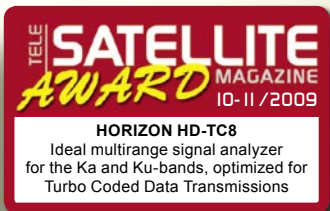


HD-TC8 from HORIZON

New feature-packed signal analyzer specially designed for the new Ka-band Internet-via-Satellite services

While it is possible with a little effort to find Ku-band satellites using a normal satellite receiver and using it to adjust the antenna, this method has its limits when dealing with Internet-via-Satellite services in the Ka-band. Even if you were to use a Ka-band LNB you would not be successful: an Internet-via-Satellite service such as Tooway, available from the HOTBIRD 6 satellite, uses a different transmission mode. Enter the new Horizon meter HD-TC8 which has the ability to directly lock on to those Turbo Coded services.



HORIZON

For a reliable solution!

toomay™


TELE-satellite World

[www.TELE-satellite.com/...](http://www.TELE-satellite.com/)

Download this report in other languages from the Internet:

Arabic	العربية	www.TELE-satellite.com/TELE-satellite-0911/ara/horizon.pdf
Indonesian	Indonesia	www.TELE-satellite.com/TELE-satellite-0911/bid/horizon.pdf
Bulgarian	Български	www.TELE-satellite.com/TELE-satellite-0911/bul/horizon.pdf
Czech	Česky	www.TELE-satellite.com/TELE-satellite-0911/ces/horizon.pdf
German	Deutsch	www.TELE-satellite.com/TELE-satellite-0911/deu/horizon.pdf
English	English	www.TELE-satellite.com/TELE-satellite-0911/eng/horizon.pdf
Spanish	Español	www.TELE-satellite.com/TELE-satellite-0911/esp/horizon.pdf
Farsi	فارسی	www.TELE-satellite.com/TELE-satellite-0911/far/horizon.pdf
French	Français	www.TELE-satellite.com/TELE-satellite-0911/fra/horizon.pdf
Greek	Ελληνικά	www.TELE-satellite.com/TELE-satellite-0911/hel/horizon.pdf
Croatian	Hrvatski	www.TELE-satellite.com/TELE-satellite-0911/hrv/horizon.pdf
Italian	Italiano	www.TELE-satellite.com/TELE-satellite-0911/ita/horizon.pdf
Hungarian	Magyar	www.TELE-satellite.com/TELE-satellite-0911/mag/horizon.pdf
Mandarin	中文	www.TELE-satellite.com/TELE-satellite-0911/man/horizon.pdf
Dutch	Nederlands	www.TELE-satellite.com/TELE-satellite-0911/ned/horizon.pdf
Polish	Polski	www.TELE-satellite.com/TELE-satellite-0911/pol/horizon.pdf
Portuguese	Português	www.TELE-satellite.com/TELE-satellite-0911/por/horizon.pdf
Romanian	Românesc	www.TELE-satellite.com/TELE-satellite-0911/rom/horizon.pdf
Russian	Русский	www.TELE-satellite.com/TELE-satellite-0911/rus/horizon.pdf
Swedish	Svenska	www.TELE-satellite.com/TELE-satellite-0911/sve/horizon.pdf
Turkish	Türkçe	www.TELE-satellite.com/TELE-satellite-0911/tur/horizon.pdf

