Alfa Radio Ltd.
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AlfaSpid MD-01/02 Controller

Revised 12 APR 2022
http://www.alfaradio.ca

This manual is for use with units sold by Alfa Radio Ltd. of Edmonton, Alberta, Canada. on or after March 1, 2022. Units sold by others may have different firmware and may operate from different voltages.

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1 Introduction

MD-01/02 is an electronic controller used for turning rotators. It is a multifunction device, allowing for various combinations of settings. The Controller may be connected to two single rotators (e.g. two Azimuth rotators) or one Azimuth and Elevation rotator and operates with direct current motors. The MD-01 and MD-02 controllers are identical on the inside. The only difference is the case: the MD-01 is in a 19” compatible rack-mountable enclosure, whereas the MD-02 is in a desk-mountable enclosure.

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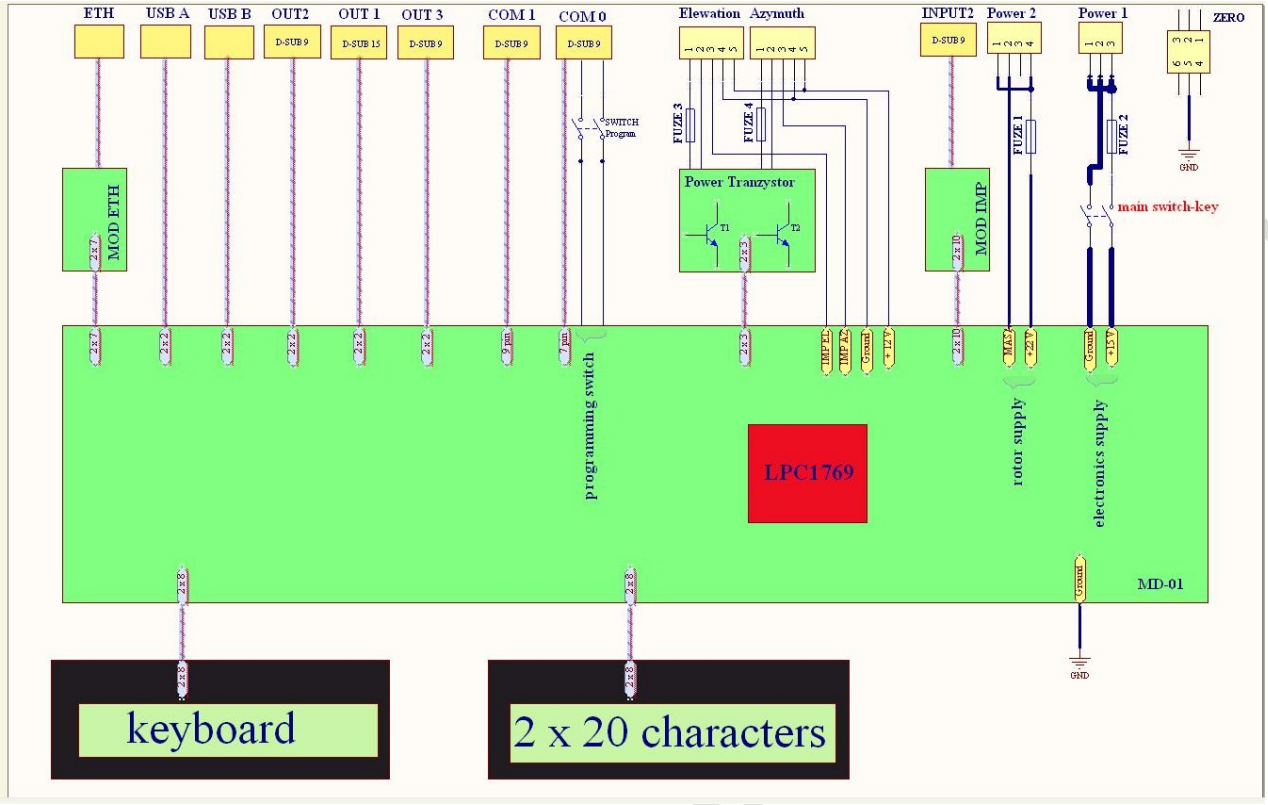
1.1 Block diagram



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1.2 Features of the MD-01/02 Controller

Supply voltage for controller electronics 13.8 to 15 VDC (I_{max} = 2 Amps)

Supply voltage for rotators 13.8 to 24 VDC (I_{max} = 40 Amps),

The maximum current of a single motor is up to 20 Amps.

2 x RS-232 ports

1 x USB host port

1 x USB device – visible in the system as a virtual COM port.

1 x Optional RJ-45 Ethernet port.

1.3 Photos and description

1.3.1 Front MD-01

1. Keyboard.
2. 2x20 characters display.
3. Switch-key.

1.3.2 Front MD-02

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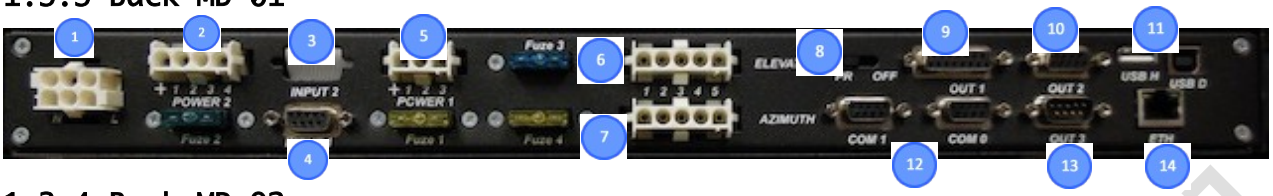
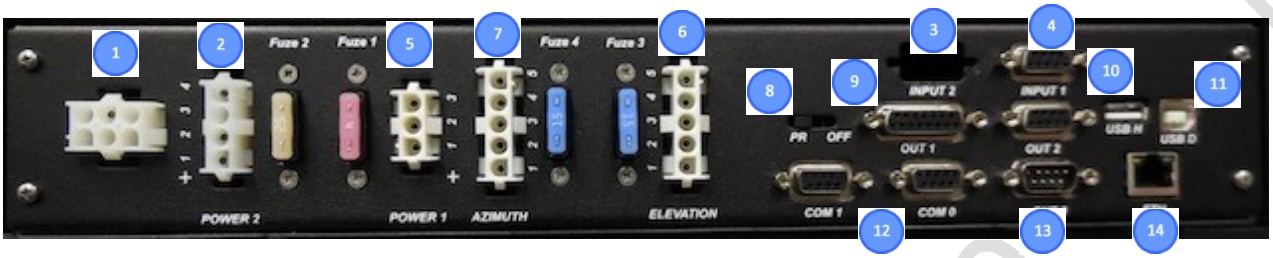
1.3.3 Back MD-01



1.3.4 Back MD-02



1. Plug-in socket for Ground Connection (the remaining PINs are not provided).

2. Rotator motor supply input (FUSE at 40 Amps Max). On older units this connector may be labeled Input 1

3. Planned future location for connecting modules, e.g. CAN, RS-485, RS-422 or analog inputs.

4. Sensor Input for systems with one or two Hall effect sensors.

5. Power Supply input for Controller Electronics (FUSE 2A). On older units this connector may be labeled Input 2

6. Supply outputs for Elevation Rotator. Pins 1 and 2 are connected to the Rotator motor and pins 3 and 4 are connected to the mechanical sensor on RAU, RAK, Real and RAS rotators. The motor output is FUSED at 20 Amps maximum depending on the motor used.

7. Supply outputs for Azimuth Rotator. Pins 1 and 2 are connected to the Rotator motor and pins 3 and 4 are connected to the mechanical sensor in RAU, RAK, Real and RAS rotators. The Motor output is FUSED at 20 Amps maximum depending on the motor used.

8. Switch used to update the controller software (FIRMWARE). To update the software use COM 0 (item 12) with the switch in the OFF position. Normal mode of the controller is when the switch is in the PR position.

9. Universal output – Future use to connect external relays. When implemented, the controller will have the function of an antenna change-over switch.

10. I2C output – used to control SW-01 switch.

11. USB HOST port (type A plug) and DEVICE port (type B plug).

12. RS-232 ports – COM 0 and COM 1. COM 0 is also used to update the controller software (see item 8).

13. Input used for a specially designed (RAS) mouse.

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14. Network input RJ45 (Optional ETHERNET Board).

CONNECTOR PIN LAYOUT

PIN	FUNCTION
1	NC
2	NC
3	NC
4	NC
5	GROUND
6	NC

1

PIN	FUNCTION
1	U1 +22 VDC
2	GROUND
3	NC
4	U1 +22 VDC

2

PIN	FUNCTION
1	NC
2	IN imp 2 EL
3	IN imp 1 EL
4	IN imp 2 AZ
5	IN imp 1 AZ
6	12 VDC
7	12 VDC
8	GROUND
9	GROUND

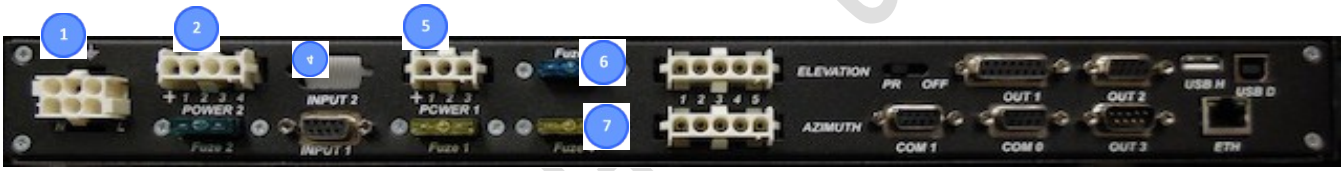
4

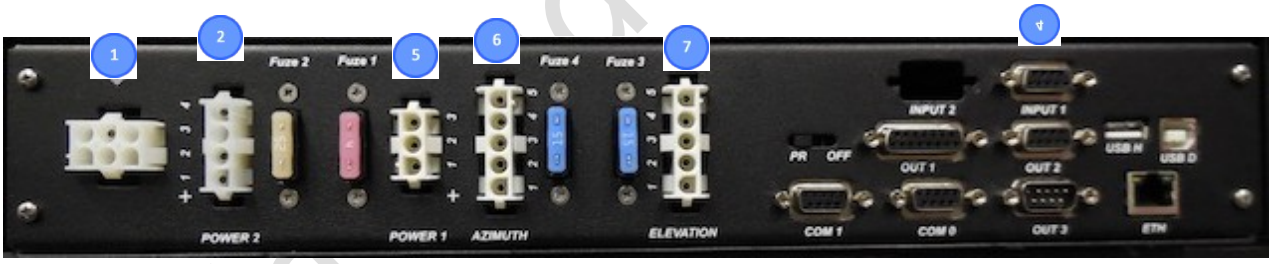
PIN	FUNCTION
1	U2 +15 VDC
2	GROUND
3	U2 +15 VDC

5

PIN	FUNCTION
1	MOTOR
2	MOTOR
3	IN IMP
4	GROUND
5	+12 VDC

6 7





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2 INSTALLATION MD-01/02

When supplying power to the MD-01/02 controller, two power cables are required.

The first cable has a 4-pin connector, which should be plugged into the **Power 2** connector on the controller. **This cable is used to supply power to the Rotator Motors.** The cable should be connected to a power supply that can provide from 13.8 to 24 volts DC at a minimum of 20 Amps. Wire gauge for the cable should be at least #14.
CAUTION. In the 4-pin connector, Pin 3 is not equipped and not used.

The second cable has a 3-pin connector, which should be plugged into the **Power 1** connector on the controller. **This cable is used to supply power to the controller electronics**. The cable should be connected to a power supply that can provide 13.8 to 15 volts DC at a minimum of 2 Amps. The power supply should not exceed 15 volts, as it could damage the controller. Wire gauge for the cable should be at least #18.

It is highly recommended that a third cable be made. This cable consists of a single wire of the largest gauge that can fit in the connector. This wire has a 6-pin connector, which should be plugged into the ground connector on the controller and the station ground.

