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SPX-03
Azimuth & Elevation antenna rotator

High resolution controller MD-02

Standard controller Rot2Prog

Picture: SPX-03/HR

The SPX-03 Azimuth and Elevation Rotor is available in 2 versions:

1) Standard version: AZ & EL rotation, **Resolution 0.5 degree** (P/N: SPX-03)
2) High resolution version: AZ & EL rotation, **Resolution 0.2 degree** (P/N: SPX-03/HR)
   (SPX-03/HR = New model with improved waterproofing and pulse counter electronics !)

The SPX-03 is a **Heavy Duty** solution to Rotate in Azimuth and Elevation your Antenna, Dish antenna , Astronomy Tele scope, Camera, Light Box and many more which must be rotated in 2 axes.
This Rotor is supplied including a Heavy Duty Mounting Antenna Bracket !
Option: Counter Weight support arms, model CWA-05. (Supplied excl. Counter weights !)

Each rotor is supplied **including an controller**, Standard Model: **Rot2Prog**, High Resolution Model: **MD-01** or **MD-02** and all comes with an build in Track interface (USB), lot of tracking program available and easy to install on your Lap-Top or PC and connect the Controller through USB.
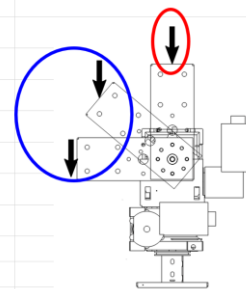You can now auto track Moon, Sun, stars, constellations, galaxies, planets, etc etc.
But if you prefer, you can operate manual by pressing the buttons on the front of the panel or supplied mouse (option MD-0X Controller). The degree readout is displayed on the front LED display in 0.1 degree steps /HR model and 0.5 degree Standard model.

SPX-03 Rotator is supplied including:

SPX-03 Standard version	SPX-03/HR Version *
Controller incl. build in track interface (USB) **Rot2Prog**	Controller incl. build in track interface (USB) **MD-01/02**
Connectors & USB Cable	Connectors IP-68
Heavy Duty mounting Antenna Bracket	Heavy Duty mounting Antenna Bracket
CD-Rom	CD-Rom
Waterproof IP-55	Waterproof IP-55
Quick start guide	Quick start guide
Control Mouse	Option: TCP/IP Module (Ethernet) + Mouse
* Controller /HR version MD-01 and MD-02 are Electric exactly equal, only the housing is different, Controller specification on page 2 !	

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Specifications: SPX-03 Azimuth and Elevation Rotator	
Turning torque	160 Nm
Brake Torque	600 Nm
Brake Construction	Double Worm Gear
Maximal Vertical Load = Red Circle	50 Kg = Red Circle Vertical load is max load on Azimuth & Elevation bearing
Maximal mounting weight bracket	14 Kg = Bleu Circle Mass weight 14Kg is without counterweight, if in perfect balance by using counter weight max 34Kg is allowed. (50Kg is Incl weight of counterweight !)
Rotation Speed	3.5 degree/sec @ 15 Volts DC
Resolution Standaard version	0.5 degree
Resolution /HR version	0.1875 degree
Rotation Range Az/El	360 / 180 deg
Weight Mass Kg	27 Kg
Position Sensor Standaard version	Reed Switch
Position Sensor /HR version	Hall Effect Sensors
Mast size Bottom mount	Depends on Accesories
Mast size Elevation mount	Depends on Accesories
Control cable core standard version	8 Core 1.5mm2 unscreened
Control cable core /HR version	4 Core 1.5mm2 unscreened & 6 Core 0.25mm2 Screened
Environment	Ground / Mobile free air and / or Sheltered
MTBF	12500 hours @ -20 to +55°C
Rotor Waterproof	IP-55

Specifications Supplied controller:

	Rot2Prog (desk-top model)	MD-01 (19" Rack mount model)	MD-02 (desk-top model)
Supply voltage:	12......18 Volts DC	12......18 Volts & 20...24 Volts DC	12......18 Volts & 20...24 Volts DC
Current consumption:	3 ...20 A (Max current depends on load)	3 ...20 A (Max current depends on load)	3 ...20 A (Max current depends on load)
Supplied including:	Digital controller, build in PC track interface, software, Connectors, mouse, USB cable	Digital controller, build in PC track interface, software, Connectors	Digital controller, build in PC track interface, software, Connectors
Dimensions:	(250x220x40mm)	(483x366x45mm)	(386x306x70mm)
Weight:	2 Kg	5 Kg	5 Kg
Housing:	Aluminium / steel	Aluminium / steel	Aluminium / steel
Environment:	Ground / Mobile Sheltered	Ground / Mobile Sheltered	Ground / Mobile Sheltered
MTBF:	15000 hours @ -5 to +40°C	15000 hours @ -5 to +40°C	15000 hours @ -5 to +40°C
Display:	2* 4 digit (green)	LCD 2*20 digit (green)	LCD 2*20 digit (green)
Connectors:	Supplied for Rotor connection	Supplied for Rotor and Sensors	Supplied for Rotor and Sensors

Note: Controller MD-01 and MD-02 are Electric exactly equal, only the housing is different !

