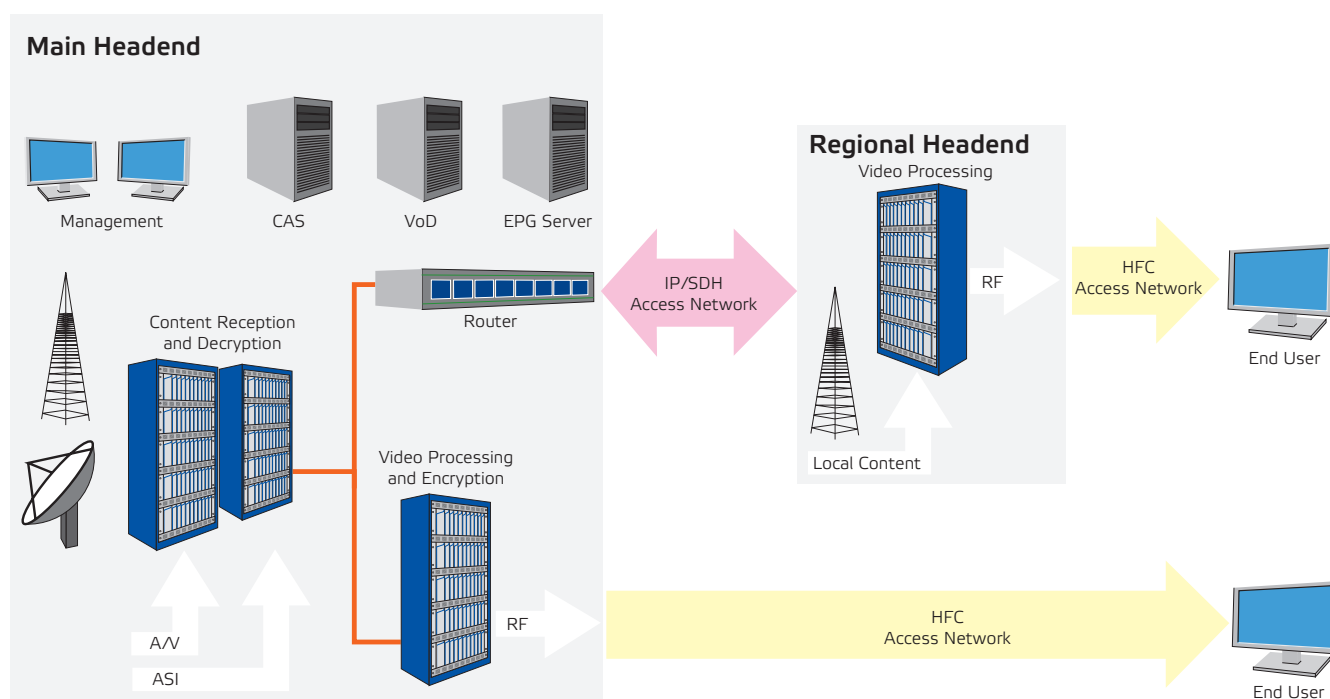


Cable TV Headend Solutions



The DVX platform

TELESTE DVX is a complete solution for digital and analogue broadcasting infrastructures for cable operators. The offering includes products for content acquisition, signal processing functions and digital backbone transmission. It enables the operator to provide an efficient and redundant interface to any access network. The solution is open and conveniently scalable in order to integrate into networks worldwide.



Introduction

DVX is a scalable and flexible solution for digital and analogue video transmission, which provides a seamless interconnection between main headend and regional headends over dedicated fibre as well as standard IP or ATM based networks. The solution offers remarkable benefits for the operators, including a combination of MPTS and SPTS transportation over the network. It also offers a large scale of signal processing units in a compact package.

DVX Platform

The DVX platform is a professional and versatile headend platform for cable TV systems. It consists of a full range of digital and analogue functions with user friendly, simple control and management tools. The modular system provides a future proof migration path to new services and technologies such as Mpeg-4 and HDTV.

The basic building block of the DVX platform is a 19" wide 6RU high sub-rack that complies with ETSI telecommunications standards. Together with a power supply and a wideband output module, each sub-rack can house up to nine signal-processing units with a cable output. An integrated part of the sub-rack is a passive back plane with a power and management bus as well as a broadband combiner, which all minimise the need for interconnection cables.