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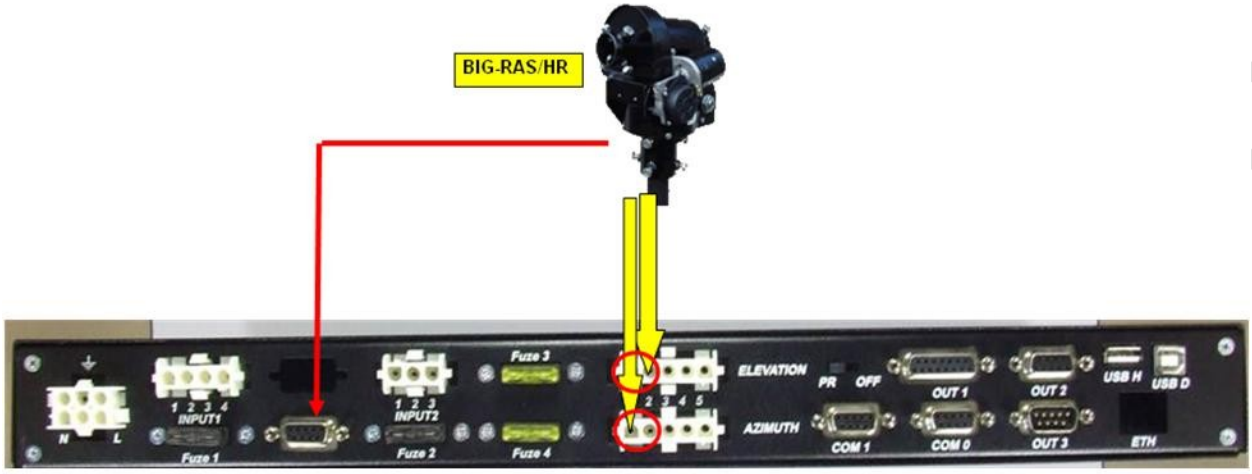
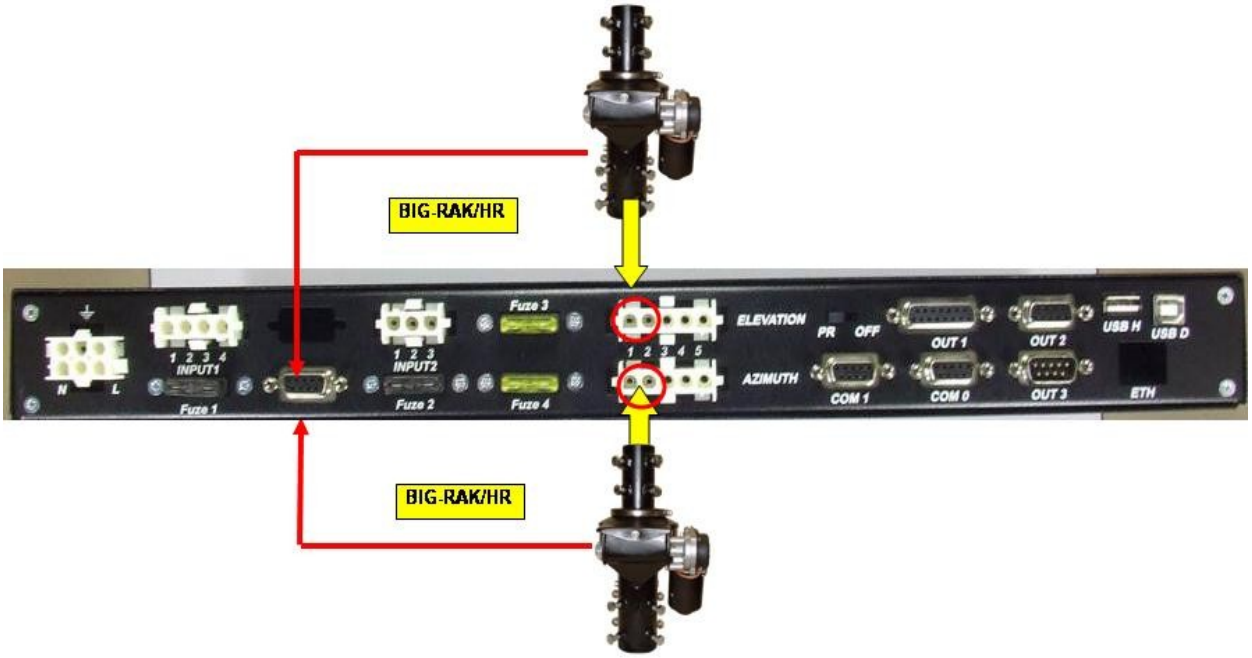
There are a number of different combinations of the MD-01/02 controller and AlfaSpid Rotators as shown below.

MD-01/02 controller and BIG-RAS/HR



MD-01/02 controller and one or two BIG-RAK/HR



MD-01/02 controller and RAS or BIG-RAS

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MD-01/02 controller and one or two RAK, BIG-RAK, RAU or Real

Note: The pictures on this and the previous page show older units. Refer to sections 1.3.3 and 1.3.4 for current connector labeling

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2.1 Wiring for BIG-RAS/HR and/or BIG-RAK/HR

See Applicable Alfa Radio Rotator Manual

2.2 Wiring for BIG-RAK, RAK, RAU or REAL

See Applicable Alfa Radio Rotator Manual

2.3 Wiring for BIG-RAS or RAS

See Applicable Alfa Radio Rotator Manual

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2.4 MD-01/02 connectors

Should additional connectors be needed, the following pictures show the part numbers for the various connector shells and pins used with the MD-01/02 controller. These connectors are standard Tyco Electronics Corp. Mate-N-Lock connectors and are available at most Electronics Suppliers.

Mate-N-Lock Pins

Mate-N-Lock Housings

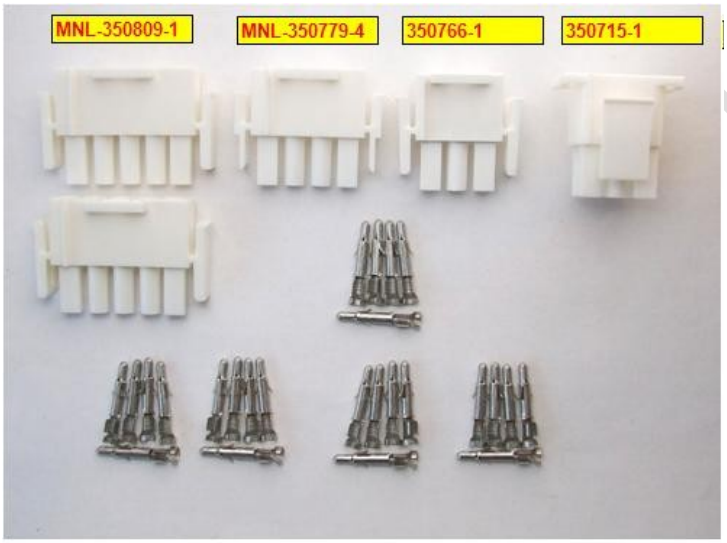

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Table of MD-01/MD-02 connectors

Number of pins	Plug Part Number Natural color	Plug Part Number White Flame Retardant	Number used by MD-01/MD-02	
3	1-480700-0	350766-1	1	
4	1-480702-0	350779-1	1	
5	1-480763-0	350809-1	2	
6	1-480704-0	350715-1	1	
				Wire Size
Pins	Spid Recommended	926894-1	18	20 - 14
	Alternate	350547-1	18	20 - 14
	Alternate	640309-3		12 - 10
Socket		350550-1		20 - 14

Information from TE Connectivity "MATE-N-LOK Instruction Sheet 408-7714

Connectors for sense connections to /HR Rotators

Mode 25-728-0

DB9P

DB9 Hood

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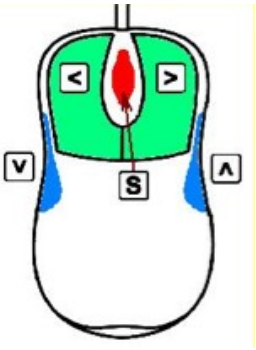
2.5 Mouse Controller



The optional mouse controller allows easy desktop access to the most commonly used front panel controls. These buttons are functionally equivalent to the corresponding front panel controls. The “Mouse Control” Switch (section 5.2.7) must be set to “ON” for the mouse controller to work.

- < - Left (Decrease)
- ^ - Up (Increase)
- V - Down (Decrease)
- > - Right (Increase)
- S Setup Mode or **STOP**

The mouse ball serves no function.

⚠ The mouse controller is a highly modified computer mouse. You cannot use a regular mouse with the *A*lfaSpid rotator nor vice-versa.

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3 SETUP MD-01/02 controller

3.1 COMMUNICATION between MD-01/02 and PC

Communication between the MD-01/02 controller and a PC is done with program **SPIDM-D01dde.exe (** This name may change).** You can use this program to configure the MD-01/02 controller as well as use it to communicate between the ORBITRON satellite tracking program and the MD-01/02. More programs will be supported in the future.

How to start communication from MD-01/02 to PC

3.2 SETUP MD-01/02 controller

3.2.1 Using USB Communications:

- When power is turned on, the MD-01 display shows: ”Mode: Normal”.
- Press the **[S]** button twice.
- You will now enter “Motor configuration”.
- Press **[Right]** button 8 times. Then select “USB” with the **[Up]** or **[Down]** buttons.

- Go to “Set Protocol” below

3.2.2 Using Ethernet Communications :(If Ethernet module is installed)

- When power is turned on, the MD-01 display shows: ”Mode: Normal”.
- Press the **[S]** button twice.
- You will now enter “Motor configuration”.
- Press **[Right]** button 8 times. Then select “USB” with the **[Up]** or **[Down]** buttons.

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Set Protocol

· Press **[Right]** button 1 more time and select SPID ROT2 with the **[Up]** or **[Down]** buttons (protocol SPID ROT2). The SPID ROT2 protocol is installed as a standard protocol in the MD-01/02 rotator controller.

· To complete and to close this setup, press **[F]** button and choose YES.

· You are now back in the running mode and ready to use the MD-01/02 controller.

All configurations of the controller are done.

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3.3 SETUP MD-01/02 software

To find out what version of firmware is in the MD-01/02 controller, press the [F2] and [F] buttons on the front of the MD-01/02 controller at the same time. The firmware version and date will be seen on the MD-01/02 display.

3.3.1 Using USB Communications:

#1 Install the FTDI USB drivers on the PC (USB D Driver) Use the Driver appropriate for your operating system. Consult FTDI Website http://www.ftdichip.com/Drivers/VCP.htm

This USB driver will install a USB Serial Port (COM x).

You can check this in Windows/configuration/device management and search for COM ports.

#2 Connect the MD-01/02 through USB D port to PC with a USB Cable (Port: USB D).

#3 Start program spidMD01dde.exe (this name may change).

#4 Click on the “show” button at the bottom middle then click on the Options Tab.

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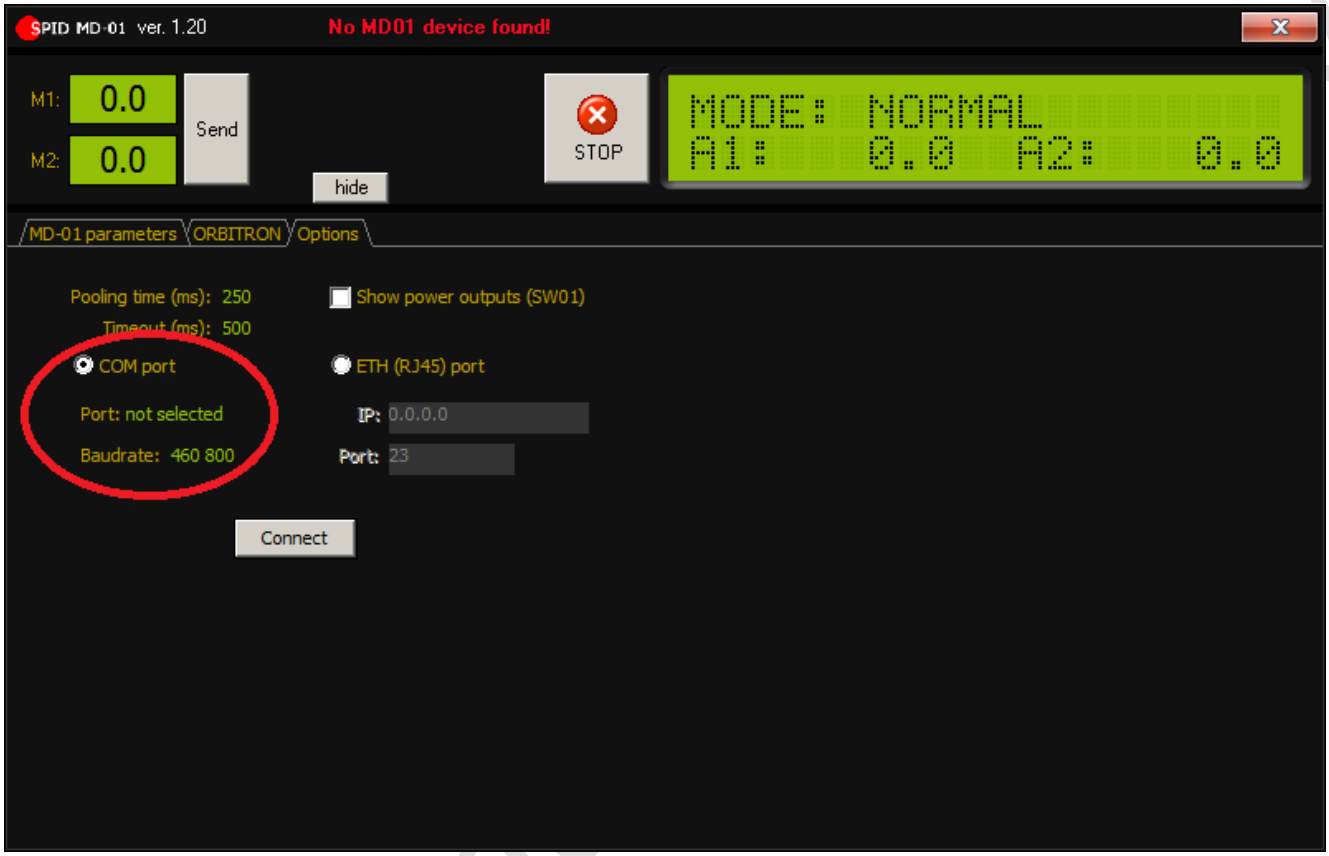
#5 For USB connection click on Com Port.
#6 Double click at “port not selected” to choose the USB Serial port which must be used.



