

SVEC 1.2 m VSAT Dish

Internet via Satellite - It's Easier Than You Think



Once you are accustomed to the Internet, you can hardly think of not having access to it for a longer period. However, there are still locations, even in most developed countries where there is no telephone line available. Are the GSM operators the only possibility then? Not exactly - we can think of two-way satellite connection instead. Receiving IP data via satellite is not that different from receiving A/V transport stream. Bits are bits and bytes are bytes.

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Except for having a DOCSIS modem, an LNB, a BUC (Block Up-Converter) and a subscription from a service provider, you need to have

a suitable dish. Such a dish should be much stronger than the one dedicated for reception only. That's because the LNB/BUC unit is big and

heavy. BUC consumes about 30 W of electric power and must be equipped with a big and heavy heat sink.

But do not forget that from the professional perspective, "very small aperture" means smaller than 3 meters.

Installation

Moreover, the dish must guarantee the proper geometry and stability of alignment because if not, it will be transmitting interfering signal to the neighboring satellites. No wonder that such dishes are bigger and more solid than the ones satellite enthusiasts are familiar with. Those dishes are often called VSAT dishes. VSAT stands for Very Small Aperture Terminal and means a two-way satellite ground station. This may sound rather funny as the dishes are bigger than the regular 60 or 90 cm reception antennas.

The parcels containing the components of the SVEC dish were big and heavy. No wonder, everything is made of steel. After unpacking and examining the components, we concluded with satisfaction that the assembly should be quite easy. And indeed, it was. Even without any assembly instructions, it was not difficult to figure out what should be connected with what. Everything fitted very well, except from one small detail. We could not figure out how to fit the two BUC/LNB side supports. After a while, we realized that the brackets attached to the dish edges that were supposed to be connected with the LNB supports are mounted upside down. When we re-assembled them in the correct way, eve-

	Standard 1 m dish	SVEC 1.2 dish
Channel Power	73.6 dBµV	74.2 dBµV
C/N	13.3 dB	13.5 dB
MER	12.4 dB	12.8 dB
Link Margin	5.2 dB	5.6 dB
CBER	9 x 10 ⁻⁵	5 x 10 ⁻⁵

■ Table 1. Comparison of SVEC dish with the regular dish used for the service in Poland. EURO-BIRD 3 on 33° E, 12522V, 27500, 5/6.



rything was OK and no further problems popped up.

Due to the size and weight of the hardware, you need a helping hand in some operations – for example when mounting the reflector on the pole. Speaking of the pole, it has a very practical three-leg base. Even if the surface is not quite flat and horizontal, you are able to adjust every leg independently and ensure that the pole is perfectly upright.

We loved the azimuth adjustment mechanism. It is really a dream when compared with the regular reception dishes. You set the antenna roughly in the proper direction and then you rotate the lever what makes the dish turn East or West. In this way, you can adjust the azimuth with absolute precision.

Elevation adjustment is more classical – a long thick

screw with two fixing nuts. We can assure you that this adjustment is also very precise and you can tip-toe the elevation as well as the azimuth.

LNB/BUC holder with a feedhorn and waveguides accepts standard reception and transmission units. It separates the polarizations - in our case vertical polarization was used for the reception and horizontal for transmitting the signal. It also allows you to adjust the tilt of a BUC/LNB set. We needed to set 10° tilt and it was no problem.

After installing BUC and LNB, we turned the antenna roughly in the direction of EUROBIRD 3 on 33° E which was the satellite our Internet provider was using for their service. After connecting a satellite signal analyzer to the LNB output, we immediately saw a signal in

the spectrum view. We ran satellite identification function and, to our surprise, it was EUROBIRD 3. Then we checked the parameters of the transponder and it so happened that our spectrum view was exactly centered on the right transponder. Unbelievable! The only thing left was fine-tuning of azimuth, elevation and tilt.

When everything starts much better than you expected, better be cautious. Murphy Law is waiting to hit you even more severely. And indeed, our DOCSIS modem could not lock to the service. The receiving LED indicator was blinking, the transmitting LED indicator was blinking and we could not connect to the Internet. After double checking everything we phoned the operator. After a while they called back with the message they could not lock to the signal either. They said that evidently some-

thing was wrong with the uplink and they would investigate the problem abroad. After half an hour or so, they called back again saying that their modem had locked. Quick check revealed that our modem had locked too. Finally, we had access to the Internet via satellite.

Performance

We checked what the download and upload speeds were and we got: 2849 kb/s and 160 kb/s. The figures were in line with the connection specification we had from our provider. A small delay before the start of the download was noticeable but this is normal in satellite communication. After all, the satellite is 36000 km up there and some data buffering must also take place when error correction schemes are used.

But how to assess the quality of the connection? We decided to compare the incoming



signal when received with SVEC 1.2 m dish and when received with the regular 1 m dish you get when you subscribe to this service at our location in Poland.

