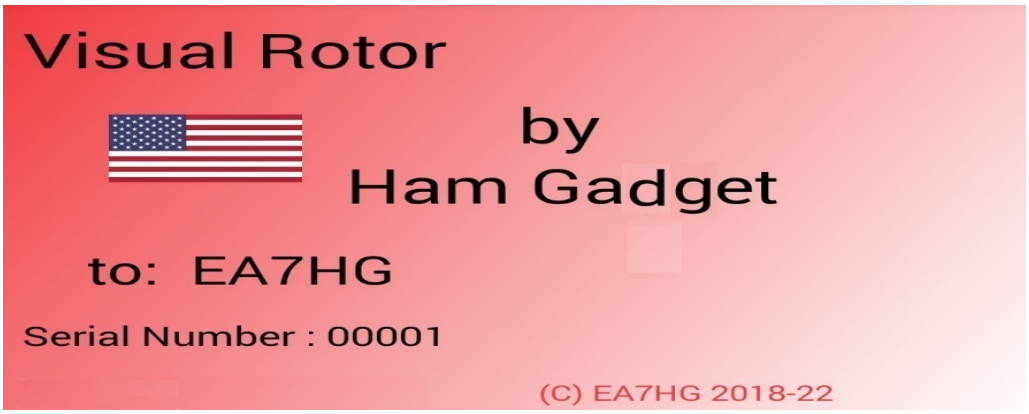
Visual Rotor V 1.62



Visual Rotor is a program created for Arduino Mega 2560 together with a 4.3-inch WQVGA 480*272 TFT touch screen and a small micro SD memory card, or an Android device, which allows you to handle almost any rotor that exists in the world. market in an easy and intuitive way, adding some functions such as RS232/USB or UDP serial communication port, supporting the Prosistel protocol so it can be controlled from a PC, **voice function for the blind, course change from the screen , Start/Stop Ramp, etc.Visual Rotor is fully software upgradeable and has been developed in 7 languages: Spanish, English, French, German, Italian, Portuguese and Dutch. It allows the use of up to four rotors, being able to define all the parameters according to the rotor model used. You can choose between Azimuth and Elevation, if you want soft start and stop, if the rotor allows rotation of more than 360 degrees, if the center of the rotor is North or South, etc. It is easy to install inside the rotor control and simple to calibrate, you only need to indicate the left stop and the right stop in Azimuth or the bottom stop and the top stop in Elevation and Visual Rotor will calculate all the necessary data for its correct use. . It has several presentations of data and use on the screen. Everything is configurable from the screen, without the need for a PC.

Thank you for trusting Visual Rotor

FEATURES

- Allows adaptation to almost any type of Rotor, both Azimuth and Elevation. With power supply in Alternating Current (A.C.) or with power supply in Direct Current (C.C.)
- Arduino Mega 2560 with 4.3-inch touch screen and microSD memory card. Fully software upgradeable and customizable.
- Everything can be managed from the touch screen without the need for a PC.
- Allows you to choose color and available in 7 languages: Spanish, English, French, German, Italian, Portuguese and Dutch.
- Easy installation and use. Allows Azimuth and Elevation.
- Possibility of using 4 Rotors independently or two on the same screen.
- Soft stop/start (between 1 and 10 degrees) for any type of rotor with different modes, both Azimuth and Elevation.
- Allows Overlap in Azimuth. You can select the range up to 500 degrees.
- Connection to the PC by LAN, RS232/USB or UDP, with Prosistel protocol, being able to select 9600,19200 or 38400 bauds.
- Reproduction of the course by voice, being able to regulate the sound volume.
- 4 types of heading representation on the screen.
- Display by name of rotor and lock of this.
- Use of rotary encoder for course change.
- Parking function.
- 8 Memories by screen or buttons
- Allows rotation speed regulation (Only with C.C. Motors).
- Management by Web Server or UDP and remote control.
- 2 Pushbuttons for turning Left/Down and Right/Up for all the rotors used. It does not need a brake button. The brake is controlled by software automatically.
- Infrared remote control
- Joystick use for Azimuth and Elevation.
- Tracking of Satellites, Moon, etc.
- Management from Android. Version >= 4.4
- Voice Playback .
- Etc.

NOTE: At no time am I responsible for any damage that you may cause to your remote control.

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WHAT'S NEW IN VERSION 1.62:

Attention... Due to the different screens used with Visual Rotor, there may be some difference in the images in this manual.

Fixed bug in Overlap with CCW, JoyStik and Screen Switches.

Fixed German language.

If the module (CAD) ADS1115 is not installed, it is not possible to select it.

If you use only the Android version, you can use the software for Buydisplay. (Previously it was only possible with the software for newHaven).

The Buydisplay version is now able to play audio thanks to the DFPlayer-Mini MP3 module. You need micro SD card.

Welcome audio message.

When you touch the screen, if the rotor is moving, it stops.

In the numerical limits, the default values are now presented.

To do a hardware reset in Visual Rotor, apart from holding down CW and CCW and turning on Visual Rotor, it is now possible to do it just by pressing CCW and turning on Visual Rotor.

SOFTWARE AND INSTALLATION PACKAGE:

The handling and installation has been tried to make it as simple as possible. The software package consists of the following files for Visual Rotor with TFT:

Visual Rotor program. (VisualRotorNx.xx.Hex) for TFT NewHaven and Android.
Visual Rotor program. (VisualRotorBx.xx.Hex) for TFT Buydisplay.
Visual Rotor voice files with .raw extension.
Visual Rotor configuration file with .cfg extension.
Visual Rotor manuals files with .pdf extension.
User File and software-activation key for Visual Rotor with extension key. It can be opened with any program that reads TXT format.
Language files with extension .IDI.
File .JPG.
File .INI
UK_USA folder, only for Buydisplay screen and have DFPlayer-Mini (MP3) installed. You will need to create a folder on the DFPlayer-mini microSD card called MP3 and copy all the files from the UK_USA folder to the MP3 folder.

To be able to record the software on Arduino Mega 2560 you must use the XLOADER software for Windows, which you can easily download from my website www.ea7hg.com.

The operation is very simple and intuitive. First select the COM-port to which your Arduino is connected. Select the HEX file to upload in the Arduino and press "Upload'.

If you are going to use Visual Rotor with the TFT screen, copy all voice files, configuration file, user file and activation key, language-files, inicio.ini and hg.jpg, to the MicroSD card (Fat32) in the root directory. Do not forget to have the user file and activation key at hand to activate the program. You can open it with any text editor.

In case it is an update and whenever you have installed the serial port on the rotor 1, you must first disconnect the wires that are soldered in the Arduino marked 0 and 1 in order to install the new software version.

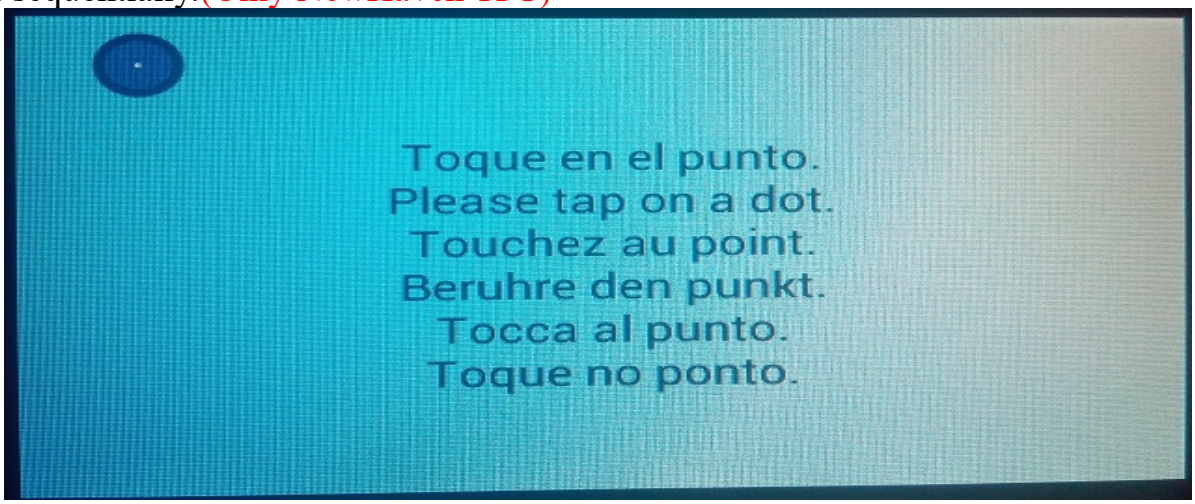
If you already have a version older than 1.3 and you are going to update to this version, you must load the 12a13.hex file on your arduino first. And follow the instructions that appear on the screen.

Always match Visual Rotor version with Android version.

Start of Visual Rotor with TFT:

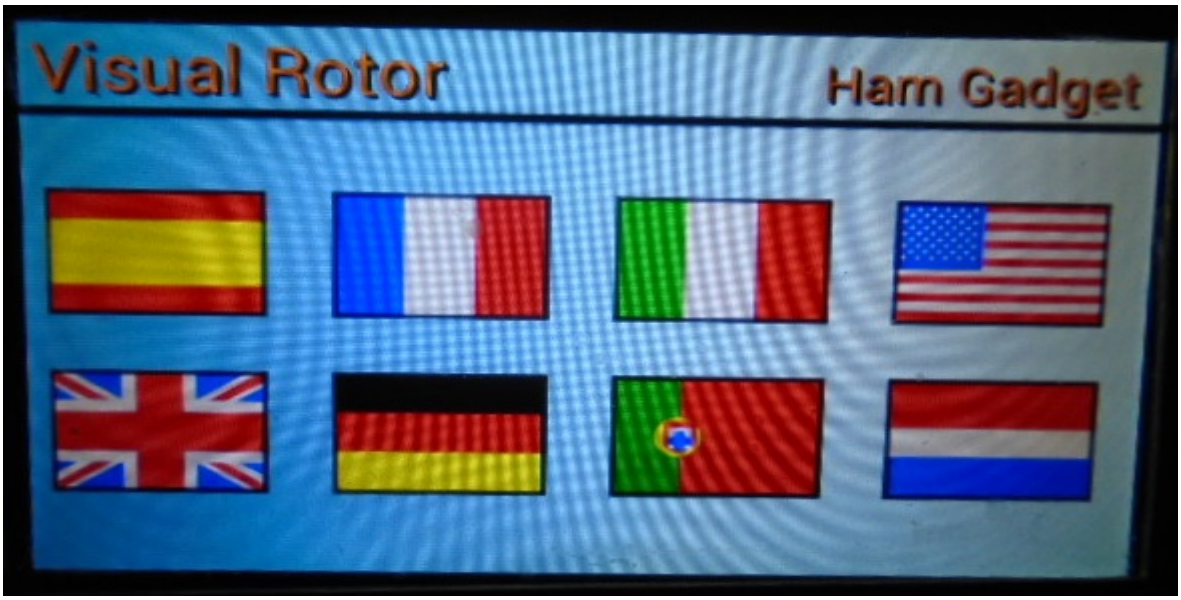
Once the software is uploaded into the Arduino Mega 2560, insert the memory card into the TFT display shield which should be mounted on the Arduino Mega 2560 pinheaders. If powered, Visual Rotor will start for the first time. It is time to have the User and the activation key of the file with activation key at hand.

