datasheet

cProcessor

CP4400

TS-Processor

The CP4400 is the ideal platform for T2-MI generation and regional adaptation in DVB-T2 Single Frequency Networks (SFN). Its flexibility simplifies the implementation of state-of-the-art DTT networks.

The CP4400 offers a flexible and highly cost-effective solution for generation of T2-MI transmitter feeds and regional adaptation of DTT multiplexes. The CP4400 can operate as a high density central DVB-T2 Gateway or as a gateway for single illumination for regionalization of DTT multiplexes.

The single illumination enables feeding transmitters in multiple SFN regions using the same Transport Stream (TS) as in the pre-existing Direct to Home (DTH) satellite system.

In addition, the CP4400 offers several tools to improve the transmission quality such as input monitoring, redundancy switching and diversity reception for TSoIP streams.

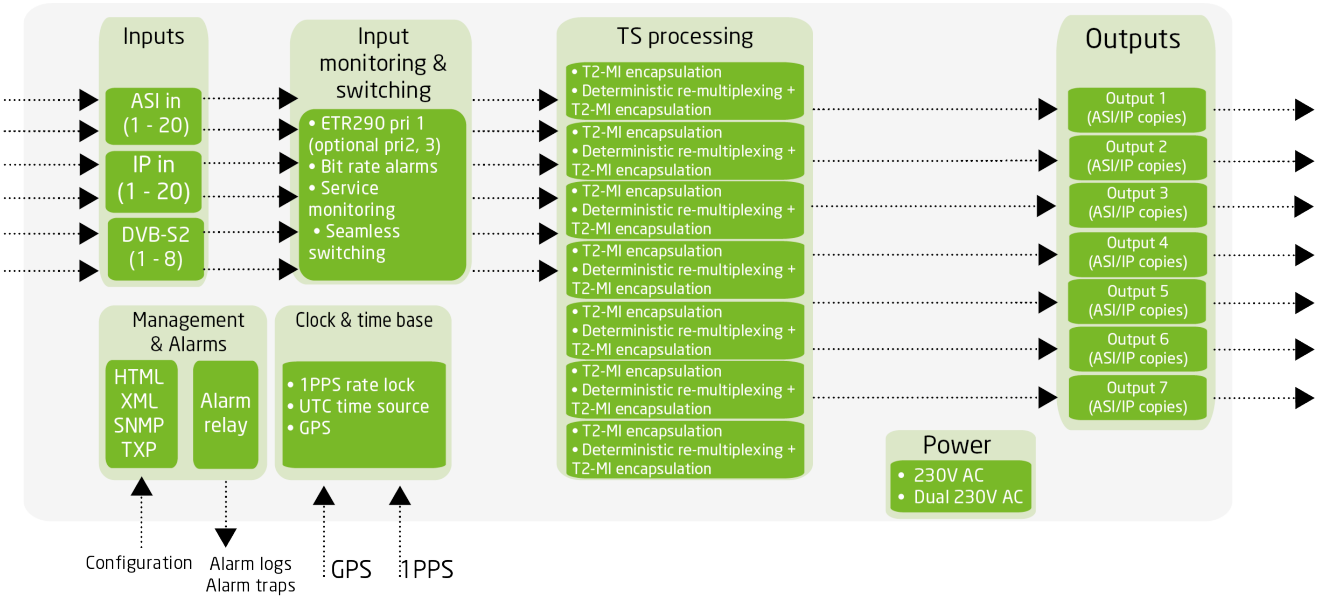
Like all products from Nevion's cProcessors family, the CP4400 can be configured via an easy-to-use web interface. Scheduled software upgrades can be performed via Nevion's VideoIPath or third party NMS.

Applications

- High density 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
- Dual illumination for DVB-T2
- Flexible input interfaces (TSoIP, DVB-ASI, DVB-S/S2)
- Input stream monitoring (QoS)
- 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 very accurate DVB-T2 time stamps used to synchronize the DVB-T2 transmitters in SFN networks. The continuity and accuracy of these time stamps crucial for 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

CP4400 can perform 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, the CP4400 monitors the input streams according to ETSI 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 overlaying management systems.

Transport Stream over IP

The output Transport Stream is encapsulated according to SMPTE 2022-2. To increase the reliability of the stream the CP4400 can insert forward error correction (FEC) packets according to 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.

CP4400 TS Processor

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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 8 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	

Regionalization and single illumination

Remultiplex incoming transport streams deterministically to build the regional DTT multiplexes and generate 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
TSoIP	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 Frequency range 950-2150 MHz (L-Band) Return loss > 7 dB Constellations QPSK, 8PSK, 16APSK, 32APSK CCM and VCM (optional ACM) Multi-stream 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 178 - 858 MHz (DVB-T/T2) Channel bandwidth 1.7; 5; 6; 7 and 8 MHz Demodulation of all DVB-T2 modes, (T2Base, T2Lite), MISO/SISO, M-PLP

Redundancy and monitoring

Input redundancy	Seamless switching between DVB-S2, DVB-ASI and TSoIP inputs IP diversity reception (SMPTE2022-7) Alarm based 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. Software based synchronization without 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

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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) 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+) 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+) Dual load-sharing 110V/220V AC PSUs.
CP4400-HW-M4-DC	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+) Single -48V DC PSU.

CP4400 TS Processor - Hardware Options

NX-HW-ASI-IO-X4-F	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. This board is fitted in the fixed chassis.
NX-HW-S/S2-DEMOD-X2-F	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. This board is only available for fixed chassis.
NX-HW-T/T2-DEMOD-X2-F	DVB-T/T2 demodulator board with two inputs, (demodulate 2 signals). 2 ASI loop ports. Monitoring for the 2 DVB-T/T2 inputs included. This board is fitted in the fixed chassis.
NX-HW-GPS-X1-BNC-F/M	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 Nevion equipment and not meant to feed other equipment.

CP4400 TS Processor - Software Options

CP4400-SW-T2GWX	Enable generation of one T2-MI stream for transmitter feed in DVB-T2 networks (v1.1.1, v1.2.1, v.1.3.1), including SFN adaptation. One TS input is included. Single PLP operation included. Additional PLPs as SW option. Licensed per T2GW module.
CP4400-SW-DET2X	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	Enable advanced TS monitoring according to ETSI TR 101 290 priority 2 alarms (e.g. PCR accuracy/overall jitter) and priority 3 DVB-SI. 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	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 (SMPTE2022-1).
CP4400-SW-ISWX	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	Enable one (1) additional PLP for the T2Gateway module.
CP4400-SW-SIPS	Enable Seamless IP Protection Switching (SIPS) for RTP/IP transport over dual diverse network links according to SMPTE 2022-7. Licensed per unit.
CP4400-SW-SSWX	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).Licensed per switch.
CP4400-SW-T2AX	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.
CP4400-SW-LDO	Enable Launch Delay Offset (LDO) for RTP/IP output, allowing transmission of multiple identical RTP/IP stream with different delays. Licensed per unit.
CP4400-SW-SSFNX1	Enable Seamless SFN switching feature used to maintain sync of modulator down the chain in case of switching. Software option only required for DVB-T and DVB-T2 systems with SFN. Licensed per switching module (SW).
CP4400-SW-TSOX1	Enable transport of 1 additional MPEG-2 Transport Streams. ASI or TS over IP (SMPTE 2022-2) input/output. Each TS can be sent to multiple ASI outputs and IP unicast/multicast destinations.

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