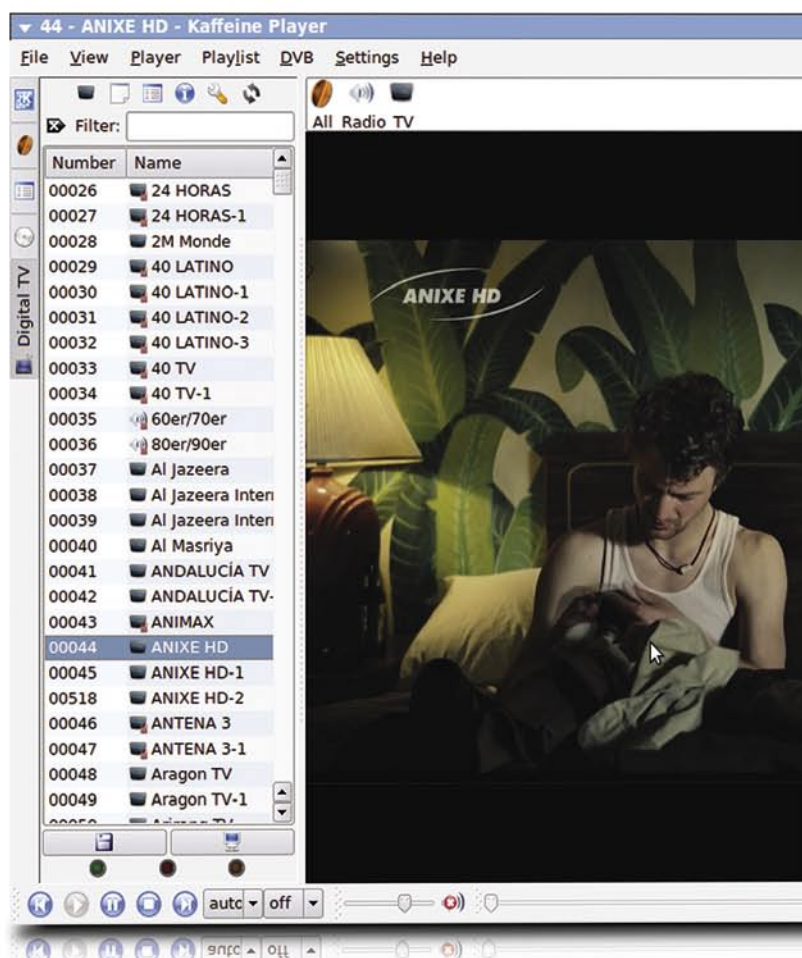


NetUP Dual DVB-S2-CI

Two Tuners in HDTV in one PC Card

A specialist company in the area of IPTV is NetUP from Moscow, Russia. They offer all kinds of products for the distribution of IPTV signals including DVB Gateways, Conditional Access Systems and even Billing Systems for IPTV networks. Their latest development is a professional high-density satellite reception card, which is mainly targeted at the professional market in DVB-IP gateways, home theaters and satellite Internet systems. Their card not only comes equipped with two DVB-S2 tuners, but also with two Common Interface slots, and all this packed into one single card fitting in a PCIe slot. Since it's a card aimed at the professional market it's running on Linux. Mainly this card will be used in rack mounts. Usually, these can house two cards. With a regular PC Card this would mean handling 2 channels. But using this new two-tuner card a single rack can manage 4 channels in one rack.



Installation

Even though this is a professional card, it is as well very attractive for the satellite watcher, who would like to watch his local football team grabbing the European cup in full-screen HD while at same time keeping an eye on what happens in the latest episode of his favorite show. The satellite enthusiast hunting satellite feeds might even have more fun with this card, now that he can track two different DVB-S2 feeds at same time. There are many ways how this card can be of good use for the real enthusiast as well as for the real professional. To be really happy with the card, I recommend using a high-end PC, because the card does not include a dedicated H.264/MPEG2 hardware decoder.

The card comes without any software or installation instructions. On NetUP's support page (http://www.netup.tv/en-EN/dual_dvb-s2-ci_card.php) it's stated that this card has "drivers for Linux OS". My next step was to check the chipset used on board: it is a Conexant CX23885. Armed with this piece of information I checked if the card is supported by video4linux (v4l for short). To do this, I went to

TELE-satellite World

www.TELE-satellite.com/...