First of all, it will ask you to touch with the finger the points that will appear on the screen to calibrate it. There are three points that must be marked and they will come out sequentially.(Only NewHaven TFT)

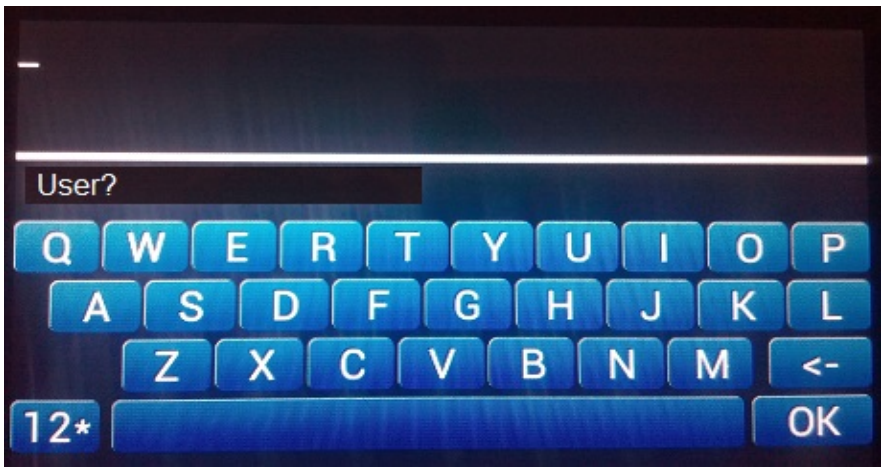


Once clicked on the three points, the calibration of the screen will be stored as long as there is no reset in Visual Rotor.(Only NewHaven TFT)

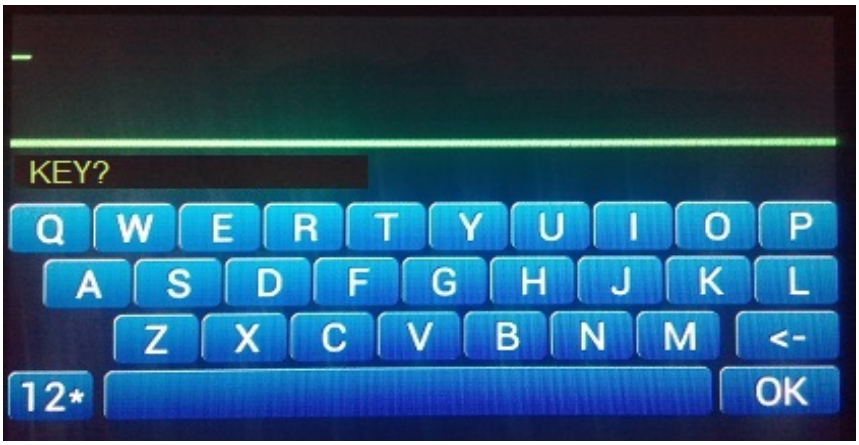
Visual Rotor will then show you a screen to select the language in which you want to use Visual Rotor. It is only necessary to press with your finger the flag of the language that appears on the screen.



Next Visual Rotor will ask you to enter the User. Use the keyboard that appears on the screen. Once entered as written in the file with extention key, press the “OK” key to confirm it.



after “User” is entered, Visual Rotor will ask you to enter the “activation key”. You must enter it as it appears in the file with Activation key.



Once entered press the “OK” key to validate the key.

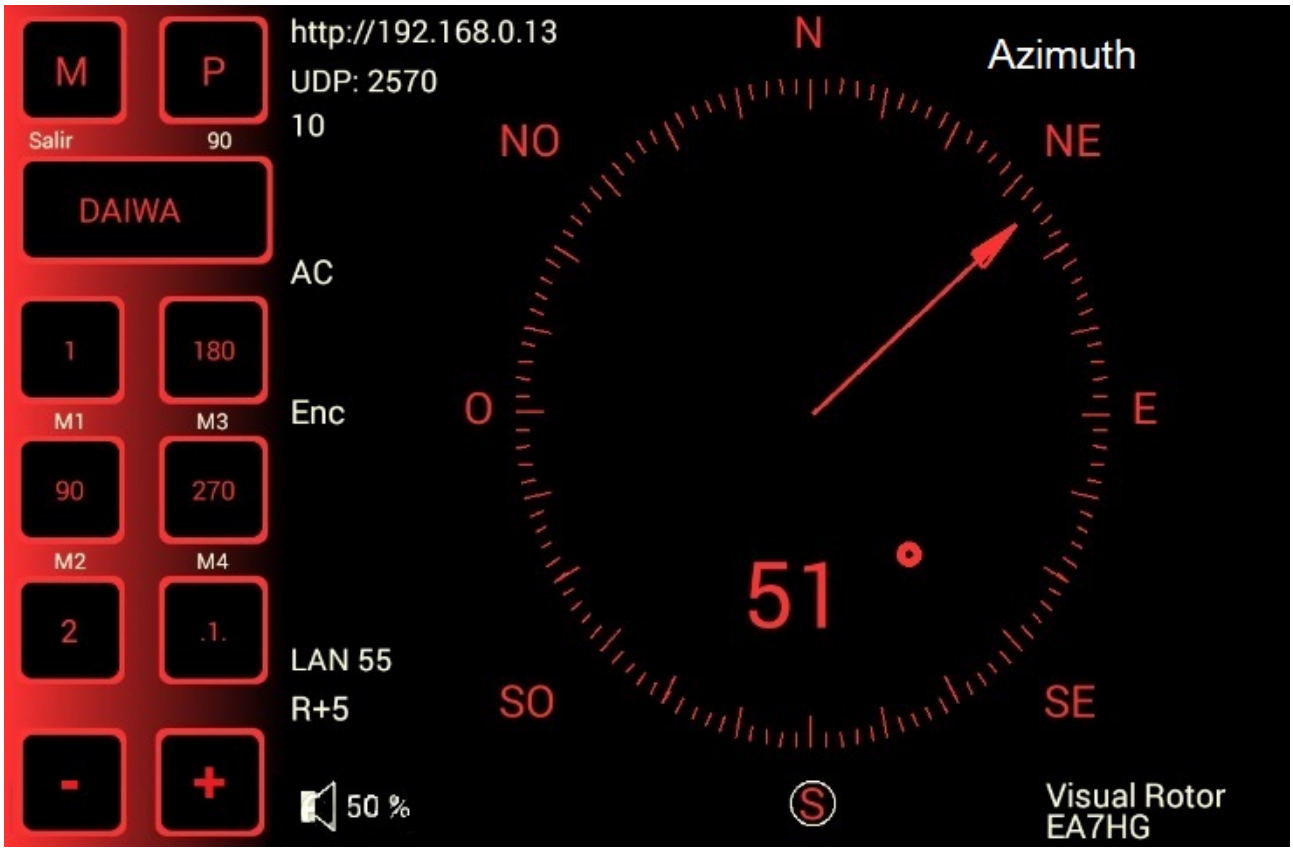
In the screen version of Buydisplay the keyboard will appear in 2D.

ATTENTION

If you enter a wrong username or wrong Visual Rotor activation key, the message “No Activate” will shown in the display and the screen will be blocked. You must turn the Arduino Mega 2560 off and turn on again and Visual Rotor will ask for the user and password again. It has three attempts. If it is not inserted correctly, Visual Rotor will be blocked and you will have to replace the Arduino Mega 2560 as it will be useless for Visual Rotor.

Once activated Visual Rotor will show the initialization-screen in which it will show with a flag in which language Visual Rotor will be operating, the registered user, the serial number of the program as well as the version of this.

After a few seconds the Visual Rotor screen will appear that allows its operation.



DESCRIPTION OF THE VISUAL ROTOR OPERATING SCREEN IN NORMAL MODE:

As Visual Rotor uses a touch screen, its operation is explained below:
The side marked in Green has the following functions:

Allows access to the Visual Rotor configuration menu when using the TFT screen.

It allows you to park the rotor on the indicated heading. The gray number below the P indicates the value in degrees for parking, in this case 90 degrees. To change the parking value you just need to turn the rotor to the desired direction for parking. Once the rotor has been rotated to the chosen direction, press the P button an keep pressed for 1 second until Visual Rotor confirms the new parking position with three tones and it will be stored. To direct the rotor to the direction marked in the parking lot, you must press the button less than one second.

Allows changing the active rotor number. To change the active rotor press the button less than one second and the menu will be displayed to choose the rotor you want to activate. If you keep the button pressed for more than 1 second Visual Rotor will emit three beeps and will cancel the rotor change, putting the name of the rotor in gray.(If sound option is installed).To unlock it, press the button for more than one second. You will hear three beeps as confirmation and the rotor will be enabled by showing the name of the rotor in the selected color for said rotor.

