

# **Installation Guide**

**for**

## **Hiltron Motorized Antenna Mount HMAM**

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## 1 Overview

The Hiltron motorized satellite antenna mount HMAM is designed for two-way VSAT communication or receive-only downlink applications. The combined head and drive form a three-axis motorized system with 180 degrees of azimuth adjustment, 90 degrees of elevation adjustment range and fully adjustable polarization. The HMAM comes complete with a flexible support plate allowing the attachment of all kinds of reflectors with a diameter between 1.2M to 3.4M whereas a mast mount with an outer diameter of 6 5/8 (+168 mm) should be used.

Prior to installation, verify that the installation site with the supporting structure and the mast mount have been installed correctly

## 2 Unpacking and Inspection

The HMAM should be unpacked and inspected at the earliest date to ensure that all the material has been received in good condition.

Verify if all necessary parts are delivered completely. As reference a complete packing list will be supplied.

Any damage to materials while in transit should be immediately directed to the frigt carrier. He will instruct you on the matters regarding any fright damage claims.

Any questions regarding missing or damaged material that is not due to freight carrier should be directed to

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### 3 Contents of Package

- 1 HMAM - Azimuth and Elevation Drive Assembly (fully integrated)
- 1 HMAM - Polarization Drive Assembly
- 1 Installation Guide (HMAM\_Install\_A.doc)
- 1 MANUAL for Monitoring & Control Antenna Control Unit HACU  
(Manual\_HMAM\_en\_A.doc)

In case there is additional material (rods, brackets, screws etc.) packed in the box this is belonging to the delivery of the antenna.

### 4 Tools Required

- Open-end Wrench (set: 10 – 24 mm)
- Allen Key (set 10 – 17 mm)
- Ratchet
- Sockets: 9/16", 3/4", 15/16"
- Wrenches, combination: 9/16", 3/4", 15/16"
- Wire stripper
- Slotted and Phillips screw drivers
- Terminal/lug crimpers
- Cable/wire cutters
- Tie wraps

Further suggested tools:

- Magnetic Compass
- Inclinator

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## 5 System / Interfaces

The Hiltron Motorized Antenna Mount HMAM is delivered in two pre-integrated units:

- The integrated mechanical and electrical azimuth and elevation drive assembly and
- the polarization drive assembly

The figure 5-1 show the side view of HMAM AZ/EL drive assembly with the interfaces to the 2.4 m antenna dish mounting and the pedestal mount. In figure 5-2 the polarization drive assembly is depicted.