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Swedish	Svenska	www.TELE-satellite.com/TELE-satellite-1003/sve/netup.pdf
Turkish	Türkçe	www.TELE-satellite.com/TELE-satellite-1003/tur/netup.pdf

Available online starting from 29 January 2010



the main source for DVB-S(2) cards, which is the LinuxTV Wiki at <http://www.linuxtv.org>. After two mouse clicks



I found what I searched for: the card is indeed supported! http://www.linuxtv.org/wiki/index.php/NetUP_Dual_DVB_S2_CI

Having finished these preliminaries, I switched on

my spare PC, which runs on Ubuntu 9.04. After power on and logging in, I would have expected the card to be automatically detected. But dmesg said: No (Pic.1). So it seems that the default version of v4l bundled with Ubuntu 9.04 is not able to use the card. Luckily, in the card's page on LinuxTV Wiki there's a hint on how to make it work: you need to check the latest source from v4l repository. The repository is based on mercurial source control system. Naturally, in order to be able to check out the source you need to install it. Under my Ubuntu installa-

tion only one command was needed:

\$ sudo apt-get install mercurial meld (Pic.2).

After this I entered the commands suggested in LinuxTV Wiki, which resulted in the required kernel modules and programs to be built:

```
$ hg clone http://linuxtv.org/hg/v4l-dvb/
$ cd v4l-dvb
$ make > /dev/null 2>&1
$ sudo make install > /dev/null 2>&1
```

Time to check if everything is in order. I rebooted the

computer and checked again the status of the card detection by using dmesg. Bingo! The card was detected this time with both of its tuners, as can be seen in (Pic.3).

Now, after the card was detected, all that was left to do is to install a player that's able to open a DVB device and play the corresponding stream. The easiest software to use is Kaffeine, which can be fastly installed by using this command:

\$ sudo apt-get install kaffeine

Kaffeine depends heavily on




```
alex@linuxtv: ~$ dmesg
[ 10.580571] parport_pc 00:09: reported by Plug and Play ACPI
[ 10.580610] parport0: PC-style at 0x378, irq 7 [PCSPRP,TRISTATE]
[ 10.772230] Linux agpgart interface v0.103
[ 10.795617] Input: PC Speaker at /devices/platform/pcspkr/input/input4
[ 10.811397] ppsdev: user-space parallel port driver
[ 10.857719] i2c-adap0 i2c-0: nForce2 SMBus adapter at 0x4c00
[ 10.857754] i2c-adap0 i2c-1: nForce2 SMBus adapter at 0x4c00
[ 11.175899] nvidia: module license "/NVIDIA" taints kernel.
[ 11.453999] ACPI: PCI Interrupt Link [APC3] enabled at IRQ 18
[ 11.454004] nvidia 0000:05:00.0: PCI INT A -> Link[APC3] -> GSI 18 (level, low) -> IRQ 18
[ 11.454011] nvidia 0000:05:00.0: setting latency timer to 64
[ 11.455361] WVRM: loading NVIDIA UNIX x86 Kernel Module 180.44 Mon Mar 23 14:59:19 PST 2009
[ 11.543665] synaptics was reset on resume, see synaptics_resume_reset if you have trouble on resume
[ 11.685356] Linux video capture interface: v2.00
[ 11.837543] cx23885 driver version 0.0.2 loaded
[ 11.837740] cx23885 0000:04:00.0: PCI INT A -> Link[APC4] -> GSI 19 (level, low) -> IRQ 19
[ 11.947365] cx23885[0]: Your board isn't known (yet) to the driver.
[ 11.947366] cx23885[0]: Try to pick one of the existing card configs via
[ 11.947368] cx23885[0]: card=<0> insmod option. Updating to the latest
[ 11.947369] cx23885[0]: version might help as well.
[ 12.161221] psmouse serial: 10: 18 00 64-0-input: PS/2 Generic Mouse as /devices/platform/18042/serial/input/input5
[ 13.405528] lp0: using parport0 (interrupt-driven).
[ 13.697633] Adding 1046520K swap on /dev/sda5. Priority:-1 extents:1 across:1046520K
[ 14.185486] EXT3 FS on sda1, internal journal
[ 15.325380] type=1505 audit(1256679311.921:2): operation="profile_load" name="/sbin/dhclient-script" pid=1858
[ 15.325571] type=1505 audit(1256679311.921:3): operation="profile_load" name="/sbin/dhclient3" pid=1858
[ 15.325631] type=1505 audit(1256679311.921:4): operation="profile_load" name="/usr/lib/NetworkManager/nm-dhcp-client.action" pid=1858
[ 15.325676] type=1505 audit(1256679311.921:5): operation="profile_load" name="/usr/lib/connman/scripts/dhclient-script" pid=1858
[ 15.340918] type=1505 audit(1256679312.129:6): operation="profile_load" name="/usr/lib/cups/backend/cups-pdf" pid=1858
[ 15.535185] type=1505 audit(1256679312.129:7): operation="profile_load" name="/usr/sbin/cupsd" pid=1858
[ 15.625142] type=1505 audit(1256679312.221:8): operation="profile_load" name="/usr/sbin/tcpdump" pid=1874
[ 23.852590] Bluetooth: BNEP (Ethernet Emulation) ver 1.3
[ 23.852591] Bluetooth: BNEP filters: protocol multicast
[ 23.866242] Bridge firewalls registered
```