RF HAMDESIGN & SPX Controllers will support the following software:

PST Rotor (Also /HR controllers MD-0X), MacDoppler (MacDoppler Ham Radio Satellite Tracking for Macintosh), N1MM Logger, Ham Radio Deluxe, Logic 7 Version => 7.0.45, Orbiton Satallite Tracking, Gpredict Satallite Tracking Linux and MAC, SatPC32   Satallite Tracking - works on windows only, DXLab (DX View), TRXmanager.
Please check in your favorite track software if SPID or the Rot2Prog protocol is supported.

Most software should also work if it supports Yaesu type rotators !
Note: #1 Software may have new versions and some options may have changed#2 We have not tested all this software !
#3 Most software is for use with Rot2Prog (Dual-Ax rotor AZ&EL), but some also work with the single Ax rotor system Rot1Prog
#4 Yaesu support is basic, only simple commants CW + CCW nd UP + Down, no special commands and possible no high resolution rotation support.

Short summary specifications MD-01 & MD-02 controller = SPX-03/HR

(MD-01 = 19" Rack mount / MD-02 = Desktop model housing)

The MD-0X rotor controller has a build in backlight Display which shows
Azimuth & Elevation real time at 0.1 degree resolution. This means the rotor
can also be used as a stand-alone configuration and the Azimuth & Elevation
engine can be moved using the arrow buttons at the front.
The menu cab be entered and changes can be made to all available functions.

Note: The MD-0X controller can handle 2 rotor systems, this means you can also drive 2
Azimuth or 2 Elevation rotators at the same time !

Build in the MD-0X rotor controller is also a track interface which will be connected through USB (Win
XP….Win 7, 8, 10) USB Driver is available and ready for download at our /HR support page. (/HR = High
Resolution)

Lots of new functions are available
now and can be configured by the
user through MD01dde.exe PC
interface:

MD-01 (UI) Interface (Picture right)
can be used to control the AZ & EL
rotor by Personal Computer.

One of the most used track
program Orbitron is integrated to
select easy.
(more info at the SPID /HR support
page)

More available functions MD-0X

(Standard controller excluded)

- ✓ Most used and special function is the integrated function: Soft Start and Soft Stop !
  Soft start and stop has available a 3 step Delay time and a 3 step acceleration time. Both Delay and
  acceleration can be set by the user step by step. This function is very helpful for large dishes
- ✓ Firmware update free of charge
- ✓ Short way function for Satellite track
- ✓ USB controlled
- ✓ Mouse option: control AZ and EL movement by a mouse connected to MD-02
- ✓ Minimum and maximum angle free adjustable for Azimuth and Elevation
- ✓ Write your own protocol and/or PC application (protocol available for download)
- ✓ Ethernet module option (ready to build in)
- ✓ Free of charge software update available at our High Resolution support page (need password to
  acces)
- ✓ Track software supported: Orbitron and PST rotor (more will be available)
- ✓ MD-01 Rotor Controller can emulate all Yaesu rotor drivers !

We recommend to use Power supply module PS-01 to drive the MD-01 controller + Rotor
And PS-02 Power supply to drive the MD-02 + Rotor

This Power module is a dual voltage output power supply which will be connected to the controller.

Short summary specifications Standard Controller Model: Rot2Prog

(Only available in Desktop model housing)

This standard controller (Rot2Porg) has a build in track interface (USB) and buttons on the front of the panel to control the Azimuth and Elevation rotation manual.
The supplied "mouse" is used to control the both axes also, the mouse is connected direct to the controller.

When an PC is connected (OS Widows) you are be able to control
the rotor through the supplied application or an Third-Party Applications and let run on auto track mode.

This rotor set works great for example mobile stations, this setup, Azimuth & Elevation Rotator
needs an external power supply of 12... 18V DC max ! (Max 20Amp)
If you need a suitable power supply, model PW32015 is available in our web-store.

Available functions Standard controller:

- ✓ Twin Green LED 2 * 4 digital readout.
- ✓ Integrated computer interface (USB)
- ✓ Manual or computer control.
- ✓ 0.5 degree resolution.
- ✓ Emulates Yaesu GS-232 protocol or uses its own SPID protocol.
- ✓ Modified 'mouse' supplied for easy manual control.

Specifications Controller Rot2Prog

Rot2Prog (desk-top model)	
Supply voltage:	12……18 Volts DC
Current consumption:	3 …20 A (Max current depends on load)
Supplied including:	Digital controller, build in PC track interface, software, Connectors, mouse, USB cable
Dimensions:	(250x220x40mm)
Weight:	2 Kg
Housing:	Aluminium / steel
Environment:	Ground / Mobile Sheltered
MTBF:	15000 hours @ -5 to +40°C
Display:	2* 4 digit (green)
Connectors:	Supplied for Rotor connection