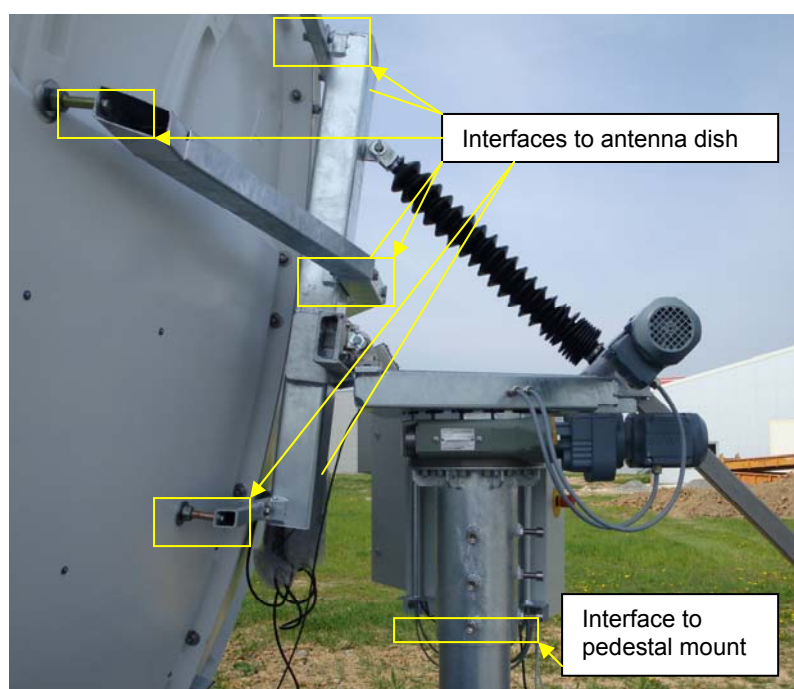


Figure 5-1: HMAM - AZ/EL drive assembly

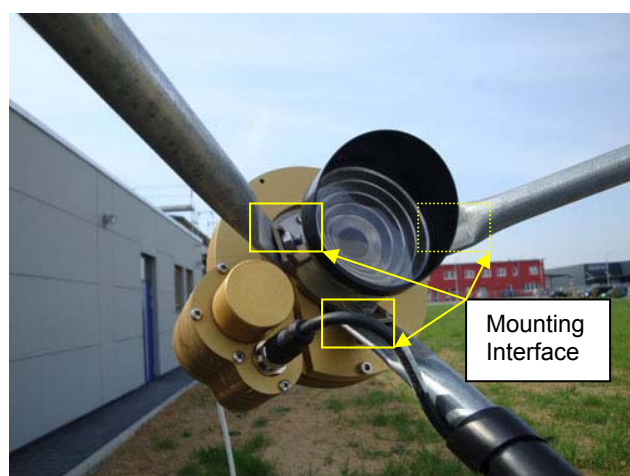


Figure 5-2: Polarization drive assembly.

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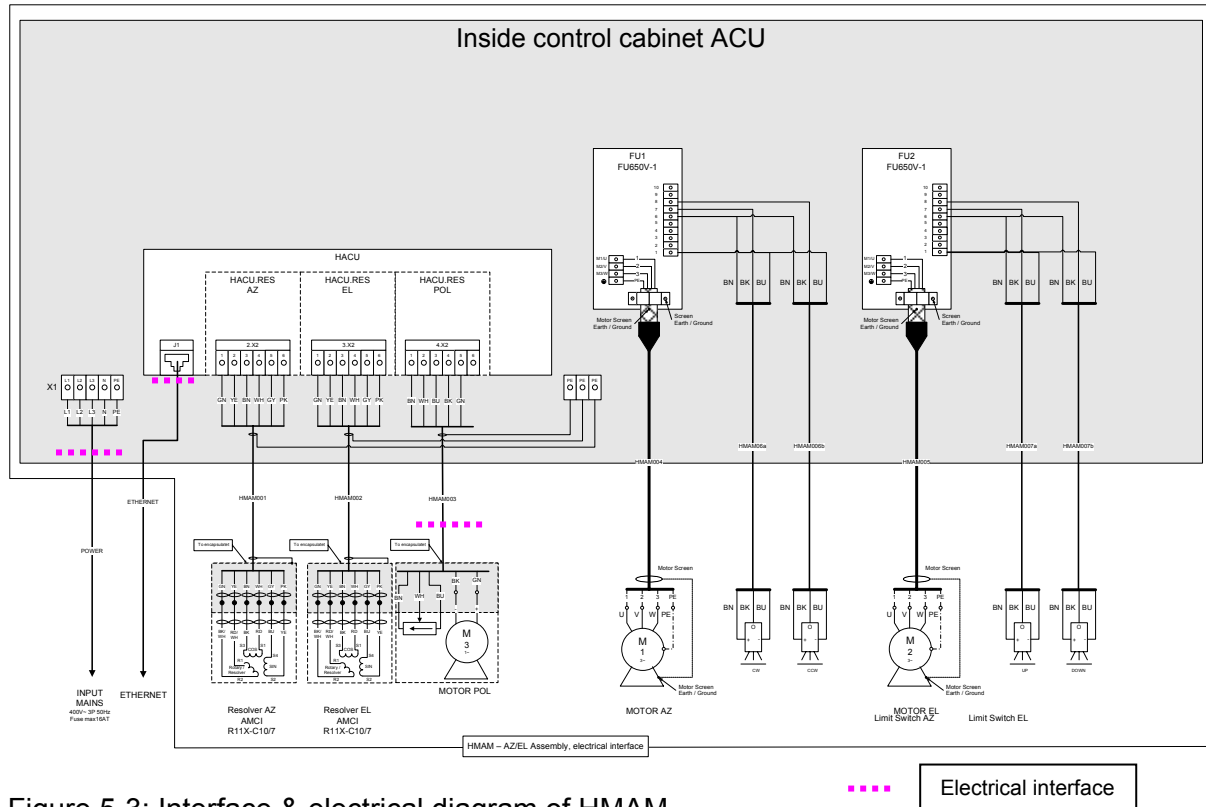


Figure 5-3: Interface &amp; electrical diagram of HMAM

The HMAM is completely electrical integrated, tested and concerning parameter setting configured.

There are only 3 electrical interfaces (see Figure 5-3) to be maintained:

- Terminals X1 – Mains Power Supply (3 phases 400VAC or 1 phase 240VAC)
- J1 – LAN connection RJ45
- J2 – Connector to Polarization drive assembly

## 6 Mechanical & Electrical Installation

The HMAM allows the attachment of all kinds of reflectors with a diameter between 1.2M to 3.4M. The support is preferably adapted by Hiltron to the relevant type of antenna and its reflector.