The buttons M1, M2, M3, ... gray marker are the eight memories available to the Visual Rotor. The number that appears above the memory indicator M1, M2, etc. is the heading value stored in memory. The operation is the same as the parking button. To change the value of a memory you only need to rotate the rotor to the desired direction for that memory. Once the rotor has been turned to the chosen direction, simply press and hold the memory button you wish to store for 1 second until Visual Rotor confirms with three beeps and the new position will be stored. To turn the rotor to the direction marked in the memory, just press the button less than a second.

The button marked number “2” indicates that you can access memory bank 2. Now you can choose the memories 1 to 4. If you access memory bank 2, the button will show the number “1”, which if pressed will change to memory bank 1. Now you can choose the memories 5 to 8.

Activates turning the rotor one degree by one degree in conjunction with the - and + buttons. If Visual Rotor has Normal (N) mode activated, because it has not installed the ramp / stop / soft start option of the rotor, it is disabled to turn the rotor in steps of one degree.
In the modes, Relays, AC Rotor and DC Rotor, you can turn the rotor one degree at a time.
When activated, it will be marked in gray color instead of the color defined for that rotor.
Depending on the type of rotor you have, in terms of measuring range and speed, the accuracy of the rotation of a degree will be more accurate.
Changing rotation to one degree only works with the screen buttons marked + and -.

It has two functions:
If you have activated the button to turn from in steps of one degree, pressing + will turn the rotor one more degree from the position where the rotor is.
Pressing - will turn the rotor one degree less from the position in which the rotor is heading.
If the button to turn in steps of one degree is not activated, pressing + will turn the rotor to the right while it is pressed. If you reach the end of the rotor range, Visual Rotor will automatically stop moving the rotor in that direction.
Pressing - will turn the rotor to the left while it is pressed. If you reach the end of the rotor range, Visual Rotor will automatically stop moving the rotor in that direction.

The part of the screen that appears marked in blue apart from graphically or numerically indicating the direction of the rotor allows you to change the direction of the rotor in two ways:
One is to touch the target address with the finger directly on the screen and when you release your finger, Visual Rotor will start the rotation of the rotor to the direction that has been selected on the screen.
Another one is to touch with the finger on the screen and without releasing it, turn the needle to the desired direction. When you release your finger from the Visual Rotor screen, the rotor will rotate in the selected direction.

These two options are only valid for when the selected chart is the Sphere, the Meter or the Sphere 2 chart.See Page 12.

If the selected graph is the Numeric, the operation is as follows:
The screen for the purpose of use is divided into two halves horizontally. In the upper half we increase the direction value and in the lower half the direction value decreases.
At the same time, it is divided vertically into two halves: the left side and the right side. On the left side the increase / decrease of the heading value is slow, if we turn the finger to the right the value will increase/decrease the value of the direction more quickly. When you stop touching the screen, Visual Rotor will initiate the rotation of the rotor to the selected direction.

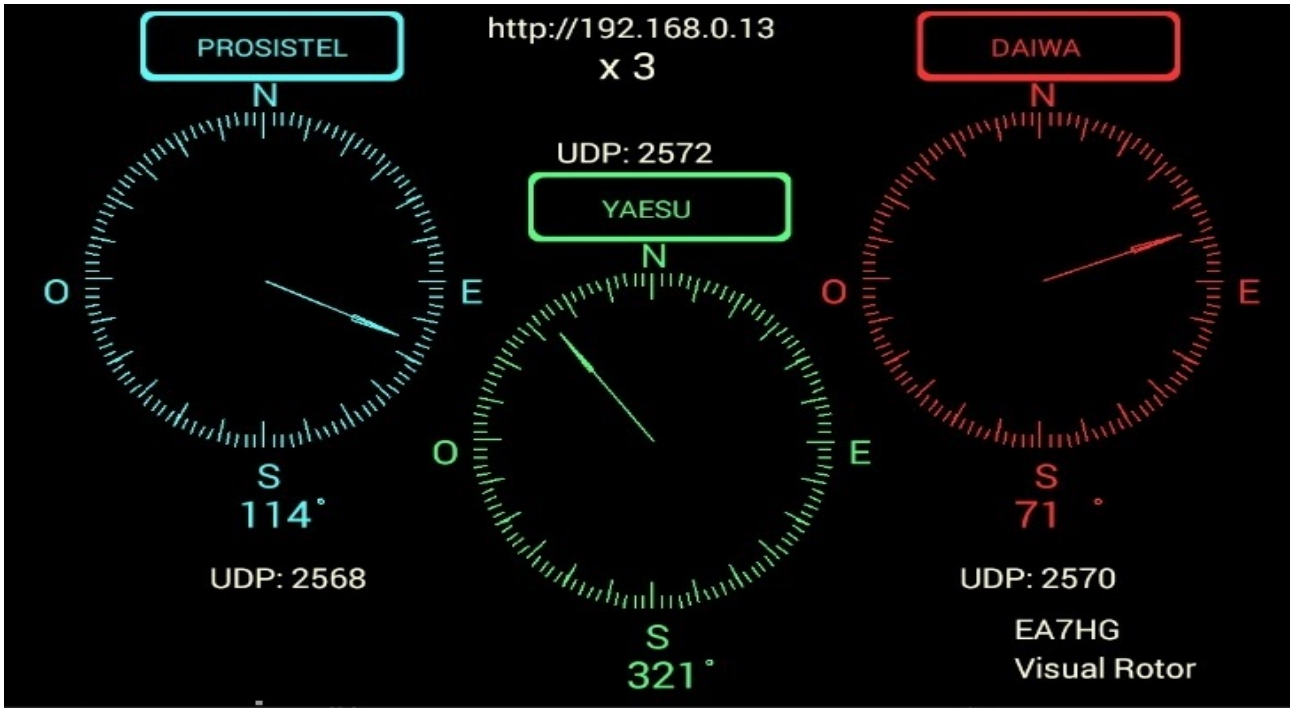
If the selected graph is Numeric and you use Visual Rotor for Android, the operation is as follows:

The screen from the right side of the Menu buttons, Memories, etc. comprises from 0 to 360 degrees with Azimuth rotors and from 0 to 180 degrees with elevation rotors. To select the course, simply press on the screen and move your finger to the left or right until the desired course is selected. Once this is done, when you take your finger off the screen, Visual Rotor will start the rotation of the rotor to the selected heading.

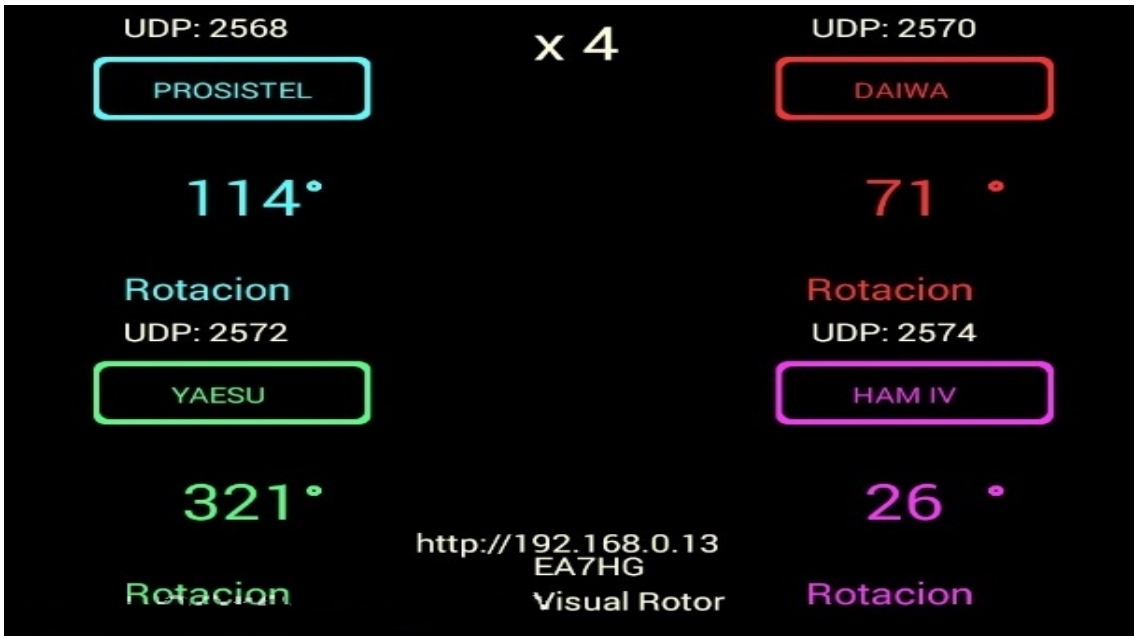
DESCRIPTION OF THE OPERATING SCREEN OF VISUAL ROTOR IN MODE x? OR IN A-E MODE:

The **x2 mode** allows two rotors to be displayed simultaneously. Each rotor has a different serial port and UDP.

The **x3 mode** allows 3 rotors to be displayed simultaneously (1,2 &3). Each rotor has a different serial port and UDP.



The **x4 mode** allows to display 4 rotors simultaneously. Each rotor has a different serial port and UDP.

