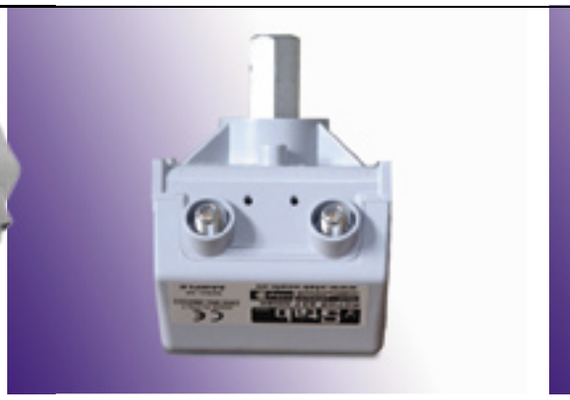
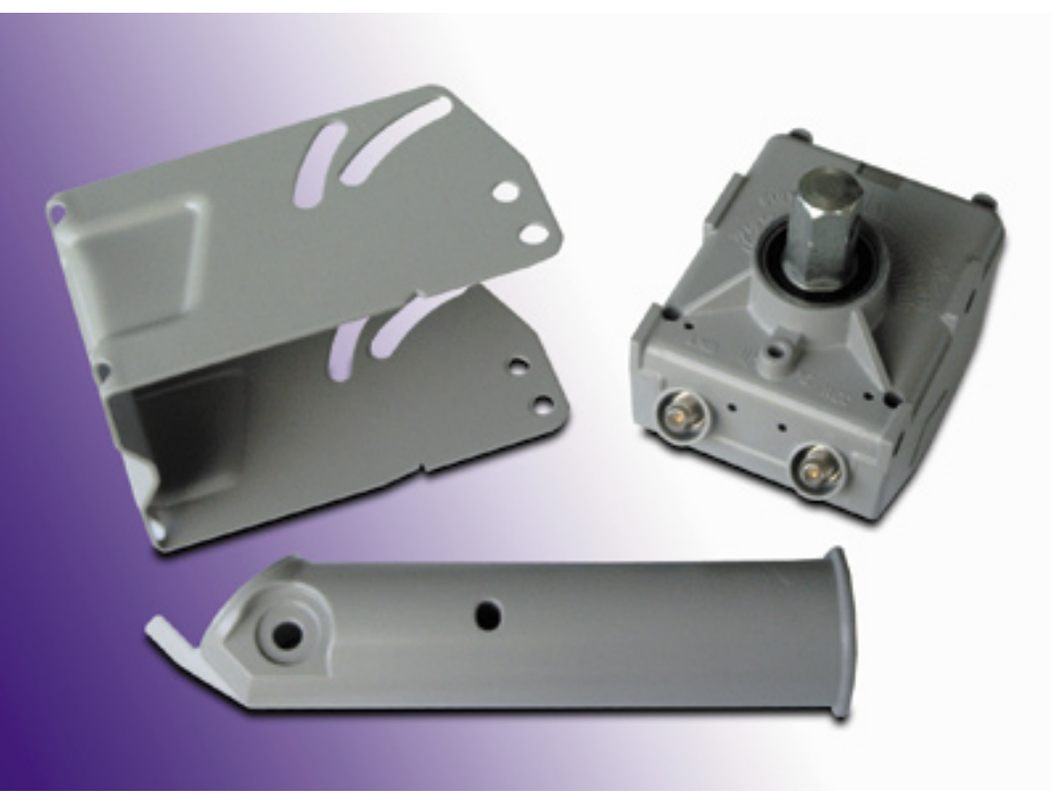


Stab HH90

Motorized antenna for poets

Have you ever thought about looking for channels on satellites other than the only one that you can receive with your fixed dish? Were you deterred from doing that by the complexity of the motor setup and its cost? Well, we have good news for you! The new Stab motor - HH90 is for everybody.