By default the design is selected for a 2.4m Ku-Band antenna System (e.g. Prodelin Serie 1251-997).

The antenna mount should

- be suitable for the antenna to be integrated.
- should have a outer diameter 6 5/8" (~168 mm)

to fit the HMAM rotating pedestal mount.

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The installation has to be carried out in 6 (7) steps:

1. Mechanical Installation of mast mount
2. Mechanical Installation of HMAM (Azimuth and Elevation Drive Assembly)
3. Electrical Installation of HMAM
4. Set elevation position 20-30°
5. Installation of antenna dish and feed support
6. Installation of Polarization Drive Assembly
7. Final Testing and Calibration

## 6.1 Step1: Installation of Mast Mount

As an example a "Non Penetrating Mast Mount" for a 2.4 m Antenna (NPMM for Antenna 1251 Footprint B) has been selected with a out diameter of 6 5/8".

The installation of the mast mount should be performed according the guidelines of the Installation Manual 4096-747.

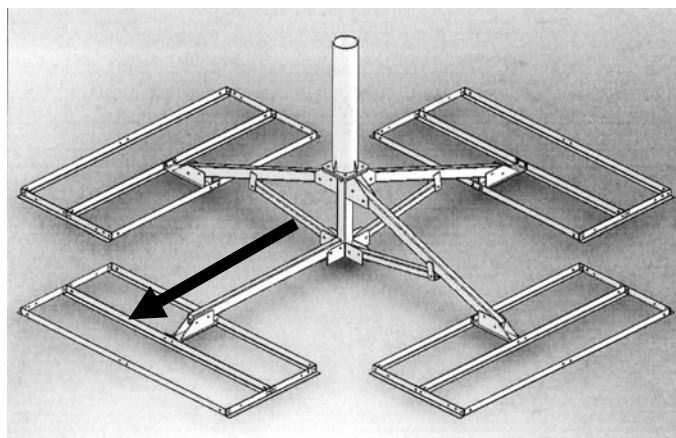


Figure 6-1: NPMM for 2.4 m Antenna

Deploy an position the mount according the supplier's instruction.

"Mount should be positioned such that the "drop leg" is aimed in the same direction as the azimuth heading of the antenna. It will allow clearance for the reflector a low lock angles."

## 6.2 Step 2: Mechanical Installation of the HMAM

Fix the Azimuth and Elevation Drive Assembly to the adapter plate of the mast mount.

(See Figure 6-2: )

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Figure 6-2 Integration HMAM or mast mount

The whole assembly should be arranged such that the antenna dish (mounted in a later stage) is pointing to the south ( $180^\circ$ ) and fix the screws.

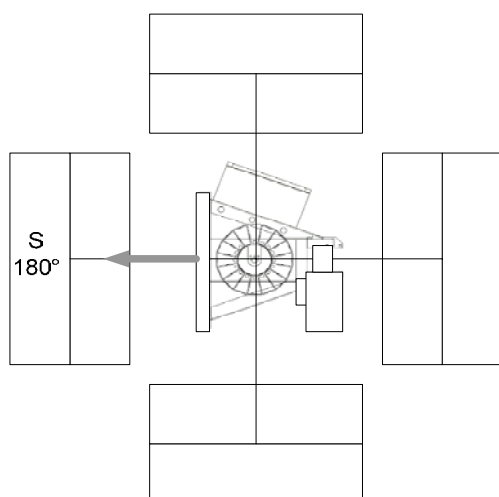


Figure 6-3: Arrangement of HMAM



### 6.3 Step 3: Electrical Installation of HMAM

Please follow the instructions for the electrical installation described in chapter 7

### 6.4 Step 4: Set elevation position $\sim 20^\circ$

The HMAM is delivered when packed in elevation position  $\sim 80^\circ$  (max. protected elevation jack screw and lowest size). The HMAM has to be put into operation to move the elevation position to  $20 - 30^\circ$  to get easier access for mounting the antenna support and the dish. Please follow the instructions for the commissioning described in chapter 8