Excellence In Headend Solutions

Key Benefits

- > Compact modularity
- > Low Power Consumption
- > Based on Standards Interfaces
- > Reliability



Compact modularity

The DVX platform offers ultimate flexibility for building a cable head-end. All functions are performed by individual units that can be added to the system as needed. The units can be organised based on requirements such as logical channel order or functionality of the units. Built-in features such as power backup and RF combining make it very easy to deploy the system. The Teleste architecture allows an operator to expand the system in phases along with his business requirements, all based upon an open and flexible architecture.

Low Power Consumption

One of the features of the DVX platform is system level powering, which provides remarkable savings in power consumption as a single power supply caters for a number of signal processing units. Low power consumption means additional savings on air-condi-

tioning as less heat is dissipated. The third dimension is increased reliability and prolonged lifetime as the units run cooler.

Based on standards interfaces

One of the key features of the DVX solution is its openness. All processing of digital and analogue content is based on existing standards such as MPEG-2, DVB and IP. All interfaces in the system are based on industry standards, which makes it very easy to complement the DVX solution with any third party equipment or to scale and inter-operate with other industry standard architectures. Implementing standards-based systems also allows operators to easily interface to other networks to expand their operating area.

Reliability

The DVX platform is deployed in several locations world wide. It has shown its reliability during system operation in these systems. The versatile backup functionality enhances system reliability both in terms of hardware and services.

Savings on power consumption reflect directly on improved temperature behaviour. This means longer component life and thus improved reliability.

The architecture of the DVX platform allows an operator to expand the system in phases along with his business requirements.

The DVX Platform Features

The DVX platform is based on individual units performing digital or analogue processing functions in the headend. The platform is easily scalable and consists of a wide range of features and in this way offers a convenient path for an operator to build a system that fulfils the requirements of the modern cable headend.

Content acquisition and IRD's

The DVX platform includes a wide range of receivers with different input options. With DVX it is possible to acquire digital content from DVB-S/S2/T, ASI or IP sources. The DVX receivers can be used for the reception of digital video, audio, teletext and other utility data. The receivers offer the capability to receive Mpeg-2 or Mpeg-4 encrypted video on standard or HDTV format.

The different variants of receivers are equipped with two independent slots for DVB common interface (CI) for conditional access descrambler modules. The receivers have a built-in transport stream processor that can be used for service de-multiplexing, program filtering and service monitoring. All receivers support commonly used interfaces such as ASI for content output.

It is also possible to have the DVX receiver with a built-in Mpeg-2 or Mpeg-4 decoder. The integrated receiver decoder (IRD) can be used for the reception of free-to-air and scrambled digital services to provide analogue video and audio signals in the headend.

Analogue modulation & up-conversion

The DVX platform includes a series of professional analogue modulators, up-converters and TV channel converters. They all support most commonly used PAL standards used worldwide and have fully frequency agile output adjustable from 47 to 860 MHz.

The DVX modulators support mono audio as well as A2 or NICAM stereo audio encoding. They have also an analogue IF interface that can be used for backup through IF switching or IF looping for external analogue encryption. The DVX modulators form an excellent pair with DVX platform IRD's for analogue turnaround of digitally received services.

The RF outputs of multiple DVX modulators, up-converters and TV channel converters can be combined and amplified for the HFC feed through the built-in combiner and amplifier in the DVX platform.

FM processing

The DVX platform can be used also for analogue FM radio signal processing. The platform features FM stereo modulators and FM channel converters with excellent input sensitivity. They all have fully frequency agile input and output tuning from 87,5 to 108 MHz based on CCIR FM band. The FM stereo modulator is equipped with RDS encoder.

The core of the DVX platform is an effective turnaround of satellite and terrestrial TV services to cable.

Transmodulation

The DVX platform's transmodulators can be used for an easy and efficient conversion of DVB-T or DVB-S to cable network. The unit consists of a satellite or terrestrial receiver, transport stream processor, signal router, and QAM-modulator with an up-converter for RF channels.

