GENERAL INFORMATION

NextLevel Systems Inc., formerly General Instrument, was founded in 1948 as Jerrold Electronics. As the Broadband industry has evolved over the past 50 years, so have we. Whether you know us as Jerrold, GI or now as NextLevel, all are synonymous with achievement and excellence in communications. We are recognized as the pioneers of the industry and will continue this commitment as the move to the NextLevel.

MILESTONES

1948 — Milton Jerrold Shapp forms Jerrold Electronics. His first product is a small booster, which enhances television pictures.
1956 — Jerrold's "Golden Cascade? distribution amplifiers increase channel capacity from three to five, causing a noticeable shift in the industry.
— Jerrold becomes involved with the first pay TV experiment in Bartlesville, OK.
1967 — Jerrold introduces the first electro-mechanical cable converter to deliver 20 channels of programming to a standard television.
— Jerrold is acquired by General Instrument (GI), becoming a wholly-owned subsidiary
1979 — GI introduces multi-level scrambling/descrambling.
1986 — GI enters the pay-per-view industry with a programming service called Cable Video Store.
1991 — GI introduces and demonstrates its digital technology for the cable industry.
1995 — The first advanced analog CFT 2200 set-top is deployed, introducing interactivity to the cable industry.
1996 — The first digital cable system is rolled out in a TCI system in Hartford CT.
— NETadvantageTM a complete package of professional services, network management and software systems are launched.
1997 — General Instrument is restructured creating NextLevel Systems, Inc. a division focusing on broadband, satellite, data and telephone services.

NEXTLEVEL PRODUCTS

Your key contact for NextLevel products is the Account Manager or Account Executive designated to serve you. He or she is backed by the industry's most extensive support team, including field engineering, application engineering, customer service, and marketing services.

This catalog is organized into several sections, each reflecting a logical grouping or a major line of NextLevel's products. Any item in this catalog can be fully explained or easily ordered from your nearest Account Executive. Your Account Executive will also supply you with other literature concerning our products. Printed material is also available by contacting:

Purchasing
Services Group, Inc.
6995 NW 46th. Street
Miami, Florida 33 166
Tel.(305)594-7757 Fax

NEXTLEVEL™

Frequency Agile to 450 MHz . . . Stereo Compatible

FEATURES

- **FREQUENCY AGILE FROM 50 TO 450 MHz**
- **BTSC STEREO COMPATIBLE**
- **FRONT PANEL CONTROLS**
- **1.75 INCHES HIGH**
- **FCC COMPLIANT**

The S450M-II modulator is a full-featured frequency agile modulator that is designed to economically meet the needs of the cable system operator.

FRONT PANEL CONTROLS

All adjustments, with the exception of stereo operation, can be made via convenient front panel controls.

Output frequency can be selected by dipswitches located behind a sliding cover. Also included in the dipswitch selection is the ability to set the required FCC offsets of either +12.5 kHz or +25 kHz.

Video depth-of-modulation and audio deviation adjustments are made by the controls located next to their associated overmodulation indicators. The LED indicator adjacent to the video control is activated when video modulation exceeds 87.5%. The audio LED indicator lights up when the deviation exceeds 25 KHz. The A/V (audio/ video ratio) control adjusts the level of the aural carrier in relation to the video. This is preset at −15 dB at the factory.

Other front panel features include an RF level adjustment control and a 20 dB RF test port. LED indicates power on/off.

STEREO COMPATIBLE

The S450M-II can accept either baseband or 4.5 MHz BTSC stereo signals. A simple relocation of internal "suitcase" jumpers allows complete stereo compatibility.

SCRAMBLING COMPATIBLE

External IF loops enable the S450M-II to be compatible with NextLevel and other manufacturers' scrambling systems.

SUB-CHANNEL OUTPUT

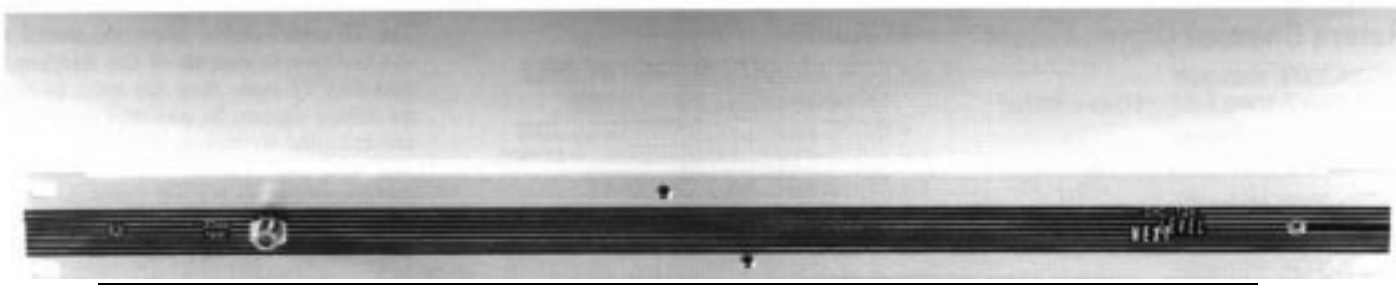
The S450M-II is available with sub-channel output as an option. Specify S450M-T when ordering.

NEXTLEVEL™

Specifications

RF	
Output Channels	2-69 IRC and FCC offsets per rule 76.612, all front panel switchable, sub-channel output (optional)
Output Level	60 dBmV Min., 10 dB adjustable
Spurious Output	>60 dB down @ 60 dBmV output, 50 to 450 MHz
In-band C/N	64 dB Minimum
Out-of-band C/N	80 dB Minimum
Frequency Stability	±5 kHz (conforms to FCC requirements)
Output Return Loss	>12 dB
Audio/video ratio	–12 dB to –25 dB adjustable (preset @ –15 dB)
Picture IF Output Level	35 dBmV nominal
Sound IF Output Level	20 dBmV nominal
VIDEO	
Input Level	0.7 V P-P min. for 87.5% modulation
Input Type	Composite NTSC, sync negative
Input Impedance	75 Ohms
Input Match	>30 dB
Differential Gain	<5% (0.4 dB) @ 87.5% modulation, APL 10% to 90%
Differential Phase	<3° @ 87.5% modulation, APL 10% to 90%
K Factor	4% Maximum
Tilt of 60 Hz Square Wave	1% Maximum
Modulation Range	0 to 100%
Overall Group Delay	75 nsec
Chrominance - Luminance Delay	±40 ms (80 ms P-P)
Signal To Noise	60 dB Minimum
Flatness	±1 dB from 25 Hz to 4.18 MHz
AUDIO	
Baseband Input Impedance	600 Ohms balanced/unbalanced
Baseband Input Level	–10 dBm (250 mV) to +10 dBm (2.5V) for ±25 kHz deviation
Preemphasis	75 microseconds ±1 dB, 50 Hz to 15 kHz Defeatable by internal jumper for BTSC stereo operation
Harmonic Distortion	1.5% Max. @ ±25 KHz deviation, 50 Hz to 15 kHz
Flatness	2.0 dB Max., 50 Hz to 15 KHz, including preemphasis
4.5 MHz BTSC Stereo Input	+35 dBmV to +45 dBmV
Input Level	–5 dBm to +10 dBm (with 25 kHz deviation)
Signal to Noise	–50 dB Minimum (@ 1 kHz)
Intercarrier Frequency	4.5 MHz ±500 Hz
GENERAL	
AC Power Requirements	108 to 132 V, 60 Hz, 15 W
Fuse	0.5A slo-blo, external
Weight	6 lbs (2.72 kgs)
Rack Mounting Dimensions	19"W x 1.75"H (single EIA rack unit) (48.07 cm x 4.42 cm)
Overall Dimensions	6"D x 19"W x 1.75"H (15.18 cm x 48.07 cm x 4.42 cm)
Operating Temperature Range	32°F to 120°F (0°C to 50°C)

Specifications subject to change without notice.



CHC-12X
Headend Combiner

The CHC- 12X Headend Combiner consists of twelve directional couplers — is used to combine twelve separate channel signals into a single output, or to split one input into twelve separate outputs. The nominal attenuation from any input to the output is 20 dB.

The rear panel includes twelve input/output connectors (J1 to J12), and RF OUT connector. A -20 dB TEST connector is located on the front panel for easy accessibility. All connectors on the rear panel accept coaxial cables with F-type connectors. The -20 dB TEST point provides a sample of the RF output signal which is 20 dB below the level at the RF

SPECIFICATIONS		
CHC-12X		
RF		
Frequency Range	50-86 MHz	860 1000 MHz
Input Ports	12	12
output Ports	1	1
Insertion Loss	20 dB *2 dB	20 dB r3 dB
Flatness	+1.5 dB	e1.5 dB
Isolation	30 dB Min.	30 dB Min.
Impedance	7.5 Ohms	75 Ohms
Input Return Loss	16 dB Min.	16 dB Min.
Output Return Loss	16 dB Min.	16 dB Min.
Test Point	-20 dB +2 dB	-20 dB *3 dB
MECHANICAL		
Dimensions	19”W x 1.75”H x 8”D (48.07 cm x 4.42 cm x 20.24 cm)	
Weight	8 lbs (3.62 kgs)	

Specifications subject to change without notice.

NEXTLEVEL™

dbxTM Noise Reduction ... BTSC Stereo ... Second Audio Program Option

FEATURES

- BASEBAND AUDIO INPUTS ENCOOEOINTOBTSCSTEREO FORMAT
- 4.5 MHz AND 41.25 MHz OUTPUT STANDARD FOR MAXIMUM FLEXIBILITY
- AUTOMATIC NON-CLIPPING OVER-MODULATION PROTECTION
- SECOND AUDIO PROGRAM (SAP) OPTION FOR BILINGUAL TRANSMISSION
- COMPACT DESIGN FOR EASE OF INSTALLATION

The NextLevel Commander Multichannel Television Sound (CMTS) Encoder enables cable operators to upgrade to true stereo TV sound. The CMTS is an economical means of upgrading system capabilities and subscriber service packages, thereby increasing overall system revenues. It allows a system operator to easily encode both stereo and secondary audio programming (SAP) for transmission and includes dbx noise reduction circuitry to ensure a quality signal.

4.5 MHz AND 41.25 MHz OUTPUT STANDARD

The CMTS encoder generates a linear, non-filtered composite spectrum for optimum stereo separation without requiring phase adjustment. This encoder/modulator transforms baseband stereo and SAP input (optional plug-in module) into BTSC multichannel sound which is then modulated to both a 4.5 MHz subcarrier output and a 41.25 MHz IF output.

