

## **NETplus™**

### **HD Contribution and Distribution Decoder**

The **NETplus** decoder is an integrated high definition 4:2:2 MPEG-2 audio/video receiver and decoder designed to provide contribution and network distribution quality for video networking. Together with the **FlexiCoder** HDP-100 HD encoding engine, the **NETplus** decoder provides a complete solution for high definition contribution and network distribution transmission applications. The **NETplus** decoder product family offers a wide choice of factory configured, industry standard transport stream network interfaces and an optional L-Band satellite tuner/demodulator. The **NETplus** system also includes options for decryption and various methods of system configuration and control including local front panel controls, a craft port interface, Local Area Network (LAN) control using Simple Network Management Protocol (SNMP) and by control from commands embedded in the incoming network signal.

#### **Features/Benefits**

- ▶ Decodes 1080I and 720P MPEG-2 High Definition compressed video streams. Professional Profile @ High Level (4:2:2) and Main Profile @ High Level (4:2:0) from 8 to 108 Mbps.
- ▶ Optional L Band satellite tuner and decoder allows distribution over digital QPSK, 8PSK and 16 QAM satellite links.
- ▶ Network interfaces support all leading formats including DVB-ASI, DS-3, E3, ATM and SONET transmission over private and public networks.
- ▶ Supports industry standard DVB compliant decryption via a PCMCIA slot.
- ▶ Dual HDSDI SMPTE-292M video outputs each with user selectable embedded audio, closed captioning and (VITC) time code.



## System Architecture

The **NETplus** HD decoder product family is based on a common platform design that includes signal interfaces for both satellite RF and transport stream inputs. The optional satellite tuner/demodulator and the selection of transport stream interfaces must be determined by the user at the time of factory order.

An optional satellite input includes an L-Band tuner followed by a QPSK/8PSK/16 QAM demodulator, which outputs the demodulated transport stream into a selector. The second input to the selector comes from the network I/O module. The network I/O module interfaces with one of many types of industry standard data networks used in broadcast and telecommunications. The selector allows the user to choose between two signal input sources.

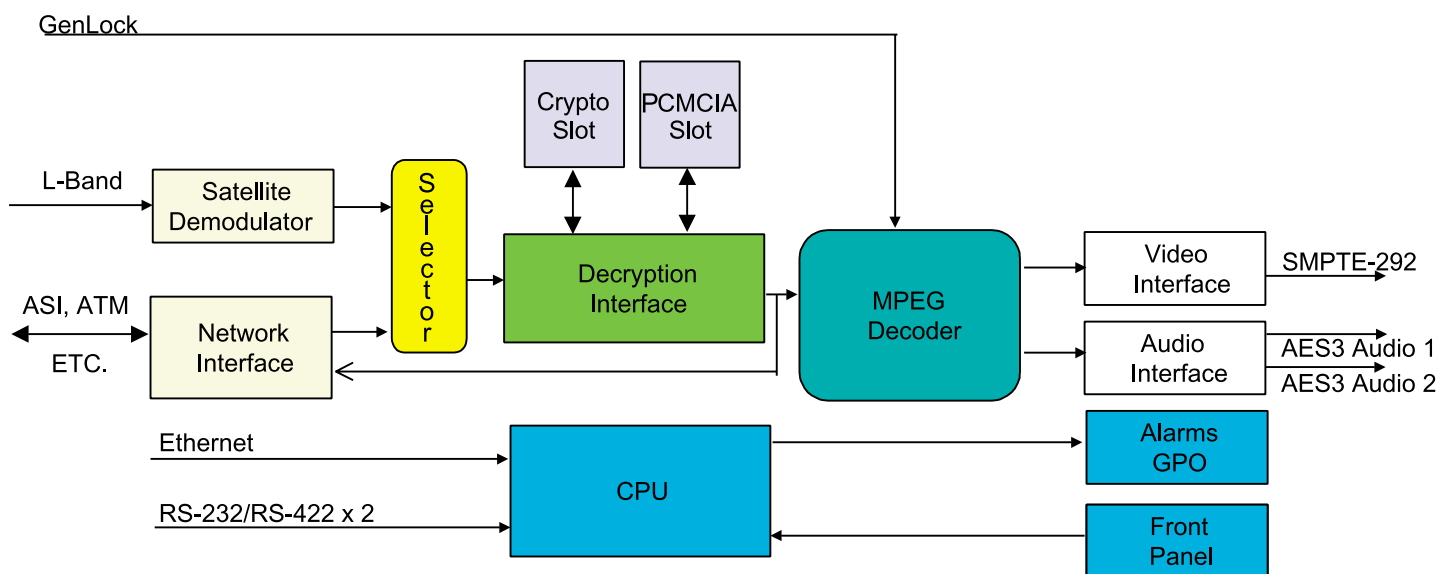
The selector output drives a standardized decryption interface allowing the user to select from many DVB A011 compliant encryption/decryption systems. The operational interface for descrambling and conditional access is via an industry standard PCMCIA slot located at the rear of the **NETplus** enclosure. Post decryption transport stream signals are routed to the MPEG-2 decoder and also to the network interface. This feature allows additional decoders and other signal monitoring functions to be driven from the network signal.

