



cProcessor

CP4400

TS-Processor

The CP4400 is the ideal toolbox for T2-MI generation and regional adaptation in DVB-T2 Single Frequency Networks (SFN). Thanks to its flexibility it simplifies the implementation of critical differentiators for network operators.

The CP4400 offers a flexible and highly cost effective solution for generation of T2-MI transmitter feeds and regional adaptation of DTT multiplexes. CP4400 can operate as a central DVB-T2 Gateway or based on Nevision's deterministic remultiplexing technology for regionalization of DTT multiplexes.

The deterministic remultiplexing enables feeding of transmitters in multiple SFN regions using the same Transport Stream (TS) as used in a pre-existing Direct to Home (DTH) satellite system.

In addition to the powerful TS processing capabilities, the CP4400 offers several tools for the improvement of the transmission quality such as input monitoring, redundancy switching and diversity reception for TSolP streams.

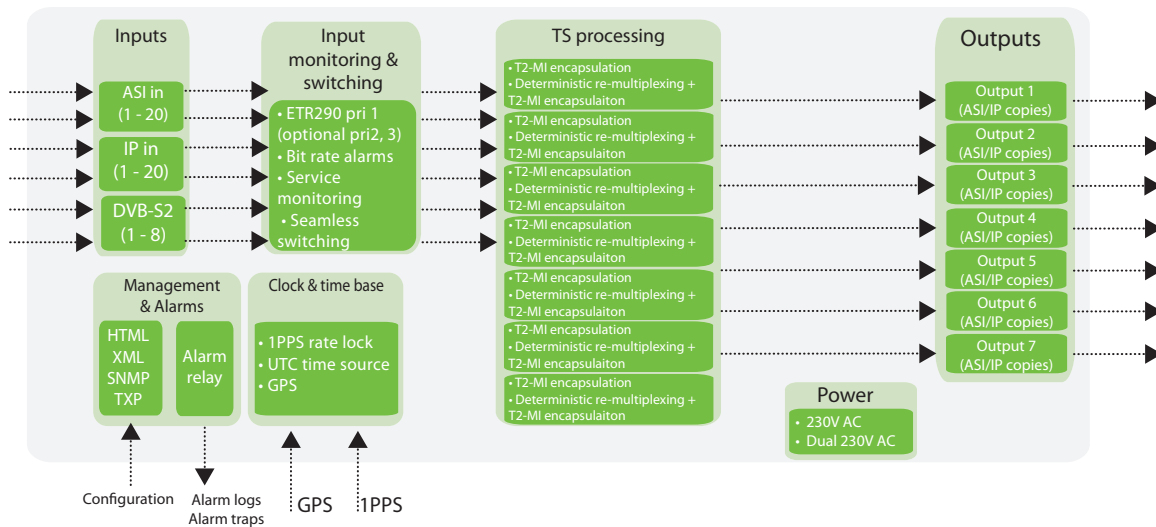
Nevion cProcessors can be configured via an easy-to-use web interface. Scheduled software upgrades can be performed via Nevision's NMS or third party NMS.

Applications

- T2-MI generation for up to seven multiplexes
- Regional adaptation in DVB-T2 SFN networks where generating identical transmitter feeds is crucial
- Regionalization of DVB-T2 multiplexes by reusing the preexisting DTH signal

Key features

- T2-MI generation for up to 7 DTT Multiplexes on one unit
- Deterministic remultiplexing for DVB-T2
- T2-MI generation including time stamps for SFN operation
- Input stream monitoring
- Input redundancy with diversity reception on IP
- Input redundancy with Input Switching (S2/IP/ASI)
- ASI and IP input/output interfaces
- GPS synchronization
- User-friendly configuration and control



SFN synchronization

Using a 1PPS input or a GPS input, the CP4400 generates a very accurate DVB-T2 time stamps used to synchronize the DVB-T2 transmitters in SFN networks. The continuity and accuracy of these time stamps is crucial for the SFN operation.

Multiple PLPs

Transport Stream inputs are re-multiplexed and mapped to physical layer pipes (PLP). This feature allows for different protection and coding of data and services. The CP4400 supports up to 8 PLPs per T2-MI output.

Seamless Input Switching

Seamless switchover between incoming streams without interruption on the output. Incoming streams are monitored, matched and aligned to handle delay differences. The streams can be received on DVB-S2, ASI or IP inputs.

Transport Stream monitoring

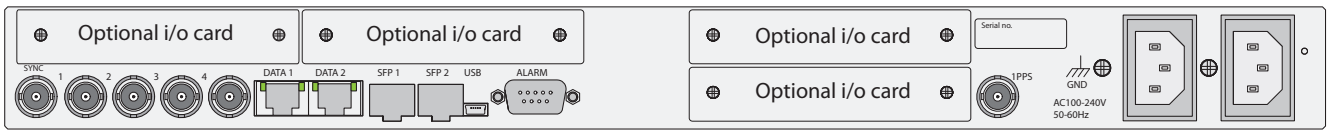
In order to ensure error free processing, CP4400 monitors the input streams according to TR 101 290 priority 1. (optional priority 2 and 3) In case of errors in the input streams, alarms are raised to inform the operator and traps are forwarded to the NMS.