Available accessories SPX-03

SPX Accessories	Refer Price List	Model
SPX-03 Mast Pole Mount Base. Max pole diameter 55mm Weight: 3.6 Kg	PLATE-50	
Counter weight Arms SPX-03	CWA-05	
Motor Control Cable 4-core (4x1,5mm2) Reel: 25, 50, 75, 100 meter length (Use for SPX-03/HR)	CC4-001/25	
Sensor Control Cable (6x0.25mm2) Reel: 25, 50, 75, 100 meter length (Use for SPX-03/HR)	CC6-004/25	
Motor Control cable 8-core (8x1,5mm2) Reel: 25, 50, 75, 100 meter length (Use for SPX-03 Standard rotor)	CC8-001/25	
Power Supply Unit 13,5 – 18 Volts / 20 A Dim: 23 x 11 x 5,5 cm (LxBxH) (Use for SPX-03 Standard rotor)	PW-32015	
SPID MOUSE Control AZ & EL rotation by mouse direct connected to MD0X	SPID MOUSE	
Power Supply PS-01, 19" Rack mount housing Dual Voltage 15Volt / 10A and a 22Volt / 22A (Same dimensions as MD-02 controller) (Use for SPX-03/HR rotor)	PS-01	
Power Supply PS-02, Desktop housing Dual Voltage 15Volt / 10A and a 22Volt / 22A (Same dimensions as MD-02 controller) (Use for SPX-03/HR rotor)	PS-02	
MD-0X Ethernet Module TCP/IP Control rotor system through internet (Use for SPX-03/HR rotor)	SPID-ET	

Note: Actual Prices can be found in our price list, download link at our web-site: www.rfhamdesign.com

