PCB or Kit, Single and Dual Axis (Azimuth (360 and 450 degrees) and/or Elevation (45, 90 and 180 Degrees))
Interface: USB, Serial and Ethernet
Protocol supported: GS232A-Az or GS232A-Az/Elev or GS232A-Az/AZ or GS232B-Az and GS232B-Az/Elev or GS232B-Az/Az and DCU-1.
Rotor controllers supported: More then 72 different ones from 12 different manufacturers.
Firmware release tested: Release 3.6 with service tool 3.3 and Rotor control 1.6
Documentation: Specifications, Assembly and Installation
Software tested: HRD Rotator, Logger32, N1MM-Rotor, Wintest_Rotor, PST_Rotator and Nova.
Rotors Controllers tested: Ham-IV, G-500A, Alliance HD-73, G-800SDX, G-5600B and G-2800DXA.
Softwares supplied with purchase: Service tool, Rotor Control, FTDI USB driver, Lantronix utility and PST-Rotator-Lite
Web Site: http://easy-rotor-control.com/
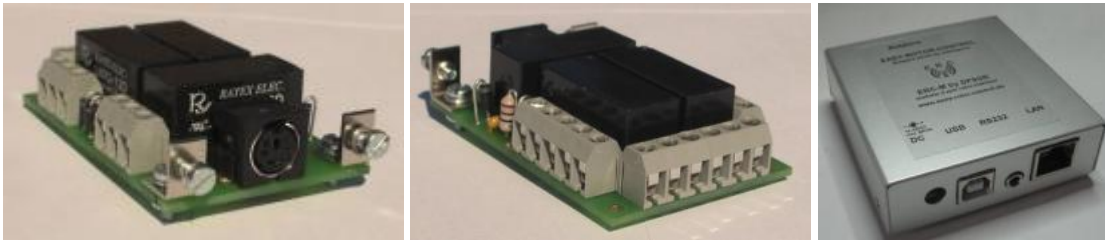**Cost**: 54EU to 89EU depending on device type (RS-232 vs USB and Kit vs SMD)

Rene's DF9GR has an history of coming with what I have (and anyone else who tried them!) qualified as the best rotor interface designs out there. Not only for the german quality technical designs themselves but also for his top notch support, Service Tools, calibration process, etc... And the very important fact that his firmware's are NOT outdated... He comes out with regular updates fixing small bugs, but mostly adding features to his world class designs.

ERC-1 , ERC-3D, ERC-M has you saw in my past reviews and articles like my June 2010 AMSAT-UK "Best of" rotor interface article are both very impressive little unit that really left their marks… And as I said to a lot of you "Keep an eye on this guy he's got more to come..." Well he did... and did again and again... The ERC-M was his latest in his evolution of the his DUAL-AXIS designs making its marks. combine with his ERC original SINGLE-AXIS unit, they made the perfect team. Not that the ERC-3d and ERC-R were not great designs, they were just not good enough for Rene DF9GR, I remember him contacting me just before the release of the ERC-M and challenging me to challenge HIM on how he could make his designs better and he did by making the ERC-M a modular design.

You see a lot of Rotor controllers already come "*__interface ready__*" and that gave Rene the possibility to drop the relays from the the ERC-3D design and those were the principals driving the ERC-M. But as soon as you say that you need to stop and go, "But, not all of them are interface ready..." and that is where the modular aspect of the ERC-M comes in, Rene moved the relays on optional Rotor-Cards that are single axis relay boards that you add to your ERC-M if you need them... This means if you have an

HD-73 and a G800SDX (like I do) you can use the Rotor-Card in the HD-73 and a direct connection to the G800-SDX. And if you have an HAM-IV and a G500A (like I do) you can still get them going by installing rotor-cards in both. Finally if you are using a G-5600 satellite rotor control controller (like I do) then you don't need any...

But... WAIT A MINUTE HERE... HD-73 and G800-SDX are both AZIMUTH rotors... this does not give!!! Well actually IT DOES! You see Rene a couple of years ago approached me about a new rotor control protocol I put together that would in theory let you control 2 AZIMUTH rotors via a single interface, this was basically a DUAL_AZIMUTH rotor protocol. Based on the original GS232B-AZ/EL DUAL-AXIS protocol and was an evolution of this protocol called the GS-232B-AZ/AZ. A GS232A-AZ/AZ was also possible but more difficult to deal with for programmers since the response feedback portion of the protocol could not clearly differentiate the axis.

And yes! Rene when he came out with the ERC-M made it DUAL-Azimuth compatible, a WORLDS FIRST. By doing this he made the first major evolution in rotor controllers in decades. Thus now you can use an ERC-M for single Azimuth Rotor, Satellite setup running Azimuth and Elevation and (YES!) two seperate distinct Azimuth rotors. The release of the ERC-M was soon backed by the support of the DUAL-AZIMUTH GS232B-AZ/AZ protocol by PST Rotator and soon after Hamlogger 32.

Modularity for Rene went further, offering very small aluminum extrusion case for hidden small installation, large Satellite or Dual-Azimuth design cases with front control, LEDs (I Love LEDS!) and LCD display that could almost replace your rotor controller. Finally supporting RS-232, USB and Ethernet interfacing.

And even after my original review, Rene kept on going adding more features to the ERC-M firmware and service tools offering even the possibility to link to ERC-M in Master/Slave setup to offer remote control of an ERC-M unit from another unit installed in a large case with controls, LEDs (Have I told you how much I LIVE LEDs) and LCD display via the Ethernet interface and yes the Internet.

