DekTec DTA-2138

- *receives DVB-C, DVB-C2, DVB-T and DVB-T2*
- *ideally suited for monitoring DVB-C2 and DVB-T2 TV networks*
- *hardware-based demodulation, does not use the PC's processing power*
- *provides information on HF signal level, MER, BER and L1 parameters*
- *DekTec API for programming and compiling tailor-made applications*

Professional DVB-C2/DVB-T2 card for PCI Express

TELE-audiovision readers have come to know and appreciate DekTec as a specialist for digital signal measurement. The range of products on offer includes PCI, PCI Express and USB-based receivers for existing digital TV signals worldwide, as well as corresponding modulators to create all those signal types from scratch. Added to that are software applications for Windows which can be used to analyse, modulate, demodulate and even multiplex signals – without requiring an IT degree from their users. What's more: Any combination of DekTec hardware and software can be chosen, since they are all designed to work with each other no matter how you match them.

And if you also add the new DTA-2138 card to the existing DekTec range, you'll arrive at a fully-fledged system for carrying out all imaginable professional tasks. The DTA-2138 is a PCI Express card with built-in DVB-C2/DVB-T2 receiver, which of course is also compatible with the DVB-C/DVB-T transmission standards. It comes in a box that – in addition to the card itself – includes an adaptor sheet so that the DTA-2138 can be installed in standard PC cases as well as in small-size cases and blades.

Contrary to this adaptor sheet, firmware and suitable applications for the DTA-2138 are not shipped with the card by default, but can be downloaded from DekTec's website. There you will also find the software developer kit (SDK) complete with the DekTec API. Watch out for a dedicated report on the API in one of the upcoming issues of TELE-audiovision.

DekTec recommends the following applications for its DTA-2138 card:

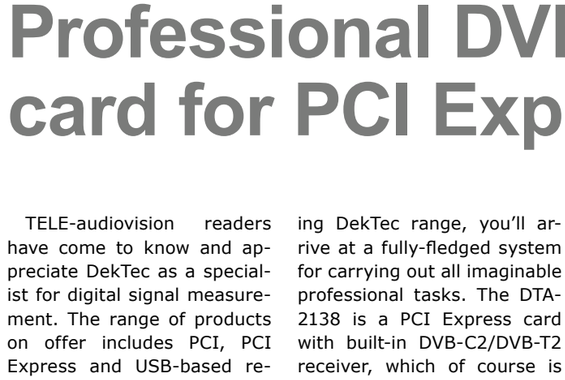
- DtTS Television
- DtGrabber+ Recording
- MuxXpert Real-Time Multiplexing
- StreamXpert TS Analyser

All of these applications have to be purchased and must be licenced individually. We can also recommend the DtInfoTool software which gives you detailed information on all installed DekTec components and comes with handy tools for configuring all components as well as for updating the firmware, if required. Actually, one of the signature features of DtInfoTool is its firmware update alert: Newly added features and functions as well as bug fixes are listed in an exemplary way so that users can decide whether or not an update makes sense on a case-by-case basis. Updates are never forced on anybody, which is another exemplary strategy by DekTec. What's more, all installed licences can be called up with this software, and new licences can be imported.

DtTS Television

This is an easy-to-use application for displaying TV channels. Any available transponder can be selected from one of the installed DekTec cards and its content will appear on screen quick as a flash. Both window and full-screen mode are available and obviously you can zap up and down the list or call up the required channel directly. Compared to fully-fledged TV applications such as DVB Viewer, this piece of software does not come with additional features like teletext or an EPG. But then again, DtTS Television serves an entirely different purpose.

Professionals have different requirements than your average John Public. One of those prerequisites is reliable operation 24/7. With the



DTA-2138 you need not worry about overheating, since the entire card acts as a single solid cooling element. Our test proved that the card does not heat up significantly even under heavy use, which means it can easily be removed and re-installed without causing burns. As a pleasant side effect, electrostatic discharge is also reduced considerably.

If you expect channel lists and different search modes, DtTS Television is not for you. Frequencies need to be entered manually, which is just the way it has to be in professional environments. After all, this application is designed for test scenarios that call for quick and efficient evaluation of specific frequencies without having to first go through a settings editor and channel search.