SPX-03 Azimuth & Elevation antenna rotator
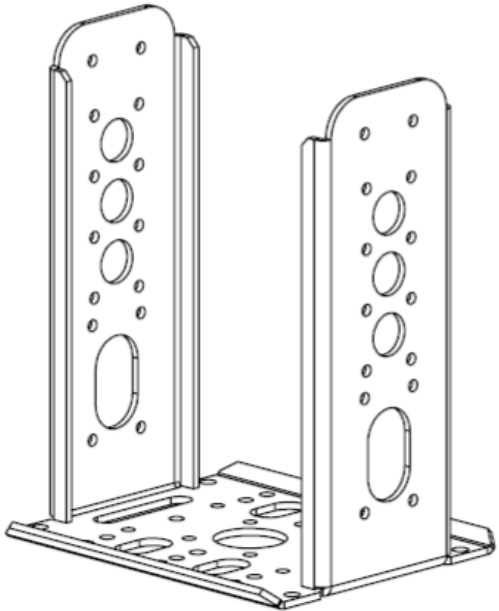
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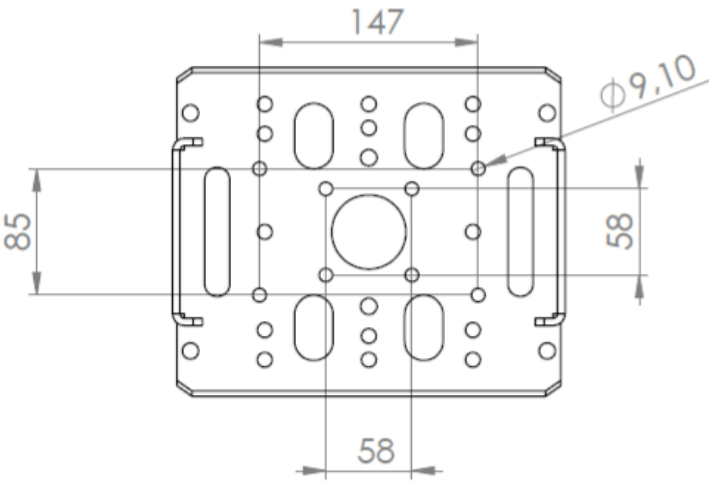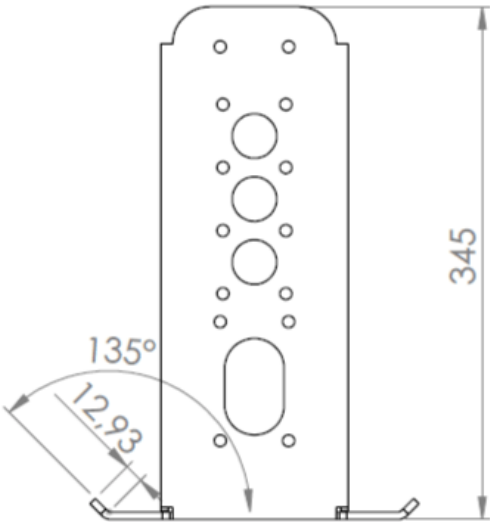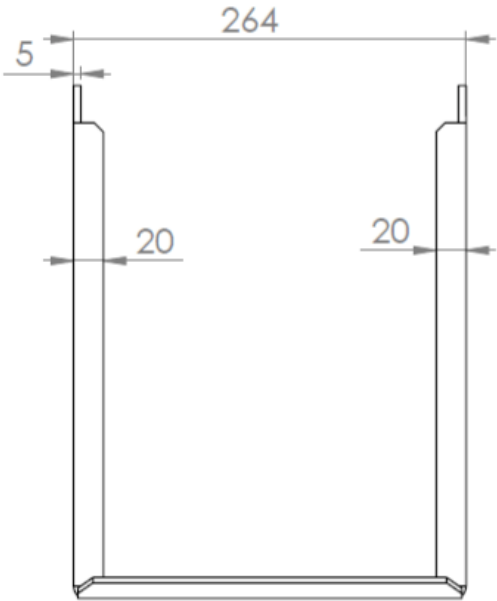
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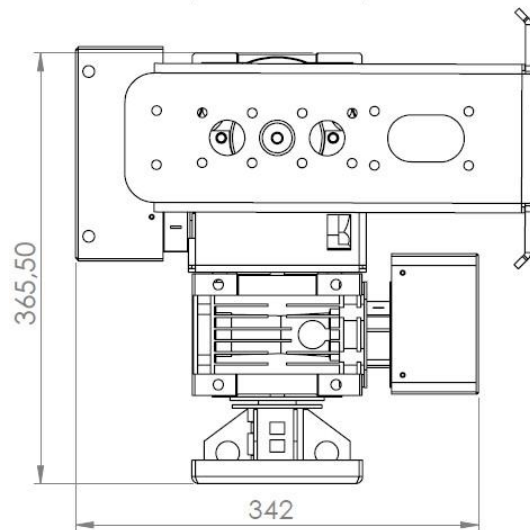