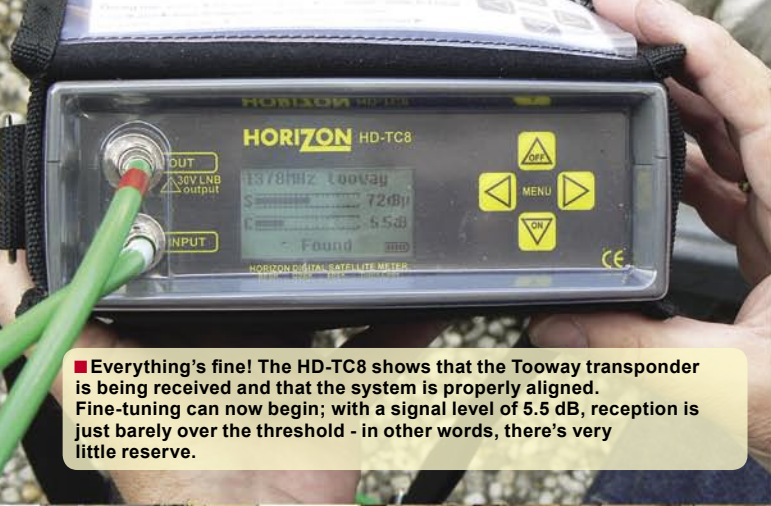
Available online starting from 2 October 2009



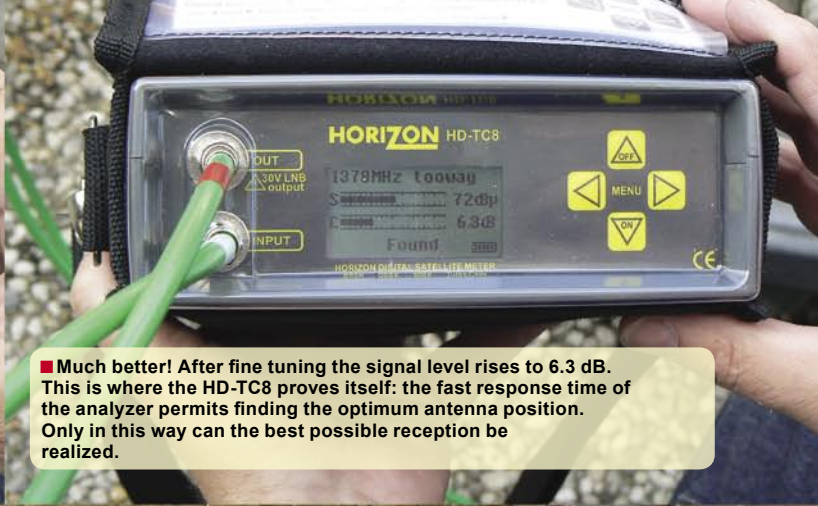
■ Ka-band specialist Ron Ebersson adjusting the Tooway dish using the HORIZON HD-TC8. Have no fear; the Tooway dish is standing properly. Polarization is set manually on Tooway systems. The LNB has a fixed position within the antenna assembly which requires the whole antenna to be rotated for correct polarization adjustment. The Tooway hardware is supplied with the correct feed (Tria) assembly for the required receive and transmit paths.

HORIZON

For a reliable solution!



■ Everything's fine! The HD-TC8 shows that the Tooway transponder is being received and that the system is properly aligned. Fine-tuning can now begin; with a signal level of 5.5 dB, reception is just barely over the threshold - in other words, there's very little reserve.



■ Much better! After fine tuning the signal level rises to 6.3 dB. This is where the HD-TC8 proves itself: the fast response time of the analyzer permits finding the optimum antenna position. Only in this way can the best possible reception be realized.