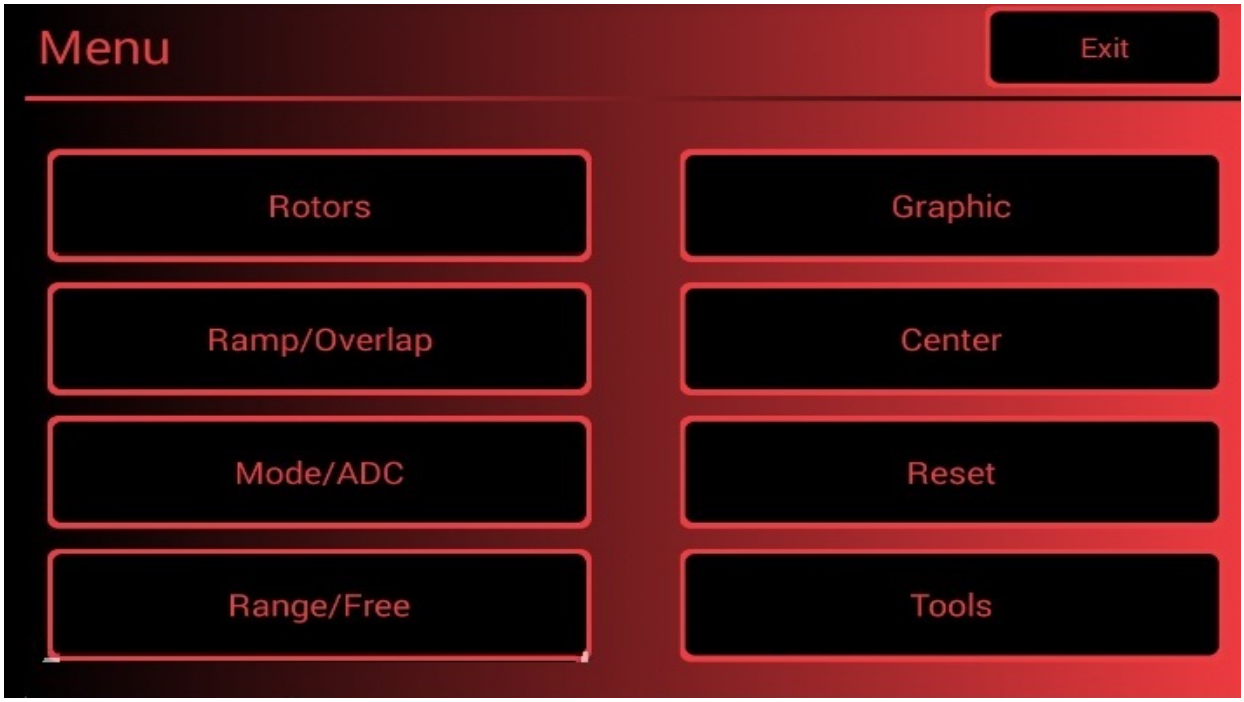


The **A-E mode** allows to display Rotation rotor and Elevation rotor simultaneously, having a single serial port and UDP (2568) for tracking satellites, moon, etc.

To access any of the rotors, simply touch the screen on the desired rotor. Once the rotor has been chosen, the operation is the same as for Visual Rotor in normal mode. You can change the graph, limits, rotation, elevation, etc. To exit these modes, simply access the rotors menu and choose Normal. In A-E mode, if you have the Joystick installed, moving it horizontally will move the Rotation rotor and if you do it vertically it will move the Elevation rotor.

MENU FUNCTIONS:

Once you press the key marked Menu on the screen, (M) will show you the parameter menu.



The Menu has 8 options:

- **Rotors**: It allows you to select the name of the rotor to be used, as well as the rotor type, whether it is azimuth type or elevation type, etc.
- **Ramp / Extention**: It allows you to indicate in degrees, both the start stop of the rotor gradually, as well as whether the rotor allows the rotation function of more than 360 degrees known as “overlap”.
- **Mode/DAC**: It allows you to select the start / stop mode of the rotor.AC or CC, and DAC,etc
- **Limits/free**: It allows you to define the limits of rotation of the rotor or free mode.
- **Graphic**: Allows you to select the type of graphic to show the information on the screen.
- **Center**: Allows you to select if the center of the rotor is in the North or in the South.
- **Reset**: It allows you to reset Visual Rotor to the default values by screen. **The hardware reset is done by pressing CW and CCW at the same time, pressing only CCW or positioning the JoyStick on the right side and turning on the controller.**
- **Tools**: It allows you to calibrate the accuracy of the rotor, change the language, if we want sound or if we want to activate the serial port.

MENU DESCRIPTION:

Within the main screen, just push the desired button on the screen.
When you set certain parameters of Visual Rotor you will be asked to turn the unit off and on again.
Most parameters and functions in the Menu only affect the rotor that is active.

ROTORS:

We have 4 options to select:

Name: Where you select the rotor and you can assign it a name. The maximum number of characters is 8. Use the keyboard that appears, to finish press "OK".

Type: Allows you to select if the rotor is Azimuth or Elevation type.

Colors: We will indicate what color we want for the rotor using red, green and blue obtaining the desired color. The x10 button allows the values to be in steps of ten instead of one. You can change the brightness of the screen, as well as the background of screen for day or night mode.

Nomal / x? / A-E: We will select operating mode. Normal, a single rotor on the screen and allows you to change the rotor number. If you select x2, x3 and x4, where 2,3 or 4 rotors are displayed on the same screen. In x2 and A-E they can be chosen by the user. If you select A-E, rotor 1 will be Azimuth and rotor 2 Elevation for tracking satellites, moon, etc.

RAMP / EXTENTION:

We have two options to select:
Ramp: Where select the value of the ramp. Once the rotor is selected, indicate the value of the ramp between 0 and 10 degrees. Once the value of the ramp has been decided with the screen buttons + and -, you must press the "Record" button on the screen so that Visual Rotor has this value. The value of the ramp works in the start/ stop of the rotor when selected for the rotor the "Relay"mode, "Rotor AC" or "Rotor CC". In "Normal" mode it does not work. Using the ramp, the resolution is + - one degree using the "automatic mode" of Visual Rotor. If you use the right/left turn controls, even if the ramp is defined, the resolution will be equal to the resolution of the rotor. When the rotor is operated manually, the ramp does not act.
If you do not want Ramp, you must record the value 0. If the value of the ramp is between 1 and 10 degrees, the display will show the indicator **R** + the value of ramp degrees.

What is the Ramp and how does it work?

The majority of rotors start and stop abruptly, as you can see at the top of the above figure. Using the "ramp" provided by Visual Rotor, the rotor will start slowly and progressively accelerate until it reaches the maximum value of the ramp. Once this value has been reached, the rotor will rotate at its maximum speed. When the rotor reaches its destination minus the value defined on the ramp, it will start to decelerate the speed of the rotor until it reaches its destination. It is represented in the lower part of the graph.
For example: Suppose you have selected a 10 degree ramp. Let's suppose that your rotor is heading in a direction of 20 degrees and we want it to turn up to 70 degrees. When the rotation starts, it will start at 20 degrees and will accelerate until it reaches 30 degrees (20 degrees of start + 10 degrees of ramp). Once it exceeds 30 degrees, the rotor accelerates at its maximum speed until it reaches 60 degrees. When it reaches 60 degrees (70 degrees it was the stop - 10 degrees of ramp) it will begin to decelerate until it reaches 70 degrees which was its final destination.

Extention: Where you define to Visual Rotor a rotor is used with a rotation-range of more than 360 degrees of rotation, introducing the value in degrees. It is known as "overlap". For example, if the rotor allows a 500 degree turn, have 500 degrees - 360 degrees =140 degrees. Those 140 degrees will be divided into two equal ranges for the right turn and for the left turn. Therefore, the value to enter in Visual Rotor is 70 degrees. If we do not want the rotation-range, for example, to exceed 60 degrees, although we have 140 degrees, choose 30 degrees. If we set it to 0 degrees Visual Rotor understands that there is no "overlap".

If your rotor does not have a rotation of more than 360 degrees, the value of the extention must be 0. If the extention value is greater than 0 degrees, the **LAP +** indicator will show the extention degree value on the screen.

CW,CCW,CW/CCW: Allows you to choose the extension, CW on the right side, CCW on the left side and CW/CCW on both sides.

MODE/DAC: We have 4 options to select:

MODE:

We have 4 options to select:

Normal: Visual Rotor will not use neither start nor soft stop, even if a ramp value has been defined. It is valid for any type of rotor. The indicator **N** will be displayed on the screen. It does not allow resolution of one degree.

Relays: Visual Rotor will use the action of the relays to start/stop the rotor in a delayed way and will depend on the value of the ramp. It is valid for any type of rotor. The display will show the indicator **R**.

Rotor AC: Visual Rotor will use the start stop of the rotor controlling the motor of this electronically, only if the option of electronic control for AC-motors (Alternating Current) has been installed and will depend on the value of the ramp. The **AC** indicator will be displayed on the screen.

Rotor DC: Visual Rotor will use the start/stop of the rotor controlling the motor of this one electronically, only if the option of electronic control for DC-motors has been installed and will depend on the value of the Ramp. The **DC** indicator will be displayed on the screen.

Once the mode is selected, a submenu will appear with two options,Only in the case that you are installed the ADS1115:

Arduino: Visual Rotor will use a 10 bit analog to digital converter (ADC). Doors marked on the plate as A6...A9. The display will show “10” to indicate that you are using the Arduino CAD.

ADS1115 : Visual Rotor will use a 16 bit analog/digital converter. Doors marked on the plate as A0...A3. You must have the circuit installed for it to work. The screen will show “16” to indicate that you are using the ADS1115. If your rotor has a path of less than 1.8V it is advisable to use ADS1115

LIMITS/FREE: We have 2 options to select:

Free: Allows you to rotate/raise the rotor regardless of heading or stops.CW turning to right, CCW turning to left, by screen,joystick or switch.

Limits : Visual Rotor will keep the limits of the rotor path values both left and right in the rotation or upper and lower rotors in the elevation rotors. You just have to follow the instructions that appear on the screen depending on the configuration of the defined rotor. Rotors with mechanical stops are much simpler.
You have two options:
Normal : will save the limits of the rotor travel values left and right in azimuth or up and down in elevation. Follow the instructions on the screen.
Numeric : Allows the values of the stops to be entered directly through the keyboard.It will tell you the recorded value.

GRAPHIC: Visual Rotor allows you to use four types of graphics to present the information on the screen:
Sphere: Visual Rotor shows the rotor heading in a spherical way (compass), showing the degrees in a small window within the sphere, on the top or bottom of the sphere.

Meter: Visual Rotor shows the rotor heading in analog meter format.

Numeric: Visual Rotor shows the rotor heading numerically.

Sphere 2: shows the heading with a needle on a circle. In normal mode, only degrees appear as text. In + mode, with numbers.

CENTER: Visual Rotor allows you to select for rotation rotors if the center of the route is in the north, with which you must select “North” or if the center of the rotor's direction is in the south, with which you must select “South”. In the Sphere and Sphere 2 screen the rotor stops will be indicated within a circle.