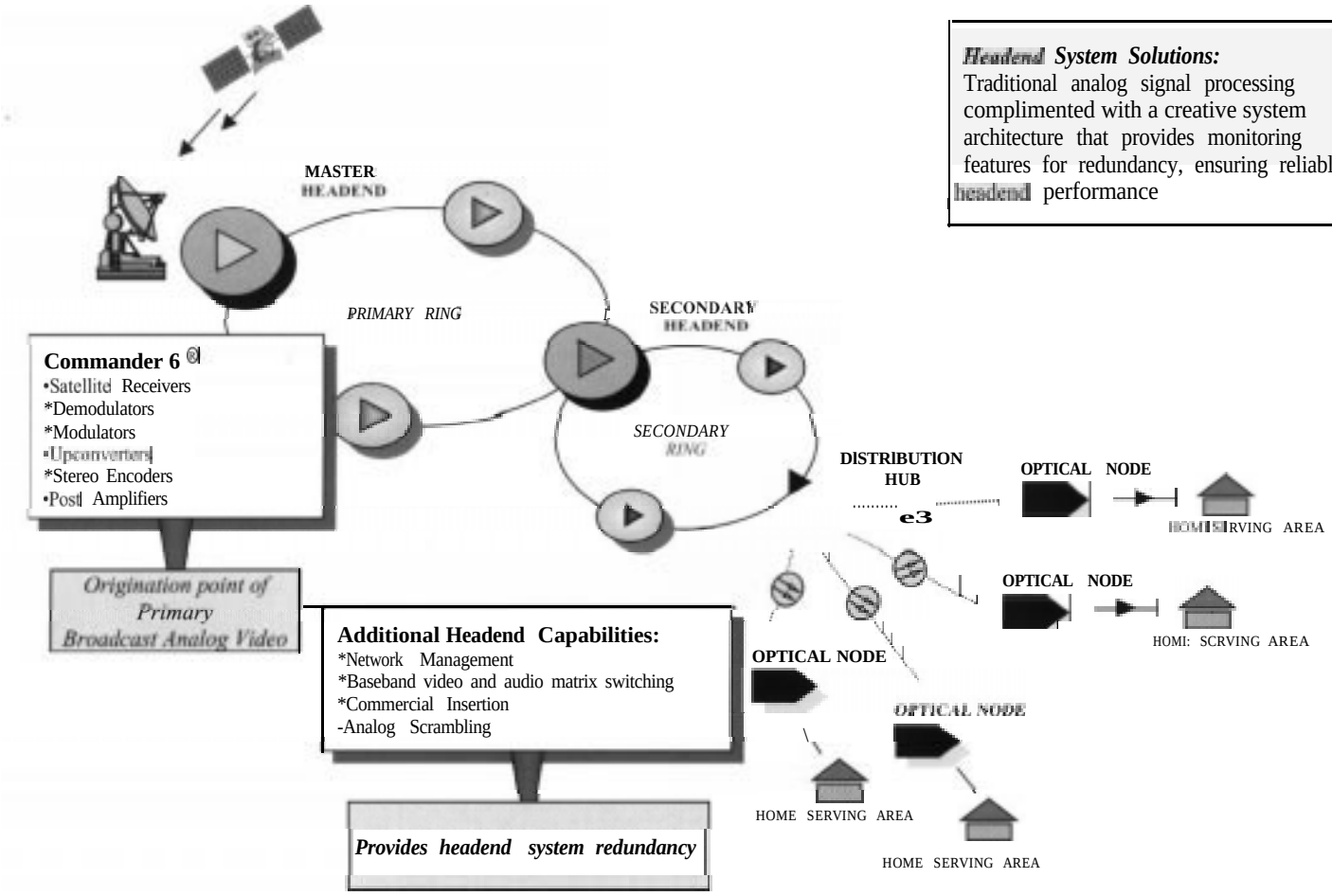
The integral precision 4.5 MHz crystal phase locked voltage-to-frequency converter included in the CMTS encoder provides unmatched linearity and minimum phase noise while the 41.25 MHz crystal upconverter is provided for interfacing with non-stereo compatible modulators.

DESIGNED TO FIT IN TIGHT SPACES

The CMTS is a rack-mounted unit with a 1.75 inch high chassis, enabling the operator to easily locate the unit even in most space-restricted configurations. It provides front panel access to all audio input level controls and includes bar graph indicators on the front panel for left, right and SAP channels. The bar graph indicators provide a true peak deviation metering of incoming audio signals, helping ensure that subscribers are receiving a high quality audio signal. In addition, the CMTS encoder includes automatic non-clipping over-modulation protection on all channels; a video lock indicator; and offers remote-controllable A/B input for automatic commercial insertion.

The CMTS encoder provides a cost-effective solution to stereo transmission in cable systems.

NEXTLEVEL™



Headend System Solutions:
Traditional analog signal processing complimented with a creative system architecture that provides monitoring features for redundancy, ensuring reliable headend performance

As analog headend architectures become more complex, NextLevel Broadband Networks Group is leading the way in providing true system solutions. Complimenting our traditional portfolio of high performance Commander 6 signal processing solutions is the ability to look at the headend as a system rather than just individual components. This approach offers not only flexibility but also crucial redundancy features as well.

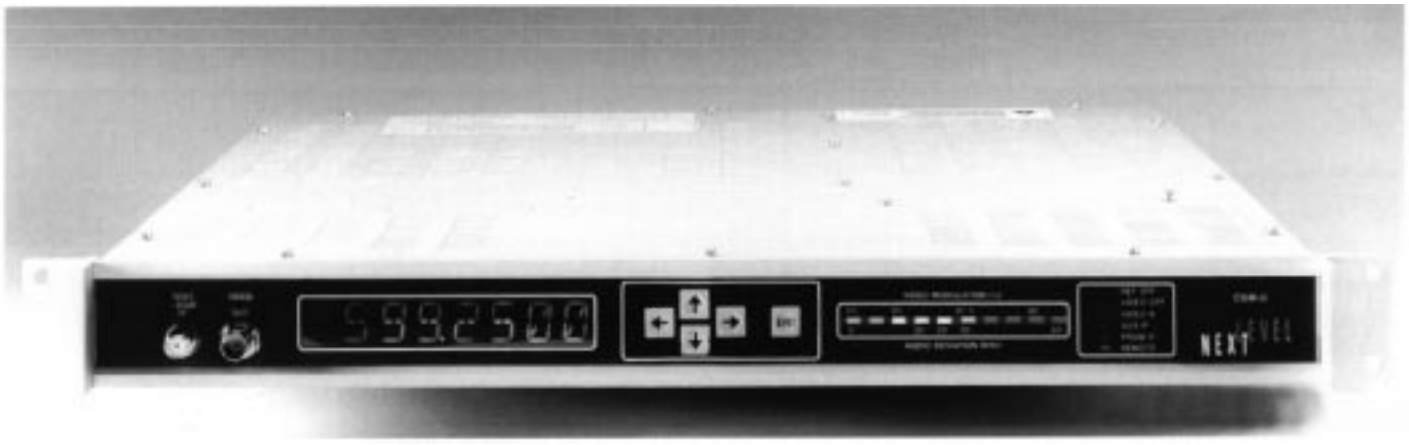
NextLevel has also developed a complete headend monitoring system called LIFEnetTM for Headend Control and Monitoring. The software follows Simple Network Management Protocols (SNMP) standard and is therefore easily added to a broadband operators Network Management System.

LIFEnet Headend Monitoring: All Commander 6 modules have complete mom-toring parameters. Through LIFEnet, our complete headend software package, the broadband operator will remotely monitor the RF and Cableoptics@ headend parameters.

Custom Pre-packaged Headend Designs: Every headend situation is unique. To help facilitate an efficient plan for design, layout, equipment selection and channel line-ups, our engineers work with each customer to fully understand their system requirements. After the headend is designed and assembled in our facility, we transport it to your location, install and provide proof-of-performance testing verification.

NEXTLEVEL™

COMMANDER 6@
NTSC Video Modulator



FEATURES

- 1 GHz FREQUENCY AGILE TUNING
- FREQUENCY SELECTION IN 12.5 kHz STEPS OR BY HRC, IRC, EIA OR NEXTLEVEL (STD) CHANNEL MAPS
- USER FRIENDLY FRONT PANEL INTERFACE
- NETWORK MANAGEMENT CAPABLE
- BASEBAND INPUT SWITCHING, 4.5 MHz SUBCARRIER INPUT, BASEBAND AGC CAPABLE (OPTIONAL WITH MOB)
- INTEGRATED BTSC STEREO ENCODER
- DC POWER CAPABLE

DESCRIPTION

The Commander 6 Modulator Version II, (model C6M-II) NTSC video modulator, delivers versatility, flexibility and ease of maintenance to all existing and new broadband communications headends. The C6M-II is frequency agile from 50 MHz to 1 GHz in a single rack unit (1U) package, using the latest technology in switching power supplies to minimize heat and increase power efficiency.

The C6M-II provides control of most parameters from the large eight-digit alphanumeric LED display on the front panel. All parameters are microprocessor controlled for precision, accuracy, stability and reliability. In addition to the standard rear panel connections, a video test port and a -20 dB RF test port are available on the front panel for easy testing access.

Upon frequency or channel selection, the microprocessor automatically engages internal bandpass filters, ensuring that a combined carrier-to-noise (C/N) ratio for up to 149 channels is at least 60 dB. Typical combined C/N ratios of 63 dB are much more common with the C6M-II.

The precision frequency stability of the C6M-II meets the band frequency accuracy requirements for the FCC. The FCC mandated frequency offsets of +12.5 kHz and +25 kHz are generated automatically as well. The C6M-II also exceeds all FCC RF and baseband signal performance requirements.

SYSTEM COMPATIBILITY

The C6M-II is compatible with commercial scrambling systems, offering a composite IF input connection to facilitate interfacing with NextLevel's model MVP-II in all scrambling modes, and dual IF loop-through connections for other encryption systems.

The C6M-II modulators also interface easily with NextLevel's model CMTS, BTSC stereo encoder; model C6R, analog satellite receiver; model DSR-4500, DigiCipher@ II satellite receiver, and model C6BD, broadcast demodulator. The C6M-II is compatible with all present and past NextLevel headend equipment.

Purchasing Services Group, Inc.
6995 NW 46th. Street
Miami, Florida 33 166
Te1.(305)594-7757 Fax (305)594-2773

&EVEL'

Multi-Standard International Satellite Receiver

FEATURES

- BROADCAST QUALITY PERFORMANCE IN NTSC/PAL/SECAM/ANO MAC FORMATS.
- C AND KU BAND FREQUENCY AGILITY, 950 - 1750 MHz
- PRECISION MICROPROCESSOR CONTROLLED DUAL CONVERSION PLL TUNING
- DIGITAL AFC TRACKING CIRCUIT WITH CONTINUOUS FINE TUNING ABILITY
- 70 MHz IF WITH SPECTRUM INVERSION CIRCUIT FOR UPLINK TURNAROUNDS
- TERRESTRIAL INTERFERENCE (TI) LOOP.
- FRONT PANEL TEST POINTS FOR VIDEO AND 70 MHz IF
- AUTO CALIBRATING REAL-TIME C/N METER
- OPTIONAL MULTI-STANDARD BROADCAST QUALITY STEREO AUDIO DEMODULATOR

The C6R-MS1 is an international, multi-standard satellite receiver capable of receiving satellite transmitted signals in NTSC/PAL/SECAM/ and MAC formats. Frequency agile with an input RF bandwidth of 950 to 1750 MHz, the PLL synthesized COMMANDER 6 receiver is designed for broadcast quality performance.