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## 6.5 Step 5: Installation of antenna dish & feed support

a) Mount crossbar on HMAM main bracket



Figure 6-4: Mounting the crossbar

b) Install first half of antenna dish on the provided attachment points

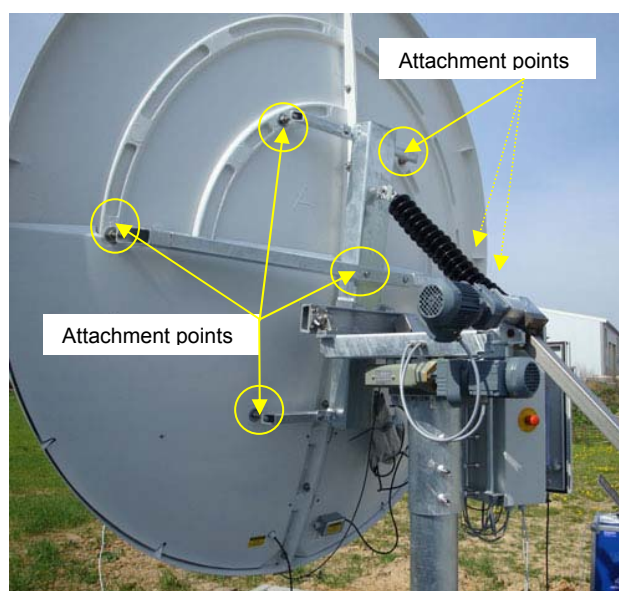


Figure 6-5/6: Mounting the antenna dish

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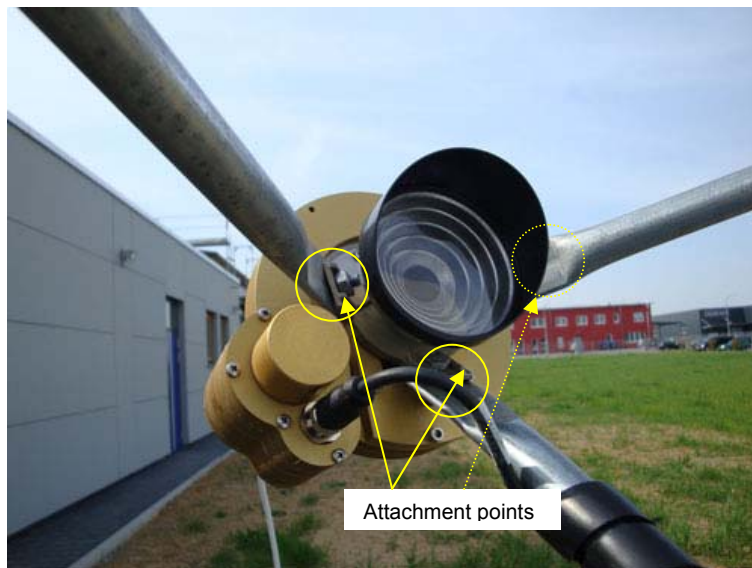
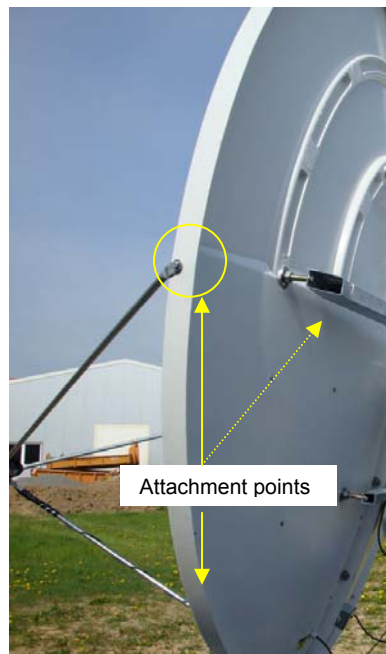


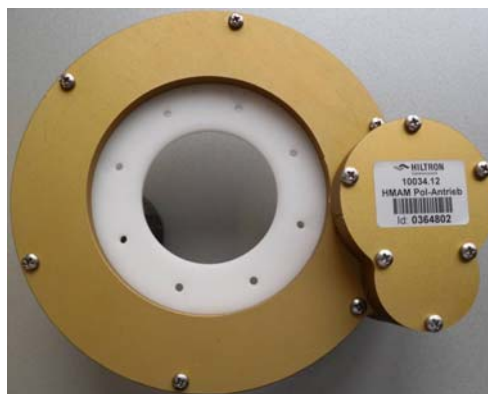
Figure 6-7/8: Mounting the feed

## 6.6 Step 6: Installation of Polarization Drive Assembly

In Figure 6-9/10 the polarization drive without feed is depicted.



Front side



Rear side

Figure 6-9/10: Polarization drive

The drive is assembled with the feed consisting of feed horn and OMT to the polarization drive assembly shown in figure 6-11/12.

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Rear side



Front side

Figure 6-11/12: Polarization drive assembly

Please mount the polarization drive assembly to the provided rods of the feed support and connect the drive interface cable.



Figure 6-13: Mounted polarization drive assembly

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## 7 Electrical Installation (Steps)

### 7.1 Grounding

For the HAMAM there is no external separate grounding point. On safety reasons the protective ground (see figure 17-1) has to be connected to the PE provided by the customer.