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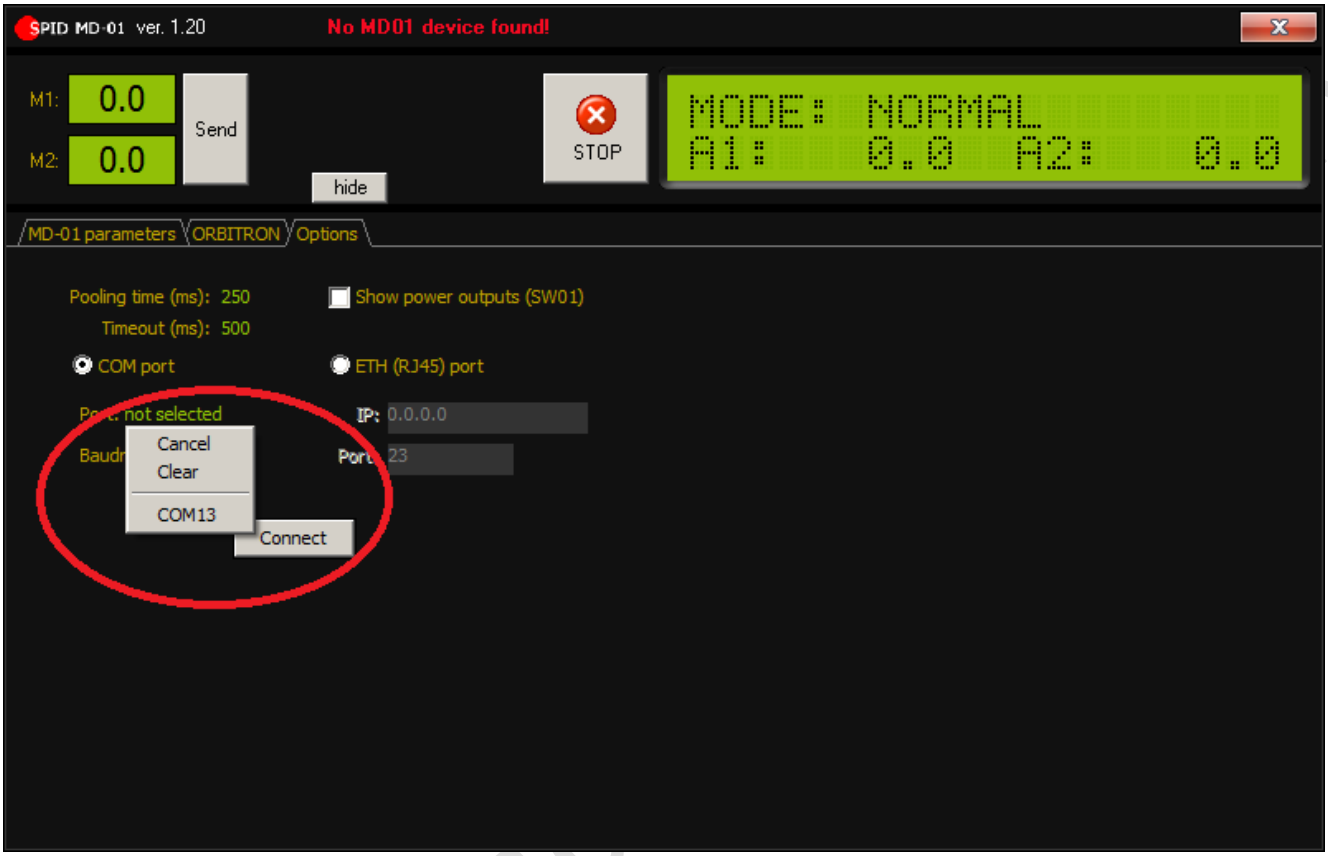
#7 Click on the USB Port (COM13 in this example). Do **not** change Baud Rate, Pooling Time or Timeout at this time!



#8 Click on Connect Box.

3.3.2 Using ETH Communications:

#1 Connect the MD-01 through ETH port to the local LAN with an Ethernet Cable.

#2 Start program spidMD01dde.exe (this name may change).

#3 Click on the down arrow at the bottom middle then click on the Options Tab.

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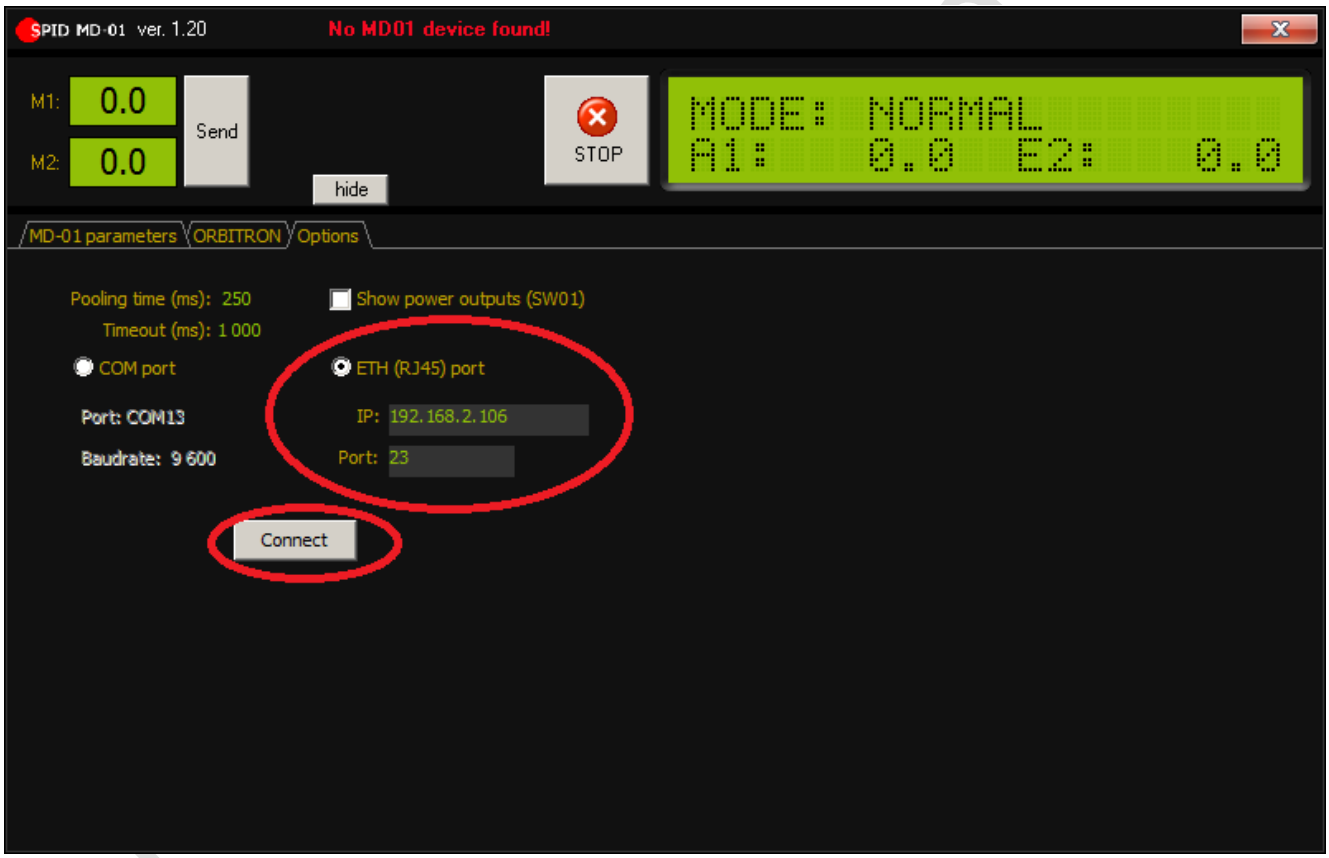
#4 For ETH connection click on ETH (RJ45) Port.
#5 Determine the IP address of the MD-01/02 controller by using a program such as NETSCAN or KT-ETH-Manager from a PC.
#6 Enter the IP address of the MD-01/02 controller in the IP: Box
This address can be a numbered address or a DNS address.



#7 Click on Connect Box.

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COMPLETING the Configuration

Now click at MD-01 parameters / Ports and check if the screen as below, USB COM or ETHERNET State must be “ON” but **not** both.

The Baud setting for the USB COM port is normally set to 460800. If the USB COM port is to be used in normal operation and the control program used in normal operation uses a different baud rate, then the setting on the screen below will need to be changed to match. When the settings are uploaded to the MD-01/02 controller, communications between the setup program below and the MD-01/02 controller will stop. It is best to restart the PC setup program, as described in section 3.3.1, this time using the new baud rate.

If the setup is correct and the spidMD01dde.exe (** this name may change) program is properly connected to the MD-01/02 controller the upper right display on the PC will synchronize with the display on the MD-01.

To test:

Press arrows on the MD-01/02 keypad. The rotator should move and the PC display should update with changes in the MD-01/02 display.

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Enter new values in the M1 and/or M2 boxes and click on the Send box.
The rotator should move to the selected locations and the PC display should update with changes in the MD-01/02 display.

Be sure all cables are connected to MD-01/02 and rotator!

3.4 More functions available in MD-01/02 software:

With the MD-01/02 software you are able to configure the MD-01/02 controller.

How does this work?

Click at an item you want to change in the MD-01/02 parameters screen. The parameter selected ("Start Powers: 30%" in the example above) will be highlighted in green.

You can now change this value using the arrow keys, **[Up]**, and **[Down]**.

When you change some settings you can now upload them to the MD01/02 controller by pressing the Upload button. Click Yes at the question. Wait for a second, and, if needed, manually check to see if new data is active.

Note: Most values can be changed. Care must be taken, as changing the motor configuration can result in a non-working rotator.

Possible changes that can be made by the user:

Soft Start and Stop (3 step)

Minimal and Maximal turning angle (AZ & EL)

Protocol change (advance setting / experience)

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3.5 Pooling time and Timeout

The Options page of the spidMD01dde.exe program has two timing options:

Pooling Time (ms) - This is the interval at which the program will poll the controller for its Azimuth and Elevation status. The default value for this is 250 ms.

Timeout (ms) - This is an interval that the program expects to receive a complete response from the controller. The default value for this is 500 ms.

The default values generally work out fine for connections on the two COM ports and the USB port at Baud rates of higher than 9600. For baud rates of 9600 and lower, it is suggested that these values be set higher to approximately 750 ms for pooling rate and 1000 ms for Timeout.

With Ethernet connections on a busy network, the user will notice that the program may disconnect. Adjusting the pooling rate and timeout values will lessen the problem.

3.6 Rotator Testing

See Applicable Alfa Radio Rotator Manual

3.7 Rotator Troubleshooting for non-/HR Rotators

See Applicable *Alfa* Radio Rotator Manual

4 Operation

MD-01/02 controller may be operated from the front panel keyboard or a computer connected to one of the Communication ports.
The MD-01/02 controller has two modes (MODE).
NORMAL – normal mode.

MOTOR ANGLES – calibration mode.

To change the mode, push the **[F]** key.

4.0.1 Normal mode (NORMAL)

In this mode, the Controller may be operated with the **[Right]**, **[Left]**, **[Up]** and **[Down]** buttons, or from a connected computer. The Controller supports communications protocols such as SPID ROT1, SPID ROT2, SPID MD-01 and YAESU that can be assigned to any communications port (COM 0, COM 1, USB D and ETH) in the settings. YAESU protocol may not support the full capability of AlfaSpid rotators.

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The **[Right]** and **[Left]** buttons are used to adjust the azimuth of the antenna.

The right direction – the antenna turns in a clockwise direction; the value of the angle in the display increases.

The left direction – the antenna turns in an anticlockwise direction; the value of the angle in the display decreases.

The **[Up]** and **[Down]** buttons are used to adjust the elevation of the antenna.

The Up direction – the rotator turns right from a facing perspective; the value of the angle in the display increases.

The Down direction – the rotator turns left from a facing perspective; the value of the angle in the display decreases.