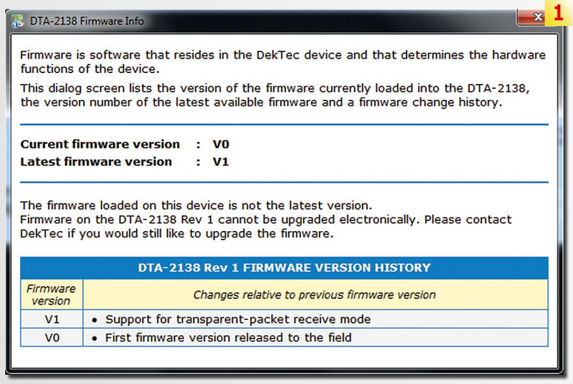
One of the draw cards of DtTS Television is the fact that you can launch the application any number of times concurrently, even if only a single card is installed in your PC. Each instance appears in a separate window that does not interfere with others so that an overall impression of different channels on the chosen transponder can be created. This feature even gives you the option of launching the application for each single channel on a transponder, thus creating a live mosaic view. There's only one word for it: brilliant! Additional windows can be enlarged if required and the only limit is your PC's processing power. At any rate, with DtTS Television being a lean and streamlined piece of software and with the DTA-2138 card not requiring CPU capacity for demodulation, you should be able to go a long way before bringing your PC to its knees. To give you an impression of how far you can go: During our test I was able to open up to ten windows with ten live channels using an ageing Intel Core 2 Quad PC with 2 GB of RAM. Talk about efficiency!

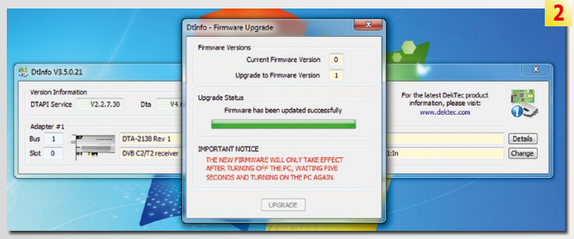
And while I was at it I wanted to check out whether the UltraHD test transponder of HISPASAT (30.0W) could be passed on as a DVB-T2 modulation as well. It is in a situation like this that you thank heavens for DekTec with its many different hardware components that can be shuffled and combined to your heart's content. For my particular job all I had to do is match the new DekTec DTA-2137C card – which features a DVB-S2 receiver with two ASI IN/OUT interfaces that can be freely configured – to the DTU-215 Gold USB modulator. This combination did the trick and modulated the UltraHD transponder from DVB-S2 into DVB-T2. MuxXpert was used on the software side. This is a software multiplexer that can be configured through XML files and allows any combination of input-output stream multiplexing. So what did I get out of all this? Well, nothing less than perfect reception of the UltraHD test channel that has been modulated into a DVB-T2 signal. And the best part? Even my rather weak PC could handle and display the signal flawlessly.

DtGrabber+ Recording

This is your number one choice for recording a transport stream. DtGrabber+ Recording takes the transport stream from any DekTec card that is installed and saves it as a TS file. As an alternative, a network transport stream (IPTV) can be recorded as well. This setup allows to use the DTE-3137 receiver from DekTec, for example, which is an autonomous professional satellite receiver for DVB-S2 that feeds the received transport stream into the network. Thanks to its small size it is wonderfully suited for rack installation in a control cabinet. If you want to find out more about this excellent device please have a read of our test report that was published in TELE-audiovision 11-12/2012.

After I had installed DtGrabber+ Recording on my test computer, the software detected the DTA-2138 card right away and allowed me to modulate the received signal into DVB-C, DVB-C2, DVB-T or DVB-T2. Here, too, we found that the application is not only extremely easy and self-explanatory to use, but also does not require a lot of processing power and therefore hardly affects your PC's resources. After a double-click on the application icon it is ready for use more or less immediately. If you're inclined to assume now that so much ease of use might ultimately affect the range of available





1. Just fit the DTA-2138 in an empty PCI Express slot and install the drivers. You don't even have to select between different driver archives, because Dektec offers one single installation to cover all their products. To check if everything is OK, use the free DtInfo utility. In my case DtInfo informed me that a new firmware was available. Clicking on the Info-button reveals this window, showing the changes of the new version. It is nice that DekTec does not force you to update drivers and in some cases DekTec explicitly alerts you which incompatibilities may result with custom software.

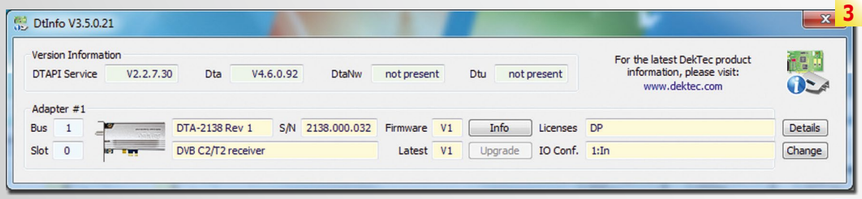
2. Of course I updated the firmware immediately, if not just to see how it works. However, there is not much to tell here: it just worked flawlessly.