It is recommended to ground the mast of the antenna via ground wire and clamp. The mast clamp must have a good electrical connection to the mast pole. However, each customer applies it own grounding and lightning protection concept to fulfill the general and national regulations.

### 7.2 Power and Network Connection

For the power connection an flexible electric cable is required. Taking into account the total cable length and that a circuit breaker (16 Amp) on the power distributor is protecting the HMAM the correct cable type with the wire cross-section has to be selected accordingly.

Root the electric cable through the provided feed-through (PG\_M25 on rear bottom area of cabinet) and attach the wires to the terminals. By default a 3 phase power connection is provided. If only one phase is available, please use L1 and put bridges (see separate package in outdoor cabinet) from L1 to L2 and to L3.

Root the network cable through the dedicated feed through (PG\_M25 on front bottom area of cabinet) and connect this to the LAN connector (J1) on the antenna control.

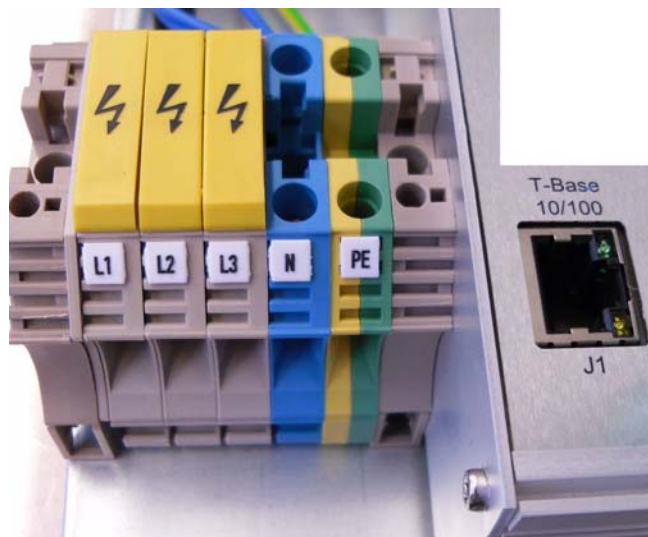


Figure 7 -1: Power and network interface in HMAM Antenna Control Cabinet

After the installation of power and network cables the antenna control is ready to operate and can be powered by switching on the circuit breakers (see F1 ...F5).

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## 8 Setting into Operation

### 8.1 Setting the IP Address

In order to use the Web interface, the following prerequisites for a computer must be met:

- A standard web browser (e.g. Internet Explorer version 6 or higher) installed.
- Java Runtime Engine (JRE version 1.5 or higher) installed (can be downloaded from [www.java.com](http://www.java.com))

The antenna control unit has the default IP address setting of

IP address	192.168.33.188
Subnet Mask	255.255.255.0
Default Gateway	192.168.33.2

To configure the required IP address following procedure is proposed:

- Connect a computer via a crossover cable to the LAN connector J1 of the Antenna Control Unit .
- Configure the computer to the same network segment e.g. with following addresses  
IP-address 192.168.33.100  
Subnet Mask 255.255.255.0
- Set in Web browser the default IP address "192.168.33.188" and open the web interface of the antenna control.

The figure below shows the top view of the opened web interface

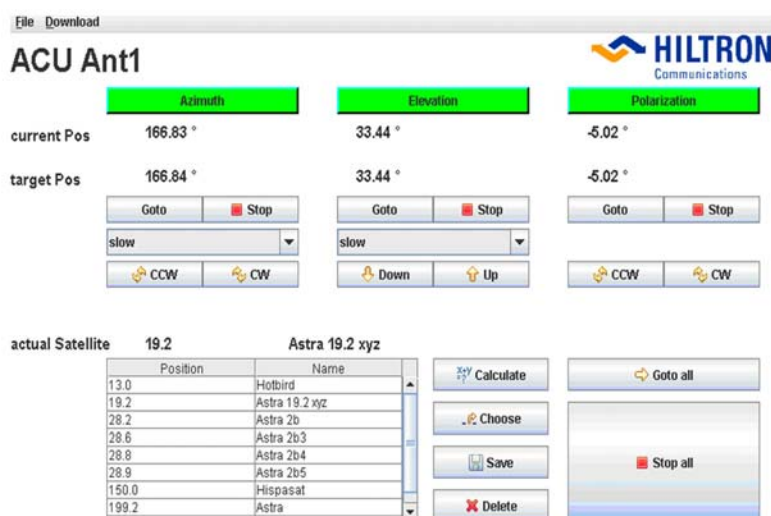


Figure 8-1: Web interface of the Antenna Control Unit

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On the top the Web diagram you will find the menu line with the main menu items “File” and “Download”

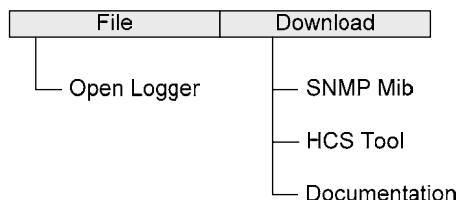


Figure 8-2: Menu items “File” and “Download”

Select on the menu item Download the item “HCS Tool” and load down the Hiltron controller IP configuration program “HCS Tool”.

