EMP P.168-W
"Motorized" DiSEqC Switch

DiSEqC 1.0 and 1.1 are for switching LNB's, and DiSEqC 1.2 and 1.3 (USALS) are for controlling motors. Right? Right for everybody but not for EMP-Centauri! EMP-Centauri is a large manufacturer of multiswitches and DiSEqC switches as well as related accessories. Evidently, there must have been a young engineer in that company who did not know that DiSEqC 1.2 was for motors - not for switches. Thanks to that fortunate event, we can now enjoy the P.168-W switch. The switch that can be controlled both with standard DiSEqC 1.1 and DiSEqC 1.2 commands!

The first nice thing about the switch becomes evident right after the first look. Yes, this is a switch to be mounted outside. Its protective cover and all connectors mounted on the bottom side leave no doubt about it. It means that one hole in your window frame is enough to get access up to 8 antennae. Moreover, you can use it to route the signal from your terrestrial antenna too. Of course you will need to split it up back to satellite and terrestrial cables after passing a window or a wall.

But let's say something about the control of the switch. P.168-W can be driven by DiSEqC 1.1 command "Write N1" which selects one out of eight "uncommitted switches" (specific DiSEqC term). Namely, the following DiSEqC commands are used: Switch 1 (A/B), Switch 2 (A/B), Switch 3 (A/B) and Switch 4 (A/B).

If your hunger is not satisfied with 8 birds, you may extend this distribution system with the additional "normal" DiSEqC 1.0 switches. That's because P.168-W responds only to the commands reserved for DiSEqC 1.1. So, when cascaded, the system can offer you even 32 LNB inputs (4x8). Naturally, your receiver would have to be compatible with DiSEqC 1.0 & 1.1.

Figure 1. The principle of operation of P.168-W.

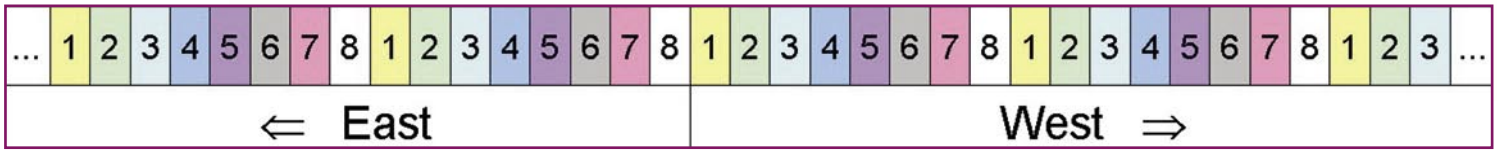
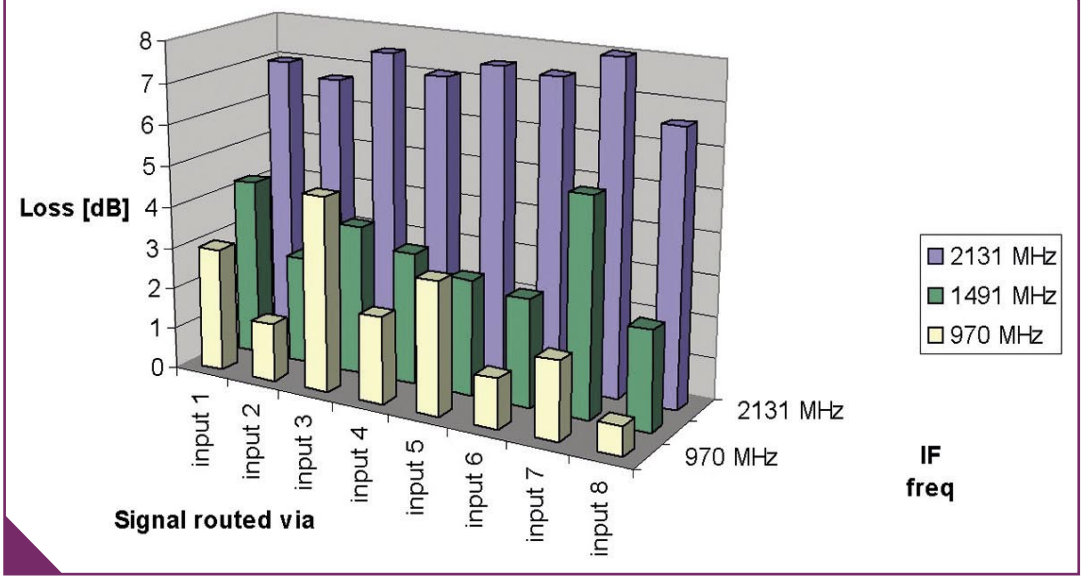