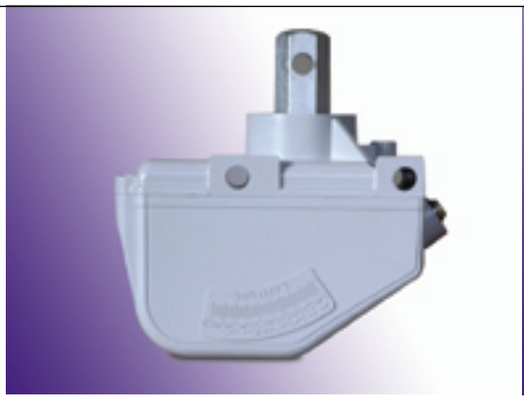
The motor and its accessories are packed in a small carton. If you never worked with hardware like this before, it will probably surprise you how easy and simple all this is. The hardware consists of three main components: a motor with built-in control circuitry, a bracket used to fasten the motor to the pole and a shaft. The HH90, in contrast with two other members of the Stab HH family (HH100 and HH120), has its shaft directed downwards - not upwards. Moreover, the shaft is not permanently connected to the motor. The shaft should be first attached to the dish and then to the motor's pivot. This is done with only one screw. The part to which you fasten the dish is 14.5cm long. Thus only unusual dishes having two U-bolts far apart for mounting will pose a problem. Except for the three main components mentioned above, there is a plastic bag containing all the necessary hardware accessories: screws, nuts, clamps, bolts, F-type connectors with protective covers and even a simple spanner for assembling everything. Last but not least, you will find a very helpful user manual inside the package. It is full of pictures and detailed explanations. Almost all the parts are made of metal; only a portion of the motor's cover is plastic. Despite that, the entire assembly is very light (2.6 kg) and compact. It is durable in appearance and the workmanship leaves nothing to be desired.

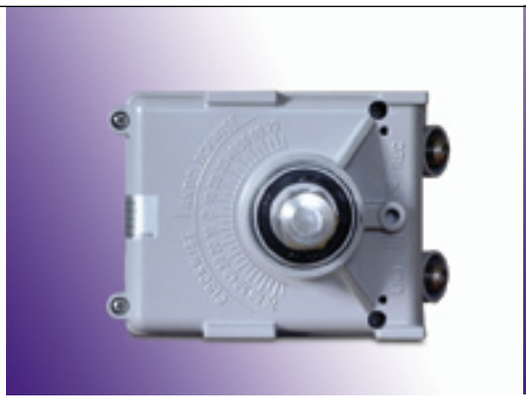


Installation

The motor can be controlled by USALS or DiSEqC 1.2 compatible receivers. We used a USALS system first. Before starting the installation, you should find the geographical coordinates of the location where the antenna is to be installed. You can read them either from a map (an accuracy of 0.1° is more than sufficient) or find them on the Internet. Instead of „googling for it", you can try the service provided by Stab on their webpage, www.usals.info. After entering the type of motor (HH90), your country, city and e-mail address, you will get an automatic response providing the necessary data. We were really surprised to discover that the system also worked for very small village locations - and not only for larger towns. In addition to the Longitude and Latitude values, you will also need to know the Dish Elevation expressed as an angle in degrees. If you don't get it from the Stab automatic service, you can find it on the paper maps attached to the user manual. Once all three parameters are known, you can proceed with the actual installation.

The first very important step is to make sure that the pole on which you want to mount the motorized dish is perfectly vertical. Use a spirit level or plumb line to check it. Then, mount the motor in the bracket at an angle corresponding to your latitude. The scales engraved on the motor's case are used for this purpose. You simply set the angle equal to your latitude. The next step is to fix the bracket and the attached motor to the pole with the included U-shaped bolts and brack-





ets. Well done! You have completed the first stage of installation. Now take the shaft and attach it to the dish. Do it carefully to avoid any skew between the shaft and dish axis of symmetry. Adjust the angle between the dish and the shaft. Set the elevation reading on your dish to the angle equal to the Dish Elevation parameter. If your dish lacks the elevation scale, you will have to adjust its elevation by trial and error once everything is mounted on the pole. So, if you lack experience in aligning satellite dishes, you might be better off with a dish that has an elevation scale.

During our tests, we used a 90cm offset dish equipped with an Invacom quad LNB for the Ku-Band. The LNB had a noise figure of 0.4dB. Of course, you can use a smaller dish and a single, twin, quatro or other type of LNB. The HH90 is suitable for dishes up to 95cm. The larger the dish and the smaller the noise figure of LNB, the better the signal quality and weather margin that can be achieved.

