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BI-AXIAL-ANTENNA-POSITIONING-SYSTEM
PROFITRACKER CL

CONTENT: base version | extensions/options | system description | specifications | price list | news
IMAGES: gear parts and options || MORE IMAGES AND INFO

- exceptionally simple and fast installation, but highly accurate alignment due to separate motors for elevation and horizontal rotation (azimuth), plus a high-speed positioning computer
- completely equipped: the system consists of an external unit (rotor) and an internal control unit (operating panel with power supply)
- depending on the maximum dish diameter 2.5 m
- no additionally parts between mast top and reflector needed for antenna diameters up to 1.2 m. For exceeding diameters we recommend an individual solution or our special antenna mount
- stylish appearance due to distinctive industrial design
- high operational convenience by pre-programming all geostanionary satellites all around the world up to date. Rotor-Equipment useable from packing-out immediately in all parts of the world, no matter if you are south or north of the equator
- comprehensive information readout during the programming process and every-day operation provided by a 40-symbol alpha-numerical display
- all satellites are identified by name and position
- suitable for the future with 400 satellite memories, allowing the user to individually enter, alter or erase data as desired
- all programming and adjustment operations can be remote-controlled from the location of the receiver set and the control unit! No alignerent-works out at the rotor
- sophisticated electronics allow optimum and most accurate adaptation to any existing system (please refer to detailed program list on Page 6)
- all data and all settings stored in the memories are protected against accidental erase in case of power failure by a long-life backup battery
- important data and settings accessible only after entering a password
- auto-focus, auto-tracking and super-search makes live much easier. Don't forget all the other helping functions (see advanced program listing)
- particularly suitable for using several LNBs (C, Ka, Ku, L, S band and Yagi antennas). The focal point of each feed can be memorized individually!

"HAM" radio application with parabolic and yagi antennas

It is the smallest indeed (shown straight right), however, a fully professional one too – the EGIS rotor in duty at "EUTELSAT" in Paris/France

EGIS rotors at the USA-Antarctic-Program with Yagi antennas for ATS-3 satellite (also used for commanding & telemetry VHF on GOES-3) 149 MHz & 137 MHz and LES-9 satellite 302 MHz & 249 MHz.
All of the above antennas are used in support of the "United States Antarctic Program". The 'Malabar Satellite Operations Center' of the University of Miami provides communications to various research stations on the antarctic continent, including the 'Geographic South Pole station', and 'Palmer station' in the antarctic.
Mostly EGIS rotors are used for antenna tracking.

The EGIS-Rotor in use by the Foreign Secretary of the German Government in Bonn

EGIS rotors in a ground station at the "U.S. Air Force Academy" in Colorado Springs, USA. Use: Mission Control.

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a. BASE VERSION

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optional extension possibility
– control unit inside 19" rack:

This basic version is suitable for geostationary satellites, **inclining ones***** too.

- with 40 degrees elevation span
- with 180 degrees azimuth turn angle
- with control unit
- with **400** memories, **345** of them preset with actually satellites
- with time-saving logic: in some positioning phases both motors are running simultaneously!
- with receiver interface* (**image G**), to connect and remote control the sat-tuner and motor drive, with **pre-settable** take-over speed (1 to 99 pulses/sec.), via four wires only (motor = 5 to 60 V – pulse = max. 50 V, 100 mA) – the 4-wire control cable to the receiver is delivery included
- with simultaneous signal shift-over when both motors are active together!
- with analog input (**AGC**) for signal-strength dependent positioning optimization** – the operational range of the **AGC** signal can be matched to the resp. sat-receiver as well in amplitude/ramp as well as in zero point value – (max. 12 V – Signal-Δ min. 0.1 V pos. & neg.)
- for the optimization of performance in private or commercial areas at fixed sat-positions
- for geostationary, but also local inclining satellites

The search and tracking behaviour **(AUTO-FOCUS/AUTO-TRACKING)** can be influenced motor-sparing by selecting the max. allowed deviation, the timing settings of next search cycle, by determining the search amplitudes, and by determining the search algorithm. Field-strength informations are gained out of the sat-tuners AGC output, (but all other linear systems will do), resulting **C**, **Ka**, **Ku**, **L** and **S** band systems can be used. The analogous signals measured are converted into one 8-bit word (0 – 255). The input clock rate/resolution is about **250 Hz**! The relative field-strength is shown in the control units display continuously. Long time before the person watching TV remarks any quality loss in the picture, the field-strength optimization is performed automatically, quickly and with highest precision. The AGC cable to the sat receiver are included.

The motors are switched by SSR (solid state relay).