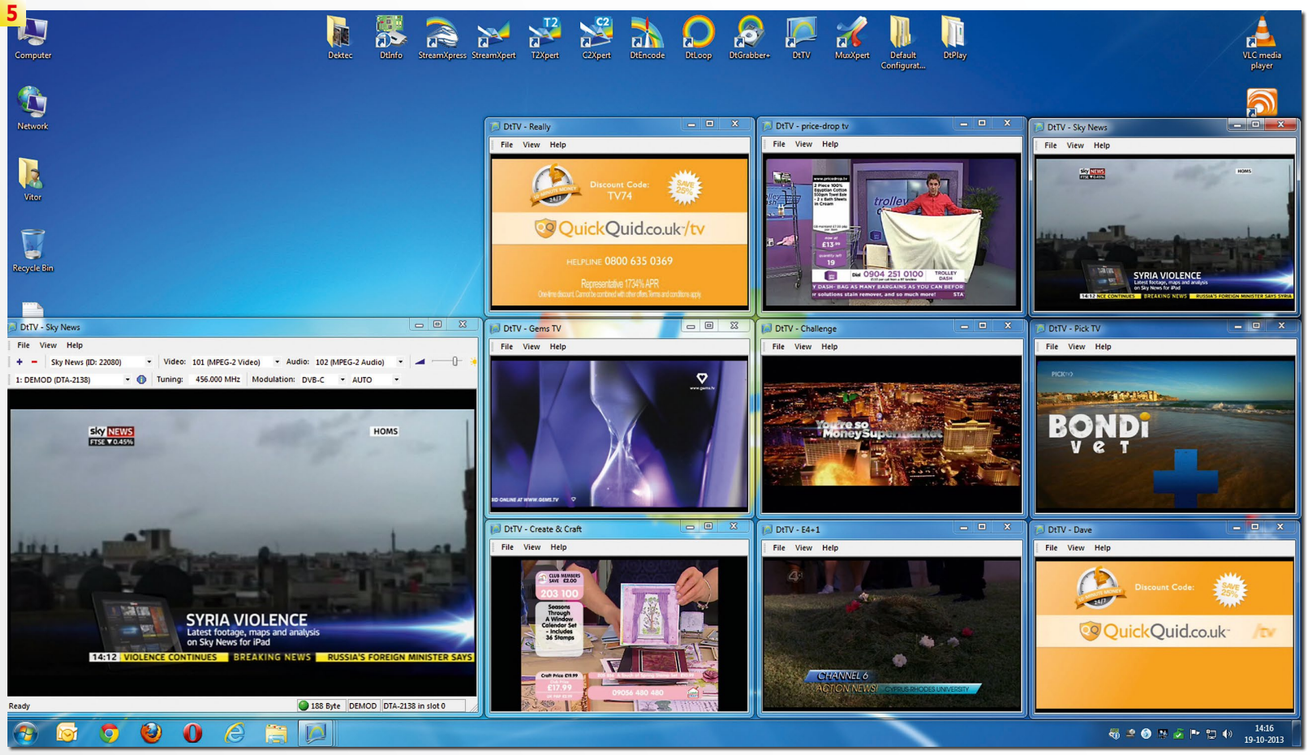
3. now DtInfo shows that the computer is fitted with one DTA-2138 Rev 1 card running with the latest firmware release. You can consult and import the software licenses with this software, too.

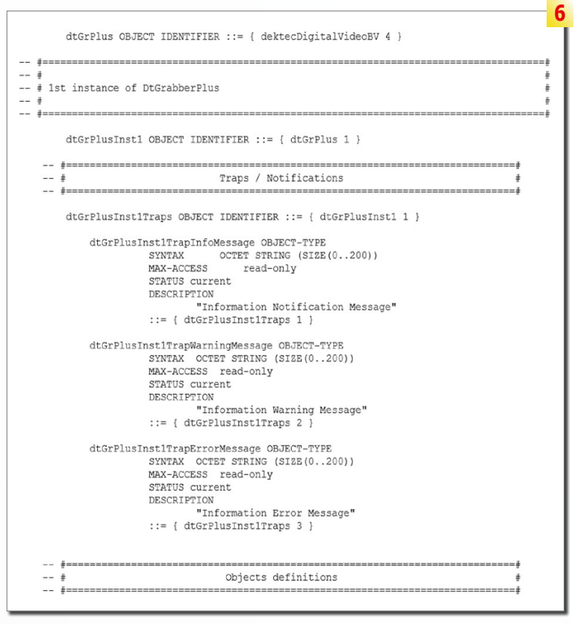
4. DtTV is DekTec's TV player application. In the upper left corner you select the device (in this case I only have the DTA-2138 installed on my computer) and chose the reception parameters. The toolbar underneath (you can move it wherever you want) allows the selection of the desired channel.

5. DtTV can be started in as many concurrent sessions as you want. The best of it is that different sessions can share the same tuner. This allows you to setup a live TV mosaic. Even better is the fact that I did not notice any slowdown on my test computer, despite using just a Core 2 Quad CPU with 2 GB RAM and no dedicated graphics card.