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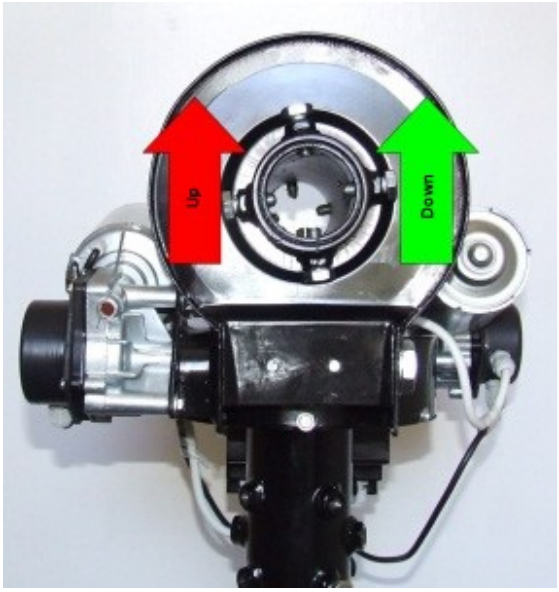
The directions of antenna elevation rotation are shown in the picture:



4.0.2 Calibration mode (MOTOR ANGLES)

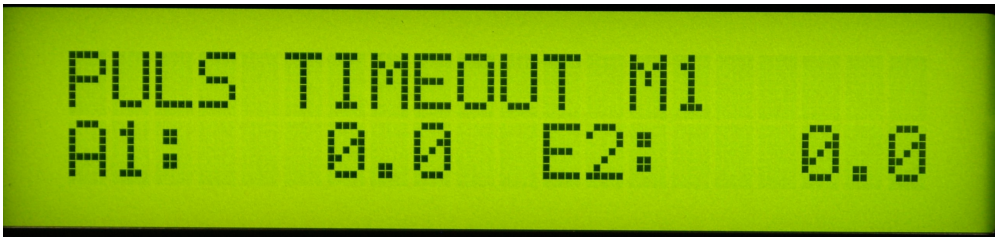
To switch the controller to the calibration mode, push the **[F]** button. In this mode you can set the azimuth and elevation angles without turning the antenna. This mode is needed to preset and calibrate the antenna positions.
To reset the azimuth angle to zero, push the **[F1]** and **[Left]** buttons simultaneously. To reset the elevation angle to zero, push the **[F1]** and **[Down]** buttons simultaneously.
To change the azimuth angle, use the buttons **[Left]** and **[Right]**.
To change the elevation angle, use the buttons **[Up]** and **[Down]**.
After completing the calibration, leave calibration mode and return to normal mode by pushing the **[F]** button.

Part of the overload protection circuitry involves cutting power to the motor, if the controller does not receive a sense indication. If the motor turns for a few seconds and then stops, the motor has either stalled or there is a problem in the impulse sense wiring. The controller has not detected motor movement.

On units with older firmware, there is no indication on the display that this has happened.

On units with the latest firmware, the display screen will show which motor is a fault.

This picture indicates that the motor connected to the Azimuth connector has the fault.



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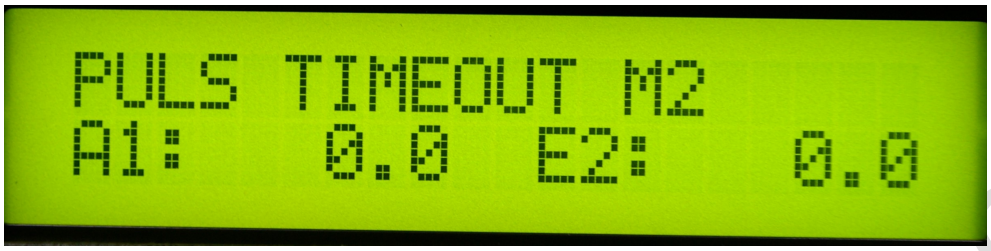
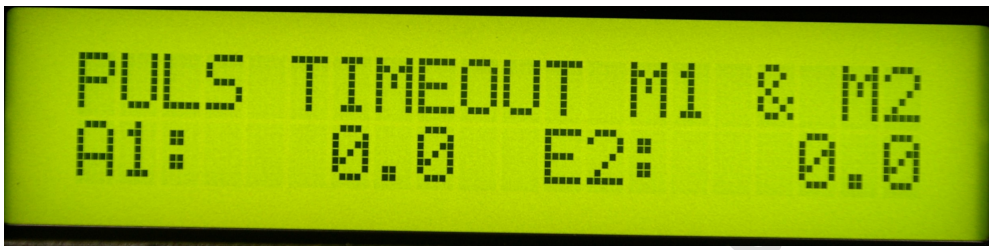
This picture indicates that the motor connected to the Elevation connector has the fault.



This picture indicates that both motors have the fault.



The operator needs to correct whatever condition is causing the fault, Cycle the power to the controller, using the front panel power switch, and try again.

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5 MD-01/02 controller configuration

When MD-01/02 controller is in NORMAL mode, you can use the **[S]** button to enter configuration mode.
The structure of the controller configuration mode is modular. Select modules using buttons **[Left]** or **[Right]**. When you select a module, you use the **[S]** button to enter in its parameters. Moving between parameters is done with the **[Left]** or **[Right]** buttons. The value of the parameter can be changed using the **[Up]** or **[Down]** buttons. The **[F]** button is used for exiting the configuration mode. After pushing the **[F]** button, the operator is asked about writing the current configuration into memory. To confirm and write the changes to memory, press the **[Left]** button. To go back to previous configuration, press the **[Right]** button.

5.1 Motor configuration

The number before the ":" in the name of the template determines which connector on the rear panel the motor must be connected:

1. AZIMUTH
2. ELEVATION

5.2 Template

The type of motors connected to the controller is pre-set by templates:

- **1:NC, 2:NC** - no motors connected to the controller.
- **1:AZ, 2:NC** - a motor is connected on the rear panel of controller on connector AZIMUTH. Motor rotates only in azimuth.
- **1:NC, 2:EL** - a motor is connected on the rear panel of controller on connector ELEVATION. Motor rotates only in elevation.
- **1:AZ, 2:EL** - there are two motors connected to the controller. Motor 1 (connector AZIMUTH) rotates in azimuth, and Motor 2 (connector ELEVATION) rotates in elevation.
- **1:AZ, 2:AZ** - there are two motors connected to the controller, which is rotated in azimuth only.

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5.2.1 Show Azimuth

Azimuth angle display format:
This angle can assume any value from -180 degree to 540 degrees max, or within the range of the rotator as set with the MAX and MIN Angle settings for each motor.

- **MATH** – show angle from -180 degree to 540 degree,
- **NORMAL** – show angle in 0 – 359 degrees.
- Example:

MATH ANGLE	SHOWN ON DISPLAY
-1 degree	-359 degree
-2 degree	-358 degree
-179 degree	-181 degree
-180 degree	-180 degree
360 degree	+0 degree
361 degree	+1 degree
539 degree	+179 degree
540 degree	+180 degree

5.2.2 Short Way

OFF - Disable Shortest Route feature on AZ Rotators or the azimuth portion of an AZEL Rotator
ON - Enables Shortest Route feature on AZ Rotators or the azimuth portion of an AZEL Rotator

5.2.3 Use EL MAP

Use elevation map. This is a map of minimum elevation angles at specific azimuth angles. This map can be created with the program “spidMD01dde” (name may change). The map can be used when, for example, high buildings or trees are around the antenna and obscure visibility.

Example: if USE EL. MAP is set (ON) and you set a minimum elevation angle of 20 degrees for azimuth angles from 10 to 100 degrees, and a satellite tracking program (like Orbitron) sends the MD-01/02 an elevation angle less than 20 degree for an azimuth angle in 10 to 100 degree range, the MD-01/02 will only take the elevation angle to 20 degrees.
The Elevation map is ignored when the MD-01/02 is controlling manually.

Note: MIN ANGLE and **MAX ANGLE** in **SET MOTOR 1** (**SET MOTOR 2**) have a higher priority than the angles of elevation map. The rotator will not go beyond these limits.

5.2.4 Const EL MAP

If this option is set to ON, option USE EL. MAP is ignored, and a minimum elevation angle of 0 degrees azimuth is set for all azimuth angles.
This option is ignored when MD-01 is controlling manually.

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Note: **MIN ANGLE** and **MAX ANGLE** in **SET MOTOR 1** (**SET MOTOR 2**) have a higher priority than the angles of elevation map. The rotator will not go beyond these limits.

5.2.5 Start

Motors run mode:

This is set for each motor separately in modules **SET MOTOR 1** and **SET MOTOR 2**, as described later in section 5.3.9,

- **IMMEDIATELY** - motor starts with max speed, soft start is not active.
- **SOFTLY** – soft start is active (See 5.3.9 for details).

5.2.6 Stop

Motors stop mode:

This is set for each motor separately in modules **SET MOTOR 1** and **SET MOTOR 2**, as described later in section 5.3.10,

- **IMMEDIATELY** – at once, soft stop not active.
- **SOFTLY** – soft stop is active (See 5.3.10 for details).

5.2.7 Mouse Control

If you have a specially designed mouse by SPID (RAS Mouse – section 2.5), you can connect it to the MD-01 controller on OUT3 port (13 in back picture of MD01/02). The mouse works if you set this option to ON.

5.2.8 External control (CONTROL xx)

This parameter specifies the communication port that is used to control the connected motors. This parameter is not available when template **1: NC, 2: NC** is chosen.

If template **1: AZ, 2: AZ**, is chosen, the motor can be controlled from either of two ports.

The Controller display will show one or two descriptions depending on the selected motor template:

- CONTROL A1 – motor template **1:AZ, 2:NC** or **1:AZ, 2:AZ**,
- CONTROL E2 – motor template **1:NC, 2:EL**,
- CONTROL AE – motor template **1:AZ, 1:EL**,
- CONTROL A2 – motor template **1:AZ, 2:AZ**.

CONTROL parameter value:

- **NONE** - no external control. Motor controlled manually with buttons on the controller.

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- **COM 0** - external control with selected protocol. Can also be controlled manually.
- **COM 1** - external control with selected protocol. Can also be controlled manually.
- **USB** - controlled through USB D with selected protocol. Can also be controlled manually.
- **ETH** - controlled through ETHERNET with selected protocol. Can also be controlled manually.

5.2.9 Protocol (PROT.xx)

Communication protocol available between the controller and the control device (for example, a PC program):

- SPID ROT1 - Standard communication for all AlfaSpid rotators and controllers in Azimuth mode.
- SPID ROT2 - Standard communication for all AlfaSpid rotators and controllers in Elevation / Azimuth mode.
- YAESU - YAESU mode may not support the full capability of AlfaSpid rotators.
- SPID MD-01 - New communication protocol from SPID Elektronik.
- BRITE - **Future.** New protocol created by SPID Elektronik firm and Space Analysis Center in Warsaw.
- HyGain - **Future.**
- **Future protocols are not guaranteed to be developed.**

5.2.10 PAIR

Only when the selected template is in 1: AZ; 2: AZ mode and the MD-01 is controlled from an external program. When the MD-01 receives an azimuth angle from the program, both rotators will go to this angle.

5.3 Set motors (SET MOTOR 1, SET MOTOR 2)

5.3.1 STATE

Read only. Depends on the TEMPLATE selected (see Motor configuration -> TEMPLATE). It displays whether the motor is switched on or switched off.

5.3.2 TYPE

Type of motor return signal:

- **DIGITAL** – controller counts pulses.
- **ANALOG** – future feature where the controller measures voltage.

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5.3.3 KIND

Read only. Depends on the TEMPLATE selected (see Motor configuration -> TEMPLATE):

- **AZIMUTH** – motor rotates in azimuth.
- **ELEVATION** – motor rotates in elevation.

5.3.4 INPUT

Sensor type of controller MD-01/02 (only when the input type is **DIGITAL**):

- **ELECTRONIC** – rotator using electronic motion sensors (Hall Effect).
- **MECHANIC** - rotator using mechanical switches.

5.3.5 GEAR

Gear ratio of the rotator motor. Example:
0.0937 for BIG-RAS/HR
0.1250 for RAS/HR
1.0000 for RAU, RAK and RAS
0.5000 for BIG-RAK and BIG-RAS

5.3.6 MIN ANGLE

Limits the minimum angle to which the motor can turn. Default -180

5.3.7 MAX ANGLE

Limits the maximum angle to which the motor can turn. Default +180

5.3.8 MAX POWER

Maximum power, as a percentage of full power, that the controller can provide to the rotator motor.

5.3.9 START POWER, START TIME

Used if you want to obtain a “soft-start”. You can set a one, two, or three-stage motor start

(START POWER 1, START POWER 2, and START POWER 3)
Power is expressed as a percentage of full power.

(START TIME 1, START TIME 2 and START TIME 3)
START TIME is expressed in seconds.

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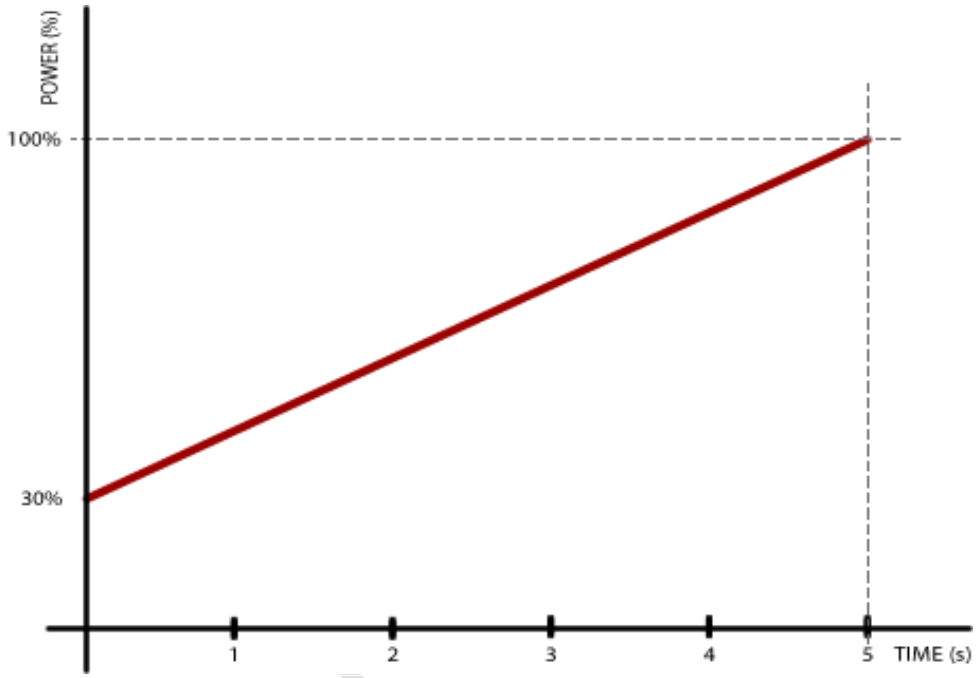
Example 1: One-step

Set the initial speed of rotation of the motor
START POWER 1 = 30%.
Set the time to reach maximum power (MAX POWER)
START TIME 1 = 5 seconds.
In this example set START TIME 2 = 0 seconds. - This will specify that the motor start is a single step.
Set MAX POWER to 100%.
This example shows that the motor is started with 30% power, and within five seconds linearly increases power to 100%.