Decoding of the MPEG-2 signal into audio, video and data is accomplished with a multi standard decoding chipset that decodes all HD video formats recognized in the ATSC table 3 format guide. The decoder is capable of being referenced to the sync system of the local facility via an NTSC compliant black burst signal supplied to the **NETplus**. An optional feature incorporated into the decoder allows local insertion of logos or graphics such as static or animated network IDs. Insertion can be controlled locally by the receiving station or by the sending network. After the audio, video and data are decoded, the signals are sent to serializing circuits that drive 75 Ohm signal outputs located on the rear panel of the **NETplus**.

System control is accomplished with a CPU that interfaces with a front panel liquid crystal display, status LEDs and a rotary encoder for selecting setup options. The CPU has 3 external serial data ports including a 10/100 BaseT Ethernet port and 2 configurable RS-232/422/485 I/O ports. Network protocols including SNMP, BOOTP and TFTP are supported allowing remote monitoring and control of the **NETplus**. In addition, major and minor alarms can be monitored via relay contact closures. Two network addressable GPI contact closures are also provided for control of local devices from the network control point.

The **NETplus** is housed in an attractive 1 RU system enclosure with all external connections terminating on the rear panel. Simple operator interface displays and controls are located on the front panel of the device. System cooling is provided via a rear mounted fan.