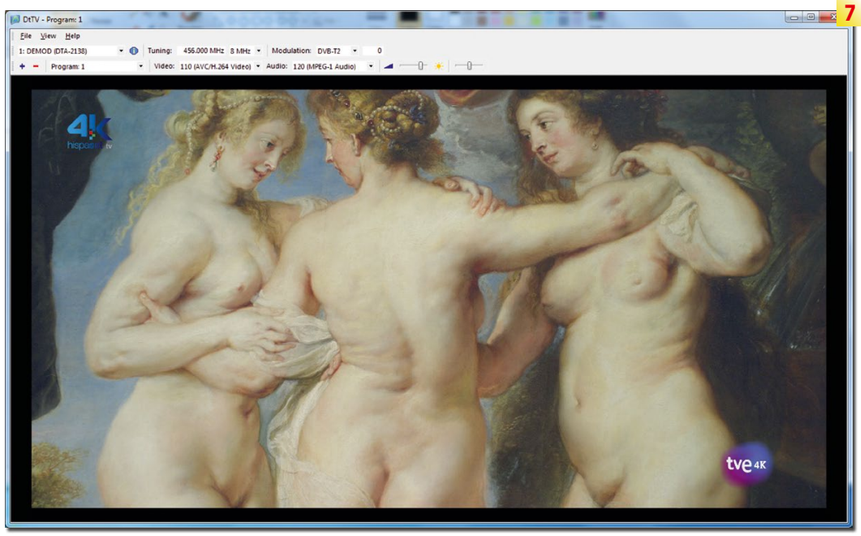
6. Excerpt from the beginning of an MIB table, which is part of the DtGrabber+ installation. The full MIB table comprises more than 6000 lines of software code and is responsible for defining the functions of the SNMP control software.







```
        dtGrPlus OBJECT IDENTIFIER ::= { dektecDigitalVideoBV 4 }

-- #=============================================================================#
-- #                                                                             #
-- # 1st instance of DtGrabberPlus                                               #
-- #                                                                             #
-- #=============================================================================#

        dtGrPlusInst1 OBJECT IDENTIFIER ::= { dtGrPlus 1 }

    -- #=========================================================================#
    -- #                          Traps / Notifications                          #
    -- #=========================================================================#

        dtGrPlusInst1Traps OBJECT IDENTIFIER ::= { dtGrPlusInst1 1 }

            dtGrPlusInst1TrapInfoMessage OBJECT-TYPE
                    SYNTAX      OCTET STRING (SIZE(0..200))
                    MAX-ACCESS      read-only
                    STATUS current
                    DESCRIPTION
                            "Information Notification Message"
                    ::= { dtGrPlusInst1Traps 1 }

            dtGrPlusInst1TrapWarningMessage OBJECT-TYPE
                    SYNTAX  OCTET STRING (SIZE(0..200))
                    MAX-ACCESS  read-only
                    STATUS current
                    DESCRIPTION
                            "Information Warning Message"
                    ::= { dtGrPlusInst1Traps 2 }

            dtGrPlusInst1TrapErrorMessage OBJECT-TYPE
                    SYNTAX  OCTET STRING (SIZE(0..200))
                    MAX-ACCESS  read-only
                    STATUS current
                    DESCRIPTION
                            "Information Error Message"
                    ::= { dtGrPlusInst1Traps 3 }


    -- #=========================================================================#
    -- #                          Objects definitions                            #
    -- #=========================================================================#
```



7. Taking it to extremes: what you see is Hispasat's (30.0W) UltraHD demo transmission, received with DekTec's DTA-2137C, re-multiplexed with DecTecMuxXpert and modulated with DekTec's DTU-215 Gold. The resolution was 3840x2160.

functions and features DekTec proves us all wrong once more. The application can be fully remote-controlled, offers timer-based recordings and alert messages if something goes wrong.

Professional users, in particular, will look for the SNMP function of DtGrabber+. SNMP is short for Simple Network Management Protocol and since SNMP is an industry standard every SNMP software will be able to control SNMP-enabled devices, irrespective of the manufacturer.

A Management Information Base (MIB) defines all functions of the various devices so that SNMP components can communicate with each other. DekTec offers the DtGrabber+ application complete with an MIB table which is saved into the program directory.

Once that information is imported into whatever control software is being used, DtGrabber+ becomes fully integrated into the existing system.

What's more, not only DtGrabber+ as an individual application joins the existing environment, but also all DekTec hardware components identified by DtGrabber+.

If, for example, DTA-2138 creates an error alert, DtGrabber+ will instantly cause a so-called trap, which means a control message is sent to the SNMP control software via UDP port 162. The control software in turn will show the data package according to the MIB definition or will initiate specific task sequences, depending on the SNMP control software that is used.