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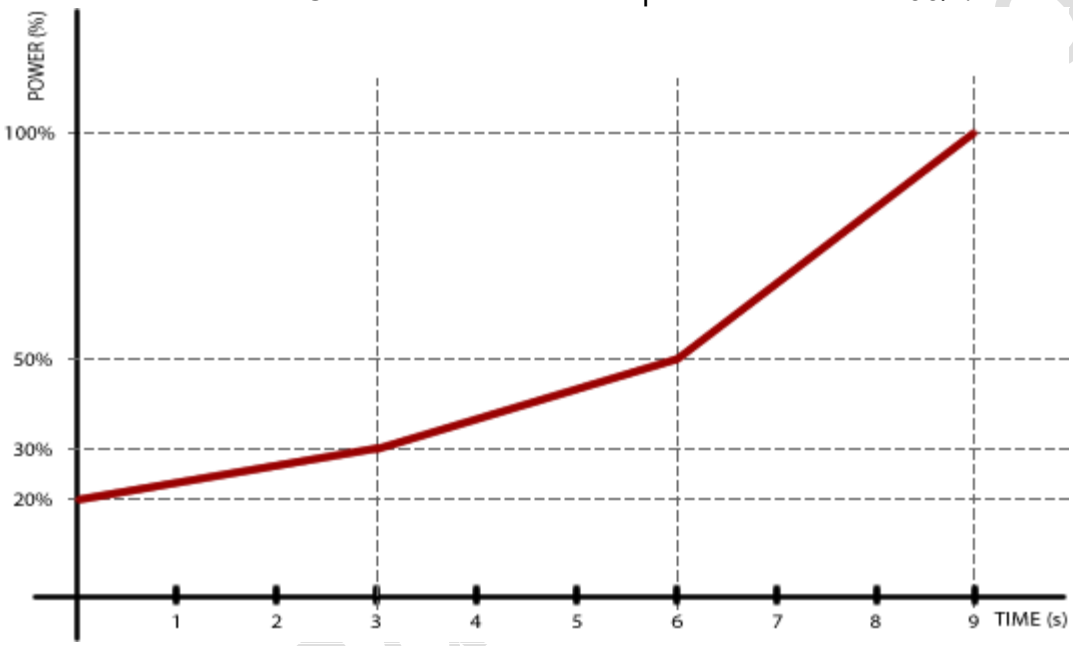
Example 2: three-step

- Set the POWER START 1 = 20%
- START POWER 2 = 30%,
- START POWER 3 = 50%,
- START TIME 1 = 3 seconds,
- START TIME 2 = 3 seconds,
- START TIME 3 = 3 seconds,
- MAX POWER = 100%.
- This means that the rotator starts with 20% power, within 3 seconds power reaches 30%, followed by 3 seconds during which power reaches 50% and the last 3 seconds in which power reaches 100%.



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5.3.10 STOP POWER, STOP TIME

Used if you want to obtain a so-called “soft stop”. It works the same way as “soft start” but is used to power down and stop the rotator.

5.3.11 STOP AT

Specifies how many degrees before the specified angle (for example, sent by a computer program like Orbitron) that the motor should begin shutting down. It only applies when SOFT STOP is selected in MOTOR CONFIGURATION.

5.3.12 PULSE TIMEOUT

Specifies how long the motor will run if it does not receive motion pulses from the rotator. Applies only to motors of type **DIGITAL**.

5.4 SET COM 0, SET COM 1

5.4.1 STATE

Read only. Possible values: ON or OFF.

5.4.2 BAUD

Possible values: 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400 and 460800.

5.4.3 DATA BITS

Possible values: 4,5,6,7 or 8 bit.

5.4.4 STOP BITS

Possible values: 1 or 2 bit.

5.5.5 PARITY

Possible values: none, odd or even.

5.5 SET USB COM

5.5.1 STATE

Read only. Possible values: ON or OFF.

5,5,2 BAUD

Possible values: 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400 and 460800.

5.6 SET ETHERNET – with optional module

The Ethernet port can be set for Dynamic or Static IP address as outlined in section 7.2. Communication with this port is done with the help of one of the protocols (SPID ROT1, SPID ROT2, SPID-MD-01 or YAESU).

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For example, the MD-01/02 controller receives the IP address from a DHCP server (e.g. 192.168.0.10). Connect to it, using a program like HyperTerminal by selecting the type of connection TCP / IP (Winsock), set host address 192.168.0.10 and port number to 23. Try using Yaesu protocol for testing because it is a text based protocol.

5.6.1 STATE

Read only. Possible values: ON or OFF.

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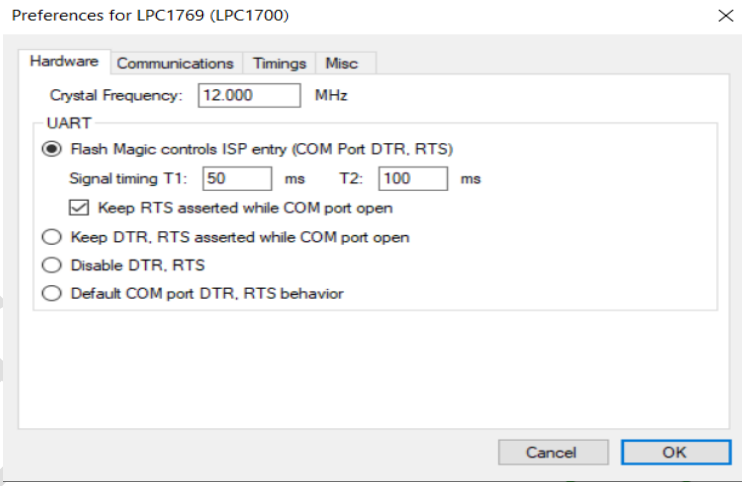
6 CONTROLLER FIRMWARE UPDATE

When a firmware update is available from Alfa Radio Ltd. the firmware of the MD-01/02 controller can be updated. It is important to install a flash program; we recommend Flash-Magic. A version is available on the Alfa Radio Ltd. website, or you can go to http://www.flashmagictool.com/download.html for the latest version.

Note: A firmware update file will be available on our web-site. Check the MD-01_MD02 Static Firmware page for the latest version.

6.1 Update Step by step:

1. Turn the MD-01/02 controller off
2. Set switch #8 to position OFF (back panel of MD-01/02)
3. Connect a serial cable to the Sub-D9-connector “COM 0” on the MD-01 and to a serial port on the PC
4. Turn on the MD-01/02
5. Start Flash-Magic
6. Now choose from menu View->**Preferances**, page **Hardware** and set options as on the screen shot below. Close with **OK** and the main screen comes back.



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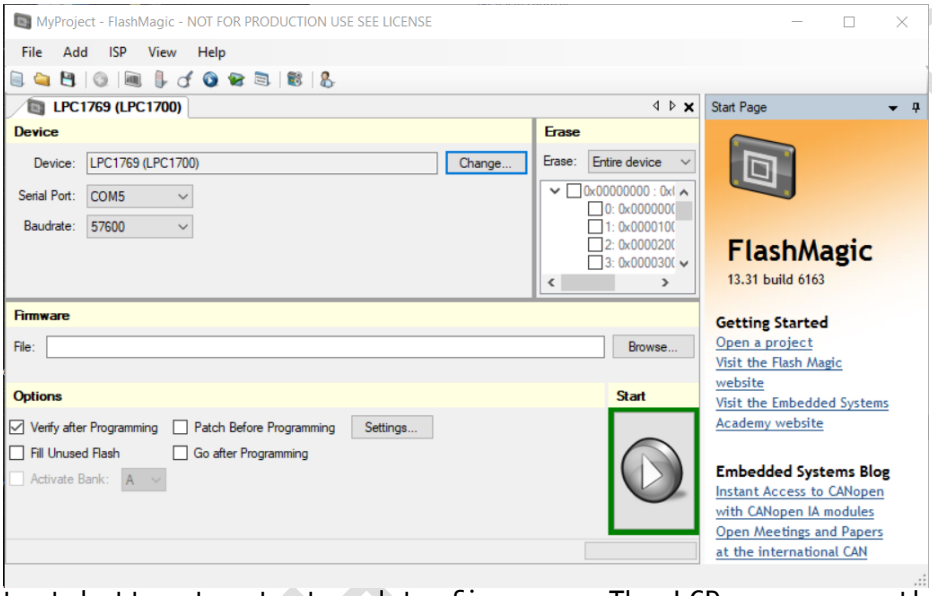
Back in the Main Screen:……

- Select Device: LPC1769.
- Select COM port that will be used from your PC to the MD-01/02.
- Select firmware received from Alfa Radio Ltd. i.e. MD01 v1.11.hex.
- Set the rest of parameters as shown in screen shot below.



7. Click Start button to start update firmware. The LCD screen on the MD-01/02 will turn **off** during update. When update is complete, the screen will light up again.
8. Turn off the MD-01/02 power after the update is finished.
9. Set switch to position from off to PR (back panel of MD-01/02).
10. Turn the MD-01/02 on.
11. New Firmware is installed and MD-01/02 is ready to use.

6.2 Firmware versions

The Alfa Radio Website has several versions of firmware for the MD-01/02 Controllers. They are filed in three subdirectories:

Current - This is the current version of Firmware approved by Alfa Radio Ltd. for customer use.

Archive - These are previous versions if you want to try them. No software support will be provided.

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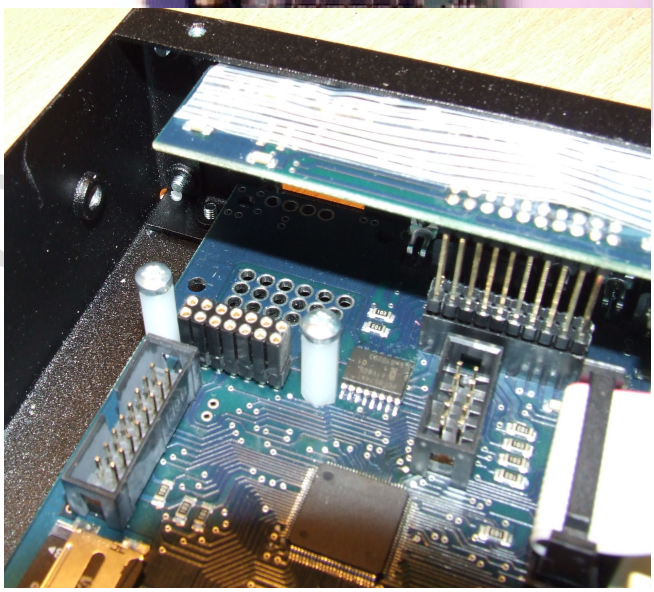
7 Optional Ethernet Module.

7.1 To install the optional Ethernet module:

Step 1: Unpack the module and note the MAC address printed on a paper sticker on the RJ45 connector.

Step 2: Remove the top cover of the MD-01/02 controller. Locate the area of the Motherboard near the Ethernet connector. Remove the two screws from the standoffs.