The next step is to attach the shaft and the dish to the pivot of the motor. This is done with just one screw and one nut. Then you slightly loosen the nuts on the U-bolts around the pole and rotate the entire assembly (motor, shaft and dish) to point the antenna exactly to the south. Now it's time to connect the cables. Instead of going directly to the LNB, the cable from your receiver must go to the „REC" connector on the motor. Another short cable has to be added between the „LNB" connector on the motor and the LNB itself. When the cabling work is done, you should bring up the installation menu in your USALS compatible receiver. Here you enter your geographical coordinates and select a satellite that is aligned as close as possible to south. That means that if your longitude is close to 19° East you should select Astra 1, if it is closer to 13° East, you should use Hotbird instead and so on. The motor will run for a short time and the antenna will move slightly. The final step is to fine-tune the azimuth alignment (rotate the entire assembly after loosening the U-bolts on the pole) and the elevation angle of the dish. Use your receiver's signal quality indicator to find the maximum signal. Once it is found, the installation is complete. Tighten the fixing screws and nuts. Settings for all other satellites from horizon to horizon are determined automatically by the Stab motor and USALS compatible receiver. No further adjustments are required.

Hints for Beginners

If you are quite new in this business and you have just finished the installation, first find out which satellites are transmitting in your direction. Otherwise you may be disappointed that your receiver cannot find any channels on this or that bird. A satellite may be perfectly visible from your location, you may have the largest possible dish mounted but your receiver may not be able to find a single channel on a satellite! Probably, your first thought will be that you did something wrong with the installation. Calm down and approach it methodically. A good start is to use SatcoDX World of Satellites software attached to every issue of TELE-satellite International. Using the Dish Track tool you can generate a list of satellites that can be received in your location. Remove from the list the satellites that require a significantly larger dish than you have (e.g. 120 vs. 90 cm). Next, make sure that the remaining satellites transmit in the band your LNB can receive. In practice, this will be the Ku-band since the C -band generally requires big dishes and HH90 motor is not the best solution for this band. So remove the satellites broadcasting only in C-band from your list. Check the SatcoDX chart to make sure that there are "normal" TV or radio channels on the satellites that are still on your list. If there are only "feeds" listed in the chart, your receiver will probably not recognize them as channels. Another reason for not receiving channels (or receiving only a few) may be the outdated transponder satellite data in the receiver's software. If your receiver is SatcoDX compatible – no problem, updating the data will be a piece of cake. Otherwise, you may be forced to do it manually. After that a repeated channel search should provide you a number of new channels.

There is yet another trick that you can do to improve your reception. When your installation is complete and the first satellite channel search is over, try experimenting a little. In the DiSEqC/USALS settings of your receiver, change your longitude setting by, say, 0.3° East. Observe on your receiver's signal meter if the signal quality has increased or decreased. Then check the reception when your longitude setting is changed by 0.3° West from your normal value. Experiment with a number of settings to find the best quality of signal. If the maximum is not found at your true longitude but somewhat east or west, it means that the dish is not perfectly aligned in azimuth. You may either mechanically correct its alignment (which is the recommended solution) or cheat your receiver by leaving the false data which gives the best result in the receiver's USALS installation menu. A difference of 1 degree or less can be corrected in this way.

Everyday Use

When the motor is installed, the next obvious action is to move the dish from one satellite to another and search for channels. In Western Poland, we were able to receive satellites ranging from Panamsat 12 at 45° East to Hispasat 1C, 1D at 30° West, over 20 satellites altogether. These carry more than 2700 TV channels including about 720 unscrambled ones.

The manufacturer specifies that the dish rotates at 2.4°/sec. when powered from 18V and 1.5°/sec. for 13V. When moving between 45° East and 30° West we found it took 38 seconds or 53 seconds depending on the polarization of the channel (and thus the voltage the receiver generated). This gives 2.0°/sec. and 1.4°/sec. which are slightly slower than the figures specified, probably because the manufacturer's measurements were taken

without a dish. Moreover, we cannot rule out the possibility that our test receiver generated somewhat lower voltages than 18v and 13v respectively. When you switch between channels broadcast from neighboring satellite positions (3° or so), the delay is about 2 seconds - which is very acceptable.

As already mentioned, we used almost the maximum allowable dish size (90cm) to test the motor. That's because, the larger the dish, the narrower its beam. Thanks to this factor, it is relatively easy to determine if the dish is correctly aligned or not. With a 90cm dish, even a 0.2° difference in azimuth can be noticed on a receiver's signal quality reading. A large dish is heavy and presents a greater surface area to the wind. So, if a motor performs well with a large dish, it will undoubtedly perform well with a smaller dish.

We must say that the Stab HH90 worked flawlessly no matter how many times and in which direction (east or west) it was rotated. It always returned to the exact position required for a given satellite. We could not observe any differences in signal level and quality after turning the dish to many satellites and then returning to the initial one. The noise generated by the motor is very low. If you install the motor on the roof of your house, you will not be annoyed by its noise while enjoying warm summer evenings in the garden. Most likely, you won't even notice that the Stab HH90 is operating - that's how quiet it is.