RESET:
Reset by screen. We have two options to select:
Total Reset: will reset all the initial parameters of Visual Rotor.

Partial Reset: will reset all initial parameters except the limits of the rotors.

TOOLS:
You have four options to select:
VDC Arduino: In order for Visual Rotor to be more accurate in its measurements, it must indicate to this which is the working voltage of the Arduino. With a voltmeter you must measure the Arduino voltage with the positive clamp of the voltmeter on the pin indicated as 5V and the negative clamp on the pin marked GND.

Once the voltage value is obtained, you can change the value in Visual Rotor, so this value will be the new reference. For example, if your measurement is 4.94 V, push the buttons on the screen to reach this value and then press the store button.

Speed: Allows you to select the percentage of operating speed of the rotor in CC mode. For the rest of the modes, it is not necessary to define them. The Speed indicator in % below the **CC** indicator will be displayed on the screen.

Sound/IR/Enc/Joy:

Sound: It will allow to regulate the volume of the sound in percentage that will be heard when pushing the buttons in the screen, as well as the voice announcement of the direction. On the screen it will show a loudspeaker with the percentage of the set audio volume. If you do not want any sound select the value 0% and the loudspeaker will be marked with a crossed line.

IR: It will allow to activate the operation with the infrared command, if this hardware option is installed. It is enabled or disabled for all rotors. The **IR** indicator will be displayed on the screen.

Encoder: It will activate the operation of the rotary encoder, if this hardware option is used. The display shows the indicator **Enc.**

Joystick: It will activate the Joystick operation, if this hardware option is used. The **Joy** indicator will be displayed on the screen.

RS232/Bauds/LAN+:

RS232: It will allow to enable/disable the RS232/USB port if this hardware option is installed. The **232** indicator will be shown on the screen.

Bauds: It will allow you to select the speed (9600,19200 or 38400) for the RS232 or USB port if you have the RS232/USB option installed. The selected value will be shown on the display below indicator **232**. **9600**, **19200** or **38400** bauds.

LAN: It will allow you to activate/deactivate the LAN port if you have this option installed. The **LAN xx** indicator will be displayed on the screen. If you have the W5100 LAN module installed, it will indicate **LAN 51**. If you have the W5500 LAN module installed, it will indicate **LAN 5**5.

As soon as you have an internet connection, the **http://** address will appear on the screen so that you can enter it in your browser and use Visual Rotor. Also below the address it will tell you the UDP port number you need to use to communicate with PstRotator via UDP.
Once this option is activated, you must enter the MAC you want to use.
In Visual Rotor for Android this LAN option is not available.

Fixed IP: Allows you to indicate to Visual Rotor that it will use a fixed IP address. You must enter an IP that is in the range of your router and then the MAC you want to use. Once entered, you must assign this address as static in your router.

OPERATION OF VISUAL ROTOR:

If your rotor has a lock (brake), Visual Rotor will Deactivate/Activate it automatically, using the relay described in the connection table (Technical Manual).

The rotor heading can be varied in several ways:

Manual: Using the buttons on the rotor control itself, generally marked CW and CCW, or with the JoyStick, if you have installed this option.

Automatic : There are several ways to select the heading so that the rotor moves automatically to the chosen destination.
One is to touch your finger to the target direction directly on the chart and by removing your finger, Visual Rotor will start the rotor movement to the heading that has been selected on the screen.
Another is to touch the screen with your finger and without lifting it, move the needle to the desired direction. Removing your finger from the Visual Rotor screen will start the rotor moving to the selected heading.
These two shapes are only valid for when the selected chart is the Sphere , Meter or Sphere 2 chart.
If the selected graph is Numerical, the operation with Visual Rotor with TFT is as follows:
The screen for use purposes is divided into two halves horizontally. In the upper half we increase the heading value and in the lower half we decrease the heading value. At the same time it is divided vertically into two halves: The left side and the right side. On the left side the increase/decrease of the heading value is slow, if we move the finger to the right the value will increase/decrease the heading value faster. When the screen is released, Visual Rotor will start to move the rotor to the selected heading.
If the selected graph is Numeric and you use Visual Rotor for Android, the operation is as follows:
The screen from the right side of the Menu buttons, Memories, etc. comprises from 0 to 360 degrees with Azimuth rotors and from 0 to 180 degrees with elevation rotors. To select the course, simply press on the screen and move your finger to the left or right until the desired course is selected. Once this is done, when you take your finger off the screen, Visual Rotor will start the rotation of the rotor to the selected course.
Lastly, if you have installed the Rotary Encoder option, by turning this you can select the destination heading, once selected after 3 seconds Visual Rotor will start turning to the destination heading.

Through IR: If you have installed the option, you can select a heading from the command keyboard. Infrared control operation:

UP ARROW/RIGHT ARROW = Up Rotor number.
DOWN ARROW/LEFT ARROW = Low Rotor number.
OK = Send to chosen course.
0-9 = Number for heading.
* = Clear heading.
# = Park rotor.
The dialed numbers will appear on the screen.

If Visual Rotor is in Mode x? or A-E , you must first select rotor number 1 (Rotor Left) or 2 (Rotor Right) without OK. Once the screen has changed to the selected rotor, proceed with the list of commands above.
Example: If you want to change the heading to 270 degrees, press 2, 7, 0 and OK.

Via PC: If you have installed the RS-232 or USB option, you can control Visual Rotor from any program that allows the Prosistel protocol. You can activate or deactivate the RS232/USB port in Visual Rotor if you do not want to use it. Each rotor number has its corresponding RS232/USB port. In A-E mode you can select the desired RS232/USB port and use PstRotator instead of PstRotatoraz.

RS232/USB configuration example with **PstRotatorAz**.

Select Communication → RS232/TCP Server to activate.
Select Communication → Com Link Setup → Same baud rate as in Visual Rotor.
Select Communication → Azimuth Com port → Select port number.
Select Setup → Controller → D Prosistel.
Select Setup → Refresh rate → 1 sec.
Select Setup → Controllers Setup → Prosistel “D” Box Setup...

RS232/USB configuration example with PstRotator (Mode A-E only)

Select Communication → RS232/TCP Server to activate.
Select Communication → EL / AZ+EL Com port→ Select port number.
Select Setup → EL / AZ+EL Controller → Combo Prosistel.
Select Setup → Rotor Refresh Rate → 1 sec.

Via LAN: If you have installed the LAN option and activate it, you will be able to govern Visual Rotor from:

Your internet browser. You must enter the same IP address that is shown on the TFT screen http;//..... in the bar of your browser. Then you must enter your username and password.

PstRotatoraz over UDP. (PstRotatoraz as of version 14.33 and in PsrRotator as of version 16.86). The UDP ports used for PstRotatoraz are:

For normal, x2, x3 and x4 mode of Visual Rotor :
Rotor 1 … Port 2568
Rotor 2 … Port 2570
Rotor 3 … Port 2572
Rotor 4 … Port 2574

For A-E mode:
Regardless of the rotors chosen, it will always be port 2568.

UDP configuration example with **PstRotatorAz**.

Select Communication → RS232/TCP Server to activate.
Select Communication → Azimuth Com port → No Com.
Select Setup → Controller → EA7HG Visual Rotor (UDP).
Select Setup → Refresh rate → 1 sec.
Select Setup → Controllers Setup → EA7HG Visual Rotor Setup...
Port number...The port that corresponds to the rotor number.
IP... the IP address that appears on the TFT screen..http://.....
Once these data have been entered, press ….Save Settings

UDP configuration example with **PstRotator** (Mode A-E only).

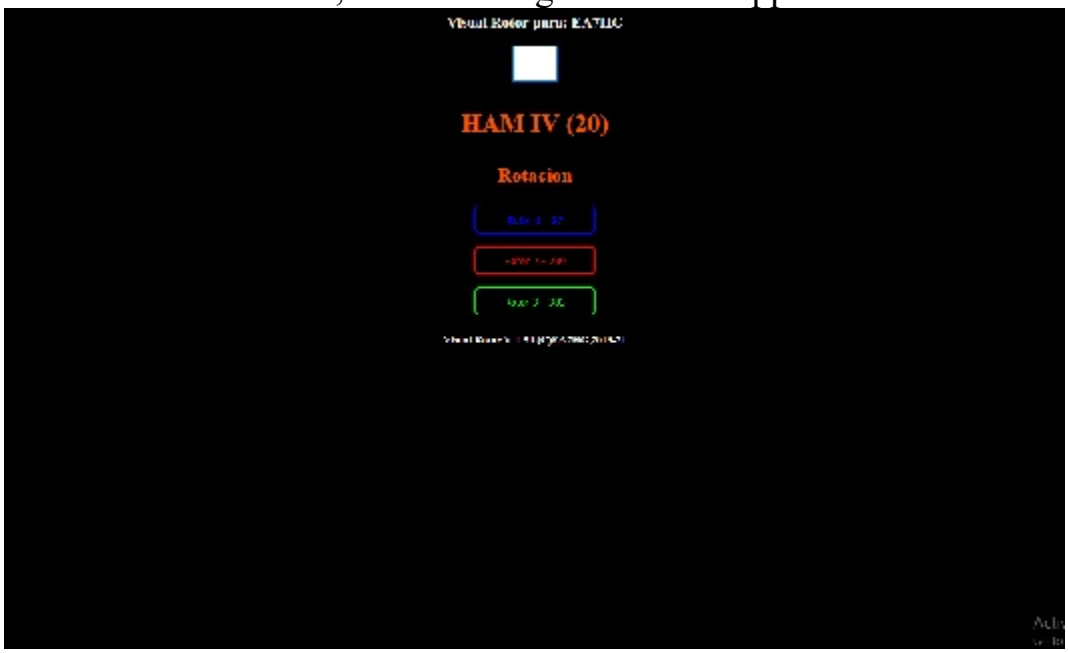
Select Communication → RS232/TCP Server to activate.
Select Communication → EL / AZ+EL COM port→ No Com.
Select Setup → EL / AZ+EL Controller → EA7HG Visual Rotor (UDP).
Select Setup → Rotor Refresh Rate → 1 sec.
Select Setup → Controllers Setup → EA7HG Visual Rotor Setup...
Port number...2568.
IP... the IP address that appears on the TFT screen..http://.....
Once these data have been entered, press ….Save Settings

To stop the movement of the rotor once it has started, pressing any of the two manual rotation buttons (CW or CCW), JoyStick or touching the screen, Visual Rotor stops its movement, waiting until the next order.