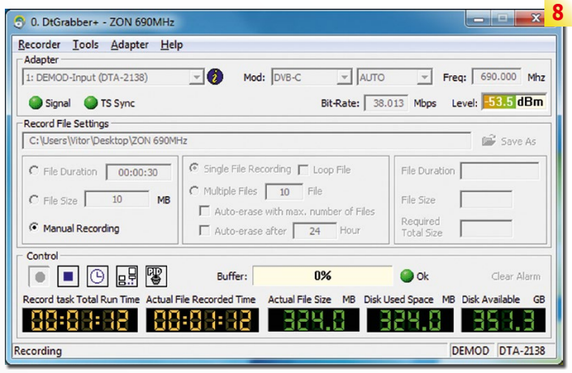
This way a text message can be sent to the mobile phone of the technician in charge, for example.

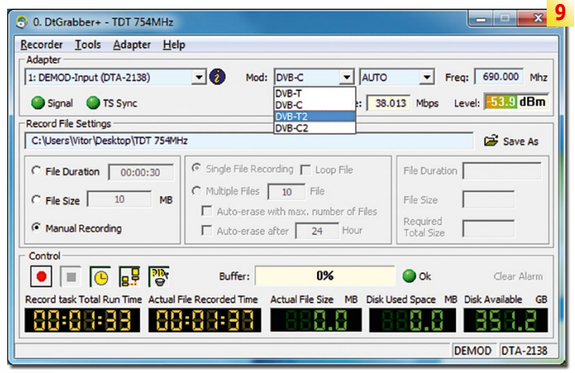
MuxXpert Real-Time Multiplexing

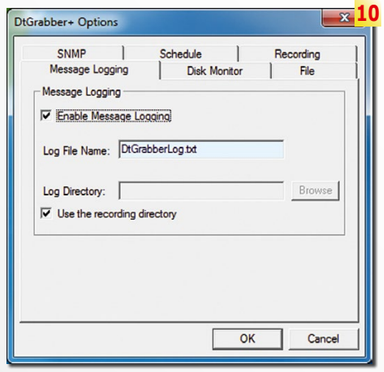
MuxXpert Real-Time Multiplexing is the name of an application that allows multiplexing and forwarding any input signal. The feed signal may originate from the tuner or the ASI interface of a DekTec receiver and is then either saved onto the hard disk or provided via IPTV, ASI or a DekTec modulator. The sky's the limit when it comes to the number of combination options, which is why DekTec has taken a somewhat unconventional approach when it comes to working with the application: Configuration takes place with the help of XML files, which can be edited and adjusted with any XML editor. If you now want to create your own XML file from scratch with all required configuration parameters, you first have to dig a little deeper and educate yourself about different ways of creating clearly-structured and purposeful XML files. Thankfully, DekTec provides default configuration files for all of its combination options, and if need be those default files can be edited and adjusted to meet specific demands.

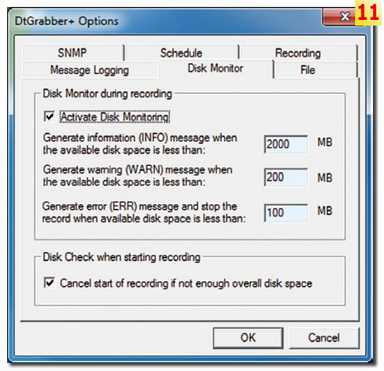
The main benefits of that approach are that it firstly takes the configuration phase offline and secondly gives users virtually endless possibilities for creating their own

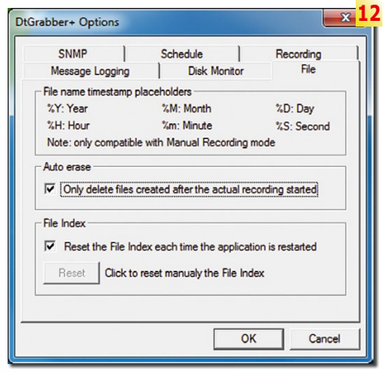
From left to right: the DekTec DTU-215 VHF/UHF Modulator to generate HFsignals from 47 MHz to 1000 MHz in any conceivable digital modulation, the DekTec DTE-3137 rack-mounted DVB-S2 to IP and ASI internet receiver - ideal to forward DVB-S2 transponders over network, the DekTec DTA2137C DVB-S2 satellite receiver card with dual LNB inputs and two ASI ports (can be configured as input or output) and finally at the far right the DekTec DTA 2138 DVB-T2/C2 receiver card.