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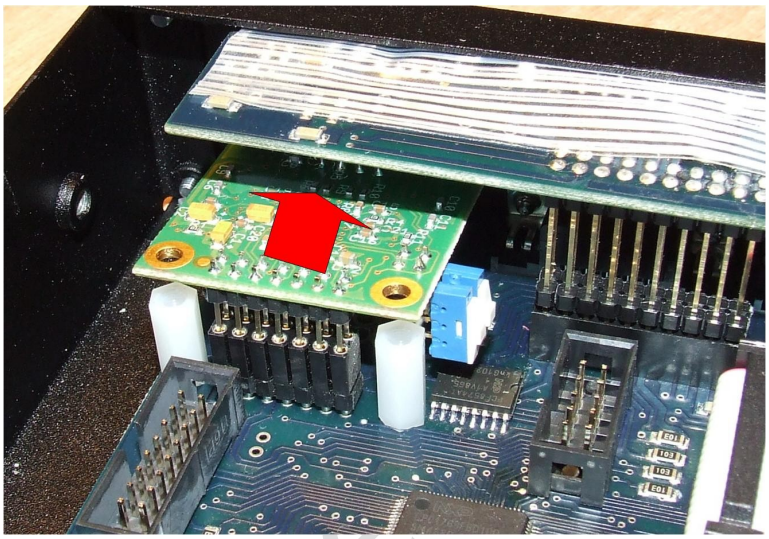
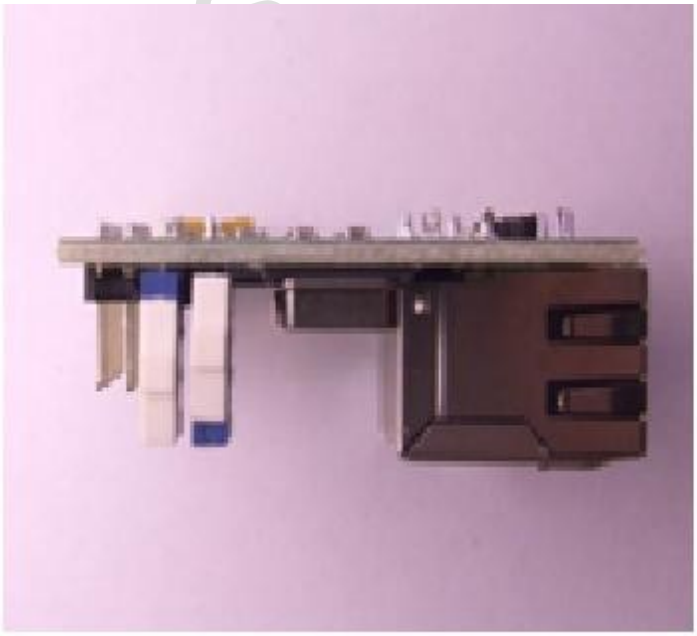
Step 3: Insert the Ethernet module into the space and align the 14-pin connector with the 14-pin socket on the motherboard. Push the 14-pin connector down and replace the two screws to secure the module.



Step 4: Set the two switches as shown if DHCP IP addresses will be used exclusively. Move both switches down if Static IP addresses will be used.



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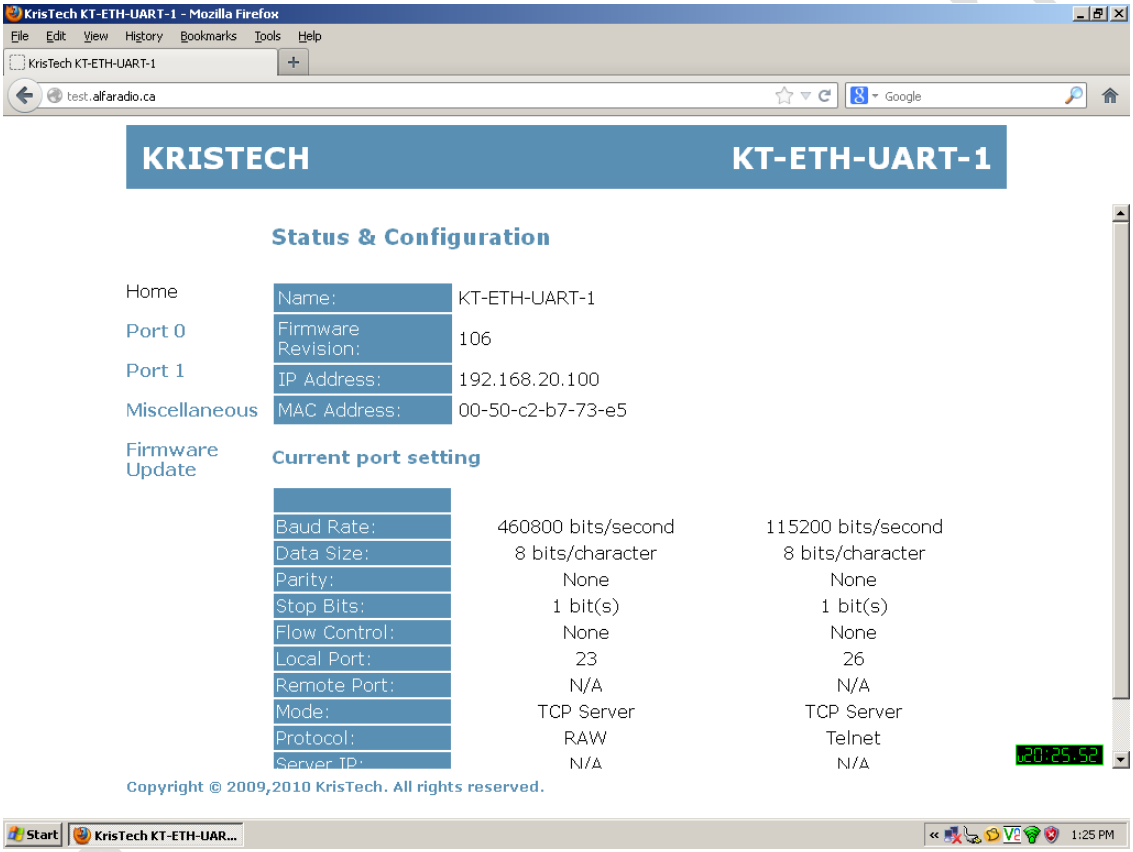
7.2 Setup the Ethernet Module

Connect an Ethernet cable from the MD-01/02 controller to the local LAN Switch. Turn the MD-01/02 controller ON and, with a PC connected to the LAN, determine the IP address of the MC-01/02 controller using a network scanning program such as “netscan.exe”.

Using a Web Browser connect to the MD-01/02. The next screen will appear.



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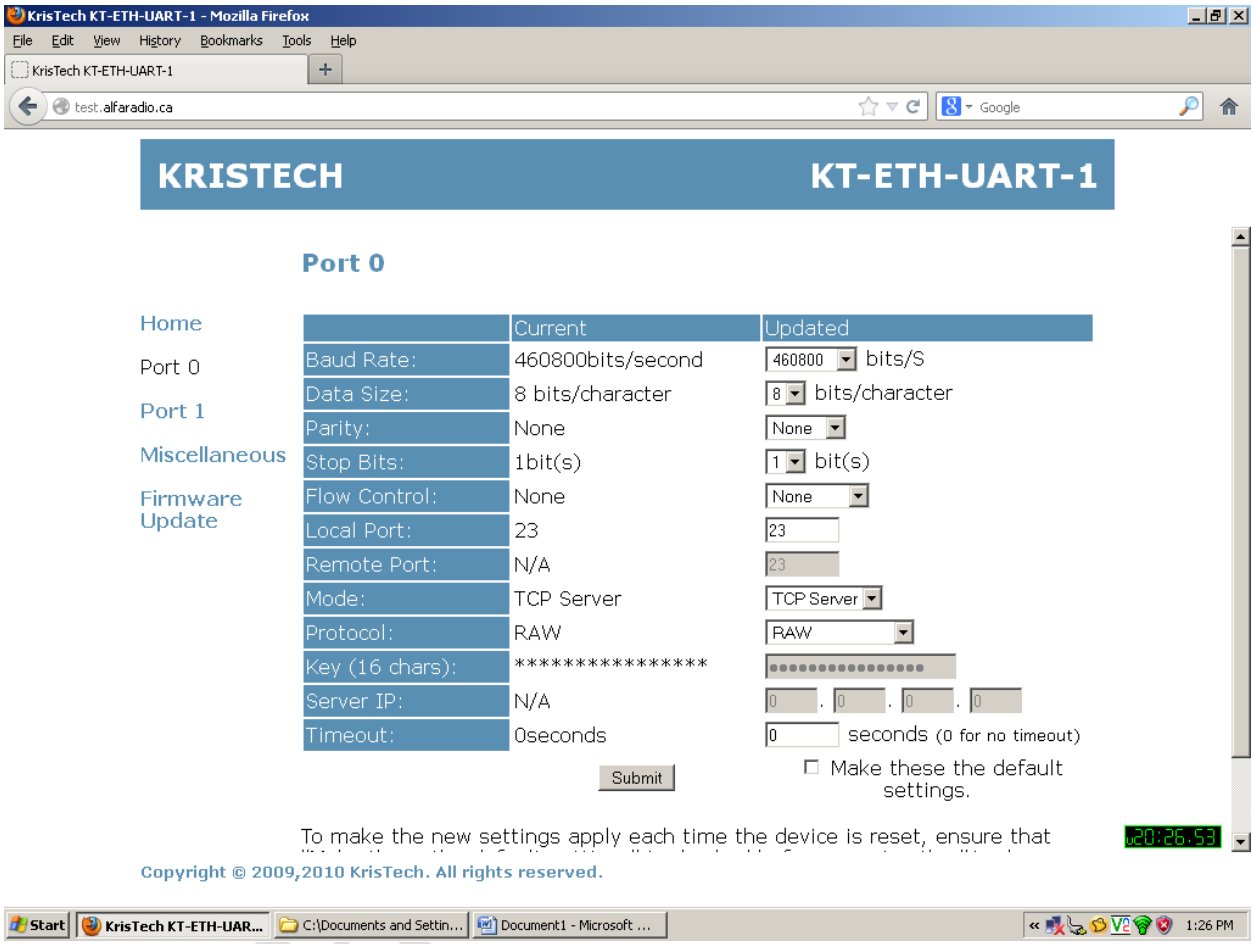
Click on the “Port 0” link.



Ensure that all the parameters are set to match the above. When all the parameters are entered, check the “Make these the default settings” box and then click the “Submit” Button.

The setup is complete. Turn off the MD-01/02 controller, re-install the top cover and replace all screws.

The Ethernet module will now operate using DHCP to determine the IP address of the controller.

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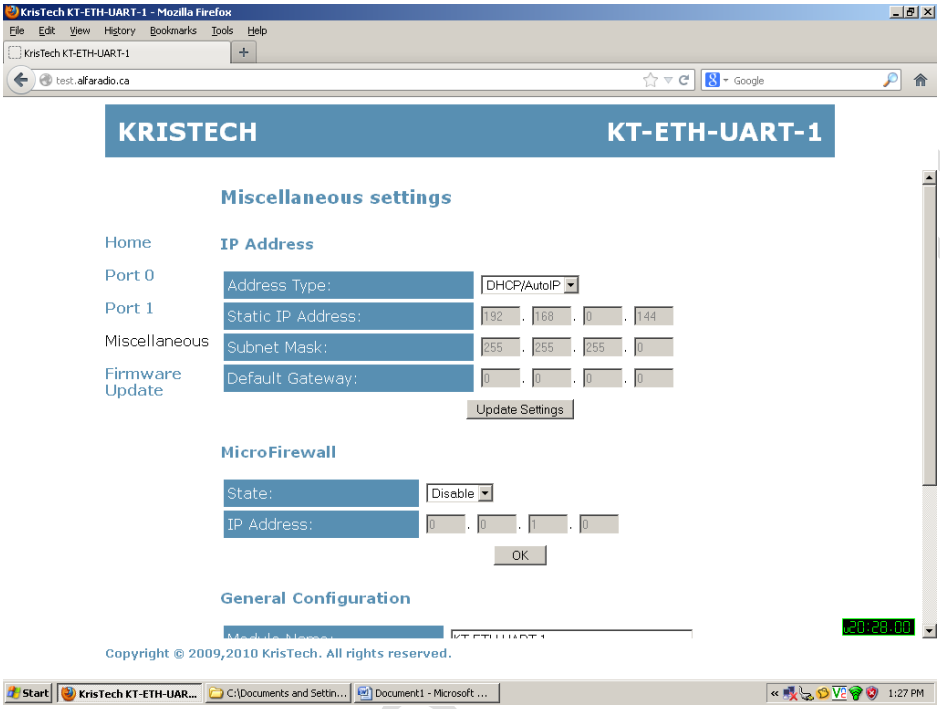
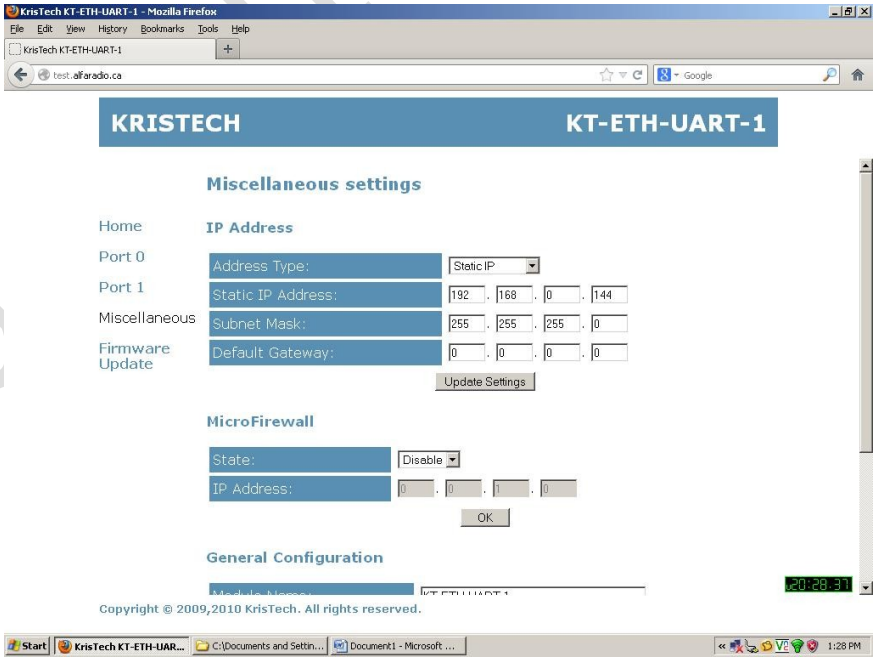
To configure the Ethernet controller for a static IP address, access the controller using a web browser as described above. Click on the "Miscellaneous" icon.