Featuring digitally locked, continuously tuning AFC and microprocessor controls, the received C/Ku-band radio frequency (RF) signal inputs are dual converted to a commercial, industry standard 70 MHz intermediate frequency (IF).

The C6R-MSI's design uses a new 70 MHz IF inversion circuit that enables direct satellite RF processing at the upldownlink site. This circuit provides more consistent and reliable video performance. It offers advantages in applications in which signal processing can be performed at an Intermediate Frequency (I.F.), rather than at baseband audio/video.

USER FRIENDLINESS

The front panel includes a three function meter indicating carrier-to-noise (C/N), fine tuning, and RF signal strength. The real-time C/N meter and alarm features consistently monitor the receive signals with maximum power ability. The tune meter enables precision, fine tuning of the input RF signal, and the RF input level signal meter is calibrated like a spectrum analyzer in dBm units.

The multiple video low pass filters and de-emphasis networks enable the C6R-MS1 for NTSC/PAL/SECAM/ and MAC operation along with all known video scrambling formats. The multi-tap power supply, with 3 voltage settings, decreases heat and power consumption and is designed for continuous 24-hour operation.

OPTIONAL ACCESSORIES/ORDERING INFORMATION

The flexible, 1.75 inch receiver design is an open architecture with field-installable options. The receiver can be ordered without audio to minimize cost in dedicating scrambling systems. It can also be ordered with the following:

ASD-MSI OPTION

Audio option with PLL frequency agile dual channel stereo audio demodulator with five adjustable IF filters (55,110,220,440,880 KHz), and multi-format audio de-emphasis networks (50, 75, J-17, and sliding) or a flat audio.

BPF-900

Front panel adjustable, multiple SAW filtered module with six 70 MHz IF bandpass filters (16,18,22,25,27, and 36).

NEXTLEVEL™

Specifications

RF CHARACTERISTICS

RF Frequency Range (stock)	950 to 1750 MHz
Input Impedance	75 Ohms
Input Level	–20 to –65 dBm
Input Return Loss	≥12 dB
Noise Figure	≤13 dB
Stock IF Bandwidth	27 MHz
Tuning	1.0 MHz
Fine Tuning Pot	100 kHz Resolution ±2 MHz
C/N Meter	7 – 25 dB
Tuning Meter	±2.0 MHz
Signal Meter	–20 to –60 dBm
Static Threshold	<7.0 dB

IF CHARACTERISTICS

1st IF Center Frequency	612 MHz
2nd IF Center Frequency	70 MHz
Min. input level for max. IF gain (1 dB change from reference)	≤ –65 dBm
FM Dynamic Threshold C/N first sparkles with color bars	≤12 dB
FM Static Threshold C/N	≤7 dB
IF Test Output Impedance	75 Ohms

TUNING

AFC Capture Range	±2.0 MHz
Fine Tuning Range	±2.0 MHz

525 PERFORMANCE (VIDEO 1 & 2)

Chroma-Luma Delay Inequality	±15 nsec
Field-Time Distortion	≤3.0%
Differential Gain	≤3.0%
Differential Phase	1.5°
Deviation Range for 1 V p-p output	10.0 to 27.6 MHz p-p
Composite Output Impedance	75 Ohms
Line Time Distortion	±1.0%
Short Time Distortion	±2.0%
Chroma-Luma Gain Inequality	±4.0%
Luminance Nonlinearity	≤5.0%
Chroma-Luma Intermodulation	±2.0%
Chroma NL Gain	±3.0%
Chroma NL Phase	±2.0°
#2 Video/Video Test Output Level Ref. #1 Video Output	±1.0%

COMPOSITE

Deviation Range for 1 V p-p output	10.0 to 27.6 MHz p-p
Video Output Impedance	75 Ohms
Line Time Distortion	±1.0%
Short Time Distortion	±2.0%
Chroma-Luma Delay Inequality	±15 nsec
Chroma-Luma Gain Inequality	±4.0%
Differential Gain	≤3.0%
Differential Phase	≤1.5 °
Luminance Nonlinearity	±5.0%
Chroma NL Gain	±2.0%
Chroma NL Phase	±2.0 °
Gain Frequency Distortion 15 Hz - 4.2 MHz	±0.51 dB
Chroma-Luma Intermodulation	±2.0%
Field-Time Distortion	≤1.0%
Dispersal Rejection	≥40 dB
Vertical Interval Distortion	≤2.0 IRE
70 MHz IF Signal Leakage	≤–65 dBm
Video Test Output Impedance	75 Ohms

625 PERFORMANCE (VIDEO 1 & 2)

Chroma-Luma Delay Inequality	±20 nsec
Field-Time Distortion	≤4.0%
Differential Gain	3.0%
Differential Phase	1.5°
Deviation Range for 1 V p-p output	5 to 14 MHz Peak
Composite Output Impedance	75 Ohms
Line Time Distortion	±2.0%
Short Time Distortion	±3.0%
Chroma-Luma Gain Inequality	±3.0%
Luminance Nonlinearity	≤5.0%
Chroma-Luma Intermodulation	±2.0%
#2 Video/Video Test Output Level Ref. #1 Video Output	±1.0%

COMPOSITE

Deviation Range for 1 V p-p output	9.0 to 24 MHz p-p
Video Output Impedance	75 Ohms
Line Time Distortion	±2.0%
Chroma-Luma Delay Inequality	±20 nsec
Chroma-Luma Gain Inequality	±3.0%
Differential Gain	≤3.0%
Differential Phase	≤1.5°
Luminance Nonlinearity	±5.0%
Field-Time Distortion	≤4 IRE
Video Test Output Impedance	75 Ohms

GENERAL

Power	50 to 60 Hz
(115,230,240 V)	–10 to +50%
Dimensions (HxWxD)	1.75"H x 19"W x 18.9"D (4.5 cm x 48.3 cm x 48.0cm)
Voltage	115, 230, 240 Vac
Current (max)	25 W
(with option	≤50 W
(without option)	≤35 W

ENVIRONMENT (OPERATIONAL)

Temperature	+14° to +122°F (–10° to +50°C)
Altitude	0 to 15,000 ft. (0 to 4,572 M)

Specifications subject to change without notice.

Worldwide telephone: (U.S.) 215-674-4800; fax (U.S.) 215-956-6497; website: www.nlvl.com. Offices in Asia, Australia, Europe, North America, and South America.

Specifications

RF	
Channels	2 to 161 (HRC, IRC, EIA, or NextLevel STD Frequency plans; Frequency tunable in 12.5 kHz steps)
Frequency Range	50 to 1000 MHz, tunable in 12.5 kHz steps
Frequency Accuracy	±5 kHz Maximum, ±500 Hz Typical
Output level	+60 dBmV Minimum
Recommended operating range	+57 to +61 dBmV
Spurious	-60 dBc Minimum @ +60 dBmV (50 to 1000 MHz) with sound carrier at -15 dBc
Output Return Loss	14 dB Minimum within channel (50 to 750 MHz) 13 dB Minimum within channel (750 to 1000 MHz)
Sound Carrier Level	Adjustable, -10 to -20 dB relative to video carrier
C/N Ratio (normalized to 4 MHz)	
In-band	68.0 dB Minimum, 70.0 dB Typical
Adjacent channel	72.0 dB Minimum, 74.0 dB Typical
Wideband	75.5 dB Minimum, 76.0 dB Typical
RF Carrier Phase Noise	
@1 kHz offset	-68 dBc/Hz Minimum
@10 kHz offset	-95 dBc/Hz Minimum
IF	
Picture IF Output Frequency	45.75 MHz
Picture IF Output Level	+35 dBmV @ 87.5% modulation
Sound IF Output Frequency	41.25 MHz
Sound IF Output Level	+15 to +25 dBmV
Composite IF Output Level (Picture IF)	+30 dBmV ±1 dB @ 87.5% modulation
CW IF Output Frequency	45.75 MHz
CW IF Output Level	+50 dBmV ± 5 dB
Video	
Standard Baseband Input	0.5 to 2.0 Vp-p for 87.5% modulation
Encoded Video Input Level	1.0 Vp-p for 87.5% modulation
Video Input Impedance	75 Ohms
Video Input Return Loss	30 dB Minimum
K factor	2% Maximum
S/N Ratio (luminance weighted)	64 dB Minimum
Chroma delay, relative to precorrection	±50 nsec
Frequency Response	±0.5 dB from 0 to 4.1 MHz
Differential Gain	±3% @ 87.5% modulation
Differential Phase	1.0° p-p Maximum @ 87.5% modulation
Tilt	1% Maximum

Specifications subject to change without notice.

Specifications

Audio	
Input Level Range (switchable)	
Low	-10 to +lO dBm, Zo = 600 Ohms
High	+5 to +25 dBm, Zo = 600 Ohms
Input Impedance (switchable)	
Low	600 Ohms balanced
High	15 k Ohms Minimum
Frequency Response	*I.0 dB from 30 Hz to 15 kHz
Preemphasis	75 psec, defeatable
Harmonic Distortion	1% Maximum from 30 Hz to 15 kHz @ rt25 kHz deviation
Hum and Noise	-60 dBc Maximum @ ~25 kHz deviation
Aural Subcarrier Frequency	4.5 MHz f 500 Hz
Aural Subcarrier Input Level Range	+35 to +45 dBmV, Zo = 75 Ohms
General	
AC voltage Requirements	100 to 240 Vrms, 50 to 60 Hz
Power Requirements	40 watts Maximum
Operating Temperature	0” to 50” c
Weight	13.5 lbs (6.11 kgs) Maximum
Dimensions	19” W x 1.75” H x 17.5” D (48.07 cm x 4.42 cm x 44.28 cm)

Specifications subject to change without notice.

NEXTLEVEL

Specifications

AUDIO CHARACTERISTICS	
Audio Input Range (for full deviation)	−10 to +10 dBm (600 Ohms balanced)
Frequency Response	
Left, Right	(50 Hz to 14.5 kHz) ± 1 dB
−3 dB Point	57 kHz Minimum
SAP	(50 Hz to 10 kHz) ± 1 dB
Channel Separation	>26 dB from 50 Hz to 100 Hz
	>30 dB from 100 Hz to 8 Hz
	>26 dB from 8 kHz to 14.5 kHz
Total Harmonic Distortion	
Left, Right	<.2%
SAP	<.5%
Dynamic Range	75 dB Minimum
Common Mode Hum Rejection	>75 dB
Crosstalk	>60 dB down
Composite BTSC Output Level	0 dBm typical (600 Ohms balanced)
L-R Carrier Supression	>60 dB
OUTPUT CHARACTERISTICS	
Video Level (Video Loop-Thru)	1 Volt P-P ± 60 dB
4.5 MHz Output:	
Output Level	+40 dBmV nominal into 75 Ohms
Spurious	−60 dB from 4.5 MHz
41.25 MHz Output:	
Output Level	+15 to +30 dBmV variable into 75 Ohms
Spurious	−60 dB from 41.25 MHz

Note: Accepts vestigal video IF in and provides composite IF out.
Preliminary specifications subject to change without notice.