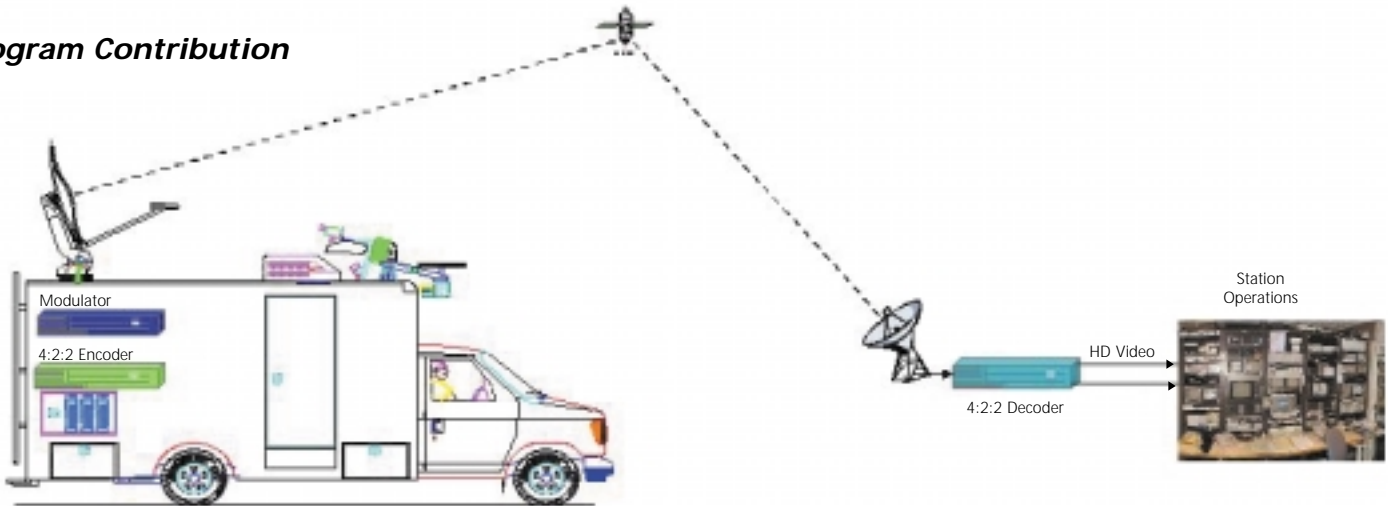
## NETplus Block Diagram



## NETplus Applications

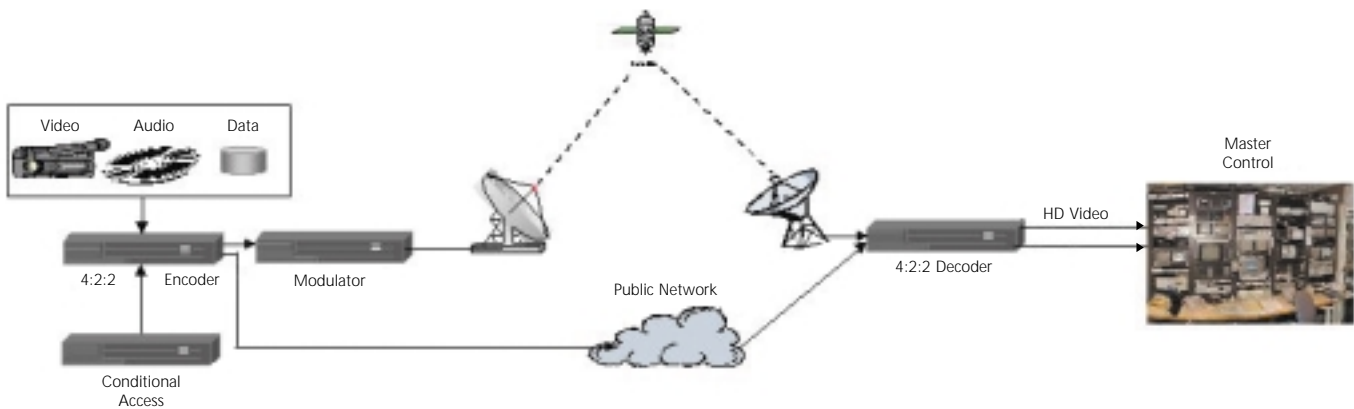
**FlexiCoder** or **UniCoder HD** MPEG-2 HD encoding systems combined with the **NETplus** HD decoder allow broadcasters to distribute high definition digital program content with superb quality over conventional satellite links. The MPEG-2 transport streams can be transmitted over satellite links modulated with QPSK or 8PSK allowing transport rates at up to 68 Mbps with conventional satellite transponders. The **NETplus** is useful for program contribution applications and Digital Satellite Newsgathering (DSNG).

### Program Contribution



**FlexiCoder** or **UniCoder HD** combined with the **NETplus** HD decoder allow broadcast networks to distribute high definition programming over satellite, microwave or public telecommunications networks to affiliate stations, cable headends or remote production facilities. A wide variety of interfaces are available to provide connectivity with all industry standard, broadband telecommunications networks. This includes continuous stream, ATM and SONET transport networks. Network distribution may be open, fix key or fully encrypted conditional access ensuring full distributor control of the program content. In addition to HD video, the **NETplus** architecture includes two uncompressed digital AES audio channels along with closed captioning, VITC time code and a private data channel providing the network operator with a complete solution for all network communications.

### Network Distribution



## General Specifications

### RF In (Optional satellite tuner/demodulator)

Connector: BNC  
Baud Rate Range: 1.0-45.0 Mbaud  
Modulation Inner Code:  
QPSK Rate: 1/2, 2/3, 3/4, 5/6, 7/8  
8PSK Rate: 2/3, 5/6, 8/9  
16 QAM Rate: 3/4, 7/8  
Outer Code: 204, 188 Reed-Solomon per EN 300 421  
RF Frequency Range: 950-2150 MHz  
Input Level: -131 dBm/Hz to -101 dBm/Hz  
Input Impedance: 75 Ohm  
Input Return Loss: >15 dB