(Pic.1) The card is not recognized by Linux

```
alex@linuxtv: ~$ sudo apt-get install mercurial
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  mercurial-common rcs
Suggested packages:
  gettext vim emacs python-mysqldb python-pygments python-openssl
The following NEW packages will be installed:
  mercurial mercurial-common rcs
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 86/973kB of archives.
After this operation, 401kB of additional disk space will be used.
Do you want to continue [Y/n]? yes
Selecting previously deselected package mercurial-common.
(Reading database ... 119609 files and directories currently installed.)
Unpacking mercurial-common (from .../mercurial-common_1.1.2-2ubuntu1_all.deb) ...
Selecting previously deselected package mercurial.
Unpacking mercurial (from .../mercurial_1.1.2-2ubuntu1_i386.deb) ...
Selecting previously deselected package rcs.
Unpacking rcs (from .../archives/rcs_5.7-24_1386.deb) ...
Processing triggers for man-db ...
Setting up mercurial-common (1.1.2-2ubuntu1) ...
Setting up rcs (5.7-24) ...
Processing triggers for python-support ...
alex@linuxtv: ~$
```

(Pic.2) Mercurial gets installed

```
alex@linuxtv: ~$ dmesg
[ 11.685356] Linux video capture interface: v2.00
[ 11.837543] cx23885 driver version 0.0.2 loaded
[ 11.837740] cx23885 0000:04:00.0: PCI INT A -> Link[APC4] -> GSI 19 (level, low) -> IRQ 19
[ 11.837910] CORE cx23885[0]: subsystem: 1b55:2a2c, board: NetUP Dual DVB-S2 CI [card=17,autodetected]
[ 12.115146] ACPI: PCI Interrupt Link [APC3] enabled at IRQ 18
[ 12.115158] CMI000 0000:05:00.0: PCI INT A -> Link[APC3] -> GSI 18 (level, low) -> IRQ 18
[ 12.115180] snd-cm106: Model 1099 Rev 00000000 Serial 10901462
[ 12.129799] cx23885 4-0044: cx23885 A/V decoder found @ 0x88 (cx23885[0])
[ 12.134637] cx23885 4-0044: firmware: requesting v4l-cx23885-avcore-01.fw
[ 12.161221] psmouse serial: 10: 18 00 64-0-input: PS/2 Generic Mouse as /devices/platform/18042/serial/input/input5
[ 12.942730] cx23885 4-0044: loaded v4l-cx23885-avcore-01.fw firmware (16382 bytes)
[ 12.949140] cx23885 dvb_register() allocating 1 frontend(s)
[ 12.949143] cx23885[0]: cx23885 based dvb card
[ 13.000904] stv0900_init_internal
[ 13.000909] stv0900_init_internal: Create New Internal Structure!
[ 13.126848] stv0900 st dvb2 single
[ 13.143201] stv0900 set mclk: Mclk set to 135000000, Quartz = 60000000
[ 13.145968] stv0900 get mclk_freq: Calculated Mclk = 134000000
[ 13.161175] stv0900 get mclk_freq: Calculated Mclk = 134000000
[ 13.161177] stv0900 attach: Attaching STV0900 demodulator(0)
[ 13.183999] STV6110 attached on addr=60
[ 13.206876] LNBx2x attached on addr=9
[ 13.206881] DVB: registering new adapter (cx23885[0])
[ 13.206886] DVB: registering adapter 0 frontend 0 (STV0900 frontend)...
[ 13.213104] NetUP Dual DVB-S2 CI card port1 MAC=00:24:20:00:00:FA
[ 13.217448] cx23885 dvb_register() allocating 1 frontend(s)
[ 13.217450] cx23885[0]: cx23885 based dvb card
[ 13.217528] stv0900_init_internal
[ 13.217529] stv0900_init_internal: Find Internal Structure!
[ 13.217531] stv0900 attach: Attaching STV0900 demodulator(1)
[ 13.220694] STV6110 attached on addr=61
[ 13.220695] LNBx2x attached on addr=a
[ 13.220697] DVB: registering new adapter (cx23885[0])
[ 13.220699] DVB: registering adapter 1 frontend 0 (STV0900 frontend)...
[ 13.230808] NetUP Dual DVB-S2 CI card port2 MAC=00:24:20:00:00:FB
[ 13.235587] cx23885 dev checkrevision() Hardware revision = 0x04
[ 13.235594] cx23885[0]/0: found 0000:04:00.0, rev: 3, irq: 19, latency: 0, mmio: 0xf0000000
[ 13.235600] cx23885 0000:04:00.0: setting latency timer to 64
```