Return Channel Diplex Filters

TF-26-XHE Subsplit
(5-26/47-1000 MHz) Diplex Filter

TF-30-XHE Subsplit
(5-32/52-1000 MHz) Diplex Filter

TF-40-XHE Subsplit
(5-40/50-1000 MHz) Diplex Filter

TF-55-XHE Midsplit
(5-60/85-1000 MHz) Diplex Filter

FEATURES

- **LOW INSERTION LOSS NEARLY TRANSPARENT TO SYSTEM**
- **EXCELLENT BAND SEPARATION**
- **1 GHz FULL BANDWIDTH RATING**
- **FORWARD AND REVERSE EQUALIZATION OPTIONAL***

The TF series diplex filters are placed after the composite output of the headend. In two-way systems they are used to extract the return signals. In one-way systems they are installed to reduce noise ingress from the unused return band. NextLevel recommends the use of a diplex filter on each trunk output regard-less of whether two-way operation is planned.

SPECIFICATIONS				
MODEL #	**TF-26XHE-III**	**TF-30XHE-III**	**TF-40XHE-III**	**TF-55XHE-III**
Passband	5-26 MHz and 47-1000 MHz	5-32 MHz and 52-1000 MHz	5-40 MHz and 50-1000 MHz	5-60 MHz and 85-1000 MHz
Maximum Insertion Loss	3.0 dB	3.0 dB	3.0 dB	3.0 dB
Stopband	26-47 MHz	32-52 MHz	40-50 MHz	60-85 MHz
Stopband Attenuation	25 dB Min.	25 dB Min.	25 dB Min.	25 dB Min.
Isolation, Between Highpass and Lowpass Ports	40 dB Typ.	40 dB Typ.	40 dB Typ.	40 dB Typ.
Terminal Match, Return Loss 75 Ohms Impedance (Minimum)	16 dB	16 dB	16 dB	16 dB

Frequency Agile to 450 MHz ... Stereo Compatible ... Heterodyne

FEATURES

- FREQUENCY AGILE FROM 50 TO 450 MHz
- BTSC STEREO COMPATIBILITY
- FRONT PANEL CONTROLS
- 1.75 INCHES HIGH
- AUTOMATIC ON-CHANNEL OPERATION
- SUB-BAND OPTION AVAILABLE
- FCC COMPLIANT

The S45OP, the NextLevel full-featured frequency agile heterodyne processor, offers an economical way to process off-air or cable-delivered signals in CATV headends without sacrificing performance.

FRONT PANEL CONTROLS

All adjustments are made via convenient front panel controls; no internal adjustments are required.

Input frequency selection is accomplished with front panel dipswitches located behind a sliding cover. The S45OP accepts VHF, UHF and cable channels to 450 MHz.

Output channel selection is also accomplished with front panel dipswitches that tune in 0.25 MHz increments from 50 to 450 MHz.

Other front panel adjustments include: an audio/video ratio (A/V) control which adjusts the aural carrier from -12 dB to -17 dB below the video carrier; an offset adjustment control which enables the output frequency to meet FCC requirements; and an RF output level control which can be adjusted 10 dB down from typical 60 dBmV output.

STEREO COMPATIBLE

The S45OP can accept and process BTSC stereo delivered signals with no added signal degradation.

OPTIONS

The S45OP is available with sub-channel (Model S450P-T) and HRC (Model S45OP-HRC) processing capabilities. Please specify the proper model when ordering to suit your application.

NEXTLEVEL™

Frequency Agile to 801.25 MHz ... Stereo Compatible

FEATURES

- HANDLES VHF, UHF AND ALL CABLE CHANNELS TO 470 MHz FOR STANDARD, HRC AND IRC FREQUENCY FORMATS
- SUB-BAND OPTION AVAILABLE
- MPX OUTPUT FOR BTSC STEREO ENCODED SIGNALS
- 1.75 INCHES HIGH

The NextLevel S890D is a frequency agile television demodulator that covers the frequency spectrum from 54 MHz to 801.25 MHz in 0.25 MHz steps. Frequency selection is by convenient front panel dipswitch. The unit provides baseband audio and video outputs as well as a multiplex output for BTSC stereo encoded signals. SAW filtering is utilized for excellent video and adjacent channel performance. The unit is packaged in a 1.75” rack mount enclosure and has very low total power dissipation, less than 8 watts.

The S890D now offers two video outputs, both rear panel switchable to composite, as standard. The unit also offers a rear panel IF testpoint, and a separate 4.5 MHz audio subcarrier output.

SUB-BAND OPTION

The S890D is available with sub-channel input capability, for use in applications where a return channel, 5 to 30 MHz is demodulated and then re-modulated for distribution. Specify S890D-T when ordering.

NEXTLEVEL™

Specifications

VHF/UHF Input	54 MHz to 801.25 MHz Selectable by front panel dipswitch in 0.25 MHz increments, including all cable channels to 470 MHz Optional 5 to 30 MHz input capability
RF Input level	– 10 dBmV to + 25 dBmV off-air – 10 dBmV to + 10 dBmV off-cable
Video Output	1 V P-P (75 Ohms)
Audio Output	500 MV P-P (600 Ohms unbalanced)
MPX Output	500 MV P-P (600 Ohms unbalanced)
Input Connectors	VHF and Cable—type F (75 Ohms) UHF—type F (75 Ohms)
Size	19"W x 1.75"H x 12"D (48.07 cm x 4.42 cm x 30.36 cm)
Power	115 Vac @ 60 Hz, 8 Watts
Differential Gain	4% Typical
Differential Phase	2° Typical
Noise Figure	VHF 7 dB UHF 9 dB
Audio Subcarrier Output	+ 40 dBmV (75 Ohms)

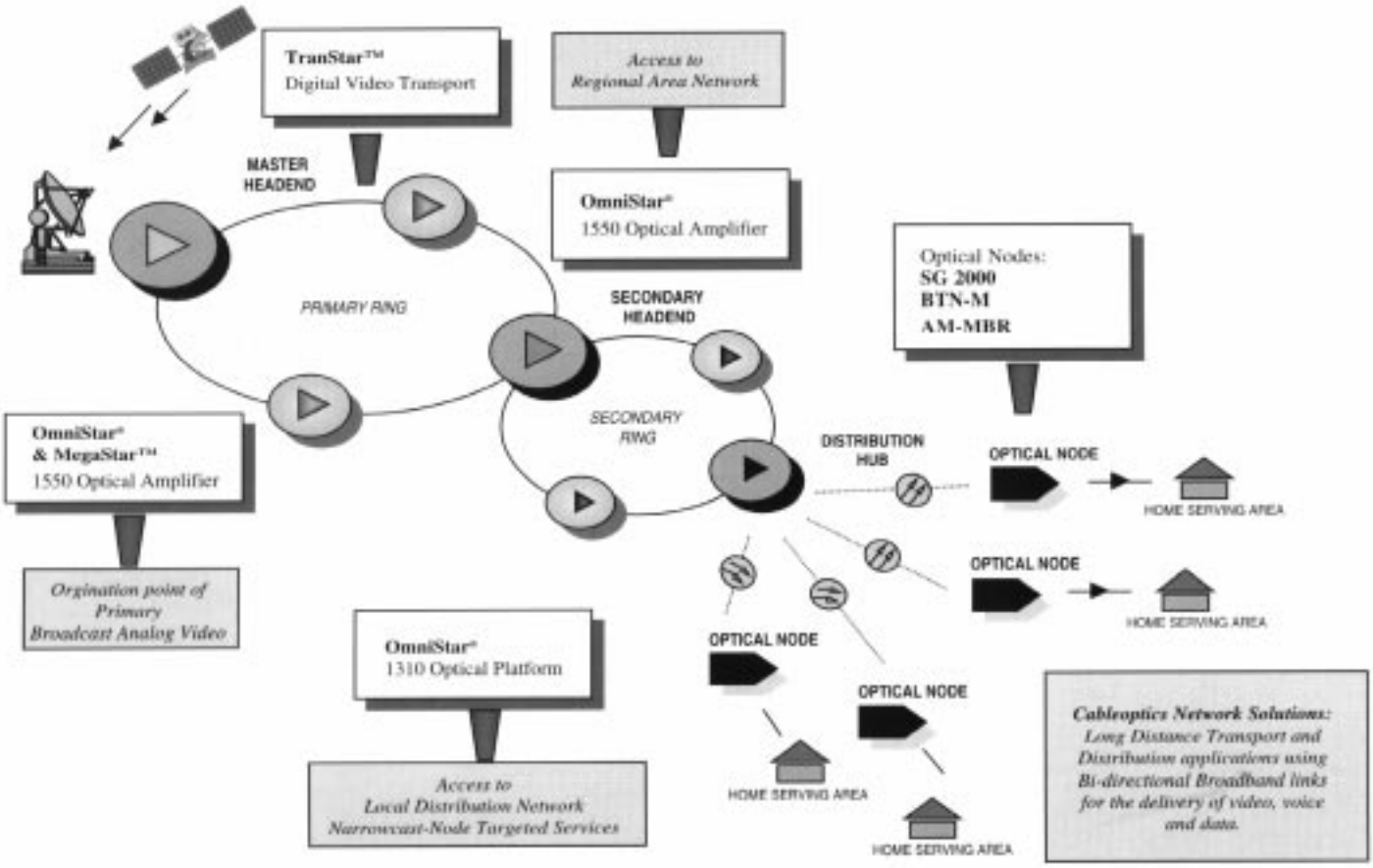
Specifications subject to change without notice.

Specifications

RF INPUT	
Input Channels	VHF, UHF and cable channels to 450 MHz Sub-Band (Optional)
Impedance	VHF: 75 Ohms UHF: 75 Ohms
Signal Level Range	Off-Air Channels: – 15 to + 25 dBmV Cable Channels: – 15 to + 10 dBmV
Adj. Channel Rejection	≥ 60 dB
AGC Range	– 15 to + 25 dBmV
Carrier To Noise	55 dB (Typical, with + 10 dBmV input level)
Noise Figure	VHF 8 dB (Typical) UHF 1O dB (Typical)
Frequency Response	2.5 dB P-P
RF OUTPUT	
Output Channels	Channel 2 through 69, (50 to 445.25 MHz)
FCC Offset	Front Panel Adjustable + 12.5 kHz and + 25 kHz
Output Level	+ 55 dBmV min, + 60 dBmV typical
Output Level Control	1O dB
Spurious Output	> 60 dB below video carrier level
Out-of-Band Noise	> 80 dB below video carrier level
Output Impedance	75 Ohms
GENERAL	
Fuse	0.5A, 250 V, slo blo
Power Requirements	117 VAC, 60 Hz, 35W
Dimensions	19"W x 1.75"H x 7"D (48.07 cm x 4.42 cm x 17.71 cm)
Input Impedance	75 Ohms
CONTROLS/INDICATORS	
Front Panel LED Indicator	Power on
Front Panel Controls	Input Channel Selection Output Channel Selection RF Output Level Audio/Video Ratio – 20 dB test point (MG connector) Offset Adjust
Rear Panel Connectors, Type F	UHF Input VHF/CATV Input RF Output IF Out IF In

Specifications subject to change without notice.