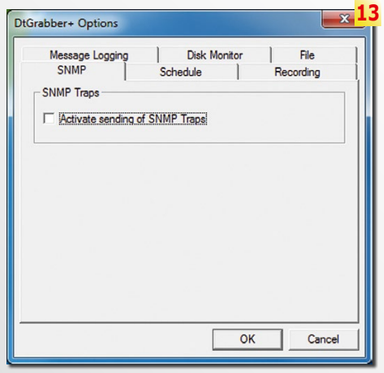


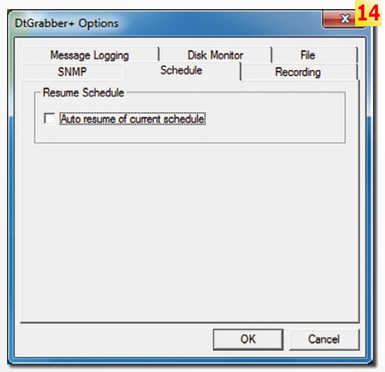


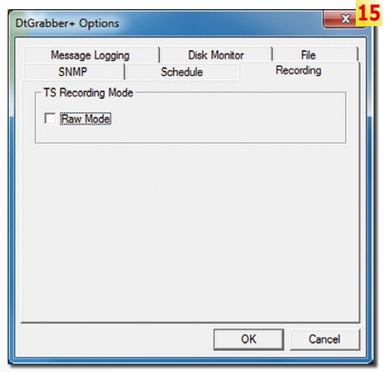


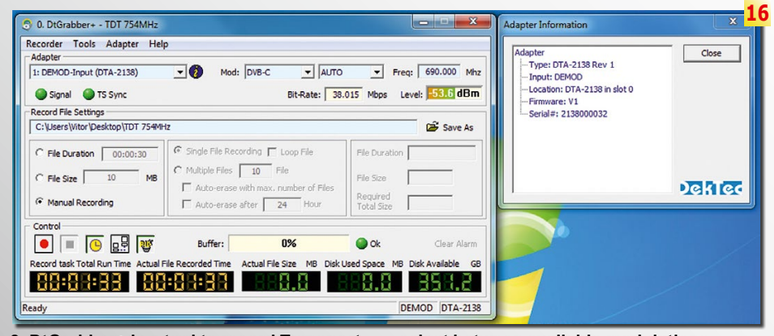












8. DtGrabber+ is a tool to record Transport Streams. It does not matter where those streams come from: just select the appropriate adapter or IP address and you're set to go. In this case, the selection is obvious: the DTA-2138 is the selected input adapter.

9. Recording can be started and stopped manually, by means of a timer or remotely. For the currently active adapter, you can select between available modulations and then set the reception frequency. Most other reception parameters are set automatically.

10. For professionals, logging is important to backtrack what went wrong in case of an error. DtGrabber+ offers such logging into simple text files, which is the best format, as it can be easily processed further on.

11. When it comes to record Transport Streams to hard disk you have to be careful to not fill the hard disk up to 100%, as this could cause severe system problems. Again, DtGrabber+ offers comprehensive functionality to alert before such a situation happens.

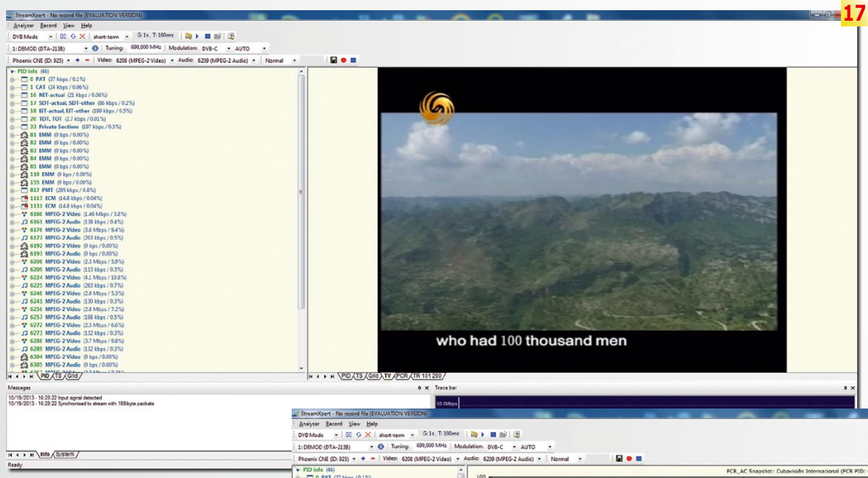
12. Files can be created with automatic naming and you may automatically erase old files.

13. IT professionals never sleep and use smartphones, which are always connected to the internet. It makes all sense that you can send SNMP traps, if something goes wrong.