REMARK: All sat-receivers internally need this AGC signal. That's why it can be made accessible for the rotor's control unit with only minor electronically efforts at the type of receiver, that do not have such signal output. EGIS is offering modification wiring diagrams for a couple of sat-receiver models.

Of course you may search satellites manually with such a system in a perfect way: have a look onto the display and watch AZ- and EL-angles – right-left – upwards-downwards. You may think "more simple is impossible". But you are wrong! Most perfect with – **"SUPER-SEARCH"**: Preset the aperture angle for your antenna (factory preset is the minimum value = 0.1°). Now choose, **during installation**, any satellite as usual. Due to mechanical montage errors you will miss the satellite – more or less. Now **SUPER-SEARCH** gets in action. Beginning from the calculated AZ- and EL-angles, the rotor now will concentrically search the sky in increasing circles, corresponding to the opening angle of your antenna. You may find satellites, under circumstances, not being selected. Hence by this key the search-movements can be stopped and started again as well. If you have got the right one, you may start the auto-focussing or optimize manually.

Summary of functions:

- with 400 satellite memories! Pre-programmed with all geostationary satellites around the globe!
- it can be pre-determined for any single satellite, whether "Autofocus" is performed after selection automatically or, e. g. at inclining satellites, permanent "Auto-Tracking" runs or only one single positioning is done
- with hardware-extension, clock incl. calendar and astronomical sun-tracking-program to prevent the risk of LNB-burnout or LNB-melting, when the formation "sun-satellite-parabolic-antenna in one line" appears. This system permanently compares the actual sun position with the AZ- and EL-angles of the target satellite. If any danger of damaging the LNB by direct centric sun-radiation exists, the system generates an alarm. The user can pre-program, how many minutes before this event a notification should be given out, whether the position is left for a short period of time after a pre-programmed time or whether the transmission is kept continuously and the position is retained. That is a must for any uplink station.
- the wind-sensor-interface is provided to connect a pulse-output wind-anemometer with the 4-wire-interface. After setting "pulse per unit of time" of the wind-sensor and after reaching the wind-speed trigger preset by the user, the unit turns into a more streamlining position also preset by the user (but only within the rotor's range of motion). The delay-time in this position can be preset, too.
- including solid state relay (SSR)
- no contact-burnout, due to mechanically contactless switching
- less noise due to absence of switching or cutoff sparks
- smooth, silent control unit, because no parts are moving
- cultivated two-speed-operation, because semiconductors are switched on and off in high frequency
- more precisely, because different speeds can be driven with solid state switches

- improved tracking behaviour, because the positions can be targeted more precisely by "stopping" and "starting" with reduced speed
- operates complete automatically, resumes operation automatically after power failure

In this version the motors are soft-powered upwards in two steps and slow down in two steps. By this dampened acceleration of masses motor, gear and bearing are less stressed and less abrasion wear occurs. Accuracy and lifetime are kept for a longer time.
"True" **soft-start and soft-stop** is achieved only with this **"Motion Control"** "SERVO"-extension. Herewith the acceleration can be defined stepless individually.

In addition this version allows the mounting of the control unit into a **19"-rack** plug-in unit **"GR-19".**

* = **Receiver-Interface:** The 4 wires, normally routed from the satellite receiver to the linear actuator motor on the roof, are connected to the terminals on the rear panel of our control unit. Now it will be possible to select the individual satellites **directly by means of the receiver's remote control** in the same way as with an actuator **–** but **more accurately** and from **"horizon to horizon"**, even at the ends of the **"clark belt"**!
** = A **very rigid**Mechanical connection between antenna and rotor is required for AUTOFOCUS operation. It must be possible to correlate signals measured by the satellite receiver accurately with a specific antenna direction (which means direction of the rotor). AGC signals shall **only indicate true field strength-related changes**, without time shifts, picture contents fluctuation and "spike" influences.
*** = To minimize fuel consumption older satellites are "inclined" in higher amplitudes. **More than 50 % of all satellites are already in "inclination orbit". And their percentage is growing steadily!** Permanent reception with greater antennas is not possible all over the time. One big advantage of this rotor system is the tracking of such satellites: even before the TV viewer will recognize any loss of picture quality, the antenna will follow the position of the satellites automatically, quickly and perfectly!