After confirming that the motor worked well with USALS compatible receivers, we did a test with a DiSEqC 1.2 compatible receiver. As expected, the installation took much longer. The Stab HH90 also worked with that receiver without any problems. The motor has 28 preprogrammed satellite positions (suitable for reception in Europe) and there is still room for an additional 21. Some DiSEqC 1.2 receivers can use this data to speed up the installation process. In such a case, the DiSEqC 1.2 installation is as easy and fast as the USALS installation.

Expert conclusion

Peter Miller
TELE-satellite
Test Center
Poland

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Stab HH90 is really simple to install. Its user manual is perfect. Finding the necessary geographical data for your location is very easy if you use Stab's web page. It is both USALS and DiSEqC 1.2 compatible.

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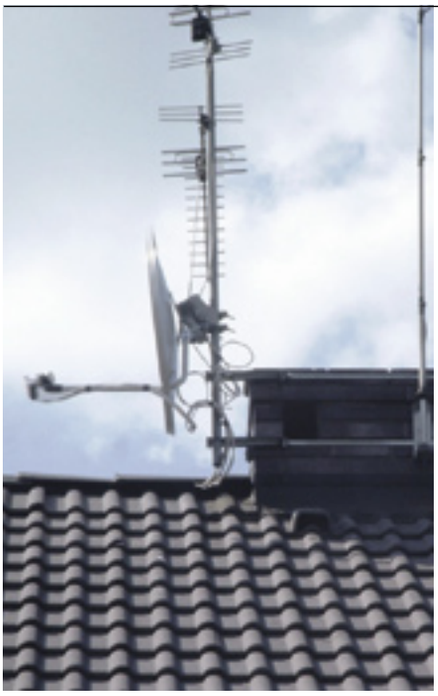
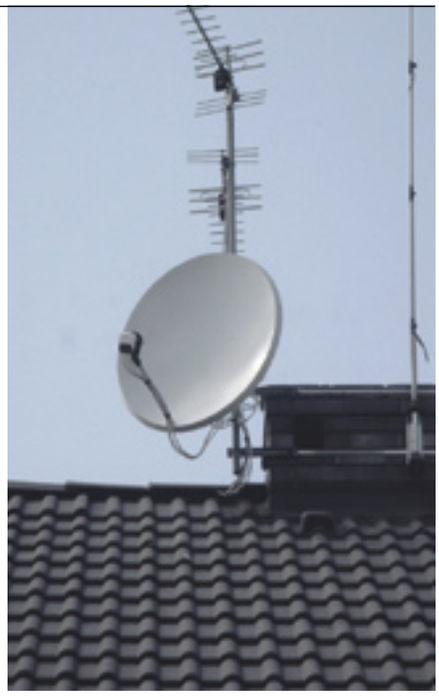
None



Receiving Hispasat 30 West



Receiving Turksat 1C 42 East

TECHNICAL DATA

Manufacturer	STAB S.r.l., Via Seminiato, 79, 44031 Ambrogio (FE) Italy, www.stab-italia.com,
E-mail	Info@stab-italia.com
Phone	+39-0532-830739
Fax	+39-0532-830609
Model	HH90
Description	DiSEqC 1.2 and USALS Compatible Dish Motor
Communication protocol	DiSEqC 1.2® Level
Maximum dish diameter	95 cm
Maximum dish weight	10 Kg
Rotor weight	2.6 Kg
Diameter of support pole	ø (35 to 68) mm
Dish support length	145 mm
Dish support diameter	ø 42 mm
Rotation angle	±65°
Rotation speed	2.4°/s for 18V, 1.5°/s for 13V (in our tests with 90 cm dish: 2°/s and 1.4°/s)
Operating power supply	13/18 Vdc
Consumption in stand-by mode	40 mA
Consumption in operating mode	180 mA
Starting movement consumption (max)	350 mA
Operating temperature	-40°C +80°C
Maximum relative humidity	100%
Programmable positions (DiSEqC 1.2®)	49 satellites
Preset positions (DiSEqC 1.2®)	28 satellites
Programmable positions (USALS®)	no limits
Connectors	F type
Connection	Coaxial cable
Mechanical limits	±72°
Programmable electrical limits	from 5° to 65°
Fine rotation by impulses	of 0.1°
Inclination of the rotor on the pole	from 10° to 70°