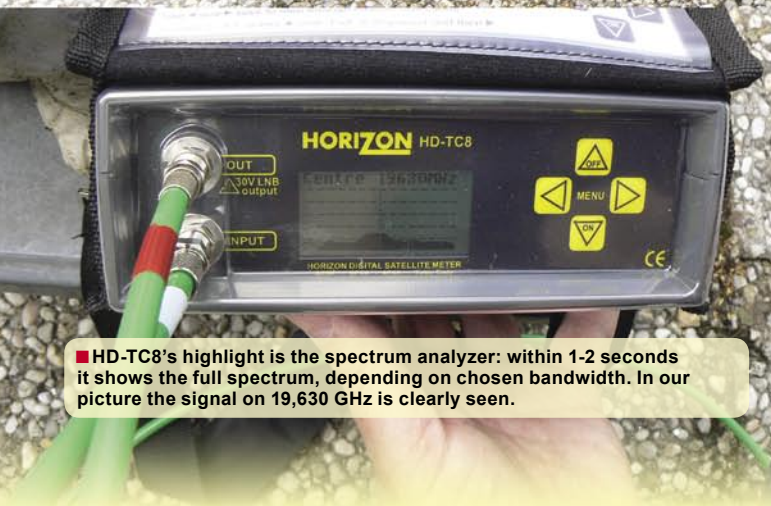


■ Are the horizontal transponders really not receivable? Since the LNB can only receive horizontally polarized signals, the entire antenna assembly must be rotated 90°.

Now with the antenna positioned properly we used the HD-TC8 to try and find one of the two horizontal transponders. But, no luck, Amsterdam is simply not in range of the horizontal beams. These beams are for France and Italy and are too far away for Amsterdam and thus too weak.

HORIZON

■ The transmitter power line is not connected, because here the satellite modem is used to provide the 30 Volts required to power the Tooway assembly. Below the HD-TC8 is supplying the 30 Volts directly to Tooway ODU which makes installations easier as there is no need to run cables before fitting the antenna.



■ HD-TC8's highlight is the spectrum analyzer: within 1-2 seconds it shows the full spectrum, depending on chosen bandwidth. In our picture the signal on 19,630 GHz is clearly seen.



■ Different spectrum spans can be selected from within the spectrum display mode. 1200, 960, 480, 240 and 120 MHz steps are available.

This is where specialty satellite signal analyzer maker HORIZON's new model HD-TC8 comes in. The Tooway LNB/Amplifier assembly requires 30 Volts to operate correctly and the HD-TC8 satellite meter's onboard power supply can provide this power directly without the need for connection to the satellite modem, making installation much easier. Actually, HORIZON's HD-TC8 is a satellite meter which can lock directly on to the turbo coded Tooway receive path carrier.

Internet-via-Satellite services primarily use the Ka-band frequency range from 18.2 to 20.05 GHz. This range provides plenty of bandwidth. Unfortunately rain tends to interfere more at this higher frequency range. For this reason, these types of services are typically installed in temperate climate zones such as in North America (e.g. Wildblue) or in Europe (e.g. Tooway).

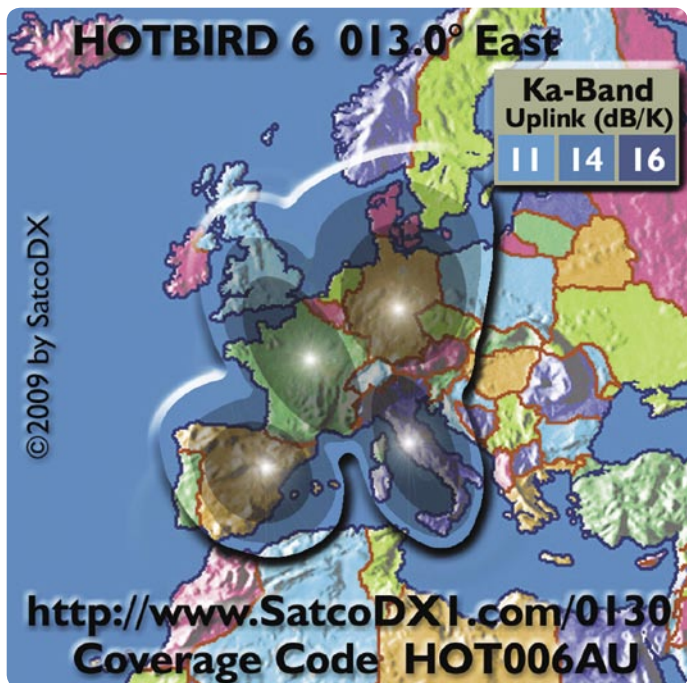
The HD-TC8 test sample that TELE-satellite received was set up for Tooway. While the downlink portion of the Tooway system covers all of Europe, the uplink side is limited to four very narrow beams. Each uplink beam has its own transponder, two with vertical polarization and two with horizontal polarization.