Transport Stream over IP

The output Transport Stream is encapsulated according to SMPTE 2022-2 including the handling of FEC. (SMPTE 2022-1). CP4400 supports multiple VLANs (IEEE 802.1Q), IP QoS and VLAN CoS/802.1P for per-flow traffic prioritization.

User-friendly configuration

The user interface of the CP4400 is simple and very intuitive, it is designed to help the operator configure the unit quickly. Running on any web browser the GUI can be accessed from any computer.



DVB-T2 adaptation

Up to 7 T2-MI outputs per unit for central DVB-T2 head-ends	
DVB-T2 MI encapsulation	DVB-T2 versions 1.1.1, 1.2.1, 1.3.1 L1-signalling frames generation Baseband frames encapsulation
Multiple PLP support	Up to 16 PLPs per T2-MI output
SFN operation	DVB-T2 time stamps insertion DVB-T2 MIP insertion
Bandwidth support	1.7MHz, 5MHz, 6MHz, 7MHz, 8MHz, 10MHz
Individual Addressing , MISO , PAPR parameters	

Deterministic re-multiplexing

Remultiplex incoming transport streams deterministically to build the regional DTT multiplexes and generation of identical T2-MI streams for SFN operation.

Mapping of services from the incoming streams (e.g. DTH signal) into the regional DTT multiplex.

Adaptation of signalling tables to convert tables from DTH to DTT signalling.

Transport Stream interfaces

DVB-ASI	4 DVB ASI i/o ports (EN 50083-9, Annex B) up to 16 additional ASI i/o ports (on up to 4 optional i/o boards) 188 or 204 byte packet length Burst and Spread mode (packet and byte mode) Female BNC connectors 75 Ohm
TSolP	2 x 100/1000Base-T Ethernet (2 x RJ45) 2 x SFP+ ports Protocols: IEEE 802.3 Ethernet, VLAN (802.1Q, 802.1ad ' QinQ'), ARP, IPv4, UDP, TCP, RTP, IGMPv2/3) TS Encapsulation SMPTE 2022 -1/2
DVB-S2	2x DVB-S/S2 inputs per card, up to 4 boards per 1RU 2x F-type connector, 75 Ohms 2x ASI outputs Antenna power.13V/18V/off, 500 mA max. current Eutelsat DiSEqC level 1.2 Frequency range 950-2150 MHz (L-Band) Return loss > 7 dB Constellations QPSK, 8PSK, 16APSK, 32APSK CCM and VCM (optional ACM1) Multistream support ISSY synchronization
DVB-T2	2x DVB-T/T2 inputs per board, up to 4 boards per 1 RU 2x F-type connector, 75 Ohms Frequency range 48 - 862 MHz (DVB-T/T2) Channel bandwidth 1.7, 6, 7 and 8 MHz Demodulation all DVB-T2 modes, (T2Base, T2Lite), MISO/SISO, M-PLP

Redundancy and monitoring

Input redundancy	Seamless switching between DVB-S2/ASI/TSolP inputs IP diversity reception Automatic input switching
Input monitoring	Included TR 101 290 priority 1, Included service monitoring Included bit rates monitoring w/ user configurable thresholds Optional advanced input monitoring
1+1 operation	Synchronized DVB-T2 frames between units operating in 1+1 configuration. This software based synchronization does not require communication between the units

Time synchronization

Clock reference	1PPS input (50 Ohm female BNC) Optional GPS input card (GPS input, 1PPS input)
UTC time reference	SNTP over the management interface (RJ45)

Control and management

Management port	100/1000Base-T Ethernet Connector: RJ45
Element control through HTTP/WEB based GUI XML Configuration import and export via HTTP	
Protocols	HTTP, XML, SNMP (v1, v2c, v3)
Alarm Relay	9 pin D-SUB. Two relays supported; one at configurable alarm level
Maintenance Port	USB

Physical and environmental characteristics

Input Voltage	100-240V AC +/- 10%, 50/60 Hz, optional: -48V DC
Power consumption	50 - 200W max
Dimensions	1RU 19", (WxDxH) 420 x 300 x 44.5mm
Operating temp.	0°C to 50°C (storage -20°C to 70°C)
Relative humidity	5% to 95% (non condensing)
Compliance	CE: 73/23/EEC, 89/336/EEC, IEC60950, EN60950, EN55022, EN55024, EN6100-3-2, CSA