At the Address Type select "Static IP"



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Fill in the “Static IP Address” “Subnet Mask” and “Default Gateway” to match the network to which the controller will be connected. Click on the “Update Settings” button to save the new settings.

Reset the MD-01/02 controller by cycling the power **off** then **on**.

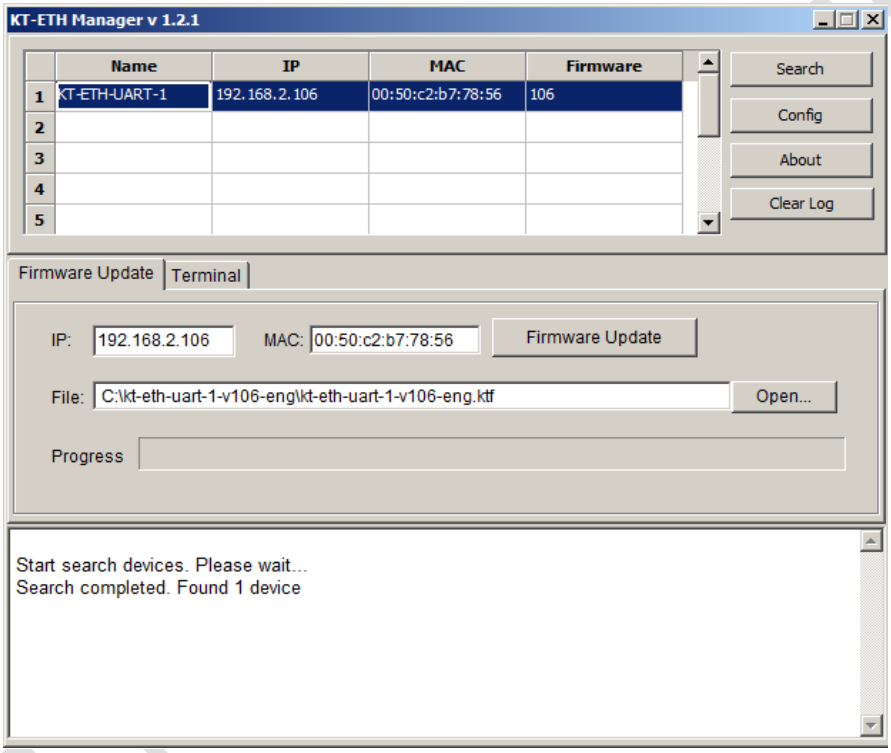
7.3 Ethernet Board Firmware Update

To update the firmware on the Ethernet Board, first download the Ethernet Manager program (KT-ETH-Manager-1.2.zip) from the Alfa Radio Ltd. website. Unzip the executable and install it on your windows computer.

Then download the latest firmware (kt-eth-uart-1-v106-eng.zip) from the Alfa Radio Ltd. website and unzip the file into a convenient directory.

Connect the controller and the Windows computer to an Ethernet LAN.

Start the ETH-Manager program:



Clicking on the “Search” Button will have the program search for the Controller Ethernet Board. When found, it will display the board’s IP address and MAC address. This feature is handy during Controller Setup.

Click on the “OPEN” button and find the copy of the firmware stored on your Computer.

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Highlight the Ethernet board; the IP and MAC addresses will show up next to the “Firmware Update” Button. Click on the “Firmware Update” button and the update will take place.

When the update is complete, cycle the power on the MD-01/02 controller and the new firmware should be active in the Ethernet Board.

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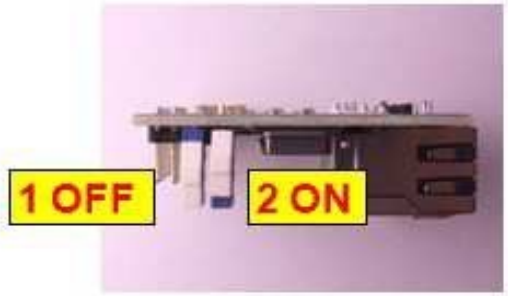
Different positions of the Ethernet Module:



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PIN1 OFF	web server is active
PIN1 ON	web server is offline
PIN2 OFF	mode according to user's network configuration
PIN2 ON	DHCP mode

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8 ORBIITRON Satellite Tracking Program

8.1 Using the MD-01/02 with the tracking program ORBITRON

The MD-01/02 rotator controller has a built in driver to connect with Orbitron track software. There are many satellites to track, as well the moon and sun, etc.

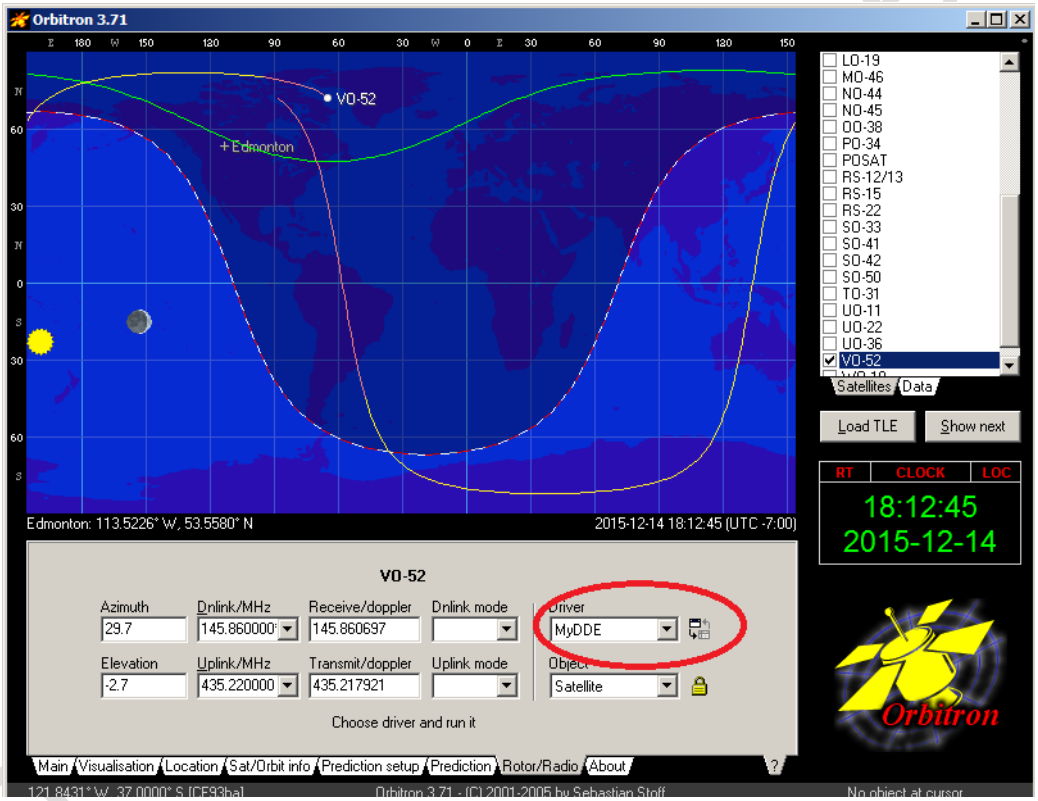
First download the Orbitron program and MyDDE driver from http://www.stoff.pl/ (links may be found on the Alfa Radio Ltd. website).

Install the program and place the driver in the same directory that the program is installed in. Go through the following steps:

#1 Open the MD-01/02 program and start the ORBITRON program.

#2 Go to the Rotator/Radio tab and select MyDDE from the Driver menu.

#3 Click the refresh button right of the text.



#4 A new screen (My DDE Client) will appear and display tracking data for the satellite selected in Orbitron. Click on “Exit”.

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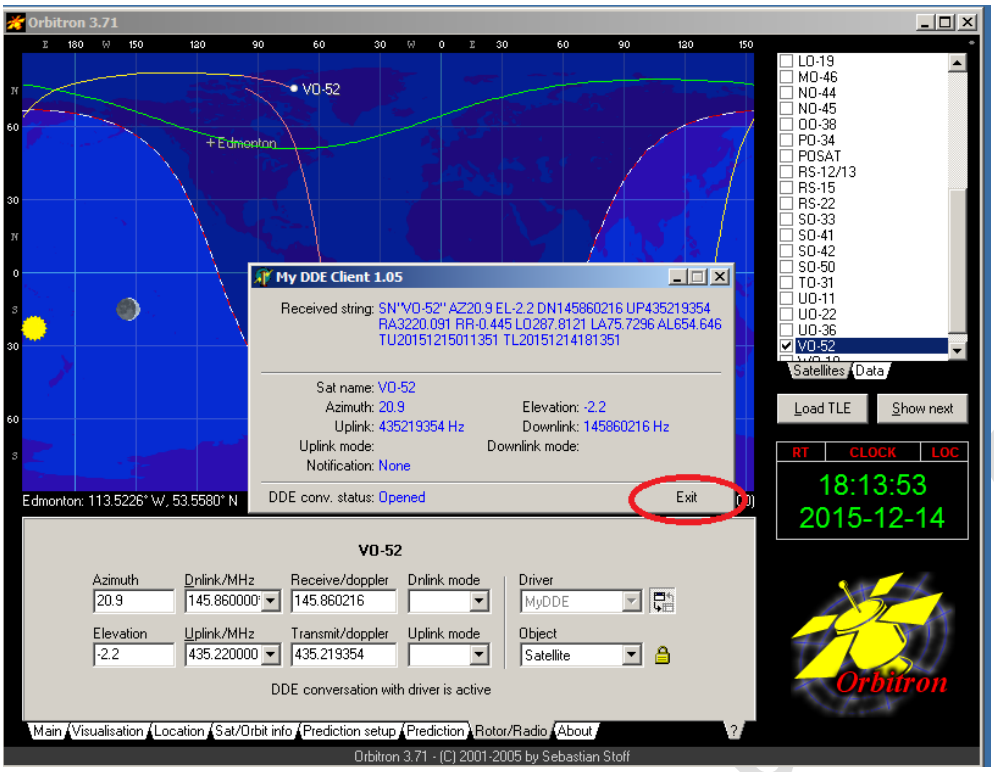
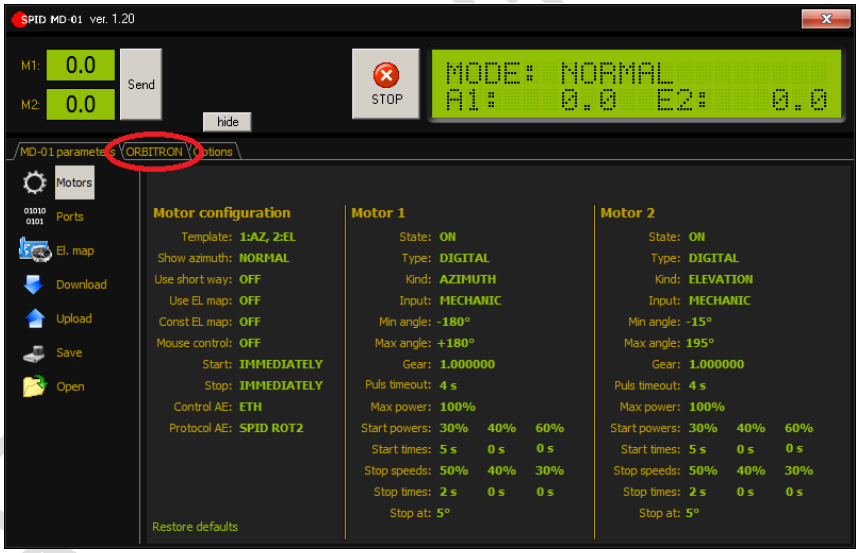


Now go back to the MD-01/02 program and select the ORBITRON tab in the MD-01/02 program.



Double click “DDE conv. status:” from closed to open.