The HD-TC8 acquires a lock on the downlink beam available in your region. The 30 Volts required is supplied to the assembly but the Transmitter is not enabled until the installation has been completed by connecting the satellite modem. Once a lock has been obtained on the required Ka-Band service, and on connecting the Transmission line on the satellite modem it will configure its narrow bandwidth return path carrier and establish a handshake with



■ How well does the Ka-band deal with rain? We used a garden watering can to simulate a rain cloud; the signal level dropped to 4.8 dB - too low for interference-free reception.

Note that in this photo the satellite modem was used to provide the 30 Volts required to power the Tooway ODU, the HD-TC8 has 30 Volts available directly from the output connector.



■ Ka-band uplink footprint for the Tooway system on HOTBIRD at 13° east. Tooway systems need to be installed within one of these four footprints in order to be able to uplink to the HOTBIRD satellite.

the Internet Service Provider, after which the Internet-via-satellite service is authorized by the provider (in this instance Tooway) and the end user then has access to Internet and Email services.

In our case it is the vertically polarized 19.630 GHz transponder. This entry is made in the HD-TC8 as the local oscillator frequency (LOF) which for us is 1378. The remaining three frequencies are 1471, 1178 and 1271; pre-programmed by HORIZON for the alignment of Tooway systems in other locations. The four footprints overlap each other only in a few locations; in most cases only one transponder can be activated.

Everyday Use

Once the proper transponder has been entered into the HD-TC8, the alignment of the receive/transmit antenna is handled the same way as with a standard reception system: the azimuth and elevation of the antenna are adjusted until the display on the HD-TC8 displays "FOUND". Signal level and quality are also displayed.

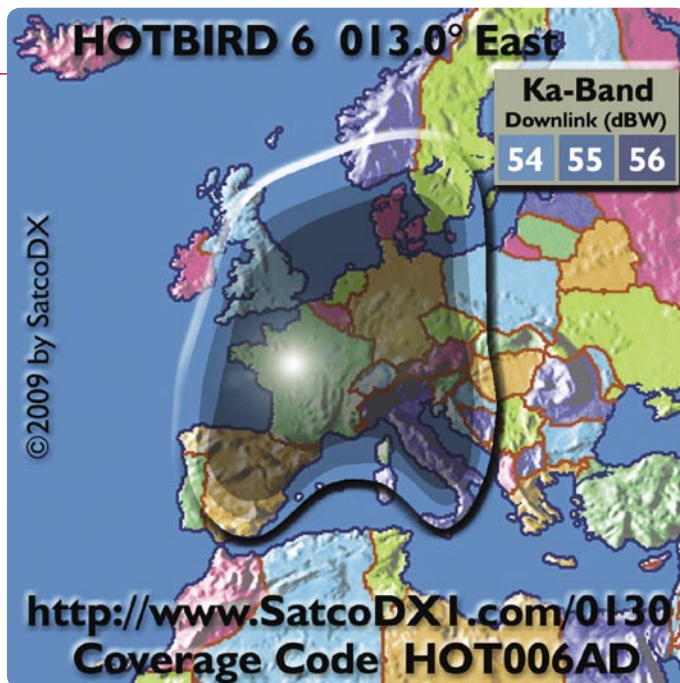
In our case at the edge of the footprint, we were only

about 1 dB over the reception threshold. Turning the antenna revealed that at 5 dB reception was no longer possible. We were only able to adjust the antenna to a maximum of 6.3 dB. The HD-TC8 is able to indicate what the reception reserve is.

We were also impressed by the long life of the built-in rechargeable battery: we were able to operate the HD-TC8 for six hours straight and it never showed any signs of fatigue.