D I S P L A Y – A R R A N G E M E N T

operating mode	focus/ autofocus	satellite position no.	satellite name	geostationary position	relative field-strength pulse rate/speed	rotor running direction	azimuth angle	elevation angle
R	F	S09	AST	019.2	L208	◬	AZ123.5	EL015.2

CAUTION: Not all function are available on all versions and for each operating mode.

b. EXTENSIONS & OPTIONS

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1. C O M M U N I C A T I O N I N T E R F A C E 'D A T A'

For communicating with an external computer the 'Profi Tracker CL' is available with optional two-way **RS 232 C Data Interface. (Data format: 8-bit/no parity/1 stop bit/50 to 9.900 baud with hardware handshake).** It is particularly suitable in conjunction with options 'AZ360' and 'EL90': for positioning and tracking of non-geo-stationary objects such as stellar constellations (astronomy), orbital space stations (MIR, ISS), amateur radio satellites (OSCAR) and up onto low flighing LEO satellites, respectively such ones with ecliptic orbits. As well sun (solar panel tracking and solar energy measurements). Another mode of application is the positioning of heavy floodlights and light deflection mirrors for outside motion picture productions, or for light guidance systems in architecture. Direction-related information is supplied to the rotor control via **"RS 232 C interface"**. It is also possible to recall information on the rotor's operational status by means of the computer in opposite direction. The **intelligent** interface even allows remote-controlled operation via **telephone modems**.
The data interface can also be used for field strength-related positioning and tracking of telemetry signals, e. g. meteorological probes (weather balloons), radio direction finding of mobile transmitters, etc. Measured direction and field strength readings are continuously transmitted to the external computer via data interface!

Command syntax examples:

- rotate azimuth motor to 134.56° – **"AZ = 134.56 [CR]"** or
- enter elevation position into computer – **"EL = ? [CR]"**
- using the instruction-word **"FOCUS"** automatically starts an focussing-run.
- using the instruction **"RESULT"**, after each auto-focussing the automatic output of operational and performance data is induced, e. g. AZ- and EL-angle with corresponding field-strength. These can be transferred to a computer (as a protocol for instance), but also onto a printer directly! These data can be stored on the computer's hard disk in a file and can be used in any commercially available spreadsheet program (MS Excel etc.) or in data bases and can be displayed graphically without a special program!
Both versions 'Focus' and 'Profi Tracker' are inserting date and time into this data string additionally. See a sample of this data string here:
Row-no.; day; date; time; tracking-channel; AZ-angle; EL-angle; AZ-motor-pulses; EL-motor-pulses; level of analog-channel 1; 3; 4 in the format as follows: 00000 Mon 11.12.98 15:23:44 01 00000 00000 00000 00000 00000 00000 00000.

These data can be transferred to a modem also! Built-in filters allow a multi rotor operation at a single interface. (Not all applications have yet been discovered. What's your idea: ...?)

This extension includes the "GPS-CAPTURE" function. This function enables the system to take over the GPS-location-/-position-data and the very accurate clock time from a GPS-receiver.

2. GPS RECEIVER FOR AUTOMATIC POSITION DETECTION AND TIME REGISTRATION

(Hardware- and firmware-modification)

These extension for the antenna-positioner provides local position detection and subsequent angle calculation of all geostationary satellites which are visible from this position.
GPS-Receiver and antenna are integrated into a common housing. If necessary, the GPS satellite signals can be transferred to the control system also externally via an included cable.
The automatic read-in process of the lat/lon-data has to be actuated manually.
The power supply for the GPS extension is taken from an included external powersupply.

3. DIALOGUE-GUIDED DYNAMIC SERVO SPEED REGULATION 'MOTION CONTROL'

Hardware and software extension for dynamic, controlled dialogue-guided servo speed definition. Selectable starting acceleration, slow-motion speed and braking retardation with high resolution (Ramp control). Particularly useful for positioning and focussing of large antennas.

4. AZIMUTH 360° 'ENDLESS' FUNCTION 'AZ360'

Extension of azimuth rotation range to **'360° endless'** operation (only for 'Focus' and 'Profi Tracker'). This mechanical gear modification kit produces **significantly less gear backlash** and is supplied with updated software which contains angular calculations extended to 360°, as well as a revolution counter with programmable limiting of revolutions (to avoid cable damage). This limitation can be set for 1 to 99 revolutions in each direction.

5. ELEVATION MOVING RANGE EXTENSION 'EL90'

Elevation angle extension up to »**90°**« operation (0 – 90°). This mechanical transmission modification kit is supplied with matching software which contains corrected angular calculations, referred to 90° elevation. **CAUTION:** Restricted to 1,8 m (6 feet) antenna bowl diameter.