Worldwide telephone: (U.S.) 215-674-4800, fax: (U.S.) 215-956-6697; website: www.nlvl.com. Offices in Asia, Australia, Europe, North America, and South America.



Fiber optic technology can be used in Broadband Transmission systems requiring the added reliability and advanced technology inherent in fiber transmission. NextLevel offers a complete array of two-way fiber optic products marketed under the Cableoptics trade name. Cableoptics products are designed and manufactured to provide customers with significant solutions through systems selection.

There are several types of system solutions, NextLevel has developed a universal platform to meet any of them. A digital fiber transport system (TranStar™) was designed for SONET ring applications, OmniStar™ 1550 nm for long haul and headend to headend connections and OmniStar 1310 nm for typical headend to hub applications.

Forward/Return Transmitter: The signal is combined into an optical signal for transmission from the master or secondary headend to a forward receiver located at a remote headend or node location. Forward/Return transmitters can either be a digital fiber transport, 1550 nm, or 1310 nm.

- AM-OMNI-1550 TX1
- AM-OMNI-LM® 750A/860D
- AM-OMNI-RPTD

Forward/Return Receiver: The receiver converts the optical signal back to an RF signal ready for reprocessing at a remote headend or distribution throughout the system.

- AM-OMNI-860R
- AM-OMNI-RPR/2
- AM-750RS-HE

LIFEnet™ Headend Monitoring: All OmniStar modules have complete status monitoring parameters. Through LIFEnet's complete software package a broadband oprator can remotely monitor the OmniStar and Commander 6® platform parameters.

NEXTLEVEL™

Cableoptics®
Dual Return Path Receiver

FEATURES:

- 5 - 200 MHz PASSBAND
- 2 INDEPENDENT RECEIVERS
- FRONT PANEL PLUG-IN MODULE WITH PLUG-N-PLAY OPERATION
- ACCEPTS VIDEO AND DATA MODULATION FORMATS
- OPERATIONAL WAVELENGTH AT 1310 nm AND 1550 nm

DESCRIPTION

The AM-OMNI-RPR/2 Dual Return Path Receiver Module for the OmniStar platform provides a universal compact solution to meet the requirements of advanced upstream video and data traffic applications. The RPR/2 is controlled and monitored locally through front panel features, and remotely through the OmniStar Control Module and LIFEnet™ Headend Control Software.

The AM-OMNI-RPR/2 is the perfect answer when Return Path data/video is needed to support upstream information transmission from either traditional node locations, or from hub sites where the potential need for frequency stacking or up conversion requires increased upstream bandwidth. The Dual Return Path Receiver is also ideal for systems where status monitoring services and interactive services, such as VOD, NVOD, Telephony and PCS, demand further processing of upstream information.

The AM-OMNI-RPR/2 features test points for received optical power and RF output level for each detector path. And for flexible user configuration, the AM-OMNI-RPR/2 offers manual gain control for variable output level.

NEXTLEVEL™

Specifications

Frequency Passband	5 - 200 MHz
Wavelength	1310 nm ±20, 1550 nm ±20
Optical Input Range	-16 dBm to 0 dBm
Channel Loading	1 Video channel and 2 data @ -16 to 0 dBm
	Up to 50 data channels @ -16 to 0 dBm
Output RF Return Loss	>16 dB
RF Output Level*	
Recommended Maximum Operating Output Level	40 dBmV
Minimum RF Output Level	15 dBmV
Manual Gain Control Range	20 dB (front panel adjustable)
Output Flatness	± 0.5 dB
Operational Gain	40 dB Minimum
RF Test Point	-20 dB, ±0.5 dB
Optical Test Point	2.0 V/mW (DC voltage) @ 1310 nm wavelength
	2.1 V/mW (DC voltage) @ 1550 nm wavelength
Optical Alarm Limits	Major Alarm, -18 dBm and +3 dBm
Data/Control Interface	Serial Peripheral Interface (SPI) using LIFEnet™ Software
Optical Connector	SC/APC
Temperature Range	0° to +50°C (+32° to +122°F)
Power Consumption	7.0 watts
Dimensions	1.5" W x 6.5" H x 14.25" D (single OmniStar module width) (3.81 cm x 16.51 cm x 36.20 cm)
Weight	2.5 lbs (1.1 kgs)
Mounting	AM-OMNI-HSG* equipment shelf, any of slots 3 through 10

Specifications subject to change without notice.

Note:
* All RF output levels are based on typical input levels to all our return transmitters.

O/W/STAR 860 MHz Laser Module for 550 MHz Analog Transmission

FEATURES:

- 50 - 860 MHz PASSBAND
- HIGH PERFORMANCE DFB LASER WITH INTERNAL ISOLATOR AND LEADING EDGE PREDISTORTION
- FRONT PANEL PLUG-IN MODULE WITH PLUG-N-PLAY OPERATION
- INTEGRATED PRE-AMP FOR RF INPUT LEVEL OF ONLY +I5 dBmV
- BROADCAST AND NARROWCAST INPUTS
- AVAILABLE IN 8 OUTPUT POWER RANGES

DESCRIPTION

The OmniStar laser module offers an innovative approach to optical transmission with unparralleled performance. The 860 MHz laser family consists of eight models with optical power ranging from 2 mW (4 dBm) to over 16 mW (12 dBm) offering a choice for the most cost effective solution based on designed loss budget, performance criteria, and splitting ratio considerations. The OmniStar laser has an integrated preamp allowing for a fixed RF input level of only +15 dBmV per channel with 77 NTSC channels while maintaining superior distortion performance. All laser modules have separate broadcast and narrowcast RF inputs eliminating the need for external combiners.

As an integrated unit providing all optical, RF signal processing, and control functions, each laser module features an internal optical isolator and RF linearization circuitry to provide superior carrier-to-noise and distortion performance. Optical performance of each laser is characterized at the factory where its optimal operating point is stored in non-volatile memory so that user adjustment of the RF laser drive level is unnecessary. The link performance is guaranteed upon power-up. The three user controlled modes of operations are *preset* - factory set AGC for optimal laser performance, *set* - user adjust-able AGC, and *manual* - user adjustable fixed gain. The ***set*** and manuaZ modes let the user customize the RF drive level for desired carrier-to-noise and distortion performance based on channel loading and system requirements. Continuous wave and video signal input modes are also user selective.

NEXTLEVEL™

OMNISTAR 860 MHz Analog and Digital Laser Module

Specifications

RF Characteristics:	
Operational Bandwidth	50 - 860 MHz
RF Input Impedance	75 Ohms
RF Input Return Loss	14 dB min.
RF Connector Type	G-type
Optical Characteristics:	
Optical Wavelength	1310 nm +/- 20 nm
Distortion Performance	(see link performance specs.)
Optical Connector Type	SC/APC
Laser Shutdown	Enable/Disable via. Control Module using LIFEnet™ Software
Eye Protection	Optical Safety Shutter
Power Requirements:	
DC Currents Minimum/Maximum	
+5 Vdc	90 mA/1.7 A
+12 Vdc	350 mA/450 mA
+24 Vdc	400 mA/550 mA
Power Consumption	25 watts
User Interface:	
Front Panel	Tri-state Module Status LED
Operational Mode	Push-button Selectable, LED display indication
Optical Power Test Point	5 mW/1 V, Scaled DC Voltage of Optical Output Power
RF Test Point	+17 dBmV/channel with 77 NTSC channel loading
Data/Control Interface	Serial Peripheral Interface (SPI) using LIFEnet™ Software
Environmental:	
Operating Temperature Range	-20° to 65°C (-4°F to 149°F)
Storage Temperature Range	-40° to 80°C (-40° to 176°F)
Over Temperature Laser Protection	Software and Hardware active
Physical Properties:	
Dimensions	1.5" W x 6.5" H x 14.25" D (3.81 cm x 16.51 cm x 36.20 cm)
Weight	4.0 lbs (1.8 kgs)
Mounting	AM-OMNI-HSG* equipment shelf, any of slots 3 - 10

Specifications subject to change without notice.

OMNISTAR 860 MHz Analog and Digital Laser Module

LINK PERFORMANCE SPECIFICATIONS

Operational Bandwidth		50 - 860 MHz (50 - 550 MHz Analog, 550 - 860 MHz Digital)
Input RF Signal Level:		
Broadcast	Analog	+15 dBmV, 50 - 550 MHz (77 channels NTSC or 65 PAL channels)
		+17 dBmV for Models AM-OMNI 11LD and 12LD
	Digital	+5 dBmV, 550 - 860 MHz
Narrowcast	Analog/Digital	22 dB above Broadcast input levels
CABLEOPTICS LINK PERFORMANCE		
CTB		-66 dB worst case
CSO		-63 dB worst case

CARRIER-TO-NOISE PERFORMANCE (dB):

		OUTPUT POWER	OPTICAL LOSS (dB)											
LASER MODEL	**(Min - Max) mW/dBm**		4	5	6	7	8	9	10	11	12	13	14	15
LM-4	2-3.2/3-5		52.0	51.0	50.0	49.0	48.0	47.0						
LM-6	2.5-4/4-6			52.5	51.5	50.5	49.5	48.5						
LM-7	4-6.3/6-8					52.0	51.0	50.0	49.0	48.0				
LM-9	6.3-10/8-10							51.5	51.0	50.0	49.0	48.0		
LM-11	10-14/10-11.5									51.5	50.5	49.5	48.5	47.5
LM-11LD	10-14/10-11.5									51.5	50.5	49.5	48.5	47.5
LM-12	12.6-20/11-13										52.0	51.0	50.0	49.5
LM-12LD	14-22.4/11.5-13.5										52.0	51.0	50.0	49.5

Specifications subject to change without notice.

Notes:
Link performance specifications are based on 50-550 MHz Analog (77 channels NTSC or 65 PAL channels) and 550-860 MHz Digital.
C/N specifications measured using RM-9 receiver and are worst case, add 1 dB for typical performance.
Specifications are measured using CW carriers per NCTA.
AM-OMNI-LM-4 specifications are for optical link budgets that include a maximum of 7.5 km of fiber (0.4 dB/km).
AM-OMNI-LM-6,-7,-9,-11LD, and -12LD specifications are for all fiber (0.4 dB/km) optical loss budgets and include 1 dB for connector loss.
AM-OMNI-LM-11 specifications are for optical link budgets that include a maximum of 20 km of fiber (0.4 dB/km).
AM-OMNI-LM-12 specifications are for optical link budgets that include a maximum of 15 km of fiber (0.4 dB/km).
AM-OMNI-LM-11LD, and 12LD require an input level of +17 dBmV for 50-550 MHz Analog (77 channels NTSC or 65 PAL channels).
All link budgets include 1 dB for connector loss and meter inaccuracy.