Figure 2. Signal loss versus frequency for different inputs.



But let's focus on 8 inputs. It is a fact that not all receivers support DiSEqC 1.1. If your receiver supports only DiSEqC 1.0, the P.168-W will be of no use for you. However if it supports DiSEqC 1.2 you may use it very easily. And that's where the magic of this product is!

Normally, DiSEqC 1.2 commands are used to move the dish to the East or to the West. In the motor installation menu you have the commands like: "Go to reference", "Go to West" and "Go to East". Sometimes also: "One step East" and "One step West". Now, if you press and hold "Go West"

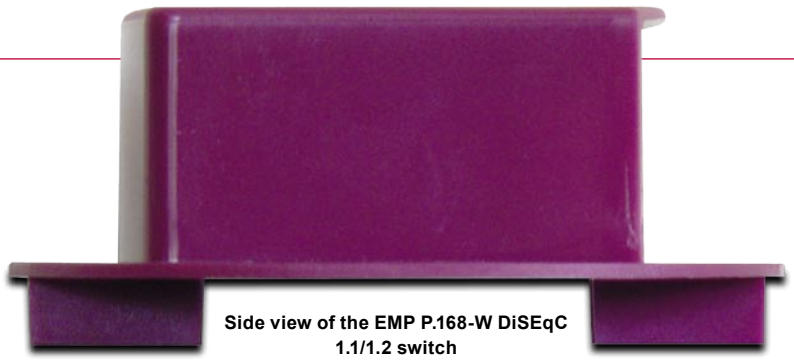
the receiver will be sending commands to move motor to the West in small steps. P.168-W is designed in such way to recognize the "position of the motor" and switch on and off its switches in turn. It can be explained as in figure 1.

For example, if we are continuously "moving the dish" to the West, after a while Switch 1 will be turned on, a moment later it will be turned off and Switch 2 will be turned on, etc. After Switch 8, Switch 1 will be turned on again, then switch 2 and so on. We checked that the selection repeats over and over again in both direction: East and West. So it is not really any problem to teach your receiver how to control P.168-W. You connect your LNB to one of its inputs, set in the installation menu that this satellite signal comes from the DiSEqC 1.2 motor, and start "moving the dish" either to East or West. After maximum a few seconds, you will notice the signal. So, you release the button and execute Save command in the motor installation menu. From this moment on, your receiver will remember how to switch to this satellite with DiSEqC 1.2 command. You repeat the process with the rest of LNB's connected to other switch inputs.

Once you understand the DiSEqC 1.2 control idea, you will not like to return to the classical DiSEqC commands like Sat Position (A/B) or Option (A/B) which are quite often confusing for the "normal" people.