6. 19" RACK HOUSING of the CONTROL UNIT 'GR-19'

For command and control centers in studios, ctv-stations, sat-communication bureaus and ENG a 19" rack mount version is often needed. This item is easily integrated in a standard **"ProfiTracker"** into a **19" rack with 2 HE and 290 mm**. High electromagnetic compatibility (EMC) and plug-in connections as well as an illuminated display are included in the price. You will also get a front safety lock (two keys) to block certain functions and prevent any misuse.
Power supplies for logic and motors can be separated. Via an additional power input interface motors can be supplied by an external power supply with lower or higher controlled voltage.

7. POLARIZER-(SKEW) INTERFACE INTEGRATION 'POL-T1'

NEW BY EGIS

For the activation of a commercial polarizer (dipole- or wave-guide-polarizer) with pulse-width control. This extension can be used to save the individually adjustable polarizer position for each single satellite position. When selecting the same satellite later on, the corresponding polarizer angle will be approached automatically.
Connection: Plus, ground and pulse-width

This funktion can be used in controllers with extention 'GR-19' only.

8. SPECTRAMIZER 'SPEC-T1'

This device provides an AGC-analogue-signal for a manual and automatic alignment of aerials/antennas, depending on electric field force. It was designed for "finding" as well as "tracking" satellites but also for other "mobile" RF-signals.

An entire satellite, a specific transponder or a defined frequency can be selected via the integrated spectrum-analyzer in order to generate the AGC-signal.

details in pdf-format

9. WEB-SERVER INTEGRATION INTO CONTROLLER UNIT 'WEB-T1'

Integrated web-server, making EGIS-antenna-positioners controllable by means of a computer network. A choice of satellite-positions will be made available to all clients for selection and approach via Internet or Intranet. Programs, memory, logs and anything 'soft' are stored undetachably on flash memory. Any Internet browser (i. e. MS Internet Explorer, Mozilla, Apple Safari and so on) can be used platform-independant to select and approach satellites as well as positions from the net. Of course a simple hierarchy of programmable authorisations is already implemented, which will control the number of users selectively.
The use becomes transparent by a log working automatically in the background.

Caution: The control devices (Profi Tracker) requires a RS232 interface (option: pos. b1 !)

10. WEB-SERVER 'EGPOSER III'

The EGPOSER III (EGis-POsition-SERver) is a web-server, making EGIS-antenna-positioners controllable by means of a computer network. A choice of satellite-positions will be made available to all clients for selection and approach via Internet or Intranet.

Any Internet browser (i. e. MS Internet Explorer, Mozilla, Apple Safari and so on) can be used platform-independant to select and approach satellites as well as positions from the net. Of course a simple hierarchy of programmable authorisations is already implemented, which will control the number of users selectively.
In addition to passwords you may also use address-barriers. The use becomes transparent by a log working automatically in the background.

NEW: Programs, memory, logs and everything "soft" are stored undetachably on flash memory. Therefore no mechanical devices are needed!

With this device 4 Profi-Tracker may be administered and controlled.

Typical users are news-editorial departments, studios, news agencies, broadcasting services but also research establishments and public authorities.

The hardware is installed into a 19"-rack-frame/housing (optically matching the rack-frame "Profi Tracker" and "EGPOSER").

CAUTION: The used control devices (ProfiTracker) must be provided with a RS232 interface for operation of the EGPOSER (option: pos. b1 !).

details in pdf-format

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11. MASTTOP/MASTDESK 'MA-...'

Mechanical connector between mast bent (of a round mast) and the rotor. It consists of a heavy steel(desk-)panel with a tube welded on. This part of the tube is slipped over the mast. This construction allows to turn the unit on the mast. 6 clamp screws serve both as leveling as well as fixing the system. The tube is clamped with 4 attached screws onto the (desk)-panel. Both versions listed below are capable to carry the max. allowed load.

masttop/mastdesk for 79 to 89 mm Ø (3.5")-mast, weight: 5.5 kg - **Typ 'MA-35'**

masttop/mastdesk for 118 to 128 mm Ø (5.0")-mast, weight: 8.0 kg - **Typ 'MA-50'**

12. ANTENNA-MOUNT 'PT-T2'

Multi-purpose mechanical connector between the antenna and the rotor-head. The entire dimensions of the diamond-shaped component are measuring 1.0 x 1.0 m, made out of square steel-tubes (50 x 30 x 2 mm). Protection against corrosion is provided by hot dip galvanizing. Then these can be thrilled and screwed with each other. The own weight of the carrier is 8.0 kg. Delivery includes interconnection-material onto the rotor-head (**typical utilization**).

13. SHELL-ANEMOMETER/WIND-SPEED-SENSOR 'Wi-S1'

The anemometer performs the measurement of the local appearing wind-speeds. The 4-wire-interface at the control unit is quite ready to read and process the signals from the anemometer.