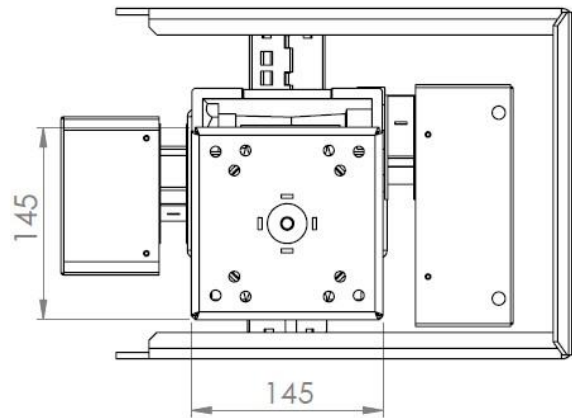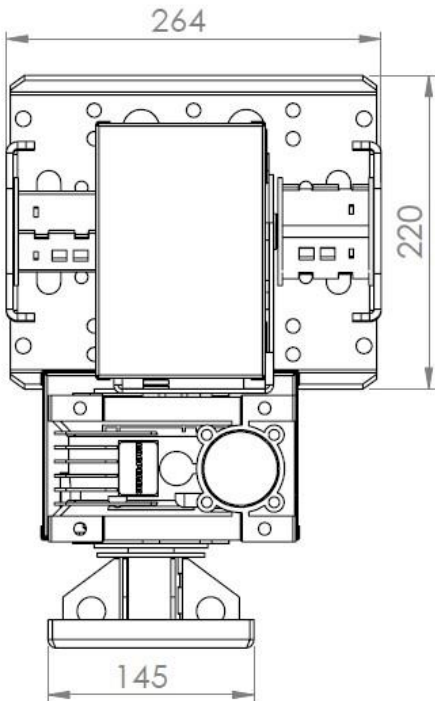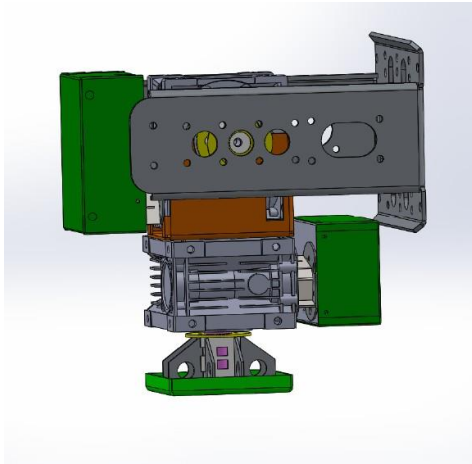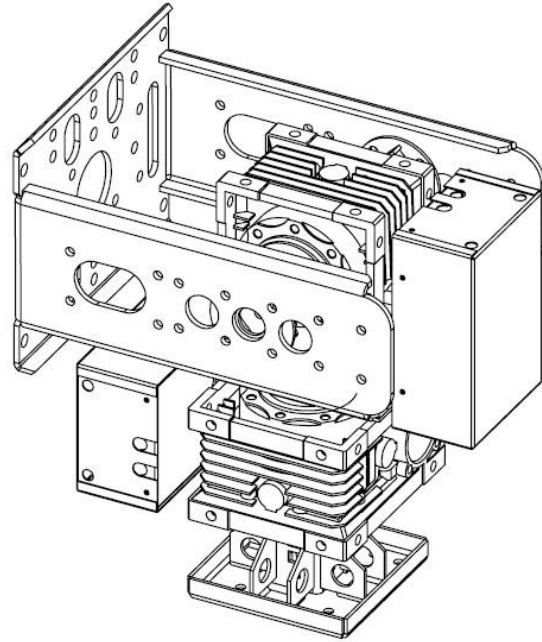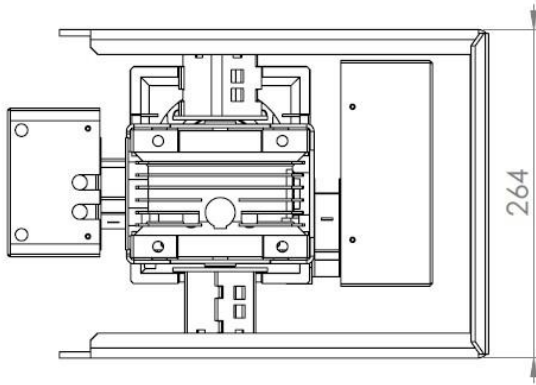
SPX-03
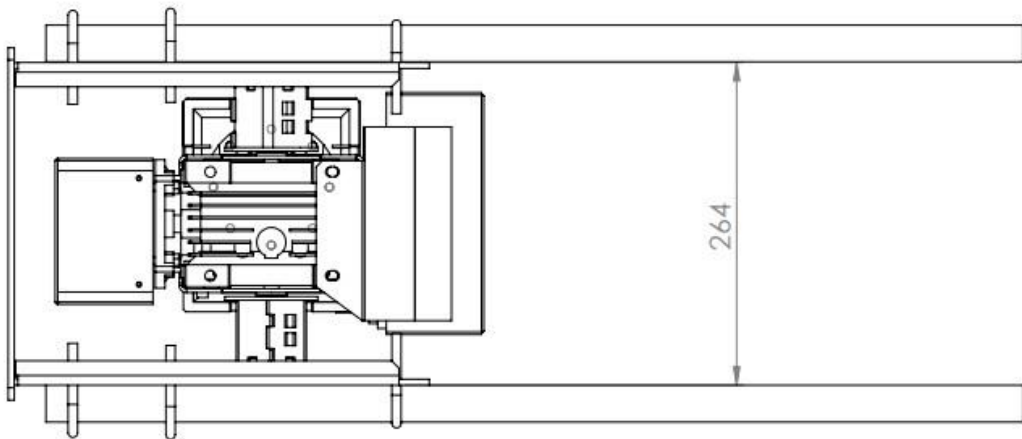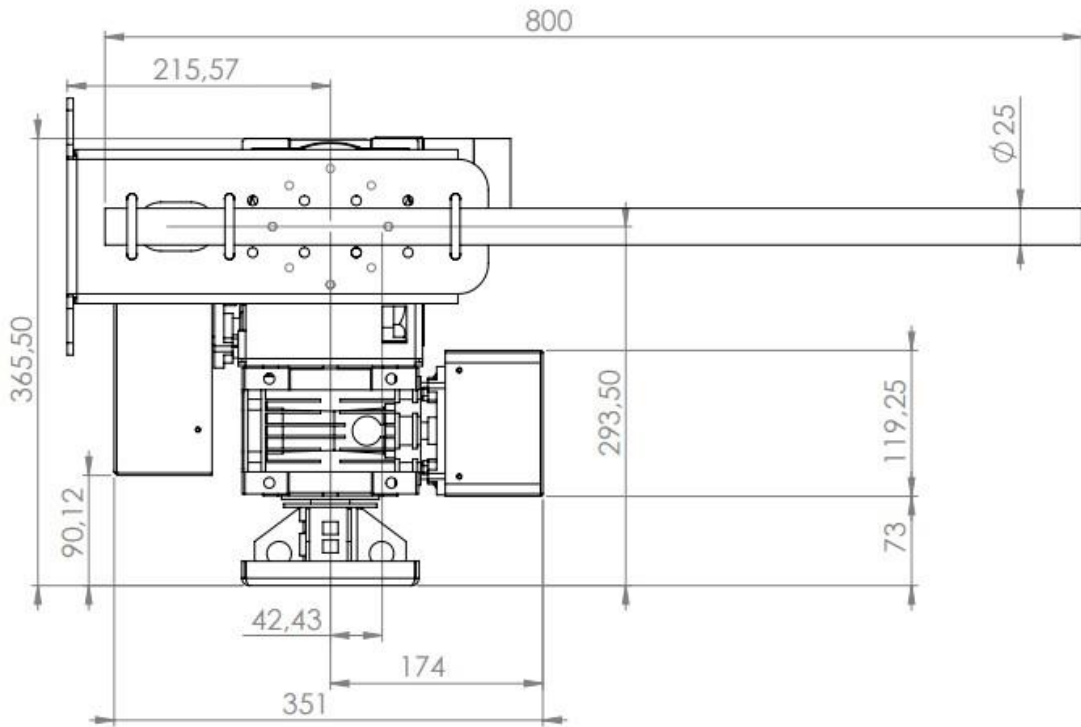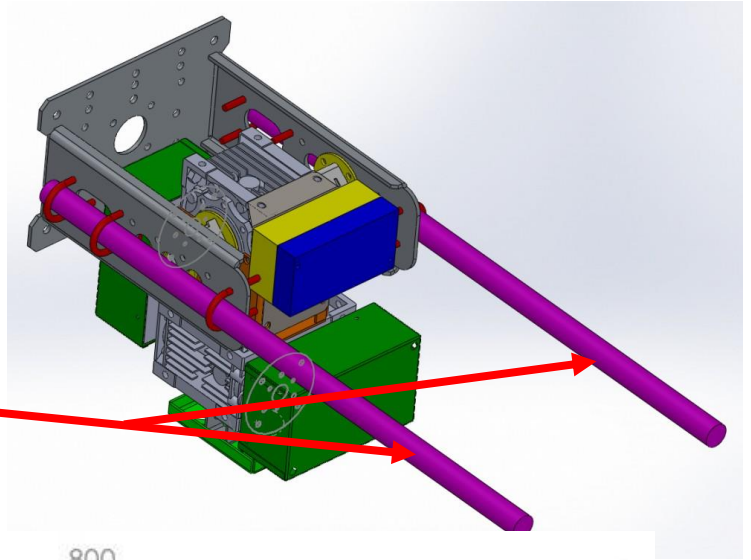Dimensions in mm