As you can see in the table, SVEC dish delivered stronger signal of better quality. It is especially visible in the Channel Bit Error Rate. It was almost twice as good as

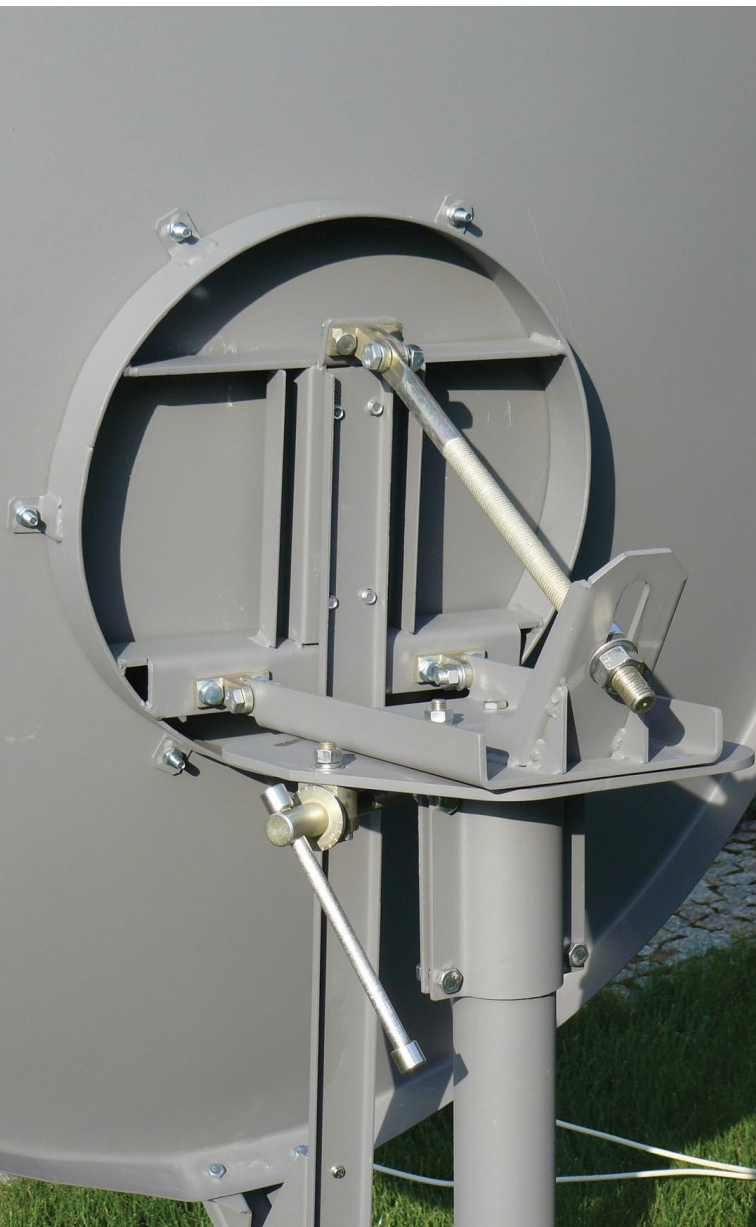
the reference. For the readers not familiar with the term: the lower the CBER, the fewer erroneous bits that need to be corrected by the modem.

the same ratio. That's physics. We can say so because both LNB and BUC use the same feedhorn located in the same position with respect to the reflector.

Also the link margin increased from 5.2 dB to 5.6 dB and you should know that 5 dB is already considered as very good. We can be sure that with the SVEC dish our Internet connection will be almost completely insensitive to whether conditions.

Our test revealed that SVEC 1.2 m antenna is very good (if not too good) for the casual Internet access in Poland. In the other regions of the world where the signal is not that strong, using 1.2 m dish instead of 1 m can make a difference. Our measurements proved that the gain of the dish is big. It means that its geometry leaves nothing to be desired. The SVEC 1.2m dish is a perfect choice for using it with VSAT.

We had no possibility to measure the transmitted signal but the performance of the SVEC model must be better than the reference in



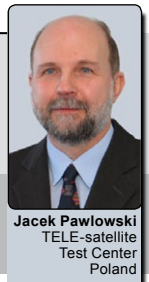
Expert Opinion

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Very solid, excellent azimuth adjustment mechanism, very good adjustable three-leg pole base.

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It might be too heavy for some applications.



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TECHNICAL DATA

Manufacturer	Sichuan Video Electronic Co., Ltd.
Web page	www.svec.com.cn
Email	svec@china.com
Fax	+86-028-87838898
Model	VS-1.2KU
Description	VSAT Dish for Ku-Band
Dish Size	120 cm (49 Inch)
Frequency Range	Receiving: 10.95 – 12.75 GHz Transmitting: 13.75 – 14.50 GHz
Mid Band Gain	Receiving: 41.5 dBi Transmitting: 43.1 dBi
VSWR	Receiving: 1.5 : 1 Transmitting: 1.3 : 1
Cross Polarization	-20 dB off axis, -30 dB on axis
Sideline Envelope	2° < 0 < 20° : 29 -25 log 0 dBi 20° < 0 < 26.3° : -3.5 dBi 26.3° < 0 < 48° : 32 -25 log 0 dBi 48° < 0 : -10° dBi on average
Noise Temperature	<55K at 20° elevation
Dish type	Prime Focus and Offset Feed
Waveguide Flange	WR75
Reflector Material	2.0mm Aluminium Plate
Mount Type	Elevation over Azimuth
Mast Size	3.5 Inch outer diameter
Azimuth/Elevation Adjustment	Azimuth: 0° - 360° Elevation: 5° - 90°
Weight	27 kg (60 lb)
Wind Load	Operational: 80 km/h (50 mph/h) Maximum: 200 km/h /125 mp/h)