Details:

- 3-shell-system
- shell ring outside-Ø: 120 mm
- shell-Ø: 40 mm
- profile: 70 mm
- material: ABS
- pulse transducer system: magnet/reed switch
- pulse-rate: 60 km/h = 16.8 m/sec. = 47 Hz
- suitable for mounting onto or besides the mast

ATTENTION: The 4-wire-interface can be used either to connect a satellite receiver or to connect a wind-sensor – not both.

14. PC-Software for 'GEOs' 'SatPicker I'

PC software on CD (in English language) to select **geostationary** satellites via an **RS-232 C** interface and an EGIS antenna positioner.
All current **"GEOs"** are pre-installed within the program. To improve the clarity of this comprehensive list (over 300 satellites) some satellites may be inserted into a priority list and saved there – by a simple mouse click. The satellite desired can be defined by clicking again. In the same way a bi-axial fine-correction is possible. These data are also saved non-volatile in the PC. The "clark belt" will become visualized in a desk-window and the position of the current satellite is indicated graphically.
The program is particularly suitable for journalists, correspondents and editorial offices in publishing-companies, broadcast-offices and translation-services, but not at least for education and authorities. Inclusive is a more detailed manual.

Click here to see a screenshot of the program.

System requirements: PC with harddisk with at least 1 MB free storage space, Windows 95/98/Me/NT/2000/XP/Vista/7, CD-drive, mouse and serial interface

15. PC-Software for 'LEOs' 'SatPCI'

A PC-software on CD with a detailed information booklet (in English and German language). For controlling and handling of the rotor via an **RS-232 interface**. Kepler data of roundabout 300 satellites are available. Actual data in NASA-Format can be loaded. Lots of graphics & infos like orbit data, orbit curves, calculated shadow regions, viewing angle and more and more.

System requirements: PC with harddisk with at least 20 MB free storage space, Windows 95/98/Me/NT/2000/XP/Vista/7, CD-drive, mouse and serial interface

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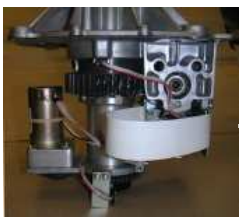
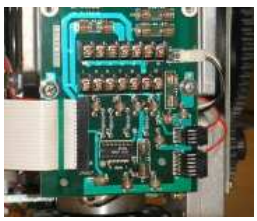
gear parts inside rotor housing





rotor connection fixes

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c. SYSTEM DESCRIPTION

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A system description showing the benefits of this rotor.

The azimuth and elevation rotor system consists of an external antenna rotor EPR 203 and the indoor control unit EPS103. There are no additional parts needed between the mast mount and the dish.

The external rotor directs the parabolic dish fully automatically and microprocessor-controlled to one of the **345** pre-programmed satellite orbit positions. For this purpose **two separate (!)** 24 V **motors** are installed in a weather-proof cast aluminum housing of the external rotor assembly. They actuate the parabolic antenna in the desired direction horizontally in the azimuth and vertically in the elevation direction via reduction gears with high precision and less than **0.2°** repetition accuracy.
Due to two absolutely independently working drive motors, there is from now on no need for any polarmount alignment any more, no time consuming calibration of declination and elevation, north-south axis a.s.o. The problems of many popular polar mounts to accurately approach the extreme west or east are things of the past. Any alignment can be made out of the living rooms armchair!