Rotary Encoder: Once this option is installed, it allows selecting the destination course.
Rotary encoder operation:

Turning the encoder clockwise increases the heading and counterclockwise decreases the heading to select the destination. Once the destination course is selected, after 3 seconds of not changing course, Visual Rotor turns to the selected course.

Webservers:
Write this address in the bar of your browser that appears on your TFT screen and you will have access to Visual Rotor.A screen will appear in your browser asking you to enter your Username and Password. (User: Your callsign, Password: The Visual Rotor password).
IMPORTANT: Both the User and the Password must be entered in capital letters.
Once these have been entered, the following screen will appear:



In the blank box we will enter the direction to which we want to turn the antenna. Below this appears the name of the rotor that is active indicating the heading and if it is rotation or elevation. The rest will be the buttons to select the rotor to use. According to the Visual Rotor mode, Normal,x? or A-E, the different rotors to select for use will appear.
To change the rotor, simply press the desired button located below the active rotor, which is found with the name, color and heading of the remaining rotors.

VISUAL ROTOR OPERATION IN x2 MODE:

Visual Rotor's x2 mode allows operation of two rotors on the same screen. Visual Rotor has control of up to 4 rotors with different characteristics, so the x2 mode allows us to choose the two that we will use out of the four possible. To make it easier to understand we will rely on the following example. Suppose we have two towers and each one has a rotor installed. Tower 1, for example, has a HAM IV installed and tower 2 a T2X. In our controller, let's assume that rotor 2 has been assigned to the HAM IV and rotor 4 has been assigned to the T2X. (Important: Before entering x2 mode, we will need to configure the rotors in the normal Visual Rotor mode, since x2 mode is based on this configuration). Following the example, we will name rotor 2 as HAM IV and rotor 4 as T2X.

To access this mode we will enter the Menu, select Rotors and finally select the Normal/x2/A-E button. Selecting this option will allow us to select between Normal, x2 and A-E mode, so we will select the x2 option. Visual Rotor has control of up to 4 rotors with different characteristics, so the x2 mode allows us to choose the two that we will use out of the four possible. Once this is selected, we must choose which two rotors we want to choose. First we will select the one that will be the rotor number one of the four possible to choose from. In the case of this example we will select the second button that appears on the screen that corresponds to rotor 2, called HAM IV. Next it will tell us to select the second rotor. Now the rest of the available rotors will appear to choose from and it will no longer appear to select rotor 2 (HAM IV). Following the example we will select the last button that corresponds to rotor 4 called T2X.
Once the second Visual Rotor is selected, it asks you to turn the controller off and on again for x2 mode to work.
When powering up the controller again, Visual Rotor will appear in x2 mode.
To exit x2 mode, simply tap on the screen on any of the two rotors that appear. Once you have touched the screen, select Menu, Rotors, Normal/x2/A-E and select Normal, so that Visual Rotor works in mode again. normal.
How can we now use the two rotors? . There are several options:
OPTION 1: If we have installed the RS232/USB port options in Visual Rotor and we have them connected through a serial port to the computer, being two independent rotors we will have a serial port for each rotor. Following the example, rotor 2 (HAM IV) will have communication with port 2 (RS232/USB) of Visual Rotor and rotor 4 (T2X) will have communication through port 4 (RS232/USB) of Visual Rotor. so we can manage them independently from the computer.Also via UDP.

Once the order to change course is received from the PC, Visual Rotor will automatically move the rotor to the indicated course.

OPTION 2: If we have installed the LAN option in Visual Rotor and we have them connected through the computer via LAN, once the page with the indicated IP address is loaded, the possibility of choosing between one rotor or another for its use will appear. driving. The rotor that appears inside the large box is considered the rotor to handle, in which we can use the memories, parking or change of course, select the destination course in the window and click on the Rotation or Elevation button, which appears to the left of the heading selection. Once either option is pressed, the rotor will move to the destination heading. To change to the other rotor, simply press the button for the second rotor and it will automatically become the active rotor. When the rotor reaches its destination it will update the page with the information on the destination heading.

OPTION 3: If we have installed the IR option (Infrared Control) the process is very simple. If we want to move rotor 1 (to the left of the screen) of the two that appear on the screen (in this case the HAM IV) just press the number 1 on the remote control. Once pressed, on the screen the rotor will be displayed in a larger size, with all the information, as if it were in normal mode. If we do nothing else after 5 seconds, the screen will display the two rotors again. If, on the other hand, we want to change the course, all we have to do is type the desired destination course on the command and press OK, in this way it will change to selected heading. If we want to move rotor 1 (to the right of the screen) of the two that appear on the screen (in this case the T2X) simply press number 2 on the remote control. (More information on the operation of the control in the chapter OPERATION OF VISUAL ROTOR OPTIONS.

OPTION 4: Regardless of the options installed, you can control the rotor, either by the movement buttons or by the Joystick apart from the touch screen. To control any of the two rotors, simply touch the screen of the desired rotor. Once this is done, the rotor will appear on the screen in a larger size and will appear in Normal mode, being able to use it as if Visual Rotor were in this mode. If you do nothing again for the next 5 seconds Visual Rotor will return to the screen showing both rotors at once. If, on the other hand, we press one of the rotor movement buttons (Left/Right) or the Joystick, the rotor will move as long as the movement button or the Joystick is pressed. If instead of using a button or the Joystick, we press on the screen it will go to the selected course or if we press on the screen and move the needle to the destination direction, once it does not touch the screen it will start the movement to the destination course selected.

VISUAL ROTOR OPERATION IN A-E MODE:

Visual Rotor's A-E mode allows the operation of two rotors on the same screen. Unlike the x2 mode, the left rotor will rotate and the right rotor will always lift. Visual Rotor has control of up to 4 rotors with different characteristics, so the A-E mode allows us to choose the two that we will use out of the four possible. To make it easier to understand we will rely on the following example. Suppose we have two rotors, one for rotation (HAM IV) and another for elevation YAESU G-550. Before entering A-E mode, we will need to set up the rotors in the normal Visual Rotor mode, as A-E mode is based on this setting. In our command, let's assume that rotor 2 has been assigned to the HAM IV and rotor 4 has been assigned to the YAESU G550. The rotor that appears on the left of the screen will always be a rotation rotor (according to the example: HAM IV). The rotor that appears on the right of the screen will always be of elevation (for example: Yaesu G-550).

To access this mode we will enter the Menu, select Rotors and the Normal/x2/A-E button. Selecting this option will allow us to select between Normal, x2 and A-E mode, so we will select the A-E option. Once A-E is selected, it will ask us if we want to activate the serial port to communicate with the PC. If we choose the YES option, then it will ask us what serial port we want to use for both rotors of the four available from Visual Rotor. Once the port is selected, it will ask us to select the communication speed of the serial port. If we select the NO option to indicate to Visual Rotor that we will not use a serial port.
Once the serial port has been selected or not, we must select from the list of four rotors that appear which one we want to use as the Rotation rotor. Following our example, we will press the second button that appears that would correspond to the HAM IV. Next, the rest of the available rotors will appear to select the elevation one. According to the example, we will select the last button that would correspond to the YAESU G-550.

Once these options are selected, Visual Rotor will ask us to turn the remote off and on again. When you turn on the Visual Rotor remote, it will be in A-E mode.

To get out of A-E mode, simply tap on the screen on any of the two rotors that appear. Once you have touched the screen, select Menu, Rotors, Normal/x2/A-E and select Normal, so that Visual Rotor works in mode again. Normal.

How can we now use the two rotors? . There are several options:

OPTION 1: If we have installed the RS232/USB port options in Visual Rotor and we have them connected through a serial port to the computer, it will receive the information through a single serial port. Following the example, once the order is received from the PC to change the course, Visual Rotor will automatically move the rotor to the indicated course of rotation or elevation according to the order received.Also via UDP.

OPTION 2: If we have installed the LAN option in Visual Rotor and we have them connected through the computer via LAN, once the page with the indicated IP address is loaded, the possibility of choosing between one rotor or another for its use will appear. driving. The rotor that appears inside the large box is considered the rotor to handle, in which we can use the memories, parking or change of course, select the destination course in the window and click on the Rotation or Elevation button, which appears to the left of the heading selection. Once either option is pressed, the rotor will move to the destination heading. To change to the other rotor, simply press the button for the second rotor and it will automatically become the active rotor. When the rotor reaches its destination it will update the page with the information on the destination heading.

OPTION 3: If we have installed the IR option (Infrared Control) the process is very simple. If we want to move the rotor on the left of the screen of the two that appear on the screen, in this case the HAM IV simply press the number 1 on the remote control. Once pressed, the screen will show in a size larger the rotor, with all the information, as if it were in normal mode. If we do nothing else after 5 seconds, the screen will display the two rotors again. If, on the other hand, we want to change the course, all we have to do is type the desired destination course on the command and press OK, in this way it will change to selected heading.

If we want to move the rotor on the right of the screen of the two that appear on the screen, in this case the YAESU G-550 simply press the number 2 on the remote control. Once pressed, the screen will show in a larger size the rotor, with all the information, as if it were in normal mode. If we do nothing else after 5 seconds, the screen will display the two rotors again. If, on the other hand, we want to change the course, all we have to do is type the desired destination course on the command and press OK, in this way it will change to selected heading.