SPX-03 Supplied Bottom Plate Dimensions in mm
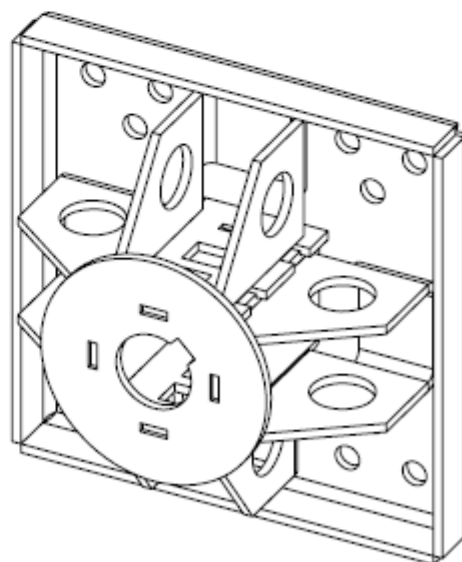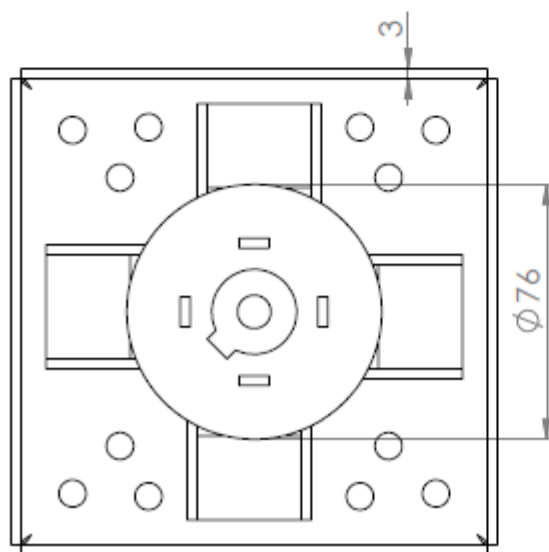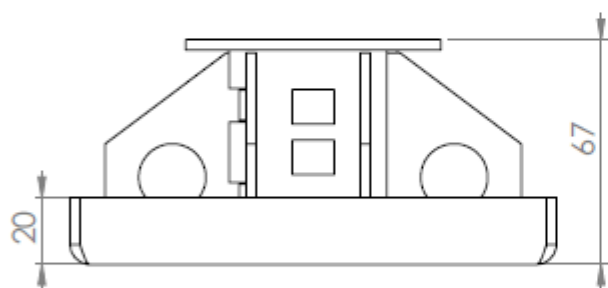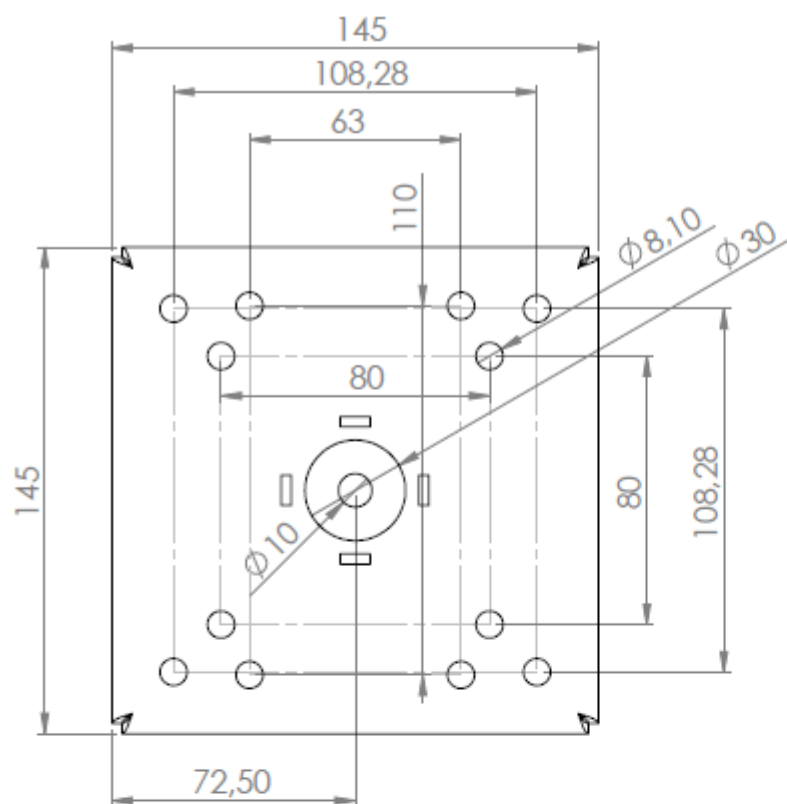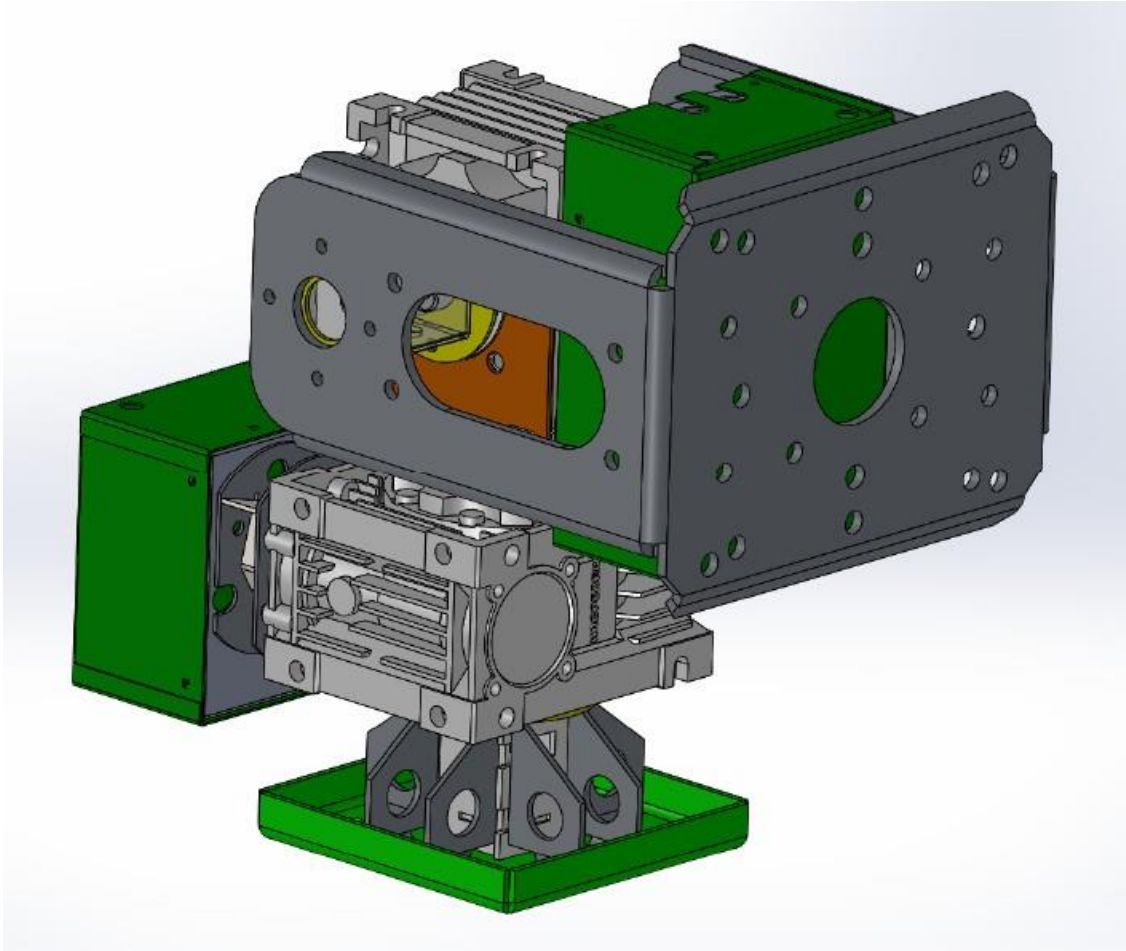
SPX-03 Supplied Mounting Bracket Dimensions