Once the primary job of aligning the Tooway system's antenna was taken care of, we wanted to know what else we could find under the HD-TC8's hood. First we wanted to know if it could receive all of the Ka-band frequencies and how does that work?

The HD-TC8 comes with a fantastic feature: a spectrum analyzer display! In just a few seconds the display shows the entire frequency range making it possible to instantly see where any transmissions happen to be. The spectrum can be set to very wide (1200 MHz) through five steps to very narrow (120 MHz). The wide setting is used to determine if a transmission even



■ Ka-band downlink footprint for the Tooway system on HOTBIRD at 13° east.

exists while the narrower settings will identify exactly where the transmission can be found.

The four control buttons on the HORIZON HD-TC8 provide logical and simple menu access. To determine the upper and lower Ka-band limits of the HORIZON, a simple push of a button is all that's necessary to find out that the lower limit is 18.850 GHz with 20.050 GHz being the upper limit. It's a beautiful thing: finally transmissions in the Ka-band can be found - all in just a few minutes.

But what about the standard Ku-band? Can the HD-TC8 handle that? But of course! The HD-TC8 is really an upgrade of HORIZON's successful HDSM USB Plus model. It even looks the same. Just like the USB Plus, the HD-TC8 can also be connected to a PC via the USB interface so

that satellite and transponder data can be edited. The latest satellite and transponder data can be downloaded from HORIZON's web site www.horizongh.com. This data would of course include additional Internet-via-Satellite services that work using other transponder frequencies.

Conclusion

For a satellite installer looking to upgrade to equipment that won't become obsolete too quickly, the HD-TC8 from HORIZON would be a good choice since Ka-band Internet-via-Satellite services are becoming increasingly popular.

To be able to properly set up a receive/transmit system, a proper signal analyzer is necessary. The HD-TC8 lets you do both: you can use it to align a normal Ku-band system and at the same time perfectly adjust a Ka-band system with uplink transmitter. It's really two analyzers in one!

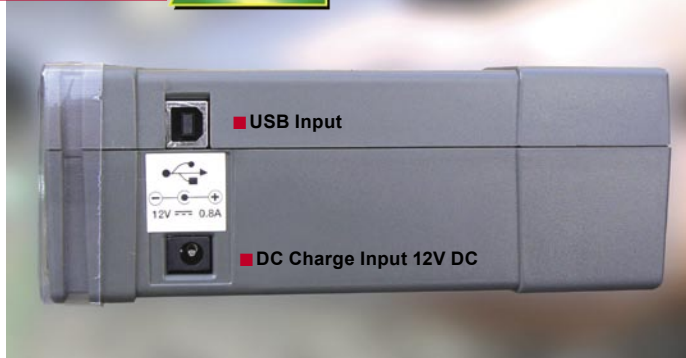
Expert Opinion

- + Optimized use for Ka-band reception
- Fast response spectrum analyzer display
- Extremely long battery time



Ron Ebersson
TELE-satellite
Test Center
Netherlands

- Display hard to see in bright sunshine



TECHNICAL DATA

Manufacturer	Horizon Global Electronics Ltd., Unit 3, West Side Flex Meadow Harlow, Essex, CM19 5SR, United Kingdom
Tel	+44 (0) 1279 417005
Fax	+44 (0) 1279 417025
Web	www.horizonhge.com
Email	sales@horizonhge.com
Model	HORIZON HD-TC8
Function	Satellite Meter optimized for Ka-Band