The advanced transport stream processor allows program filtering, monitoring, service information replacement and bit rate adaptation. The advanced transport stream processor with a flexible signal router allows for versatile use of the unit. The functionality of the device can be defined from a basic transparent QAM modulator to a transmodulator with dynamic PSI/SI processing and autonomous backup from a secondary signal source.

The processed Transport Stream is modulated to a QAM signal according to ETS 300 429 and ITU-T J.83 Annex A or Annex B. The transmodulator has an integrated agile up-converter for frequencies from 47 to 862 MHz.

DVB processing and multiplexing

All of the received content can be routed over the DVX system to multiplexers for DVB processing and modulation. In the DVX platform, the service multiplexing and associated processing is performed by a single unit that also takes care of QAM modulation and up-conversion. Each unit is able to handle one multi program transport stream.



Key Features

- > Content acquisition and IRD's
- > Analogue modulation & up-conversion
- > FM processing
- > Transmodulation
- > DVB processing and multiplexing
- > DVB simulcrypt scrambling
- > Content routing and transmission
- > Encoding

well as distributed scrambling at sub headends. The system has been integrated with all major DVB simulcrypt compliant CAS vendors in Europe and Asia.

Content routing and transmission

The DVX platform is able to transport services efficiently between the headend stations with high speed. This allows flexible service selection from incoming transport streams to be routed over the network.

The core of the transmission is a node that routes the selected services for local multiplexing and for external headend stations. The selection of services to a particular multiplexer is performed in the service routing. The services can be routed over the transmission network in SPTS or MPTS format.

The DVX platform supports service transmission over IP, ATM and SDH backbone networks. For the IP network transmission it offers a gigabit Ethernet interface to connect the sub headends. In this case Telesat's edge QAM unit can be used to convert services from IP base to RF.

Encoding

The DVX platform offers a compact and cost effective solution for encoding analogue video to Mpeg-2 format. The DVX platform houses up to 10 Mpeg-2 encoders in 6RU, offering a selection of options for mpeg bit rate and GOP structure. The encoded channels can be integrated smoothly with other digitally processed services in the DVX platform.

DVX platform supports a variety of digital content such as MPEG-2 & MPEG-4 / SD & HD

DVX platform features a wide range of analogue and digital signal processors

DVB processor with multiplexing and scrambling

The unit allows the user to select the services that are multiplexed. The advanced transport stream processor takes care of the PSI/SI insertion and other necessary content management. Beyond this, the services can also be encrypted in the unit by using the DVB common scrambling algorithm.

The processed Transport Streams are modulated to QAM signal according to ETS 300 429 and ITU-T J.83 Annex A or Annex B. The unit has an integrated agile up-converter for frequencies from 47 to 862 MHz. The created transport stream can also be routed out from ASI or ATM interface

for MPTS re-routing over the DVX system to sub headends.