NEXTLEVEL™

FEATURES:

- UNIVERSAL CHASSIS FOR FLEXIBLE CONFIGURATION
- AC AND DC POWERING OPTIONS
- POWER REDUNDANCY CAPABLE
- INTEGRATED STATUS MONITORING AND REMOTE NETWORK MANAGEMENT CAPABILITY
- ACCEPTS FRONT PANEL PLUG-IN MODULES WITH PLUG-N-PLAY OPERATION
- INCREASED OPERATIONAL DENSITY PER RACK UNIT SPACE (8 ACTIVE MODULES IN 5 RU SPACE)

DESCRIPTION

OmniStar, the next generation of Cableoptics headend products, is a fiber optic analog signal transmission platform that supports advanced Broadband Hybrid Fiber/Coax Telecommunications Systems. It is the perfect solution for modern broadband network systems where increasingly smaller node sizes and the deployment of point-to-point lasers require optimal headend or central office space. As a compact rack-mount optical platform it is ideal for complete two-way broadband transmission and also for applications which use rack-mount transmission equipment in a Distribution Hub or OTN.

The OmniStar design incorporates a printed circuit board back-plane providing easy plug-in interface to a Serial Peripheral Interface (SPI) bus. The SPI bus distributes power and control signals to eight universal module slots within the unit. Additionally, there are two slots dedicated for AC or DC powering options (120/240 Vat or -48 Vdc) and another slot in the chassis is dedicated to the unit's microprocessor controller or Control Module (CM). A separate rear panel houses the AC or DC input power connection, and remote connector interface.

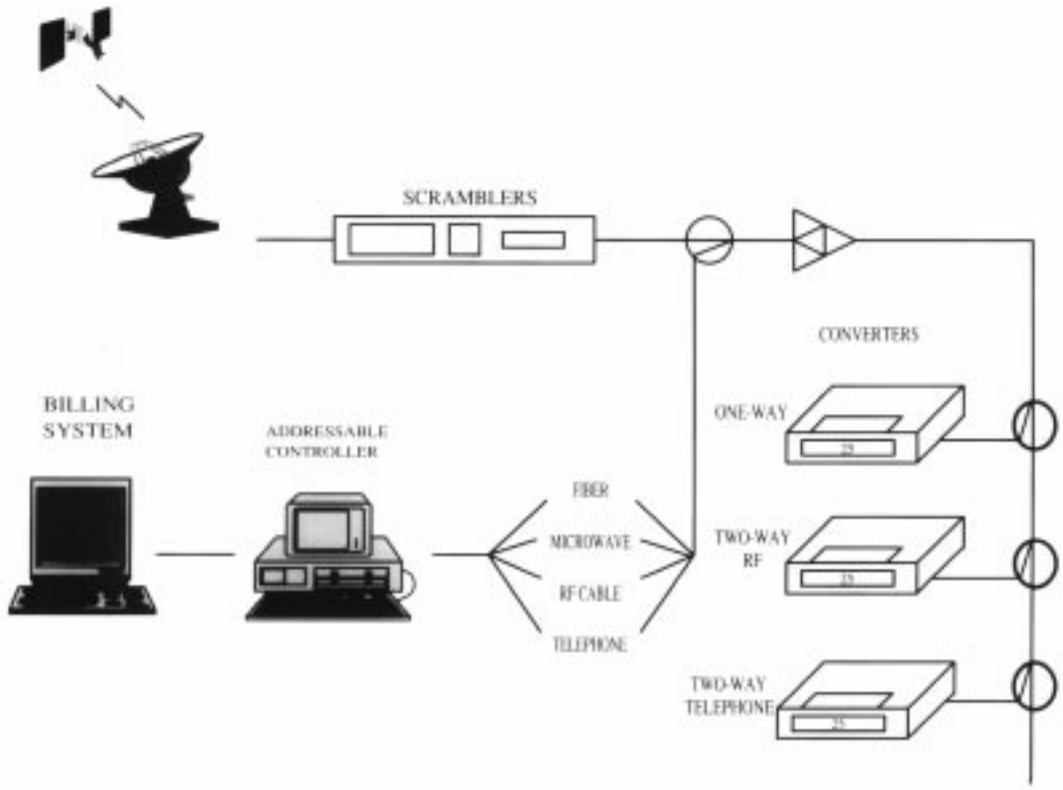
The use of shared resources within the chassis allows for configuration flexibility, improving the overall cost effectiveness of the OmniStar system. Based on application requirements, the OmniStar system will accommodate power supply options and any variation of laser transmitters, receivers, or a series of other modules available in the near future.

Specifications

Dimensions:	
AM-OMNI-HSG/5/* (5 RU Configuration)	8.75" H x 19" W x 17" D (22.2 cm x 48.3 cm x 43.2 cm)
AM-OMNI-HSG/5/*/FAN (5 RU with fans)	8.75" H x 19" W x 17" D (22.2 cm x 48.3 cm x 43.2 cm)
Weight:	
AM-OMNI-HSG/5/*	14 lb (6.4 kgs)
AM-OMNI-HSG/5/*/FAN	16 lb (7.3 kgs)
5 RU configuration fully loaded*	40.75 lbs (18.48 kgs) approx.
Environmental:	
Operating Temperature Range	0° to 50°C (+32° to 122°F) 0° to 25°C (No Fans required)
Storage Temperature Range	-40° to 80°C (-40° to 176°F)
Fans, AM-OMNI-HSG/5/*/FAN only	4 fans @ 22 cfm each
User Interface:	
Communications Port	RS-485 Interface, In and Out, RJ-11 (off-set latch)
Alarm Relay	Contact closure, 250 mA/40 Vac or Vdc Max.
RF Connectors	F-Type, floating barrel, 5 per module slot
Powering:	
AC Input Voltage (Auto-sensing)	95 - 264 Vac @ 47 - 63 Hz (120/220 Vac applications) requires an AC Power Input Unit sub-assembly
DC Input Voltage	40 - 56 Vdc (-48 Vdc application) requires a DC Power Input Unit sub-assembly

Specifications subject to change without notice.

*Based on a fully loaded shelf with PS/AC, 8 laser modules, and control module.



FEATURES

- **ONE- OR TWO-WAY IMPULSE CAPABILITY**
- **COMPATIBLE WITH LARGE AND SMALL SYSTEMS**
- **RF AND BASEBAND SCRAMBLING**
- **COMPLETE SERVICE AND TECHNICAL RESPONSE**

NextLevel is the world's leading provider of addressable systems. The IMPULSE® 7000 system incorporates state-of-the-art technology with traditional forward addressability and the option to upgrade to either an RF or telephone return "impulse" system. The store-and-forward impulse system combines the benefits of impulse pay-per-view purchasing with the advantages of non real-time communications. The addressable system has four main components: the addressable controller, data path equipment, scramblers and addressable terminals.

ADDRESSABLE CONTROLLERS

NL's addressable controller is the heart of the system, controlling total operations. Various controllers are available to meet the needs of the smallest one-way operator and the largest two-way system. Addressable control data can be linked to the system via any distribution medium (RF, telephone, fiber, microwave), providing complete flexibility in tying the business office with the headend. The addressable controllers can be operated in a standalone mode or operated as a slave to any of the billing system via a standard wirelink interface.

SCRAMBLERS

A headend encoder, which can be remotely controlled from the addressable controller, provides video channel scrambling in RF, baseband or mixed modes. Each scrambler maintains a queue of future scheduled events to simplify operation in a pay-per-view environment.

RF AND BASEBAND Terminals

The IMPULSE® 7000 terminal family consists of the full-featured CFT-2200, an 860 MHz interactive-capable terminal, and 550 MHz digitally controlled addressable terminals, which includes the CFT-2000 on-screen display model and the basic DP7100P RF design. These terminals provide the ultimate in consumer features, including upgradability to two-way impulse-pay-per-view operation with an internal module. Remote control options consist of a range of units from the top-of-the-line universal remote through the basic limited function unit.

COMPLETE PROJECT MANAGEMENT

To insure proper operation of the system, NL provides a complete project management capability from application design through system installation and training. A 24-hour technical response center and a field support organization is available should any additional assistance be required.

NEXTLEVEL™

ACC-4000 Lite, Classic and RAID

Analog Addressable Control System

FEATURES

- POWERFUL, SCALEABLE INTEL-BASED PLATFORM (PENTIUM® PRO)
- MULTI-TASKING/MULTI-USER
- USER-FRIENDLY GRAPHICAL USER INTERFACE
- DOWNLOADS ADDRESSABLE OPERATING PARAMETERS TO ONE-WAY AND TWO-WAY SET-TOPS
- FULL REMOTE CONTROL OF MODULATING VIDEO PROCESSORS (MVPS) AND SCRAMBLING ENCODERS
- WORKS WITH ALL OF OUR ANALOG AND ADVANCED SET-TOPS INCLUDING CFT-2200
- STARVUE® AND STARFONE® IPPV SYSTEMS COMPATIBILITY
- MUSIC CHOICE™ SUPPORT
- SEGA™ SUPPORT
- ANIC-A SUPPORT

INTRODUCTION

The ACC-4000 Family of Controllers represents the latest development in a long tradition of access controller design. The new releases of ACC-4000 Lite, ACC-4000 Classic and ACC-4000 RAID offer solutions for a full spectrum of system requirements.The ACC-4000 Lite is the ideal access controller for systems with less than 30,000 set-tops. Fully-featured like the ACC-4000 Classic, the ACC-4000 Lite is the perfect lower cost companion for smaller system operators.

The ACC-4000 Classic is the natural evolution of a staple product in the cable industry. The ACC-4000 Classic features a hardware and software operating environment with improved power, including our state-of-the-art Software Application.

The ACC-4000 RAID employs a Redundant Array of Independent Disks serving as the high-end solution in a family of robust and reliable controllers.

ADVANTAGES

Powerful

The ACC-4000 access controllers are Intel-based and incorporate a server platform designed to meet the growing needs of cable operations. The standard tower configuration includes three 2 GB Hard Drives, 64 MB of Error Correcting Code RAM (for single-bit and double-bit error correction), one 3.5" Floppy Drive, one 2.0-5.0 GB QIC Tape Drive for Database backups, a 17" SVGA Monitor, a Port Multi-plexer and a Remote Diagnostics Modem.

Scaleable

Based on the *fast!!!* Pentium® Pro architecture (Digital's Prioris™ HX6200), the ACC-4000 Family forms a highly scaleable set of controllers to keep pace with an operator's changing requirements. The Prioris™ HX6200 expansion capabilities includes up to 1 GB of ECC memory, 6 PCI slots, 5 EISA slots and a total 11 bays to name a few.

For further expansion capability, we offer a migration path from one controller to another. Five flexible upgrade packages are available with the ACC-4000 Family of Access Controllers:

- External RAID Upgrade Kit for the ACC-4000/XP.

Provides a RAID solution to owners of the ACC-4000/XP, an earlier version of the access controller.

NEXTLEVEL

CUSTOMER SERVICE

Our comprehensive range of Customer Service options include:

- Certified Classroom Training Seminar
- On-Site Installation and Overview Training
- Standard Telephone Support
- Emergency Telephone Support
- Telephone Technical Literature Retrieval System Access
- Internet Access
- Preventive On-Site Maintenance
- Standard Remote Minor Software Update
- Emergency Remote Minor Software Update
- Standard Minor Software Upgrade, loaded On-Site
- Hardware Platform Warranty
- On-Site Security Implementation
- Code Object (Set-top Applications) Download
- IR Codes Downloads (for IR Blaster)
- Emergency On-Site Service

These customer service options may be purchased individually or as part of one of the following packages:

- Initial ServiPac™
- Silver ServiPac™
- Gold ServiPac™
- Platinum ServiPac™

All of the ACC-4000 controllers include the Initial ServiPac™. The ACC-4000 Classic also includes one year of Silver ServiPac™, and the ACC-4000 RAID includes one year of Gold ServiPac™.