The aforementioned azimuth/elevation rotor system turns the parabolic dish antenna throughout a 180° azimuth range, which is wider than the theoretical and practical line of sight to the satellite orbit. The **elevation range** of the system is **40°**. It remains to the user, where he uses this elevation range. In Europe you will mostly use the elevation span from 0 to 40°, near the equator this will be from 50 to 90°. Because the system carries out all operations with utmost silence contrary to some noisy actuator motors, it can be used at night without waking up neighbours, as it could be assumed from such a high-quality system.
The only adjustment of the external rotator unit is the approximate directional north alignment of the aluminum housing. "Approximate" means that all corrections are performed by a microprocessor inside the indoor control unit. This takes us to the technical details of the operating and control unit. It serves as a simultaneous control and computer center and can thus be described as the heart of the system. The heart itself is a **fast 16-bit microcomputer** and offers technicians among the users a real eldorado of programming opportunities. Just when mounting it, the system recognizes incorrect or missing wiring. E. g. the control panel includes electronic blocking- and overload-protection, spin-watch and additional non-coded text information.
Let us emphasize those points which are of prime interest to the system operator and user. There is the memory for example. Its latest version has stored all actual satellite orbit locations with all data and names. For instance there is the memory, the latest version incorporates **345** pre-programmed geostationary satellites (all around the globe!) with names and all further data, as well as the opportunity of self-programming **400** satellite positions.
To realize an easy and trouble-free reception from the satellite data stored in the computer memory, only one additional data entry is required and this data is the last unknown the computer cannot know: The geographic coordinates of the antenna location! After entering these data in the processor by means of keypad and operating instructions, it will calculate all required azimuth and elevation angles between the antenna location and the satellite locations within the geostationary orbit.
After this calculation you have to choose any good receivable satellite and tune your sat-receiver to the corresponding channel. Then you will see, mostly, "nothing" on your TV-set. Due to mechanical errors the antenna "looks" more or less aside the satellite. For such a rotor this is no problem: start **"Super Search"** by pushing a button. Now the rotor starts to turn around in concentric/helical and increasing circles to look around in the sky, beginning from the calculated AZ- and EL-angles. You can start or stop this procedure by pushing the button. Did you find "the right one", you may start the autofocussing or try to find out the best reception settings by pushing the buttons UP/DOWN/EAST/WEST. All out of your armchair.

This correction causes the control panel to re-calculate the positions of other pre-programmed satellites. **Immediately** you can switch over to any other wanted satellite – and the rotor will find it with good reception quality. If you have connected the AGC field-strength signal to the control panel before and adjusted it, this function will focus the chosen satellite to an optimum that you can not afford by hand. If you like, you can freely optimize every satellite signal by hand or auto-focus and store it.

Installation is easy and simple. What about every day use? Via the front buttons you can switch to all satellites sequentially. Or take the number-pad for direct-access to the satellite-number. More comfortable is the zipping with the remote-control of your sat-receiver. The four wires leading normally to the actuator (linear motor) for your antenna on the roof are to be connected to the control panel. Now program as usual. After that enjoy the remote-comfort of a polarmount-set with the perfect precision of the 2-axis rotor.

If one or another satellite cannot be adequately received due to a slanted position of the antenna mast as a result of improper concrete casting, the computer program allows to individually correct azimuth and elevation of all satellite locations! For this purpose four keys of the keypad which is concealed by a cover plate are available for UP/DOWN and EAST/WEST adjustment to align the parabolic antenna under all circumstances to those angles which provide optimum reception. Of course all of these new values can be stored in the memory, so the entries must be made only once.

But this is not the end of operating convenience, rather the beginning, e. g. entering a new satellite orbit location which is desired, but not yet stored in the memory. To do this, you select a sub program and the computer asks you which storage space you want to use. After selecting the desired space, you just enter the satellite location's degree of longitude in the orbit and perfect reception of this satellite is guaranteed. Because of its advances design, the computer is capable of performing calculations with persistent accuracy of all antenna locations, regardless if they are East or West of the Greenwich Zero Meridian. The computer can be used of course, to compile a table of angles for all pre-programmed satellite positions after entering the desired grid coordinates for large cities. Thus you can use your rotor computer for calculating the angles, under which the individual satellites can be received at each receiving station on the earth. But it does even more: It tells you, if the satellites are within the present range of vision or already hidden behind the horizon.

To minimize fuel consumption older satellites are **"inclined"** in higher amplitudes. More than 50 % of all satellites are already in **"inclination orbit"**. And their percentage is growing steadily. Permanent reception with greater antennas is not possible all over the time. One big advantage of this rotor system is the tracking of such satellites: Even before the TV viewer will recognize any loss of picture quality, the antenna will follow the satellites position automatically, quickly and perfectly. This system is superior to all sat-receivers with integrated 2-axis-control too!

One of the most outstanding performance features of the system is its ability to cope with high wind speeds. Proved by **finite elements calculation** for material and shape of the load carrying parts. On the first look you recognize the high durability and stiffness of the aluminum die cast. But what's going on inside? Here some infos for the technicians, how the rotor is constructed:

- all used toothwheels are made of steel – not plastic!
- all used toothweels are milled – not punched!
- the most important toothwheels are especially "sediment hardened"!
- the gear-toothwheel for the AZ-movement weights 2 kg alone. Module 4 is used!
- the bearings used:
  2 pieces ball-bearing 110 mm Ø x 70 mm Ø x 20 mm
  4 pieces cone-roll-bearing 55 mm Ø x 30 mm Ø x 18 mm
- all parts of the gear are built to have a long lifetime and high precision.
- all parts are highly corrosion-protected, even in the interior of the rotor!
- motor-sensing is not done by mechanical switches or reed-contacts, but by touchless working twin-puls-generators based on the "hall" principle!
- all feedback-signals from the motors via line to the control panel are transmitted on 24-V-level, which is much more safer then using only the wide-spread 5-V-TTL-level!
- for lightning-protection and main phase-errors in the antenna system 10 overvoltage suppressors are provided! (Do you find THAT in any normal rotor?)