OPTION 4: Regardless of the options installed, you can control the rotor, either by the movement buttons or by the Joystick apart from the touch screen. To control any of the two rotors, simply touch the screen of the desired rotor. Once this is done, the rotor will appear on the screen in a larger size and will appear in Normal mode, being able to use it as if Visual Rotor were in this mode. If you do nothing again for the next 5 seconds Visual Rotor will return to the screen showing both rotors at once. If, on the other hand, we press one of the rotor movement buttons (Left/Right) or the Joystick, the rotor will move as long as the movement button or the Joystick is pressed. If instead of using a button or the Joystick, we press on the screen it will go to the selected course or if we press on the screen and move the needle to the destination direction, once it does not touch the screen it will start the movement to the destination course selected. If we have the JoyStick option installed, in A-E mode it has a special function. If we are on the screen where the two rotors appear, if we move the joystick to the left or right the rotation rotor will move. If we move the joystick up or down the elevation rotor will move.

VISUAL ROTOR OPERATION IN x3 MODE:

Visual Rotor's x3 mode allows operation of 3 rotors on the same screen.

The rotors displayed on the screen are rotor 1, rotor 2 and rotor 3. Each one is represented as it is defined in Normal mode.

If information is received through the RS232/USB port or through LAN (UDP or Web Server), the directions are updated automatically.

To select the rotor you want to move or access it, simply touch the desired rotor on the screen.

VISUAL ROTOR OPERATION IN x4 MODE:

Visual Rotor's x4 mode allows operation of 4 rotors on the same screen.

The rotors shown on the screen are rotor 1, rotor 2, rotor 3 and rotor 4. The representation is numerical. Once you access it, it does display the chart type defined in Normal mode.

If information is received through the RS232/USB port or through LAN (UDP/ Web Server), the directions are updated automatically.

To select the rotor you want to move or access it, simply touch the desired rotor on the screen.

ROTOR CONFIGURATION:

Visual Rotor allows you to work with up to four rotors of different models and by default it starts with the rotor selected as active. First of all we will access the Visual Rotor Menu and select the ROTORS option in which 4 options appear. We will select the NAME option and we will be able to assign a name to the rotor to easily identify it. Supports a maximum of 9 characters. In this way we can more easily identify the rotor. We will access the Visual Rotor Menu again, we will select ROTORS again and we will select the TYPE option in which we can select if the rotor to use is Rotation or Azimuth or we will use an Elevation rotor. If you want to change the color for the rotor select again Menu , Rotors and finally colors to use the desired color.

We will return again to the Visual Rotor Menu and select the MODE option in which we will indicate which control method will be used for the rotor. We will select the Normal Mode, Relays, or Rotor of Alternating Current or Direct Current according to the options that we have installed for Visual Rotor.

We will go back to the Visual Rotor Menu and we will select the CENTER option in which we will indicate if the center of the rotor is in the south or in the north. As an example. If your rotor has the spin stops in the south, you should choose Center North.

We will go back to the Visual Rotor Menu and we will select the TOOLS option, we will select VCC Arduino in which we will indicate to Visual Rotor the operating voltage of the Arduino so that the precision of the measurement is more exact. Therefore, you must measure the operating voltage of your arduino as indicated in the Menu functions chapter.

Once this is done, we will proceed to calibrate the rotor for its correct operation.
To do this we will access the Menu and select the LIMITS option. I have been able to observe in several models of rotors that for the voltage that measures the heading to be perfectly stabilized, it takes at least 5 minutes from when the rotor control is turned on, so it is advisable to leave the control on before setting the limits. about 5 minutes before doing this process.
If your rotor has stops where it does not allow the rotor to rotate further to either side, calibration is easier.

Select Right to calculate the right stop of the rotor and we will follow the instructions indicated on the screen. As you follow the instructions, you will see a number appear that is updated as the rotor rotates. When said number does not change or the last two numbers change even though you keep telling the rotor to turn, it indicates that it is already at the top and therefore you can record this value by following the instructions on the screen. Repeat the same step but to calculate the left stop.

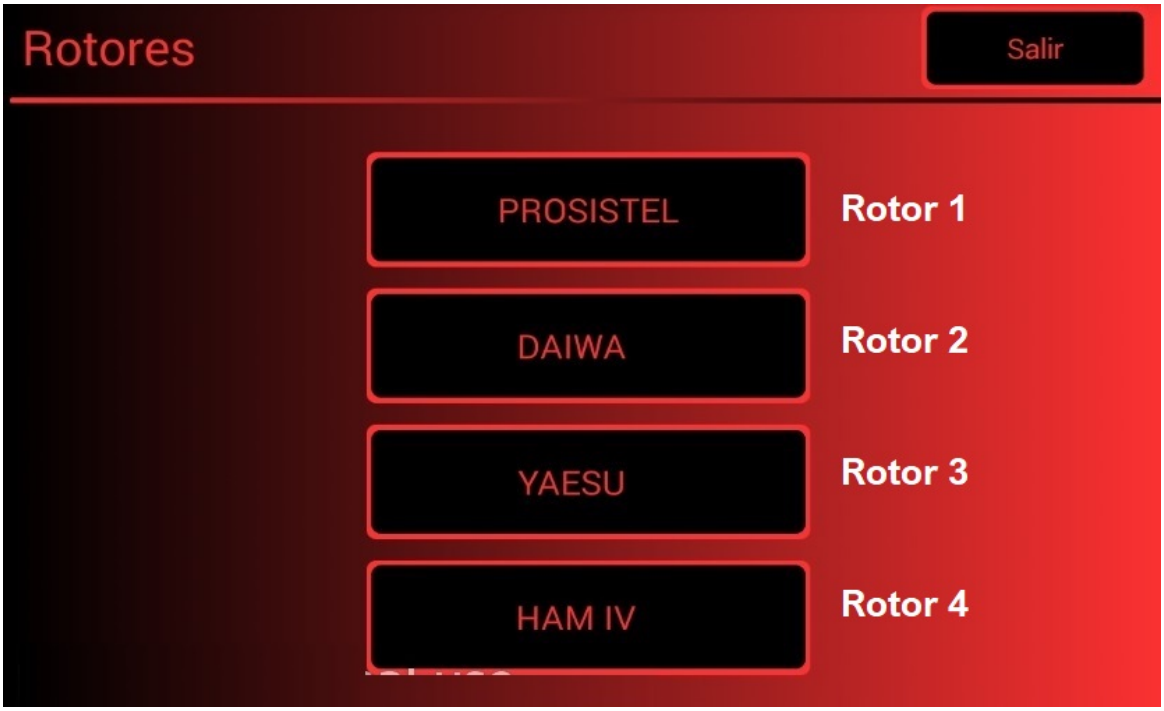
If your rotor does not have stops where it allows the rotor to rotate more to both sides, the calibration is a bit more laborious.
Make all the connection of the circuits provisionally for the rotor and without modifying anything of the original rotor, turn the rotor until you reach the right side on the rotor control meter (If your rotor has Ovelap, turn to the right side until you reach at 180 degrees, assuming it ends in the south or 0 degrees if it ends in the north). Once this is done, connect the cables of the down rotor potentiometer to the Visual Rotor sensor on the Arduino board and following the instructions on the screen I recorded the right stop. Reconnect the potentiometer cables to the original remote and turn the rotor until it reaches its left stop (If your rotor has Ovelap, turn it to the left until it reaches 180 degrees, assuming it ends in the south or 0 degrees if it ends in the north)., proceeding to connect the cables of the down rotor potentiometer to the Visual Rotor sensor on the Arduino board and following the instructions on the screen I recorded the left stop. Once this is done, proceed to its final assembly inside the rotor control. As an example: In a prosistel rotor the path is 500 degrees so it does not have mechanical stops that cut the operating voltage of the motor. The right stop would be 180º turning to the right. The left stop would also be at 180º but turning to the left.

If in MODE we have selected Relays, AC Rotor or DC Rotor, you can define the value in degrees of the Ramp. Also regardless of the selected mode if your rotor allows Overlap, set the value for Overlap as well.

For a correct calibration, do it with the cable with which the rotor is going to be installed, since depending on the meters the voltage drop will vary and therefore the reading will not be correct.

CHANGE ROTOR NUMBER:

When clicking on the rotor change button, the following screen will appear, in which it is possible to change the rotor number in the Normal mode of Visual Rotor. By way of information: Rotor 1, Rotor 2, etc. that appears on this screen is for information only to know which rotor number each button corresponds to.



Change of presentation image: ONLY FOR TFT

This Visual Rotor presentation image can be changed for another that the user decides. The file called HG.jpg is the one that contains this image and is located on the microSD card. To change it, simply replace it with another in JPG format. The only necessary requirement for it to work correctly is that the size of the image must be 320X194 Pixel. The best program for compatibility is Windows Paint.

Heading voice change: ONLY FOR TFT(Only for NewHaven screen).

The audio format of the .raw files so that Visual Rotor can play the course is 11025 Hz, Mono and 8 bit Signed PCM. With the Audacity software (it's free) convert the audio files to the format necessary for Visual Rotor.
The .raw files correspond to the six languages that Visual Rotor has:
The name format is as follows:
The first number of the file corresponds to the number that is recorded in voice. The second corresponds to the language, followed by .raw.
Number of Languages:
0 = Spanish
1 = English
2 = French
3 = German
4 = Italian
5 = Portuguese
7 = Dutch
Examples:
14.raw : Contains the voice of number 1 in language 4 which is Italian.
23.raw : Contains the voice of number 2 in language 3 which is German.

The audio files are located on the microSD card.

Change languages: ONLY FOR TFT

The files with the different languages are located on the microSD card. Its ending is .IDI. They are files in text format. They are made up of two numbers + A + two numbers plus the ending .IDI and each one corresponds to the value in the following table.
00 = Spanish
01 = English
02 = French
03 = German
04 = Italian
05 = Portuguese
07 = Dutch
Do not change the order of how they are structured. If you want to change any value, let me know before I can correct the structure.

Visual Rotor para Android:

You can use a Wifi-enabled Android device (version 4.4 or higher) with all the features of Visual Rotor without having to use the TFT screen, memory card or speaker that is required in the regular version of Visual Rotor . For Visual Rotor Android you just need to burn the Visual Rotor software on the arduino and download and install the Android app on your device.

In this way, all the circuitry can be installed inside any rotor control command, without external cables, etc., also allowing the original operation of the command in case of an emergency, or not wanting to use Visual Rotor at a given moment.

All control of the rotor is still on the Arduino Mega, so if you ever lose connection, you won't have to worry about a thing.