The ACC-4000 Family of Access Controllers

SPECIFICATIONS

	ACC-4000 Lite	ACC-4000 Classic	ACC-4000 RAID
HARDWARE OPERATING ENVIRONMENT			
Server Platform	Digital Prioris™ I-IX6200 with 512 KB L2 Cache	Digital Prioris™ HX6200 with 512 KB L2 Cache	Digital Prioris™ HX6200 with 512 KB L2 Cache
CPU	Intel's Pentium® Pro (200 MHz)	Intel's Pentium® Pro (200 MHz)	Intel's Pentium® Pro (200 MHz)
Display	SVGA 15" Monitor	SVGA 17" Monitor	SVGA 17" Monitor
Memory	48MBECCRAM	64 MB ECC RAM	64 MB ECC RAM
Hard Drive	1 x 2.0 GB Fast- Wide SCSI HD	3 x 2.0 GB Fast- Wide SCSI I-ID	3 x 2.0 GB Fast- Wide SCSI HD
Hard Drive Controller	Buit-in SCSI controller	Built-in SCSI Controller	2 Channel PCI RAID Controller
Disk Drive	1 x 1.44 MB 3.5" Drive	1 x I.44 MB 3.5" Drive	1 x 1.44 MB 3.5" Drive
Redundant Power Supply	Option	Option	Standard
Expansion Kit	4 Port Multiplexer, 8 Port Concentrator	4 Port Multiplexer, 8 Port Concentrator	4 Port Multiplexer, 8 Port Concentrator
Surge Protection	APC SU1000	APC SU1000	APC SU1000
Backup	2.0 - 5.0 GB QIC Tape Drive	2.0 - 5.0 GB QTC Tape Drive	2.0 - 5.0 GB QIC Tape Drive
Cable Interface	ANIC or ANIC-A	ANIC or ANIC-A	ANIC or ANIC-A
Printer	Option	Standard	Standard
SOFTWARE OPERATING ENVIRONMENT			
Operating System	SCO® OSE (UNIX@) 3.0	SCO® OSE (UNIX®) 3.0	SCO® OSE (UNIX@) 3.0
Database Manager	Sybase® System 10	Sybase® System 10	Sybase® System 10
Graphical User Interface	Unify ACCELL	Unify ACCELL	Unify ACCELL
SOFTWARE APPLICATION			
Our Software Application	ACC-4000 Lite (Max. of 30,000 Set-tops)	ACC-4000 Classic	ACC-4000 RAID

Specifications subject to change without notice.

- RAID Upgrade Kit for the ACC-4000 Lite. *Upgrades an ACC-4000 Lite with RAID capability.*
- RAID Upgrade Kit for the ACC-4000 Classic. *Converts an ACC-4000 Classic to an ACC-4000 RAID.*
- *ACC-4000* Classic Upgrade Kit for the ACC-4000 Lite. *Converts an ACC-4000 Lite to an ACC-4000 Classic.*
- *ACC-4000* Classic Upgrade Kit for the ACC-4000 Lite and RAID. *Converts an ACC-4000 Lite with RAID to an ACC-4000 RAID.*

UPS

The ACC-4000 Controllers are all configured with an intelligent UPS System and software to safeguard an orderly shutdown of the operating system in the event of a power failure or brownout. The UPS kit also includes 2 CATV surge protectors for the ANIC (one for the ANIC input and one for output) and one Telco Surge Protector for the Diagnostics Modem. The Multiplexer comes equipped with its own surge protector.

Flexible

The controllers are located at the Central Office or a local cable headend and operate in stand-alone mode or as slaves to a Business System Interface.

The 'Analog WireLink' communication protocol used by the ACC-4000 controllers is already supported by all major third party Business System Vendors and operator-specific billing systems.

Supports wide range of analog addressable terminals

The ACC-4000 Family of Controllers is fully compatible with the complete range of our addressable set-tops. It is also designed to support one-way STARVUE® and STARFONE® terminals with the addition of a modem kit. Compatibility with emerging technologies is built-in. Our current software release supports advanced analog set-tops such as the CFT-2000, Music Choice™ and SEGA™.

Operator Friendly

The ACC-4000 Lite, Classic and RAID all feature a straightforward, user-friendly Graphical User Interface ensuring easy integration into new or existing addressable systems.

HARDWARE OPERATING ENVIRONMENT

Up To Three Hard Drives

The ACC-4000 Classic and RAID are configured with three 2 GB hard drives, the ACC-4000 Lite with one 2GB hard drive. The first drive in the ACC-4000 Classic stores the operating system, the second the database and the third drive serves as a spare, used for database backup to ensure that the system is continuously on-line.

Streaming Tape Drive

The high capacity streaming tape drive accepts tapes up to 5 GB. The drive handles loading the initial system software and routine database backups. In addition, it is ideal for installing software upgrades as new enhancements are made available to users.

Diagnostics Modem

All platforms include a modem for our service engineers to communicate with any controller installed in the field and perform remote diagnostics so that necessary remedial steps are accomplished without an on-site visit. *(Always connect the modem to a separate, dedicated line that is not part of the PBX system in the cable office.)*

Printer

The ACC-4000 Classic and RAID packages include a Dot Matrix printer for printing reports available to the user through the operating system.

Addressable Network Interface Card (ANIC)

The ANIC interfaces with the cable system via a bi-phase 14 KB datastream. The proprietary card encodes the input and output datastreams to ensure transportation to all addressable devices.

ANIC-A Ready

The ACC-4000 controllers support ANIC-A, our newly released rack-mountable component. When present, the ANIC-A connects to the ACC-4000 Lite, Classic or RAID via an Ethernet 10BaseT link. The separation allows more than one ANIC-A to be assigned to a single controller thereby increasing data throughput between a controller and its set-tops.

WireLink Addressable Control

The Controllers operate in a stand-alone mode or under the control of a Business System (also referred to as a Subscriber Management System). The WireLink Ports are provided standard with each controller package. Our 'Analog WireLink' protocol is given to the interface provider upon execution of a Trade Secret License Agreement.

SOFTWARE OPERATING ENVIRONMENT

The ACC-4000 Lite, Classic and RAID ship with Sybase®'s powerful relational database, SCO® UNIX@ and Unify Accell's Graphical User Interface software.

SOFTWARE APPLICATION

The ACC-4000 Family includes our **powerful** Software Application, a pinnacle in Software Research and Development designed by our World Class Engineering Team. The Software Application controls all subscriber authorizations, terminal functions, channel maps, service codes, packages, impulse and one-way events, message management, and extensive reporting. Moreover, the Software Application is constantly being updated with improved functionality.

The Software Application used in the ACC-4000 Lite is feature-identical to that in the ACC-4000 Classic. However, the Software Application in the ACC-4000 Lite is customized for systems with a maximum of 30,000 set-tops.

NEXTLEVEL™

Addressable Control System
Data Path Modulator

Modulates Controller's Bi-Phase Data Stream

FEATURES

- **THREE SEPARATE UNIT FUNCTIONS**
  - **—FREQUENCY AGILE DATA MODULATOR, 73-122.9 MHz**
  - **—SIX PORT BI-PHASE DATA SPLITTER**
  - **—SIX PORT BI-PHASE DATA COMBINER**
- **FRONT PANEL FREQUENCY SELECTION**
- **ONLY 1.75 INCHES HIGH**
- **FOR ONE-WAY ADDRESSABLE SYSTEMS**

The Data Path Modulator (Model DPM) is a multi-function, frequency agile data modulator used in the NextLevel Addressable Control Systems. The DPM modulates the controller's bi-phase data stream to an RF carrier for distribution on the cable system, controlling addressable terminals in subscribers' homes.

With a frequency range of 73.0 to 122.9 MHz, the DPM can control numerous terminal types in both domestic and international markets.

MULTI-FUNCTIONAL

In addition to its primary function as a frequency modulator, the DPM incorporates two other addressable headend control features: a six port bi-phase data splitter and six port bi-phase data combiner.

The data splitter receives a single data feed, providing six identical data outputs that can be used to addressably control six different headend devices, such as NL's MVP encoders. The data combiner allows for six separate data inputs such as six MVP encoder data outputs to be combined into one composite bi-phase data output. The combiner output can be connected directly to the data receiver port of the addressable controller or to other bi-phase data communications equipment for transmission back to the controller.

MANAGES HEADEND PPV OPERATIONS

Various addressable system application configurations to manage headend pay-per-view operations can be accommodated with the DPM's multi-function capabilities to modulate, split and combine the addressable control data stream.

This versatile data path communications device is housed in a standard 19-inch wide, 1.75-inch high, space-saving, rack-mountable enclosure.

Frequency selection is achieved through a four digit switch on the front panel that tunes in 100 kHz increments. Front panel LEDs offer quick visual status checks of modulator data present, modulator output on, combiner data present, RF synthesizer lock and power on.

NEXTLEVEL™

Specifications

RF OUTPUT	
Modulation Method	Frequency Modulation
Delay	50 µsec Max
Frequency Range	73.0 to 122.9 MHz
Selectability	100 kHz steps
Level	+60 dBmV Minimum
Spurious Outputs	−55 dBc at> ±500 kHz from carrier center frequency
Frequency Accuracy	±0.008%
Frequency Stability	±0.005% + 0.0001%/degree C
Modulation Rate	13,980 K bits/sec
Modulation Depth	±75 kHz, ±20%
Load Impedance	75 ± 5 Ohms
SPLITTER	
Data Format	Biphase digital data*
Source Impedance	75 ± 5 Ohms
Delay to Any Output	1 µsec Max
COMBINER	
Delay from Any Output	1 µsec Max
Logical "1" Voltage	1.4 ± 0.2 V into 75 Ohms
Load Impedance	75 ± 5 Ohms
GENERAL	
Supply Voltage	105 to 125 Vac or 210 to 250 Vac 50 or 60 Hz A switch, located in the IEC rear panel connector block, selects either the (nominal) 115 or 230 Vac input voltage.
Power Dissipation	10 W Max
Signal Connections	Female "F" type connectors.
Power Connection	IEC connector allows the use of any suitable AC power cord
Dimensions	1.75"H x 19"W x 18.35"D (including rear panel connectors and front panel protrusions)
Weight	6.75 lbs
Operating Temperature	0 to +50 degrees C
Storage Temperature	−25 to +75 degrees C

*Proprietary NL DataChannel™ format

Specifications subject to change without notice.