SPX-03
Counter weight arms: CWA-05

CWA-05 is optional and should be ordered
separate. (1* CWA-05 = 2* Arms)

SPX-03 Standard Supplied + Controller options

Available Controller Options:

|	
Standard Controller Model: Rot2Prog (0.5 degree system)	
High Resolution Controller Model: MD-01 (0.2 degree system)	
High Resolution Controller Model: MD-02 (0.2 degree system)	

Optional Power Supply Module, PS-01 & PS-02

Model: PS-02

This Module, PS-0X is a Dual Voltage PSU which should be connected to MD-0X High Resolution rotor system **SPX-03/HR**

Standard build in is an professional 15Volt / 10A and a 22Volt / 22A Power Supply unit.
The Power supply units PS-01 / PS-02 do have the same dimensions as MD-01 / MD-02 Controllers.
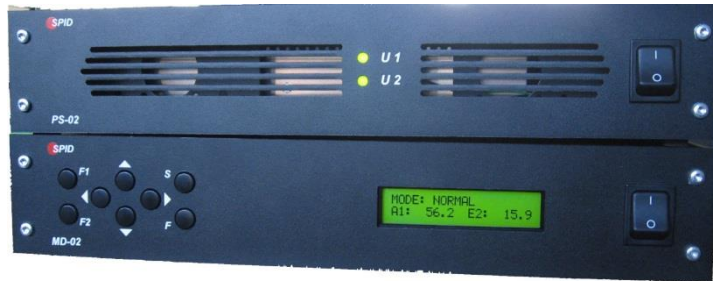