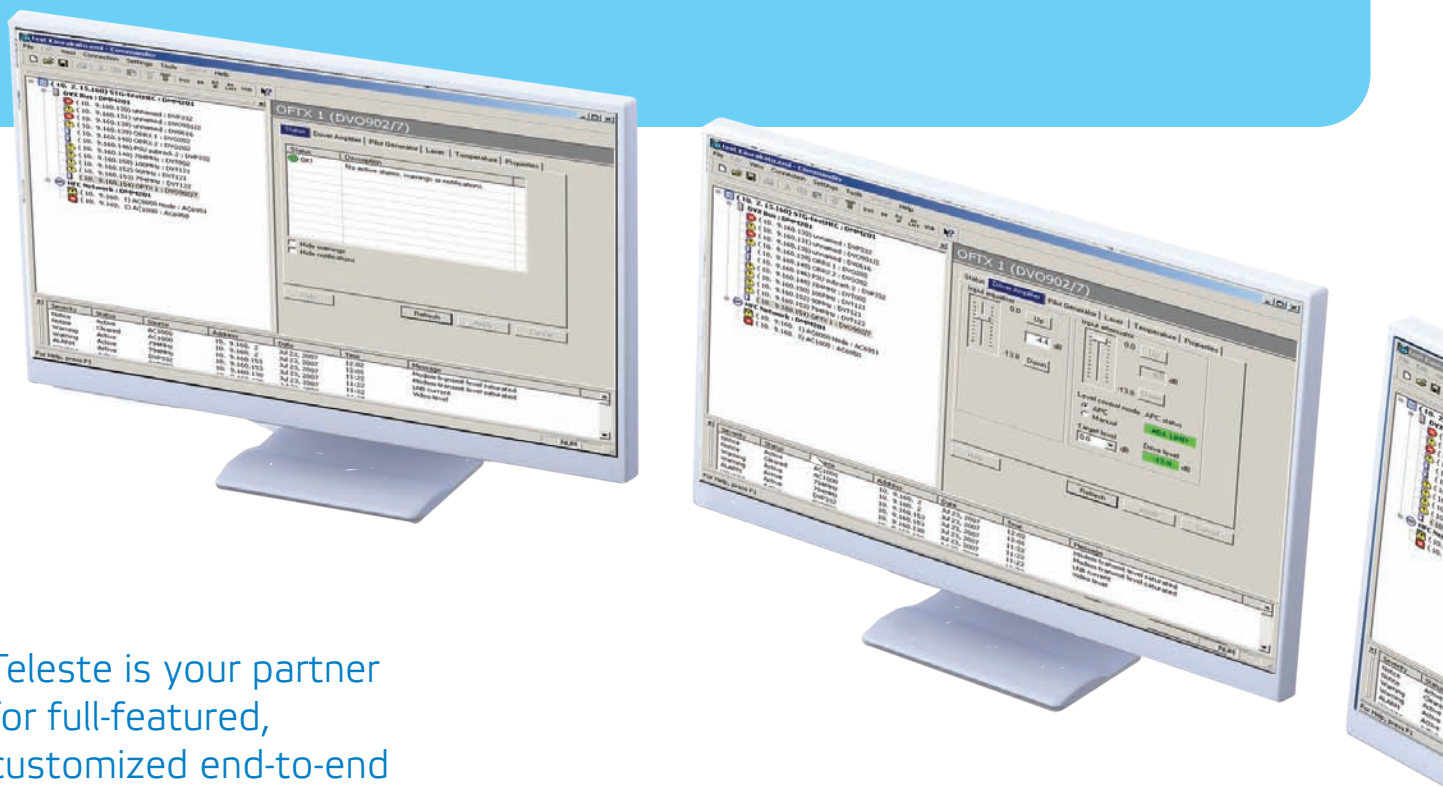
DVB simulcrypt scrambling

The DVX platform is fully compatible with DVB simulcrypt conditional access. The DVX platform has an IP interface towards conditional access system (CAS) for establishing and maintaining the connection for scrambling control messages. It takes care of control word generation, ECM and control word synchronisation as well as the insertion of the ECM and EMM messages to transport streams.

The system supports centralised scrambling in the main headend as

Management and Redundancy

The DVX platform can be fully managed via user friendly tools in CATVisor software family. The graphical user interface can be used for system configuration and monitoring but also to setup and control the redundancy functions of the system. The backup features of the DVX platform are essential to secure the high availability of the services.



Teleste is your partner for full-featured, customized end-to-end TV systems.