bearings

When you appreciate all the good things, don't forget the "nice trifles":

- LCD display (40 symbols/single line)
- true angle indications for azimuth and elevation
- electronic gear backlash compensation
- motor lag compensation
- selectable positioning tolerances
- determination of slow-motion phases
- determination of vernier-step graduation
- determination of motor delay time prior to new positioning
- automatic system test
- passwords for system entries
  and many other interesting features!

For further information please refer to the detailed installation and operating manual which is supplied with each azimuth/elevation system.

The advanced models however, are even more interesting:

- 360° azimuth rotation range (endless!)
- 90° elevation angle (horizon to zenith)
- data interface for PC, modem or printer
- **GPS** (Global-Positioning-System)-Software-Interface (NMEA183)
- astro-program to avoid the problem **"sun-satellite-antenna in a line"**
- **controlled "servo" speed**
- professional 19" rack version

Other versions are under development.

The EGIS Bi-Axial-Rotor in duty

Here shown in DLR's GSOC (German Space Operation Center) in Oberpfaffenhofen the rotor worked with Yagi antennas for official use, managing duty traffic between the russian control center "ZUP" near Moscow and the "MIR" crew/astronauts. This was done in fullduplex using the lower part of the 2 m band. Communication via the 70 cm antennas was matter of the OM/HAM fellows (SAFEX) – but they were not used for official purposes. The permanent antenna tracking, done automatically, allowed transfer-connections ranging from 4 to 12 minutes in time intervals of 92 minutes. Using Eutelsat-IIF4 this connection persisted permanently between "MIR" and "ZUP" (Moscow) via "DLR" Oberpfaffennofen.

EGIS rotor in duty at "SwissCom" (in former times Swiss PTT), satellite-groundstation Zurich/Switzerland

EGIS rotor featuring uplink antenna positioning in an "Norddeutscher Rundfunk" SNG truck

Superior perfection in each part of the system!

d. **SPECIFICATIONS** – PROFI-TRACKER CL

back to the beginning

CONTROL COMPUTER: EPS-103 mod.		
Line voltage		220/110 V AC (12 V/24 V DC versions also available!)
Power consumption		approx. 180 VA
Data indication		LCD display
Programmable memory		up to 400 satellite orbit positions and names
Motor power supply		24 V DC, for azimuth and elevation motor
Internal resolution:	*Azimuth*	0.0100°/pulse
	Elevation	0.0025°/pulse *
Pulse reading frequency		max. 500 Hz
Analog sampling rate		approx. 250 Hz
Dimensions (W x D x H)		300 x 200 x 80 mm
Weight		4 kg
Shipping box (W x D x H)		39 x 29 x 15 cm
Temperature limits:	*operational*	–5 °C to +40 °C
	survive & storage	–15 °C to +60 °C

ROTOR UNIT: EPSR-203 mod.		
Features		2 separate motors for azimuth and elevation
Motor operating voltage		24 V DC
Motor power consumption		max. 20 W
Pulse transmitting rate		max. 400 Hz
Cable 'control device to rotor'		10 x 0.6 mm^2 shielded (phone cable can be used) Version 'ProfiTracker' needs separately shielded lines. 4 x 1.0 mm^2 (for motor power supply) – over 50 m wire 1.5 mm^2, etc.
Control mechanism		pinion and gear transmission
Max. azimuth tracking range		360° *
Max. elevation range		90° *
Repetition accuracy		0,2° (40° EL version) 0,5° (90° EL version) ** At the EL-swing endstops major deviations may occur!
Tracking speed:	*Azimuth*	approx. 4°/sec.
	Elevation	at 40°-stroke = 1°/sec. or 4°/sec. * at 90°-stroke = 2°/sec. or 16°/sec. *
Usable carrying capacity		approx. 85 kg approx. 60 kg using the 90° head extension (EL90) (exceeding 50 kg a counter balance could be needed)
Cabinet		aluminum die-cast, weather resistant
Dimensions:	*Diameter*	approx. 318 mm
	Height	approx. 625 mm **Click here to see a dimension sketching!**
Weight		27 kg
Shipping box (W x D x H)		75 x 34 x 41 cm
Dimension of mechanical connections:	*Antenna mounting surface*	see **sketching**
	Mast mounting surface	approx. 240 mm Ø – 4 threaded (bolts are supplied)
Max. permissible antenna diameter		for 40° or 50° EL version up to 2.5 m (8 feet) * for 90° EL version up to 1.8 m (6 feet) *
Wind speed		62,5 km/h (41 MPH) during operation, 129 – 160 km/h (80 – 100 MPH) depending on antenna diameter in quiescent state (**strength proof by finite elements calculation**)
Temperature limits:	*operational*	–20 °C to +65 °C
	survive & storage	–30 °C to +65 °C