With the start of the HCS tool program it is looking for all equipment accessible in the network and lists it with name and IP address.

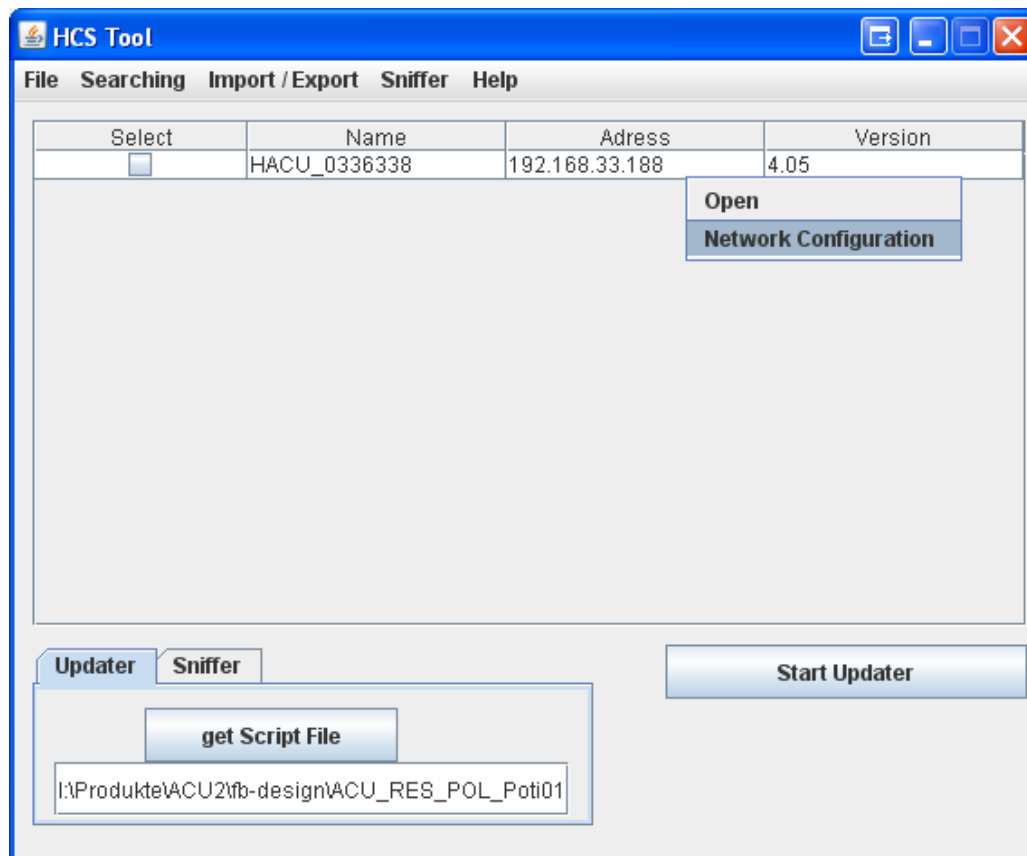


Figure 8-3: HCS Tool - control interface

With an on the right click on the corresponding device the network configuration can be opened.

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Figure 8-4: Equipment addressing

Set the new IP, Network Mask and Gateway address and confirm with the button **Config**.

## 8.2 Functionality Check and Adjustment of Axis Control

The ACU setting is pre-adjusted to the default setting for control parameters. However, a final adjustment at least a check of the setting parameters is necessary. Therefore a **form** has been prepared to summarize and record all settings to document it as a final check of the functionalities. The list can be found on the end of the installation document (Annex 1)

### 8.2.1 Check and Adjustment of Elevation Angle

Eventually it can happen that the calibrated angle value is changed or in the worst case lost during the transport or antenna integration. Therefore please check the angle with an inclinometer and compare the result with the indicated value out of the Web-interface.

In case there is a discrepancy please apply the procedure described in the document "Manual\_HMAM\_en\_A.doc: MANUAL for Monitoring & Control Antenna Control Unit HACU"

- Click on button "Elevation" and
- select the tab "Properties"
- select the item "Calibrate Angle"
- set the correct value

For a fine adjustment apply the same procedure when

- the geodetic latitude and the geodetic longitude is entered in the system (§ 6.1.9 of Manual\_HMAM\_en\_A.doc)
- the antenna is pointed to a known satellite and the position is optimized.