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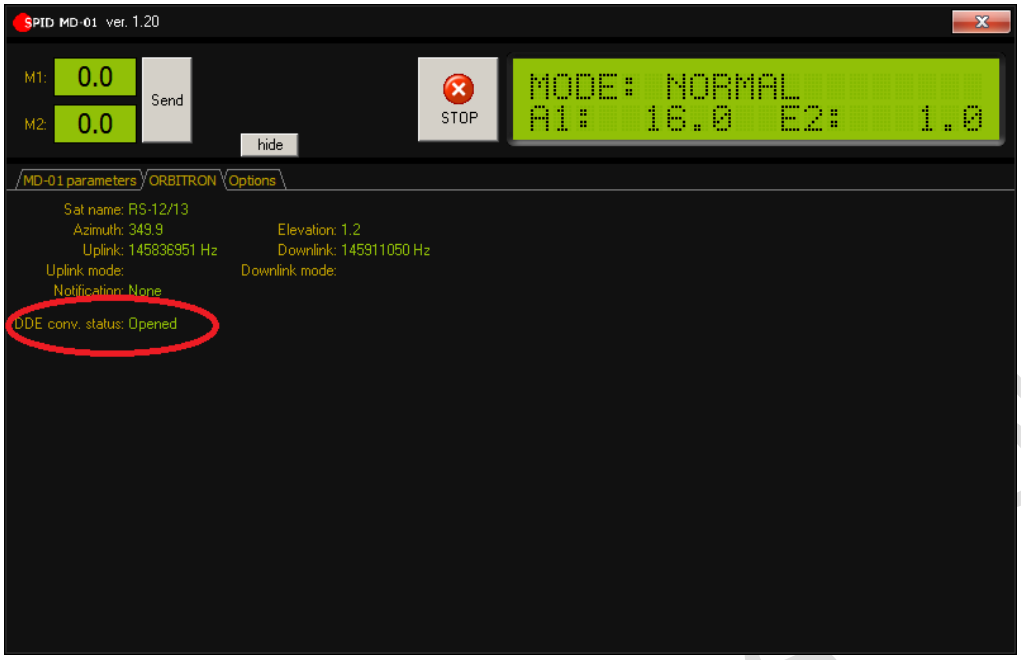

The parameters from Orbitron should now appear in the MD-01/02 screen (AZ & EL) and the rotator should start to move the correct position.

(Parameter AZ & EL must be a positive number.)

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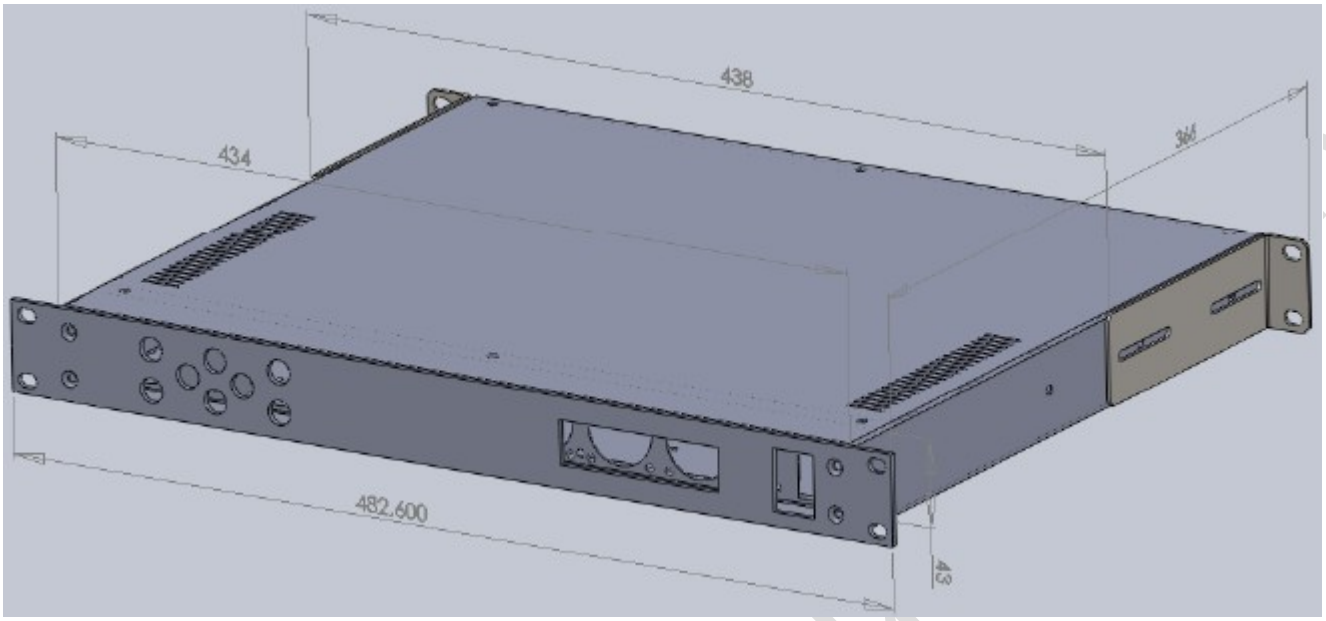
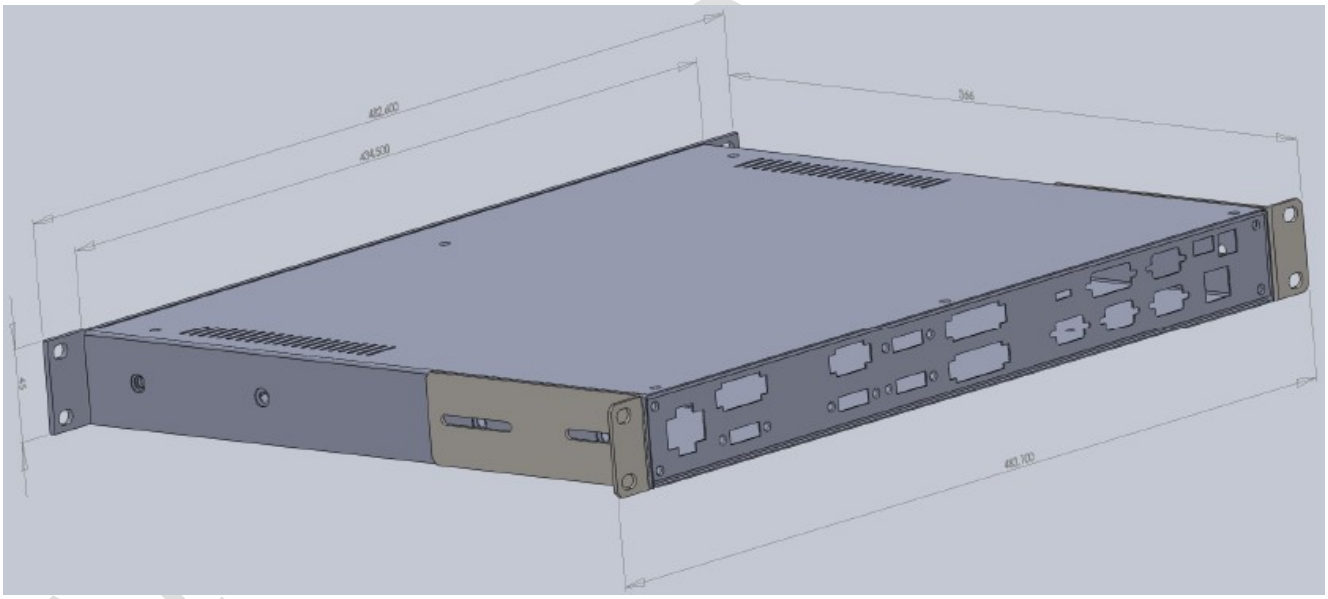
MD-01 Controller Dimensions:



Controller MD-01 Dimensions FRONT



Controller MD-01 Dimensions BACK

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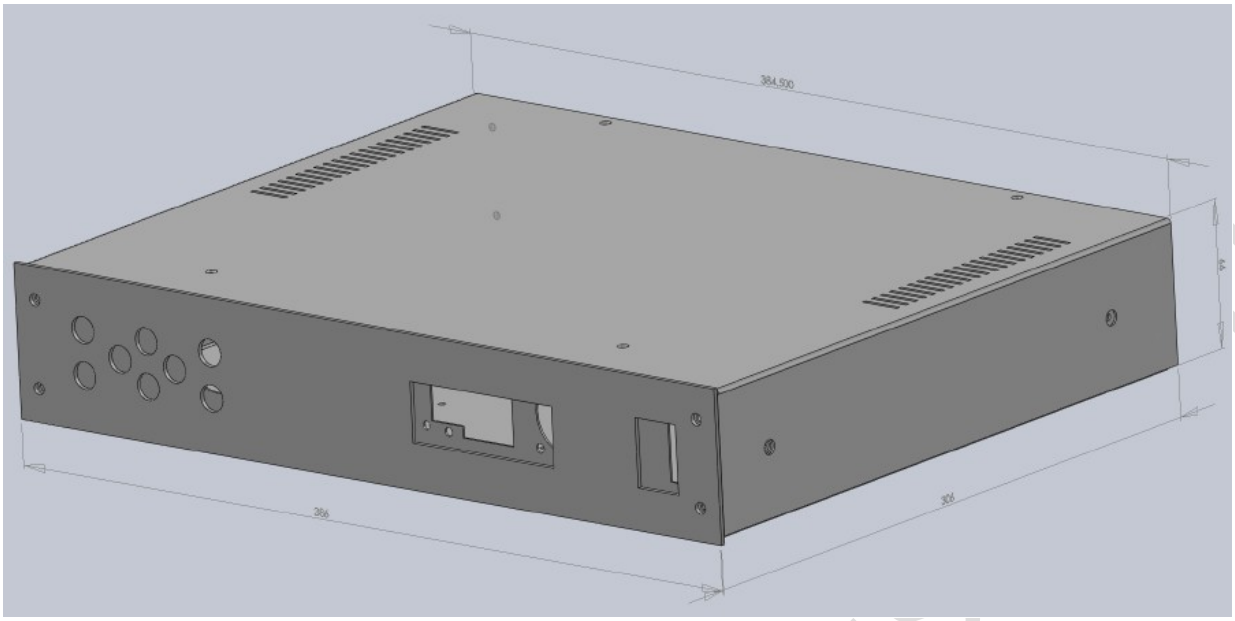
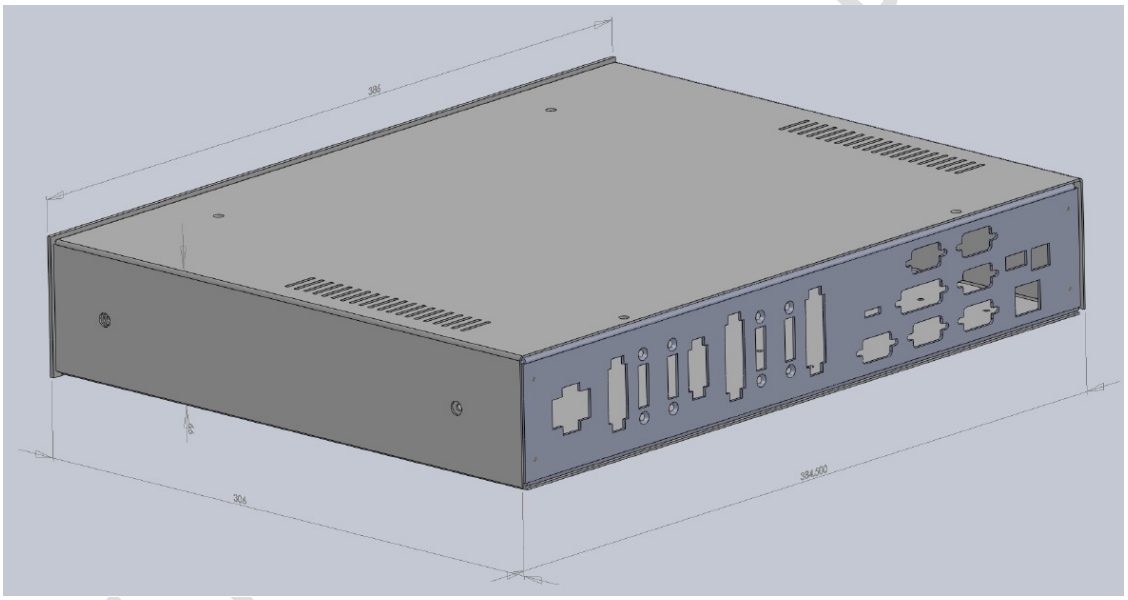
MD-02 Controller Dimensions:



Controller MD-02 Dimensions FRONT



Controller MD-02 Dimensions BACK

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12 MONTH LIMITED WARRANTY

AlfaSpid Rotators and controllers

Alfa Radio Ltd. warrants to original purchaser of the product, that the product will be free from defects in material and workmanship for the following periods after such date of purchase: Material - 12 months Workmanship - 12 months.

Alfa Radio Ltd. will, at its discretion, repair or replace free of charge such defective products subject to the following conditions:

1. Delivery of the product **prepaid** to **Alfa Radio Ltd.** or its authorized dealer.
2. Determination by the **Alfa Radio Ltd.** that a defect exists and is covered by the limited warranty.
3. Defects due to alteration, repair by an unauthorized person, misuse, accidental damage, lightning strikes, use of the equipment for purposes other than those for which it was designed, and the like, are NOT COVERED by this limited warranty. Repairs in these cases will be subject to normal service charges.
4. Damage to a Alfaspid rotator or controller caused by using said rotator or controller with a rotator or controller manufactured by any other manufacturer will NOT BE COVERED by this limited warranty.
5. Repairs and replacement parts are covered under this limited warranty only for the remaining term of the original limited warranty.
6. Under no circumstances is **Alfa Radio Ltd.** liable for consequential damages to person(s) or property by the use of this product.
7. **Alfa Radio Ltd.** reserves the right to make changes or improvements in design or manufacture without incurring any obligations to install such changes in any of the products previously manufactured.
8. All claims of defect or shortage should be sent prepaid to:

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and must be accompanied by a letter describing the problem in detail along with a copy of your proof-of-purchase.

Contact **Alfa Radio Ltd.** before sending.

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