* = depending on design
** = Greater errors may occure in excessive lift positions at the end of the moving range by overload, too.

Experiences with larger antennas

The EGIS Bi-Axial-Rotor in duty

University Budapest/Hungary. Institute for High Frequency Techniques.

Right here (in the alps) a live weather panorama cam follows the terrain profile controlled in two axis via RS-232-C interface.

Mesh antenna 3.1 m
Clickable link:
example of a mesh antenna attachment

Rotor with 3.1 m mesh-primefocus antenna for C-band reception

EGIS-Rotor (AZ = 360°; EL = 90°) in duty at the department for "Astronautic and Space Science" at the "Deutsches Museum", Munich. Weather satellites (LEOs) are scanned permanently.

SNG truck of "Antenne Bayern", Munich/Germany in position to uplink news

Rotor in use with 1.5 m parabolic antenna made by Kathrain on trawler

Shown here is a heated 1.5 m parabol antenna from Hirschmann (Technical Museum Vienna/Austria)

Shown here is a rotor (360° AZ/90° EL) supporting a 90 cm parabolic bowl antenna in the center. A 4,8 m long cross Yagi antenna for the 70 cm UHF-band and a Sat S-band antenna (13 cm/2 GHz) are also positioned by means of a crossbeam of 180 cm length.

MORE IMAGES AND INFORMATION

e. PRICE LIST

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VERSION		(excl. VAT) EURO
PROFI-TRACKER CL	Antenna positioner with basic scope	**3 360.50**

OPTIONS		(excl. VAT) EURO
b1	**'DATA'** Interface (RS-232) for version FOCUS or PROFI TRACKER	**798.00**
b2	**'GPS-H-T1'** GPS-Reciever incl. software modification is only supplied in combination with Data-Interface	**588.00**
b3	**'MOTION CONTROL'** Servo \ speed control	**989.00**
b4	**'AZ360'** Extension to 360° azimuth rotation range	**798.00**
b5	**'EL90'** Extension to 90° elevation angle	**798.00**
b6	**'GR-19'** PROFI-TRACKER-control unit fitted into a 19" rack mount (2 HE) (**image H**)	**998.00**
b7	**'POL-T1'** Extension for the activation of a commercial polarizer	**498.00**
b8	**'SPEC-T1'** Spectrum analyzer incl. AGC outlet in 19" rack	**1 997.50**
b9	**'WEB-T1'** Web-server integration (in 19"-version only)	**798.00**
b10	**'EGPOSER III'** Web server for Antenna-Rotor	**2 182.50**
b11a	**'MA-35'** Mechanical interface between rotor and mast (max. 89mm Ø mast) incl. mounting hardware (**image E**)	**198.00**
b11b	**'MA-50'** as above, but for max. 128 mm Ø mast incl. mounting hardware (**image E**)	**298.00**
b12	**'PT-T2'** Universal connecting link between parabolic antenna and rotor head	**298.00**

		Pot-galvanized, made from square tubing (50 x 30 x 2 mm); mounting hardware for rotor head installation is included. Length: 1 m. Suitable for parabolic antennas of up to 2 m (7 ft.) diameter. (**image Z**).	
b13	**'Wi-S1'**	Wind-speed-sensor/shell-anemometer	**317.35**
b14	**'SatPicker I'**	PC software on CD for selection of geostationary satellites via RS 232 C interface	**298.00**
b15	**'SatPC I'**	PC-software for controlling and driving the rotor via RS 232 C interface, booklet included on CD	**298.00**
		New user software is permanently compiled and updated by various groups and institutions. Please inquire for software to meet your requirements.	

Modification and upgrading of former system types is possible to a limited extent (**advice to soft- and hardware expansions**). Please contact us for additional information.

Retailer inquiries are welcome! Contact us on your special application problems!

Technical improvements are subject of change!

CONTENT: base version | extensions/options | system description | specifications | price list | news
IMAGES: controls and connectors | gear parts and options || M O R E I M A G E S A N D I N F O

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E G I S

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