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## 8.2.2 Check and Adjustment of Elevation Limit Switches

The limit switches will be active when the metal plate is positioned above the sensors. This is the condition for normal operation with elevation angles within the allowed range.

A limit alarm will be generated when the alarm contact is open (e.g. not connected sensor, broken line or a limit alarm when the sensor is not covered by the metal plate).

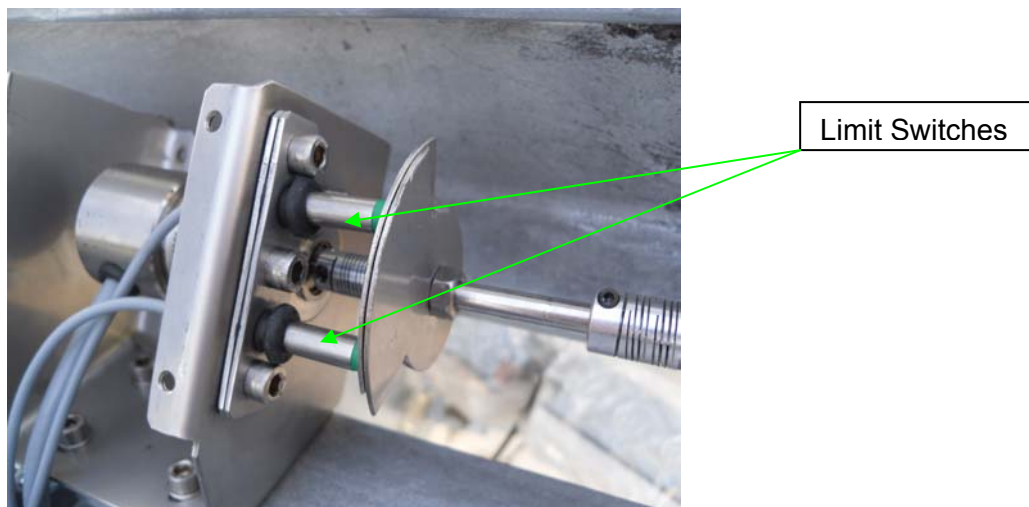


Figure 8-5: Elevation limit switches (both active)

In case the allowed Elevation angle range should be changed following steps become necessary:

- Open the housing for the Elevation resolver & limit switches
- Move the elevation of the antenna dish into the critical limit area you want to readjusted.
- Open the nut on one side of the metal plates carefully that these can be shifted slightly.

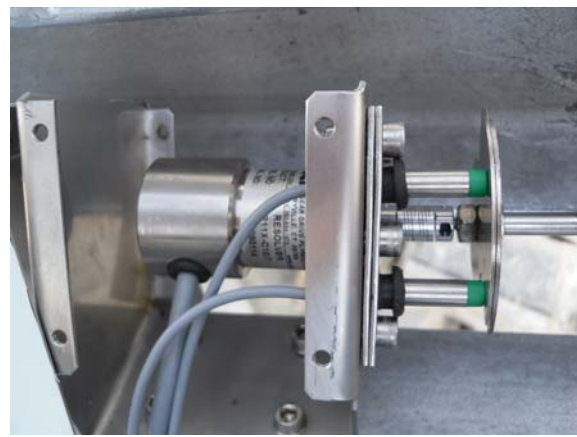


Figure 8-6/7: Elevation limit switches adjustment

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- Turn the relevant metal plate in or from the direction to its dedicated limit switch.
- Fix the nut again which was opened before.
- Enter the new limit value into the form (see Annex 1)
- Close the housing for the Elevation resolver & limit switches

### 8.2.3 Check and Adjustment of Azimuth Angle

Point the antenna with the help of a compass into the south (180 °) and compare the result with the indicated value out of the Web-interface. The offset between the actual and the indicated value can be corrected applying the procedure described in the document "Manual\_HMAM\_en\_A.doc: MANUAL for Monitoring & Control Antenna Control Unit HACU"

- Click on button "Azimuth" and
- select the tab "Properties"
- select the item "Calibrate Angle"
- set the correct value

For a fine adjustment apply the same procedure when

- the geodetic latitude and the geodetic longitude is entered in the system (§ 6.1.9 of Manual\_HMAM\_en\_A.doc)
- the antenna is pointed to a known satellite and the position is optimized.

### 8.2.4 Check and Adjustment of Azimuth Limit Switches

The limit switches will be active when the metal plate is positioned above the sensors. This is the condition for normal operation with elevation angles within the allowed range.