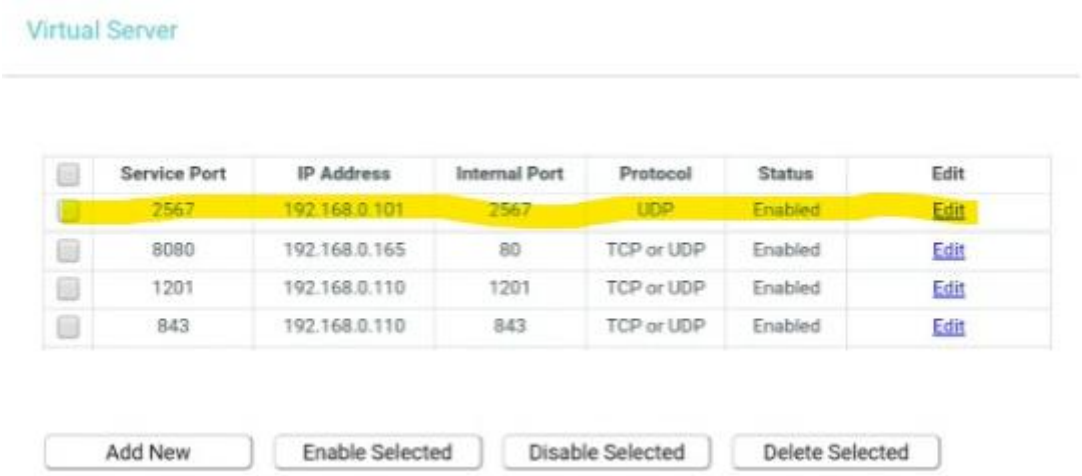
The functions of the program are exactly the same, with the same function menus supporting all the options available for Visual Rotor with TFT screen, except that the Android version does not allow to enable/disable the Internet option and the movement in the graphic option. Numbers is different.

VisualRotor android application, you can download it on my Web Page (www.ea7hg.com), so that it can be installed on your Android device.

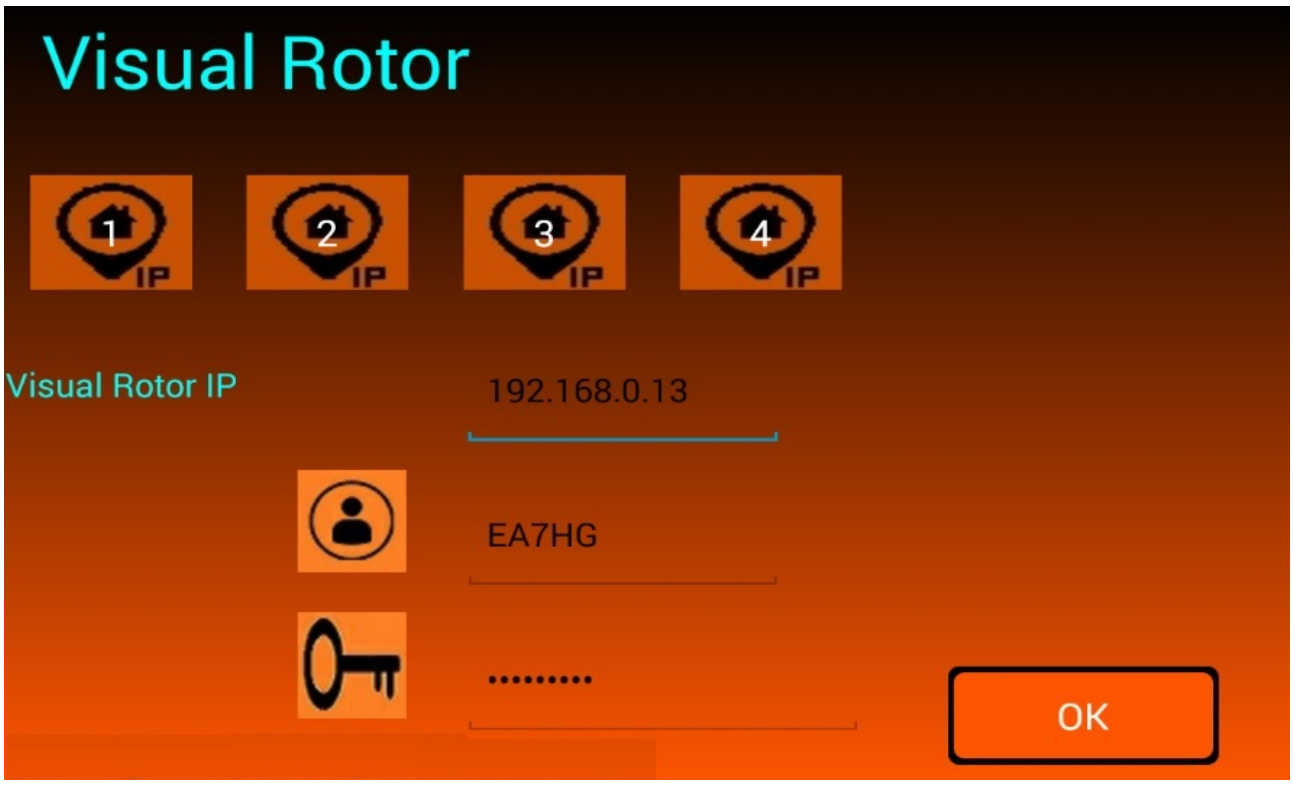
The connection for Visual Rotor to work with Android is very simple. We will connect the Ethernet cable to the LAN module W5100 or W5500 and this to our router. Once connected, we will turn on our control (once all the circuits have been installed) and we will access the configuration of our router to see what address it has assigned and we will assign it a fixed IP within our network. We will do this through DHCP reservation.

Once this step is done, we will proceed to open port 2567 for the UDP protocol

If we intend to access this device remotely, we have to route the port to access through our fixed IP, or if the DDNS server that our Router supports does not have a fixed IP.

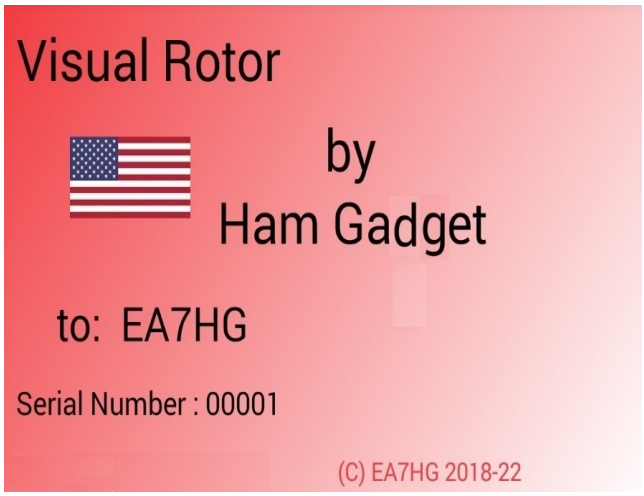


Once the assigned IP address (or the DDNS server), the ports and all the configuration described above are known, we will access the VisualRotor application of our Android device and enter the assigned address, username and password.You now have 4 memories to store IP addresses. DO NOT ENTER THE PORT (2567), the application already adds it automatically.



When the LED installed on Pin A14 of the Arduino Mega 2560 lights up, it will indicate that it is ready to connect to the android application and also allows the rotor to be controlled in its original form. Once the IP address or the DDNS server is entered in the application, it will be saved although it can be modified, so that you do not have to write it every time you use Visual Rotor.

Once OK is pressed, the connection will start showing the following screens:



A few seconds after this screen appears, the screen with the version of Visual Rotor, license, language, etc. will appear. If after more than 10 seconds the screen with the version of Visual Rotor, license does not appear, it will indicate that there is no connection.

If the connection does not occur, it can be for five reasons:

The IP address, User or password that you have written is not correct. Make sure the address you type is the same as the one assigned on your router.
The DDNS server is not configured correctly.
Port 2567 is not open or configured in UDP mode
The ethernet cable is not connected to your router or it is not connected to the LAN board W5100 or W5500 or both, or the cable is faulty.
It has not waited for the LED to light up, indicating ready to receive a connection.

OPERATION OF THE APPLICATION FOR ANDROID:

The Visual Rotor application for Android works exactly the same as with the TFT screen except for the following cases:

NUMERICAL GRAPHIC OPERATION (ANDROID):

Unlike Visual Rotor with TFT screen, with Android the change of direction in the number chart is as follows. The screen from the right side of the Menu buttons, Memories, etc. comprises from 1 to 360 degrees with Azimuth rotors and from 0 to 180 degrees with elevation rotors. To select the course, simply press on the screen and move your finger to the left or right until the desired course is selected. Once this is done, when you take your finger off the screen, Visual Rotor will start the rotation

of the rotor to the selected course.

MENU BUTTON IN ANDROID:

Unlike Visual Rotor with a TFT screen, the Menu button is marked M. Below it is the text Exit. If we leave the M button pressed, it allows the exit of the application.

ROTOR STOP:

As in Visual Rotor for TFT it is allowed to stop the rotor with the joystick or direction buttons, in Visual Rotor for Android in addition to being able to stop it with the joystick or buttons, if you touch the screen of your Android device while the rotor is turning, it will stop.

ON SOME SMARTPHONE OR TABLET SCREENS IN GRAPHIC MODE SPHERE AND SPHERE 2 MAY APPEAR SLIGHTLY CRACKED.

Chart examples:

Sphere:

Measurer:

Numeric:

Sphere 2:

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Thanks to YO3DMU, Codrut for their kindness in adding UDP control for Visual Rotor in their PstRotator programs.

Also thank all users for their contributions to Visual Rotor as well as bug fixes.

Video Version 1.0: https://www.youtube.com/watch?v=tZQ_SATz8qU

Video Version 1.1: https://youtu.be/rb6bFKrHNz4

Video Version 1.2: https://www.youtube.com/watch?v=1q9Od6d1VrU

Video Version 1.3 : https://youtu.be/N6pSJuTp1pE
https://youtu.be/eX_ByJIllYk

Revisión 1.1

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