(Pic.3) The NetUP card is successfully detected

some KDE libraries and it will install more packages than expected. But one is missing, which I selected manually: libxine1-ffmpeg This is done for software decoding of H.264. After the installation is done (which takes a couple of minutes) I went to the "Application" menu and to "Sound and Video". I clicked on "Kaffeine" and was greeted

with the welcome screen in (Pic.4).

Watching TV

In the Kaffeine menu I clicked on "Digital TV" which resulted in an interface resembling ProgDVB under Windows (albeit with less features). The next step is to scan for all the receivable channels. This can be done by pressing "C" or

going to the "DVB" menu and then to "Channels". The interface for channel scanning is pretty intuitive and Kaffeine is able to scan a whole satellite by using the NIT information contained on some transponders. Doing this, after a couple of minutes the complete list of channels is displayed (Pic.5).

However, Kaffeine can not display two tuners and is therefore of not much use with this sophisticated card. The solution is to use a more advanced piece of software, like for instance MythTV, VLC or MPlayer. But before to switch to another DVB viewer I checked the quality/signal strength indicator in Kaffeine. Though it is not really accurate (it reports either 3% or 98%) I managed to correlate these two figures by using a satellite signal meter and was able to determine that the SNR for Anixe HD is 6 dB. To put this

into perspective: it means that the power of the useful signal is twice the power of the noise, thus making the tuner in the NetUP card one of the most sensitive available.

In practice

The lock time for the card is pretty good, averaging 4minutes and 47 seconds for a full scan of HOTBIRD at 13E. This card even offers a hidden highlight: it can receive 16APSK DVB-S2 channels! This modulation is used by some channels to hide themselves away from regular viewers. Unfortunately, my 90cm dish is too small to get a decent signal at my location for HOTBIRD but I was still able to get at least some macroblocks from these transponders. If you are closer to main beam of HOTBIRD try 11.334H, 11.373H and 11.432V for such transmissions, which trade off error correction for quality (Pic.6).

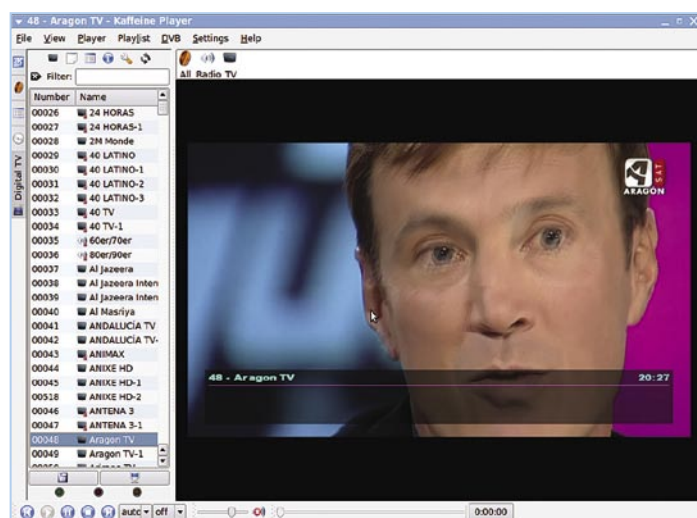


The NetUP two tuner card is highly interesting for the serious satellite enthusiast and is a must for the professional user of satellite signals in DVB-S2. Its tuner sensitivity is exceptional. It requires