### Video Formats

1080I, 720P @ 59.94 Hz

### Video Output

High Definition Serial Digital Interface (HDSI) SMPTE 292M, Y, Cr, Cb,  
8-Bit, 75 Ohm BNC

### Audio Passthrough Formats

Dolby-E, Leitch APT-x, SMPTE 302M, IEC-958 (Dolby AC-3)

### Digital Audio Output

AES/EBU (AES3-1992, ANSI S4.40-1992) 48 kHz

### MPEG-2

Main Profile @ High Level 4:2:0, Professional Profile @ High Level 4:2:2  
Encoded Stream Rates from 8 up to 108 Mbps

### Reference Input

Black Burst Composite Video Reference, BNC, 75 Ohm or Hi Z  
selectable, non-looping, SMPTE RP 154

### Conditional Access

Applicable Standard: DVB A007, Section 7

### LAN Interface

Type: 10/100 BaseT Ethernet (IEEE 802.1)  
Connector: RJ-45

### Control Data Input

Levels: RS-232, RS-422, or RS-485  
Connector: DB-9 (female)  
Synchronous: Up to 1.5 Mbps  
Asynchronous: 9.6, 19.2, 38.4 Kbps

### Craft Port Interface

Levels: RS-232  
Connector: DB-9 (female)  
Asynchronous: Up to 38.4 Kbps

### Alarms:

Network: SNMP traps  
Indicators: Front Panel LEDs: Sys, NET, TS, REF, CA  
Hardwired: Dual hardwired alarm relay contacts  
Type: Contact closure relay  
Maximum Rating: 250 mA at 48V DC  
Connector: 5-position terminal block connector

## Network I/O Interface Options

(One interface only, selected at time of order)

### E3 ATM Interface

Connector: 75 Ohm BNC

Rate: 34.368 MHz +/- 20 ppm  
Format: G.751, G.832  
Cell Mapping: PLCP (G.751)  
Applicable Standards: ITU-T G.73, G.751, G.832, G.04

### DS3 ATM Interface

Connector: 75 Ohm BNC  
Rate: 44.736 MHz +/- 20 ppm  
Format: C-Bit Parity or M23  
Cell Mapping: PLCP or no PLCP  
Applicable Standards: ANSI T1-107-1988, ITU-T G.703, G.704 and G.804

### DS3 Direct Map

Connector: 75 Ohm BNC  
Rate: 44.736 MHz +/- 20 ppm  
Format: C-Bit Parity  
Types: T1A12, Tanburg  
Transport Stream Mapping: Direct map or ATSC  
Applicable Standards: Bellcore GR-499-Core, ANSI T1-107-1988, ITUT-T G.704

### SONET/SDH (General)

Connector: SC-type duplex optical connector  
Data Rate: 155.2 MHz +/- 30 ppm  
Format: SONET or SDH  
Cell Mapping: ATM Forum: User-Network Interface Specification V3.0  
Applicable Standards: Bellcore TR-NWT-000253, ANSI T1.105, ITU-T G.707 and 1.432  
Singlemode Interface  
Operating Wavelength: 1260 nm - 1360 nm  
Multimode Interface  
Operating Wavelength: 1260 nm - 1360 nm

### DVB-ASI Interface

Connector: 2 x BNC (IN/OUT)  
Data Rate: 270 MHz +/- 100 ppm in/+/- 3 ppm out  
Logic Levels: 800mV +/- 10%  
Data Rate: 0.130 Mbps in 1 bps steps  
Data Rate Accuracy: 3 ppm  
Applicable Standard: DVB-ASI A011 Rev. 1.0

## Physical Specifications

Height: 1U VME (1.75 inches)  
Width: 482.6mm (19 inches)  
Depth: 400 mm (15.75 inches)  
Weight 3.5 kg (7.5 lbs)  
Ambient Temperature  
Operating: 0-40°C (32-104°F)  
Non-Operating: -40-65°C (-104-149°F)  
Humidity: 5%-95% Non-condensing

## Electrical Specifications

Maximum Power: 100 W  
Supply Voltage: 120/240 VAC  
Power Plug: IEC-C-19  
Protection: GMA 1.5A Fuse  
Cooling Fan Capacity: 8 CFM Rear Exhaust