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

The ERC-M is available in Kit form and preassembled SMD based design that, and when we talk about SMD the assembly process is very important, I have encountered kits in the past where you needed to

solder SMD components and that is NOT a good idea, I also encountered I am afraid to say pre-assembled rotor replacement boxes that were SMD but assembled MANUALLY instead of an automated process using robotics... Well Rene ERC-M SMD version is assembled in a proper SMD assembly plant and this is obvious as soon as you look at the soldering...

The kit version is very simple to assemble in an easy going evening, it is very well documented and hard to screw up. Has always his documentation comes with a well documented rotor controller hook up procedure. obviously if you ordered the Rotor-Card kits and the large case you will have a couple of other boards to assemble, but again they are very simple designs and very easy to assemble..

The kits came with ALL parts nothing was missing, again all the way down to screws, nuts and even tie-wraps. Parts were found to be of **very high quality** and static sensitive parts were properly protected against ESD. The documentation is very well made and complete, the assembly is simple thanks to well documented images that made assembly a lot easier. The ERC-M can be directly integrated into most rotor controller enclosures, with the small enclosure simply held on the back side of most rotor controller and with the large enclosure used to control manually your rotor.

The ERC-M is designed around a more powerful Atmel Mega644P-20 CPU and an optional FTDI USB chip set, as always the rotor position feedback sensor circuitry is the best designs I have encountered! Based around a pair (one Azimuth and the other for Elevation) of 0 to +15v bridged interfaces and the flexibility of the CPU, well designed firmware and utility software, the ERC-M 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 again I did not find one yet that I was unable to calibrate on the FIRST try…

Important Note:
Where most rotor interface most rotor interfaces uses a simple pots or combination of a couple of pots to let you calibrate your rotor position expecting a 0-5vdc. Most rotor controllers are NOT using 0-5vdc and even if they do this manual process is difficult and unreliable.

Ren's DF9GR has always used a software based calibration process that is simple, flexible and highly reliable even with highly unreliable rotors. The new versions of his software tools makes this process even more simple.

The ERC-M supports dual aux relays for Brake/Speed control. The ERC-M supports mismatched rotor pairs like Yaesu SDX and Create Elevation rotor, and yes now you can support highly mismatched pairs in satellite and dual Azimuth modes, like G800SDX with G500A or HAM-IV with G2800DXA or HD73 with Create (Azimuth or Elevation) rotors. Brake delays before and after motion request are configurable via the ERC-M service tools, 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, using the AUX relay output, you can now set a delay and number of degrees after which your rotor will go into high speed and this, you can also be set just before you get to destination, thus helping rotor precision and ware.

Big feature in ERC-M Software tool, you can SAVE and RESTORE your configuration, this means you

could use the ERC-M on pair of mismatch rotors and a G5500 satellite controller just switch the cable and restore the propoer rotor config and VOILA, no need to recalibrate!

Protocol compatibility and software supported (10/10):

The ERC-M is the most flexible design out there and the ONLY one supporting so many different protocols. The ERC-M supports DCU-1, GS232A-Az, GS232B-Az,GS232A-AZ/Elev, GS232B-AZ/Elev, GS232A-AZ/AZ and GS232B-AZ/AZ protocols. I made extensive tests using ERC-M Release 3.6 firmware with HRD Rotator (DCU-1, GS232A-Az, GS232A-Az/Elev , GS232B-Az, GS232B-Az/Elev), Logger32 (DCU-1, GS232A-Az, GS232A-Az/Az, GS232B-Az and GS232B-Az/Az), N1MM_Rotor (GS232A-Az), ERC Rotor Control, PstRotator-Lite (DCU-1, GS232A-Az, GS232A-Az/Elev , GS232B-Az, 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. all 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 72 rotor controllers from 12 manufacturers was really helpful to understand and properly install the unit into most Rotor controllers. He uses a color/numeric coded scheme that's simple enough to understand and almost foul proof… Yes I know, it worked with me! The Rotor-Card approach makes it really easy to adapt any controllers to an ERC-M, the Rotor-Card uses a simple mini-din connector making your rotor controller interface ready.

Calibration is so easy with the new Service Tool it was just incredible, The ERC family are just the easiest unit I have encountered yet as far as calibration is concerned and this new version is even better… 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 your logging or contesting software, picking protocol, speed (these can be changed in ERC-M Service Tool), 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-M Single/Dual Axis interface is fully supported in all Ham Radio rotor control application that I have tested. And the speed or break features are automatically managed by the ERC-M processor.

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 30 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 myself 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… Thus no more offset settings to think about in the

different applications I use… Nice… Very nice!

Support 10/10:

Rene DF9GR support is very well known within the HAM community it is TOP of the line, he goes overboard to help and make certain 100% of his users are operational... And Rene DOES come out with regular firmware updates, heck I have seen interfaces out there with release 1.0.0 firmware dating from 2000, Rene's not only fixes small bugs if they come up he also listens to his users and comes out with regular feature updates and new functions.

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

Conclusion 9.999/10:

As always Rene DF9GR is showing us why we need to keep eye on what this guy will come up with next… Just like the other members of the ERC family the new ERC-M is an impressive Single/Dual Axis plug ready interface with impressive features like support of multiple protocols including DUAL-Azimuth protocols, flexible break and speed functions, save and restore of rotor setup and calibration, remote Master/Slave operations over the internet. And yes, ***I would still recommend the ERC-M anytime… over ANYTHING else outthere!***

73, Richard VE2DX