cProcessor

CP4400 TS Processor -Base unit

CP4400-HW-F4-AC	CP4400 cProcessor base unit (1RU) that can hold up to four (4) factory-installed modules (fixed back panel). 4x GigE ports (2x 100/1000Base-T, 2x 1000-BaseX SFP), 4 enabled inputs on the 4 BNC connectors for (ASI). Built-in ETSI TR 101 290 Priority 1 monitoring. Single 110V/220V AC PSU.
CP4400-HW-F4-AC2	CP4400 cProcessor base unit (1RU) that can hold up to four (4) factory-installed modules (fixed back panel). 4x GigE ports (2x 100/1000Base-T, 2x SFP+), 4 enabled ASI inputs on the 4 built-in BNC connectors. Built-in monitoring (ETSI TR 101 290 Pri 1). Dual load-sharing 110V/220V AC PSUs.
CP4400-HW-M4-AC2	CP4400 cProcessor base unit (1RU) that can hold up to four (4) field-installable modules (modular back panel). 4x GigE ports (2x 100/1000Base-T, 2x SFP+), 4 enabled ASI inputs on the 4 built-in SBNC connectors. Built-in monitoring (ETSI TR 101 290 Pri 1). Dual load-sharing 110V/220V AC PSUs.

CP4400 TS Processor - Hardware Options

NX-HW-ASI-IO-X4-F	Hardware option - ASI i/o board with four (4) BNC connectors for ASI i/o. The direction of each port can be configured by the user. Monitoring for the 4 ASI inputs included. No additional SW license required for basic monitoring (ETR290 pri 1, bit rate alarms, CA alarms, service overview,...). This board is fitted in the fixed chassis.
NX-HW-S/S2-DEM0D-X2-F	Hardware option - DVB-S/S2 demodulator board with two inputs, (F-connectors, demodulate 2 signals). 2 ASI ports. Monitoring for the 2 DVB-S/S2 inputs included. No additional SW license required for basic monitoring (RF layer, ETR290 pri 1, bit rate alarms, CA alarms, service alarms). This board is only available for fixed chassis.
NX-HW-T/T2-DEM0D-X2-F	Hardware option - DVB-T/T2 demodulator board with two inputs, (demodulate 2 signals). 2 ASI loop ports. Monitoring for the 2 DVB-T/T2 inputs included. No additional SW license required for basic monitoring (RF layer, ETR290 pri 1, bit rate alarms, CA alarms, service alarms). This board is fitted in the fixed chassis.
NX-HW-GPS-X1-BNC-F/M	Hardware option - GPS input board fitting into a slot for synchronization. This can be used for applications such as SFN adaptation or T2-MI adaptation. The board has 4 BNC connectors (GPS in, 1PPS in, test 1PPS, test 10Mhz). The board is for the synchronization of the Nevia equipment and not meant to feed other equipment.

CP4400 TS Processor - Software Options

CP4400-SW-T2GWX	Software option - Enable generation of one T2-MI stream for transmitter feed in DVB-T2 networks (v1.11, v1.2.1, v1.3.1), including SFN adaptation. One TS input is included. Single PLP operation included. Additional PLPs as SW option. Licensed per T2GW module.
CP4400-SW-DET2X	Software option - Enable deterministic remultiplexing in DVB-T2 networks. The unit can receive transport streams, remultiplex them and generate the T2-MI deterministically. Two inputs are enabled by default. One PLP included in the output T2-MI. Licensed per multiplex/ T2-MI output.
CP4400-SW-AMMX	Software option - Enable advanced TS monitoring according to ETSI TR 101 290 Priority 2 alarms (e.g. PCR accuracy/overall jitter) and Pri 3 DVB-SI and ATSC A/78. Note that Priority 1 alarms is always included in base unit. Licensed per Transport Stream.
CP4400-SW-BISS-RX	License option enabling BISS 0/1 decryption/descrambling. Licensed per unit.
CP4400-SW-FEC	Software option - Enable decoding of FEC streams at the input and adding FEC at the output (including output copies). FEC increases the transmission robustness by correcting the IP packet losses (SMPT2022-1).
CP4400-SW-ISWX	Software option - Enable one (1) alarm based switch for redundant inputs. This license enables an input switch for each source to a functional module (mux, T2Gateway). The switching is not seamless. Each input switch can have four (4) inputs. Licensed per switch.
CP4400-SW-PLPAX	Software option - Enable one (1) additional PLP for the T2Gateway module.
CP4400-SW-SIPS	Software option - Enable Seamless IP Protection Switching (SIPS) for RTP/IP transport over dual diverse network links according to SMPT2022-7. Licensed per unit.
CP4400-SW-SSWX	Software option - Enable one (1) alarm based switch for redundant inputs. The switching is seamless if the stream are coming from the same source. The streams can be arriving on different interfaces (S/S2, IP, ASI). For DTT applications the switching is SFN seamless even if the streams are not from the same source. Licensed per switch.
CP4400-SW-T2AX	Software option - Enable the monitoring and analysis of 1 T2-MI stream. This license enables the monitoring of the T2-MI layer and enables the TS input to receive the T2-MI.

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