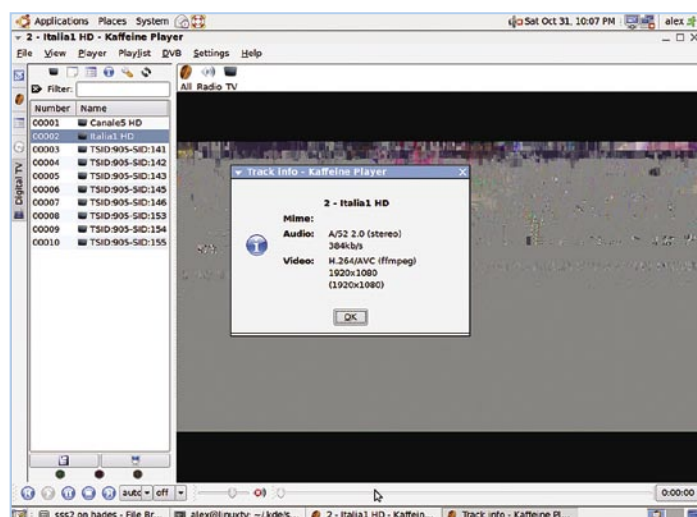
Linux and needs some software background for the one who installs it, but after this hurdle is overcome performance of the NetUP card is as perfect as a satellite PC card can be.



(Pic.4) Welcome screen of Kaffeine, a DVB viewer program



(Pic.5) After a couple of minutes the menu shows all channels received



(Pic.6) A unique feature of the NetUP card is its ability to receive 16APSK, which is used by some broadcasters, like Italia 1 HD from Italy on HOTBIRD 13E

Expert Opinion



Alexandru Porosanu
TELE-satellite
Test Center
Romania

+

**Two independent tuners on same board.
Very stable performance due to Linux.
Exceptional good tuner sensitivity.
Dual standard DVB-S and DVB-S2.**

-

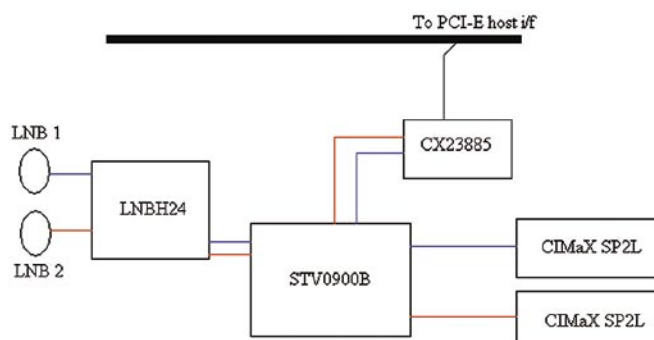
Card comes with no software support from manufacturer.

No hardware acceleration for MPEG2 or H.264.

TECHNICAL DATA

Manufacturer	NetUP, Olof Palme Str. 1, Sect. 7, Moscow, Russia
Phone	+7 495 510 1025 (ext 0) - general questions +7 495 510 1025 (ext 1) - technical support
Fax	+7 499 143 5521
Email	info@netup.tv
Website	www.netup.tv
Model	NetUP Dual DVB-S2-Cl
Function	Two Tuners DVB-S2 PCIe card
Frequency Range	950 - 2150 MHz
Systems	DVB-S, DVB-S2
Transmission Modes	MPEG-2, MPEG-4 (software)
Demodulator DVB-S	QPSK
Demodulator DVB-S2	QPSK, 8PSK, 16APSK, 32APSK
DiSEqC	up to 2.0
CI Slots	2 for any professional CA modules (PowerCAM Pro, Aston Pro Solutions, etc.)
Connectors	2 x F
Software	Linux

Technical Information



General Overview

- * 4 Layer PCB
- * 2 x CI slots
- * Long PCI-E board

Components Overview

- * 1 x STM STV 0900B – Dual demodulator that can handle DVB-S QPSK, DVB-S2 QPSK, 8PSK, 16APSK (all the standards currently used for broadcast in Digital Television, both in Europe and USA); also employs a lower voltage requirement (3.3V)
- * 1 x STM LNBH24 – Dual LNB supply and control; compatible with DiSEqC 2.0 feedback signal specification by employing a 22 KHz tone detection; supports unfiltered DiSEqC signal output
- * 2 x SCM Microsystems' CIMaX SP2L – CI interface driver
- * 1 x Conexant - PCI Express Broadcast Audio/Video Decoder, supporting two MPEG transport streams