Model: PS-02 and MD-02

Specifications: PS-01 / PS-02 power supply		
Model:	**PS-01 (19" Rack mount)**	**PS-02 (Desktop model)**
AC input	50/60Hz – 100-240VAC	50/60Hz – 100-240VAC
Dimensions	(483x366x45mm)	(386x306x70mm)
Weight lbs / Mass Kg	6 Kg	6 Kg
Environment	Ground / Mobile free air and / or Sheltered	Ground / Mobile free air and / or Sheltered
MTBF	32000 hours @ -20 to +55°C	32000 hours @ -20 to +55°C
Supplied with:	Connectors and mains cable	Connectors and mains cable

Note: Actual Prices can be found in our price list, download link at our web-site: www.rfhamdesign.com

Optional Mast Pole mounting Bracket
P/N: PLATE-07/STR

PLATE-07/STR is used to place SPX-03 and SPX-03/HR on a vertical pole
Supplied incl mounting hardware

- Max Vertical pole size: 61mm
- Weight 2.5Kg
- Material: Lasered Steel / Painted Black
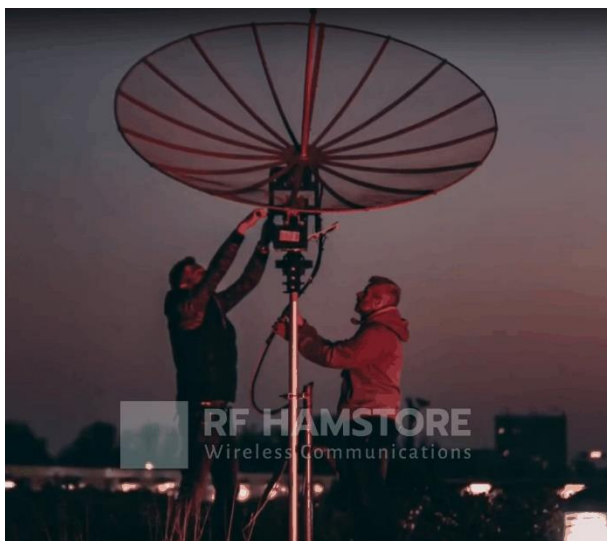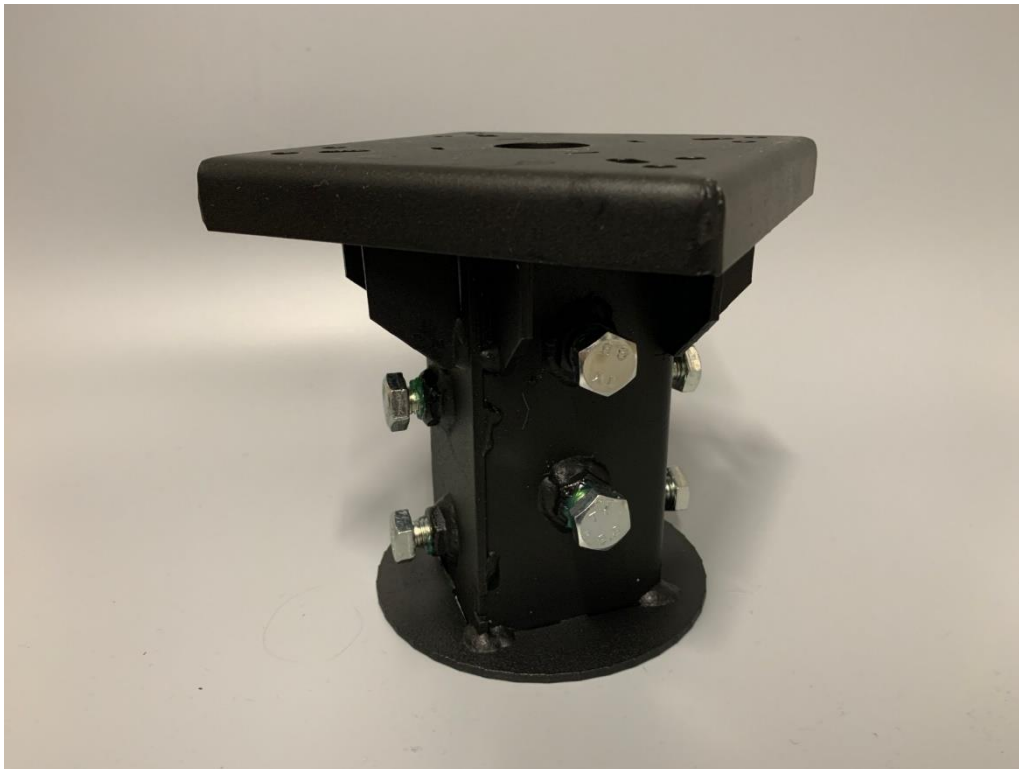
Optional BASE Plate mounting Bracket
P/N: STR-00

This Bracket can be used to mount your antenna installation direct on the concrete or an heavy duty concrete slab by use of screws.
Max vertical pole length which can be placed depends on mounting antenna or object.

For example, 1 or 1.2 Meter dish, Max pole height 1.8Meter, Drawing example can be found on this page.

- Vertical Pole diameter mount: from 32 to max 75mm

- Weight: 5.6 Kg

- Supplied incl mounting clamp vertical pole (3 x)

- Supplied incl mounting hardware but without mounting screws concrete !

- Material: laser cutted, steel, painted black