14. Here you configure if you want to resume a recording schedule automatically.

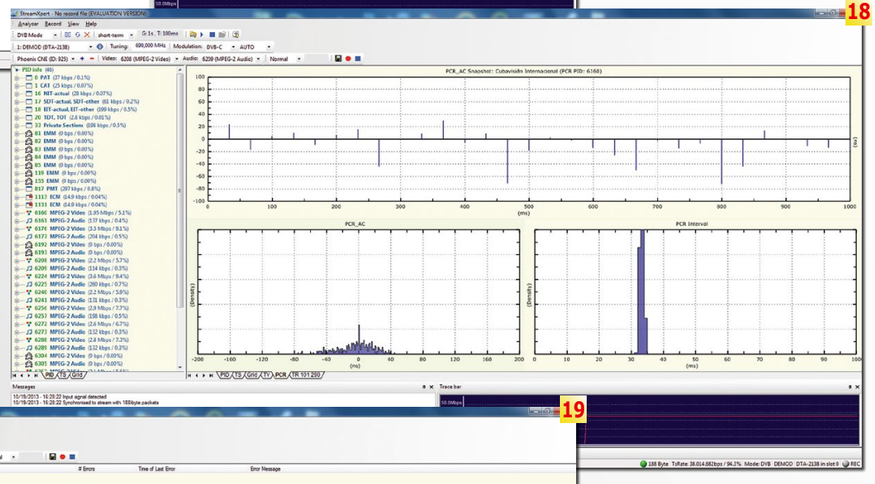
15. Should the Transport Streams be stored in raw mode? This will write all empty PIDs with lots of &H00 bytes, increasing file size. You normally would skip those PIDs, but when you want to have a 1:1 recording of the output, the check box needs to be validated.

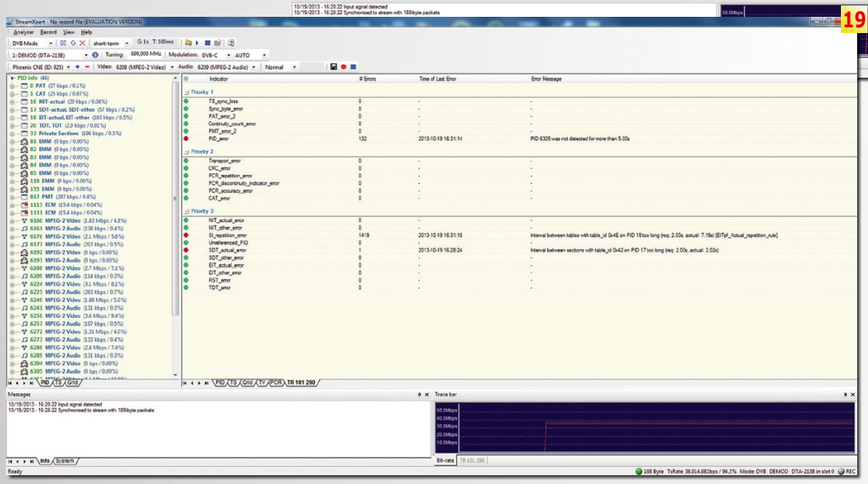
16. Is the hardware working? Just call the Adapter Information window! Yes all is working fine.



17. StreamXpert is a full TV analyzer software, which allows to simultaneously display the live picture. The window is neatly organized and gives quick access to the huge amount of data contained within a Transport Stream.

18. PCR stands for Program Clock Reference and is used to keep i.e. the audio and video data synchronized. It should be present at every 100 ms and its jitter (deviation from this time interval) should be within +/- 500 ns.





Monitoring this parameter can be crucial to detect jitter introduced by receivers, multiplexers, modulators, etc.

19. TR 101 290 represents the technical report called "Digital Video Broadcasting; Measurement guidelines for DVB systems" by JTC/EBU/CENELEC/ETSI. This tab allows to overview the most important parameters at one glance.

20. Dissecting the Transport Stream...

21. The window can be fully customized. Just drag each element to where you want it.

setup environment. In addition, it is possible to build up a whole library of XML configuration files for different jobs. Need an example? Just imagine you have both a DTA-2138 (DVB-C, DVB-C2, DVB-T and DVB-T2) and a DTA-2137C (DVB-S, DVB-S2 and ASI-IN/OUT). MuxXpert Real-Time Multiplexing allows you to quickly and easily compile an XML configuration file for multiplexing a DVB-T2 channel with a DVB-S2 channel and