A limit alarm will be generated when the alarm contact is open (e.g. not connected sensor, broken line or a limit alarm when the sensor is not covered by the metal plate).



Figure 8-8: Location of Azimuth limit switches

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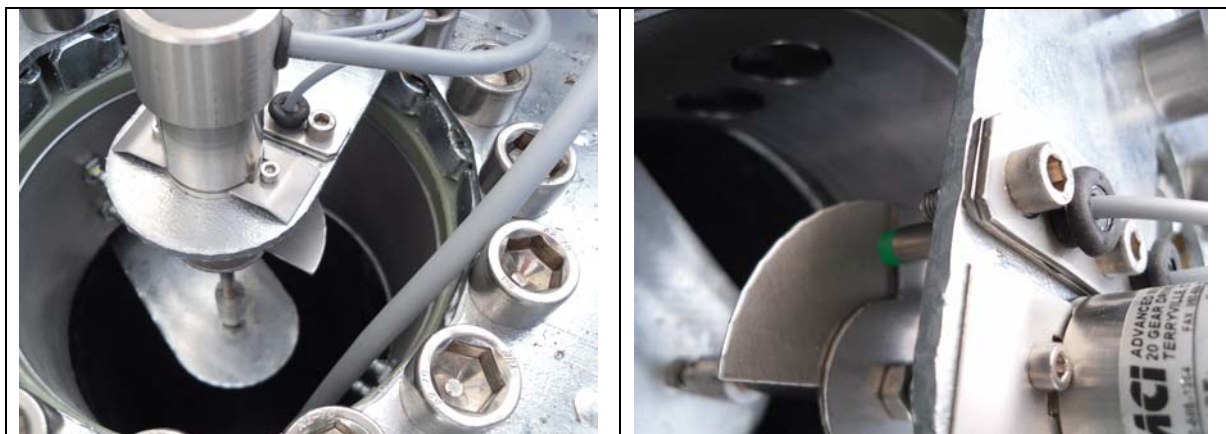


Figure 8-9/10: Calibration of Azimuth limit switches

In case the allowed Azimuth angle range should be changed following steps become necessary:

- Open the housing for the Azimuth resolver & limit switches
- Move the elevation of the antenna dish into the critical limit area you want to readjusted.
- Open the nut on one side of the metal plates carefully that these can be shifted slightly.
- Turn the relevant metal plate in or from the direction to its dedicated limit switch.
- Fix the nut again which was opened before.
- Enter the new limit value into the form (see Annex 1)
- Close the housing for the Azimuth resolver & limit switches

### 8.2.5 Adjustment of Polarization Angle

The angle value is pre-calibrated and cannot be changed manually. For fine adjustment please apply the procedure described in the document "Manual\_HMAM\_en\_A.doc: MANUAL for Monitoring & Control Antenna Control Unit HACU"

### 8.2.6 Polarization Limit Switches

The limit switches are integrated in the housing and are calibrated. Therefore it is not necessary to set these values. The setting is documented in the form (s. Annex 1)

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## Annex 1: Setting Protocol

Function	Specification	Results	Changes on Side
Hardware Limits range of the antenna			
<ul style="list-style-type: none"> <li>• Azimuth</li> <li>• Elevation</li> <li>• Polarization</li> </ul>	119.33 to 250.7 1.75 to 67.2 -49.9 to 65.77		
Software Limits range of the antenna			
<ul style="list-style-type: none"> <li>• Azimuth</li> <li>• Elevation</li> <li>• Polarization</li> </ul>	125 to 240 2 to 65 -45 to 60		
Test manual positioning			
<ul style="list-style-type: none"> <li>• Antenna up, slow/fast</li> <li>• Antenna down, slow/fast</li> <li>• Antenna left, slow/fast</li> <li>• Antenna right, slow/fast</li> <li>• Polarization left, slow/fast</li> <li>• Polarization right, slow/fast</li> </ul>	o.k.? o.k.? o.k.? o.k.? o.k.? o.k.?		
Positioning by angles			
<ul style="list-style-type: none"> <li>• Azimuth</li> <li>• Elevation</li> <li>• Polarization</li> </ul>	o.k.? o.k.? o.k.?		
Antenna Emergency Stop	Checked?		
no Alarm , error messages	Checked?		
Limit switches			
<ul style="list-style-type: none"> <li>• Azimuth CW/ CCW</li> <li>• Elevation DOWN/ UP</li> <li>• Polarization CW/ CCW</li> </ul>	Checked? Checked? Checked?		

## Annex 2: HMAM – Electrical Block Diagram