Comparison of the HORIZON HDSM USB Plus with the HORIZON HD-TC8



HDSM USB Plus



HD-TC8

Compatibility	DVB-S, DSS (DirecTV)	DVB-S, DSS, Turbo Code (AMC), Digicipher II
Modulation standard	QPSK	BPSK, QPSK, 8PSK, 16QAM
Compatible network	DirecTV legacy, DishNetwork, DVB-S other (e.g. VSAT)	DirecTV legacy, DishNetwork, DVB-S other (e.g. VSAT) also Tooway / Wildblue, Starchoice etc
Compatible RF band	L-band, C, Ku, Ka (with appropriate LNB/f)	L-band, C, Ku, Ka (with appropriate LNB/f)
Frequency range	950 to 2150MHz	950 to 2150MHz
Input signal range	-25dBm to -65dBm	-10dBm to -70dBm, with over- and under-range indication
RF input connector	Panel male F connector, replaceable barrel (from March '09)	Panel male F connector, replaceable female F-F barrel
Secondary connector	As above, looped-through RF output, DC blocked	As above, 30V dedicated output for WildBlue / Tooway etc.
Supported symbol rate	1Msps to 45Msps	1Msps to 45Msps, up to 30Mbaud data rate.
Signalling compatibility	DiSEqC 1.1, 22kHz	DiSEqC 1.1 to 2.0, 22kHz multi-standard
DC power output to LNB	13V, 18V at up to 550mA, or DC off	13V, 18V, 21V at up to 750mA, 30V at up to 250mA
Power capability	Standard or Universal LNB/f, some VSAT LNBS	As HDSM, also VSAT assemblies such as Tooway and Wildblue that require a 30 Volt supply
Data in/out connector	USB type B socket (USB 2.0)	USB type B socket (USB 2.0)
Data format	Proprietary transponder data, CSV-formatted output	Proprietary transponder data, CSV-formatted output
Data source	Horizon HDSM standard website	Horizon HD-TC8 website
Data logging destination	User spreadsheet	User spreadsheet
AC input power socket	"Figure 8" shrouded, male contacts	"Figure 8" shrouded, male contacts
AC input range	100VAC - 240VAC, 50/60Hz	100VAC - 240VAC, 50/60Hz
DC input power socket	2.1mm / 5.5mm DC power socket, centre positive	2.1mm / 5.5mm DC power socket, centre positive
DC input range	11.5VDC to 14.0VDC (vehicle lighter socket)	11.5VDC to 14.0VDC (vehicle lighter socket)
Battery rating	7.2V nominal, 3300mAh, NiMH, 6 cells, fused	14.8V nominal, 2400mAh, Li-Po, 4 cells, fully autonomous
Battery charging	4 hours to 90% approx., 8 hours to full charge	4 hours to 90% approx., 8 hours to full charge
Battery life per charge	6 hours continuous in average use	6 hours continuous in average use
RF level indication	Bargraph, with numeric values in dBuV or linear value	Bargraph, with numeric values in dBuV or expanded linear
Lock indication	"Found" displayed on screen, audible lock indicator	"Found" displayed on screen, audible lock indicator
Quality indication	Bargraph (inverse BER), MER (carrier-noise)	Bargraph and MER (carrier-noise) in dB or expanded linear
Bit error indication	Numeric, pre- and post-FEC	No BER indication (Post-FEC reading is meaningless)
I and Q indication	QPSK constellation diagram	QPSK, 8PSK, 16QAM constellation diagram
Swept frequency display	Variable-span spectrum diagram, with level boost	Variable-span spectrum diagram, with level boost
Transponder capacity	64 transponders maximum, plus 1 custom	Up to 4092 transponders, including multiple customs
Meter diagnostics	Internal main power rail, battery state, I2C	Multiple rails, battery state, I2C
External diagnostics	LNB or cable open/short circuit, faulty LNB	LNB or cable open/short circuit, faulty LNB, LNB voltage
Pointing aid	Fast, positive satellite ID	Fast, positive satellite ID, ZIP/post code lookup table
Dual TP mode available	yes	yes
Pass/fail	histogram and pass/fail indicator for Single Cable Routers	histogram and pass/fail indicator for Single Cable Routers

User Comment



■ Rini de Weijze on the HD-TC8 from HORIZON:
"I love the HD-TC8 because of its spectrum analyzer.
Aside from that, it's also a very lightweight, handy tool
that is easy to use."