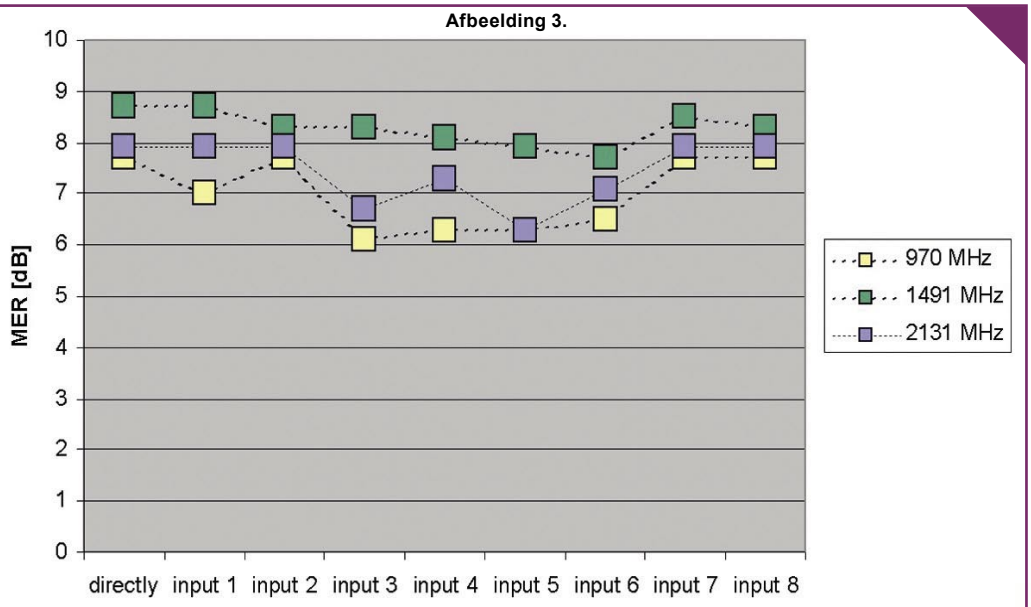
How fast is the switching between satellites? Is it comparable with a real motor system? Absolutely not! The switching is immediate, it is just a matter of milliseconds. You will not notice a difference between channel zapping within one satellite and between different satellites!

Having checked the installation and the satellite switching speed, we moved to the electrical characteristics of the product. First



Side view of the EMP P.168-W DiSEqC 1.1/1.2 switch

Afbeelding 3.



switch. We were much more concerned about its noise performance. How much quality suffers when signal passes the switch? To evaluate this, we measured the modulation error ratio when the LNB was connected directly to the analyzer and when it was connected via different inputs of the switch. We tested all 8 inputs and the results were amazingly good! See figure 3. For some combinations of frequency and input port, the deterioration of signal quality was immeasurable! In the worst case the MER was reduced by less than 2 dB. This is pretty good! You may even use this switch with your DX antenna but if you do, it is a good idea to try the most critical satellite on different switch inputs. In our test sample, input 2, 7 and 8 were the best.

parameter we measured was the signal loss. P.168-W is a passive device so it can not amplify signal, it can only attenuate it. The specification promises 5 dB loss on the average. As you can see in figure 2, it varies from about 1dB to almost 8 dB, being better for the lower end of L-band and worse for the higher end. There was no need to check it for various bands or polarizations because every LNB outputs the intermediate frequency in 950~2150 MHz range.

So far, so good. But the signal loss is not the most critical parameter for a

Experts Conclusion

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EMP P.168-W DiSEqC 1.1/1.2 switch is a very smart device. It is not only easy to install with DiSEqC 1.1 or 1.2 compatible receivers, but its electrical performance is really superior! For some input ports and frequencies, we were even unable to detect any change in signal quality despite using a dedicated analyzer (not just a commercial receiver).

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It is difficult to attach cables to this switch – the connectors are too close to one another. If we could, we would also change the color of the casing. We usually do not pay attention to such kind of attributes for switches that are supposed to be mounted somewhere under the roof, but P.168-W will most likely be put in a visible place with a bunch of white cables connected to it from the bottom. Why not grey or white?

TECHNIC DATA

Manufacturer	EMP-Centauri, Czech Republic
Internet	www.emp-centauri.cz
Fax	+420-376-323-809
Model	P.168-W
Function	8+1 inputs DiSEqC 1.1/1.2 switch
Frequency range	5-2300 MHz
Control	DiSEqC 1.1, 1.2
Insertion Loss	Sat inputs: 5dB avg.; Terr. input: 3 dB avg.
Isolation	30 dB avg.
LNB current	400 mA max.
Current drawn	50 mA max.
Dimensions (w,d,h)	112.3 x 112.3 x 48.3 mm
Temperature range	-30°C~+70°C