User Friendly Management

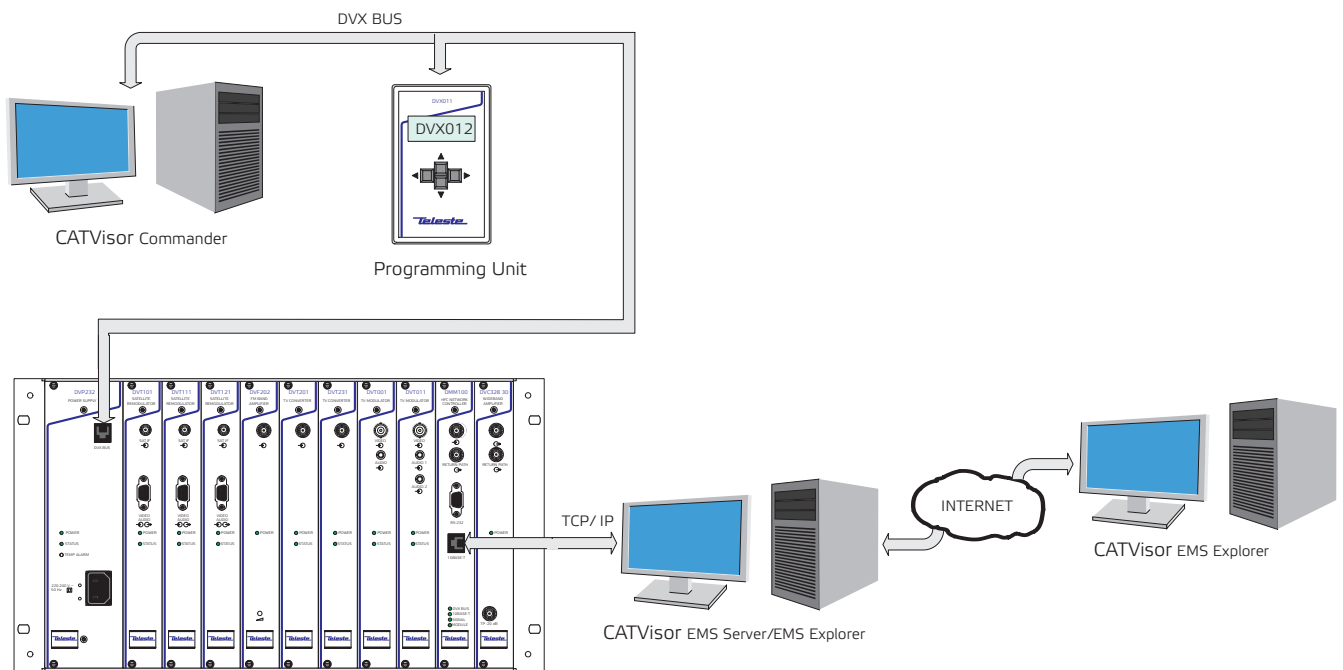
Teleste's CATVisor software family provides a variety of different software tools which are scalable from a simple local configuration tool to an element management platform. Each DVX platform product can be controlled and monitored with CATVisor software tools.

CATVisor Commander is a standalone hardware configuration tool for DVX products. All the parameters of the DVX units are programmable and controllable on the Commander's graphical user interface. With CATVisor Commander, it is possible to connect to the DVX system either

over local DVX data bus or over a remote IP connection. The Commander platform can be extended with application specific components such as PSI/SI table editor and NIT wizard for network information table creation in a transmodulator.

CATVisor Element Management System (EMS) is a client-server based element management system for the continuous fault and performance monitoring of headends. The system consists of EMS Server software and EMS Explorer client software. The EMS server is the main software component that implements most of the EMS functions, while the EMS

Explorer is user interface software intended for viewing and editing the data on the EMS server. Both CATVisor Commander and EMS system can be used to remotely control the headend over an IP network.



Redundancy

CATVisor Backup Master software is used for unit reconfiguration and signal re-routing in case of a signal or unit fault. The N+1 backup function allows one unit to act as a reserve for several similar units. Alarm and backup event reporting helps to maintain maximum headend uptime. Internal or even external triggers may be used to initiate backup procedures.

The backup control function monitors the operational status of the

units in the backup set. If a backup trigger condition is detected, e.g. a signal or device fault, the Backup Master downloads the configuration data of the faulty product into the backup unit. After that it reroutes the signals by controlling the switches thus restoring services automatically. In addition to redundancy control, the Backup Master can also be used to maintain backup copies of element configurations. The backup copies can be used to quickly restore operation when replacing a faulty unit.

OUR PARTNERS

If the operator needs features beyond the offering of DVX platform, the system can easily be extended by partner products. DVX offers a simple way to connect additional products in the system. In this way, the operator can boost his network with features such as rate shaping, EPG system or VoD.

Teleste works with industry leading partners to provide you with state of the art technology and support services.

System components

In addition to the core features of the DVX platform, several system components are available to accommodate the easy and flexible implementation of a new cable head. The DVX platform includes a full range of power supplies, group combiners and wideband amplifiers with optional return path. The range of power supplies and wideband amplifiers offers an easy but comprehensive backup functionality.

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