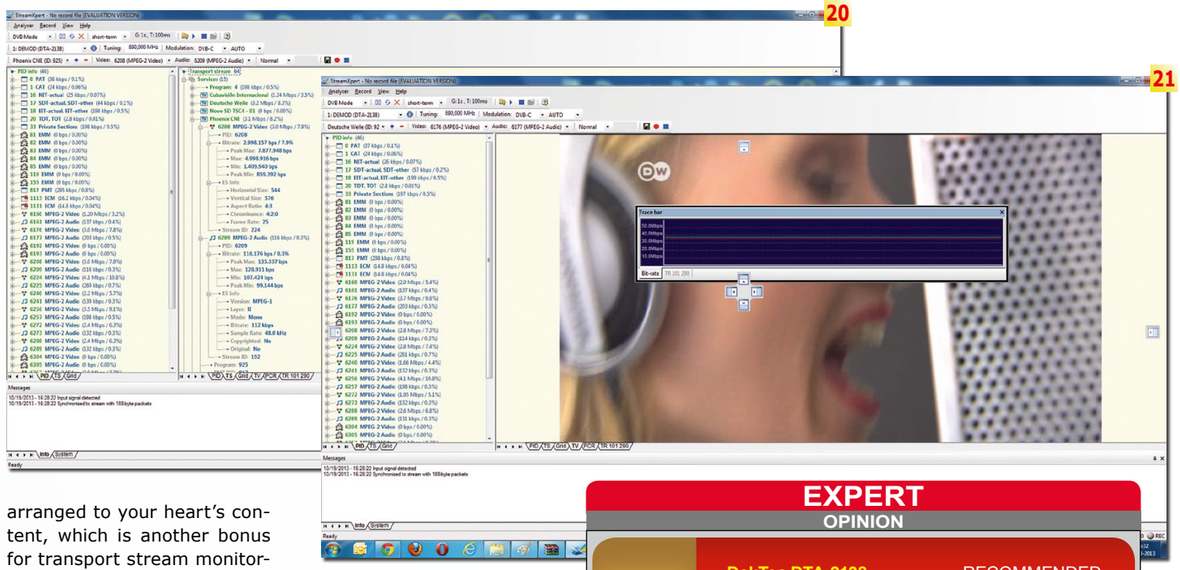
StreamXpert TS Analyser

Apart from all other possibilities, the DTA-2138 is also perfectly suited for analysing transport streams. To this end, DekTec provides the StreamXpert TS Analyser application. Once again, this piece of software is not designed for the DTA-2138 exclusively, but will work with all other DekTec products that can provide a transport stream.

StreamXpert TS Analyser instantly detects the DTA-2138, which can then be selected as input adapter. Once that is taken care of, all you need to do is select the desired modulation type and enter the specific frequency, much like with the other applications mentioned above. All remaining parameters are adjusted automatically so that the transport stream becomes available in next to no time at all.

If required, all transponder stream parameters can be displayed, which is why the application window is divided into two main sections. In the left section you can choose between PID, TS or grid presentation, while the right section features tabs for PID, TS, grid, TV, PCR and TR 101 290 display. Any combination of tabs can be shown side by side, which makes for a very streamlined and meaningful arrangement with all required information available at a single glance.

The current bit rate is simultaneously shown as a graph in real time. Being a Windows-based application, all window sections can be moved and



arranged to your heart's content, which is another bonus for transport stream monitoring and analysis.

Conclusion

The DTA-2138 is one more link in DekTec's impressive product range. With this new addition it is now possible to feed DVB-C2 and DVB-T2 signals into a DekTec system. During our test we never encountered any problems or unexpected behaviour of hardware or software components. Even when we tried to push the limits with very weak signals, reception remained reliable. What impressed us most was the fact that even with the HF input signal being switched off and on again frequently, the DTA-2138 card apparently could not care less and just kept working. There was not a single software freeze throughout our entire test and we applaud DekTec for such an achievement, which is truly out of the ordinary. We have had other TV applications before that needed to be re-launched numerous times until the card did not react any longer and the operating system had to be re-started to get everything going again. Many TV cards simply cannot handle HF signal interruptions. The DTA-2138 definitely is not one of them, since it performed just as intended and never required a system re-start.

Thumbs up for DekTec and its latest product.

EXPERT OPINION

DekTec DTA-2138
DVB-C2/T2 PCI Receiver Card

RECOMMENDED PRODUCT BY

TELE-audiovision
THE WORLD'S LARGEST DIGITAL TV TRADE MAGAZINE

Vitor Martins Augusto
Test Center
Portugal

VIP CARD

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+
- **Very robust: no crashes during whole test period, despite severe test conditions**
- **Little CPU load caused due to Hardware-based Demodulation**
- **No overheating**
- **Card provides RF level, MER, BER and monitoring of L1 parameters for measurements**
- **Free programming interface (API) provided by DekTec**

−
- None

DekTec Products

DekTec has a multitude of products in store for testing receivers and digital TV components at large. Two of those products are the DTU-215 modulator and DTE-3137 satellite receiver. Both devices were featured in test reports published in previous issues of TELE-audiovision:

http://www.TELE-audiovision.com/TELE-satellite-1201/eng/dektec.pdf

http://www.TELE-audiovision.com/TELE-satellite-1211/eng/dektec.pdf