Scrambles, Encodes and Addresses

FEATURES

- **UP TO EIGHT CONTROLLED CHANNELS PER ENCLOSURE**
- **BASEBAND ENCODED RANDOM DYNAMIC SCRAMBLING**
- **MICROPROCESSOR CONTROLLED**
- **DYNAMIC EVENT CONTROL WITH INTEGRAL REAL-TIME CLOCK**
- **STANDARD 19-INCH EQUIPMENT RACK MOUNT**

The HVP-III Headend Video Processor is a third generation processor that provides scrambling, encoding and addressing for baseband addressable terminals.

The HVP-III provides secure video scrambling using random dynamic baseband video inversion, compression and sync suppression Data to descramble is encrypted for greater security and is constantly changed.

OPERATION

The HVP-III inserts both addressing and channel control information within the video bandwidth portion of each HVP-III channel. This information includes system ID, channel packages and event numbers on pay-per-view programs. Picture quality is enhanced by video clamps, AGC and a peak white clipper.

The HVP-III is controlled by the Micro-ACS headend computer. Alterable parameters may be changed through the addressing computer without a technician's presence at the headend location. HVPs may be co-located with the Micro-ACS or remotely located via a phone line or an RF communication link.

USER FEATURES

HVP-III channel controls may be reconfigured from the Micro-ACS or by direct HVP-III input through a terminal. A selectable alternate video generator may be set for addressing even in the absence of a video source following channel sign-off.

Standard BNC connectors serve as signal input-output points on the HVP-III rear panel. A third bank of rear-panel connectors also lets any channel serve as a loop-through source for another channel.

HVP-III multicolored LED indicators give the technician visual confirmation of Micro-ACS/HVP-III communication for test and calibration purposes. Adjustments, switch settings, and test points are also conveniently located along the front edge of each HVP-III for in-place testing.

NEXTLEVEL™

Specifications

Video Inputs:
Bridging Video Input Impedance:
> 3K Ohms (DC to 6 MHz)
Level:
0.67 to 2.0 V pp

Video Outputs:
Return Loss:
> 16 dB (30 Hz to 6 MHz)
Impedance:
75 Ohms (Nominal)
Level:
1 V pp into 75 Ohms (Nominal)
DC Offset:
Blanking Level = 0.0 Vdc (± 0.25 Vdc)
Isolation Output One to Output Two:
< 60 dB (30 Hz to 6 MHz)

AGC Specifications:
Output Level Change for 6 dB Input Change:
< 0.5 dB
Manual Level Set Response Time:
Less Than 5 Seconds

Data Level at Video Output:
80 IRE Nominal

Composite Sync Output:
Output Level:
0.28 V pp into 75 Ohms

Indicators:
ACS Receive and Transmit Data
Scrambling
White Clip
Detected Scene Change
Voltage Supply
Self Test

User Adjustments:
Reset
Baud Rate
Hub ID
Channel ID
Video Offset
Video Inverting Offset
AGC Level
Sync Level
Sync Pull Up
White Clip

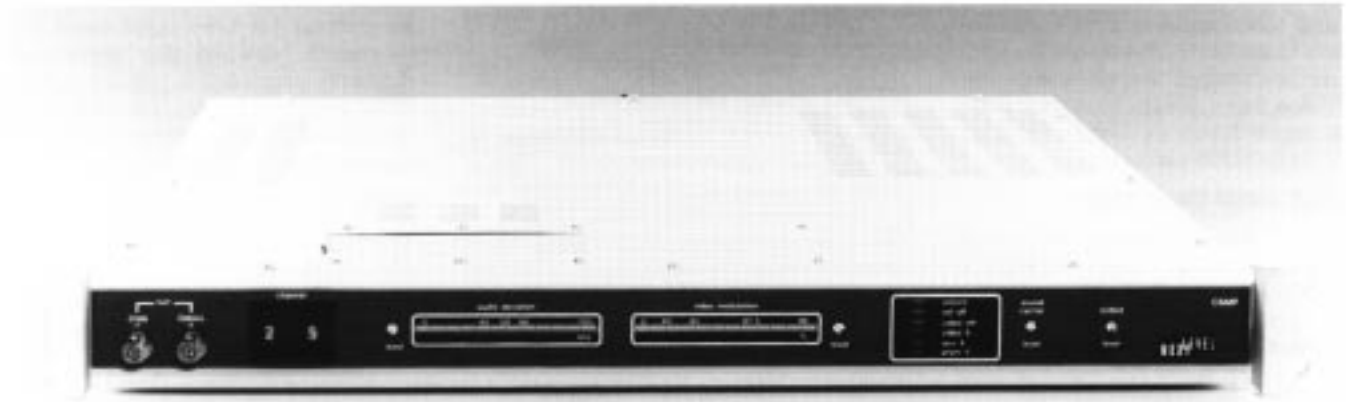
Test Points:
Input Video
Composite Sync
Power
Output Video

AC Input:
110 Volts AC, 60 Hertz

Mount:
Standard 19-Inch Rack Mount

Size:
19.0" Wide
20.5" Deep
10.5" High

NOTE: Specifications subject to change without notice.



FEATURES

- **FREQUENCY AGILE FROM 50 TO 600 MHz**
- **FRONT PANEL CONTROLS**
- **IF AND BASEBAND SWITCHING FUNCTIONS**
- **BTSC STEREO COMPATIBLE**
- **CONTINUOUS VIDEO DEPTH OF MODULATION DISPLAY**
- **CONTINUOUS AUDIO FREQUENCY DEVIATION DISPLAY**
- **1.75 INCHES HIGH**

Commander 6 Modulators are state-of-the-art, frequency agile units capable of satisfying the most demanding CATV applications.

The C6MP operates on standard, EIA, HRC or IRC channel assignments between 50 and 600 MHz. The system is packaged in a space saving 1.75 inch rack-mounted housing and utilizes efficient switching power supply regulators to minimize heat dissipation and power consumption.

FRONT PANEL CONTROLS

The C6 utilizes a front panel switch to select all channel assignments between 50 and 600 MHz.

Internal bandpass filters are automatically engaged upon frequency selection, ensuring that a weighted signal-to-noise ratio of greater than 60 dB is maintained with no external filtering required, regardless of the number of units combined.

Front Panel Bar Graphs indicate video depth of modulation and audio deviation allowing for quick visual status checks.

In addition, the front panel includes RF and IF test points, and indicators for phaselock status, video input and IF switching status. Digital channel select switches, and picture and sound carrier as well as RF output level controls are also included on the front panel.

AUTOMATIC SIGNAL SWITCHING

A switched IF input is provided which can be controlled externally or automatically on loss of video input. Additional levels of switching are offered with the options package, Module C6 MOB.

The IF to channel output converter system is frequency agile from 50 to 600 MHz. The aeronautical band frequency accuracy requirement is met and the FCC required frequency offsets of +12.5 KHz and +25 KHz are generated automatically. The RF channel output is available at a full 60 dBmV level with low spurious and high carrier-to-noise ratio.

SCRAMBLING COMPATIBILITY

The C6MP is compatible with commercial scrambling systems. The C6 Modulator is compatible with the NextLevel Scrambler, Model MVP, in all scrambling modes. The C6 offers a composite IF input connection to facilitate scrambling with the MVP.

STEREO COMPATIBLE

The C6 Modulators are easily interfaced with the NextLevel CMTS, stereo encoder. Stereo encoder interfacing can be done with 41.25 MHz or 4.5 MHz sound carrier inputs. Maximum consideration was given to simplifying the required interconnect wiring.

HRC - IRC SWITCHABLE

The output of model C6MP can be set for either harmonic or incremental related carrier (HRC or IRC) operation. The C6 phaselock modulator is connected to a phaselock reference generator, such as NL's CCG-* family, via a convenient built-in loop-through input. When the external reference signal is unavailable, carrier frequency is maintained by a precise internal reference.

OPTION PACKAGE, MODULE C6 MOB

A single option module, model C6 MOB allows the user to conveniently add baseband audio and video input switching, a 4.5 MHz sound carrier input and an additional switched IF input. These inputs are externally selectable and can be programmed for automatic switching upon loss of video input. The options module also includes defeatable video and audio AGC for applications involving variable baseband signal levels.

NEXTLEVEL™

AUDIO/VIDEO AGC

When the option board is installed, separate audio and video automatic gain control operation is available. Preset modulation levels are maintained despite changes in audio/video input levels resulting from varying signal levels or when switching between audio/video sources.

BASEBAND INPUT SWITCHING

A baseband video and audio switching facility is provided. The video switch system includes video A signal sensing to allow automatic switching to video B input when the video A signal is absent. A rear panel connection provides for external control as well. Audio Input switching follows the video input selection automatically.

SECOND IF SWITCH

The option board offers an additional IF signal input called PROGRAM. This is identical to AUX IF switching except that it has a lower priority. The PRGM IF switch is used for program switching or automatic program replacement when the AUX IF switch is used for the emergency alert function.

4.5 MHz AUDIO INPUT

When installed, the option board provides an external 4.5 MHz input and a facility to switch between that input and the internally generated sound signal. The 4.5 MHz input provides for simple audio interfacing to the output of a stereo encoder or demodulator.

WIDE VARIETY OF BENEFITS

The Commander 6 Modulator is compatible, with all present and past NL Headend equipment, and provides all the features you've come to expect from Commander products.

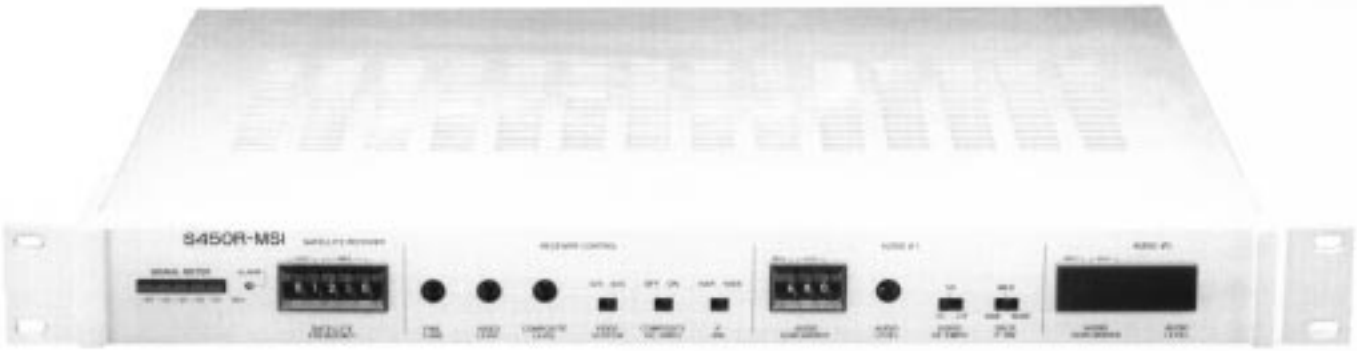
Specifications

RF		
Frequency Range	Channels 2 to 94 50 to 600 MHz (HRC, IRC, Standard, EIA)	
Frequency Accuracy	±5 kHz	
Output Level	60 dBmV Minimum	
Spurious	–60 dBc Maximum	
Output Impedance	75 Ohms	
Output Return Loss	14 dB minimum within the output channel	
Sound Carrier Level	Adjustable from –5 to –25 dB relative to picture carrier	
C/N Ratio	Typical	Minimum
In-band	70 dB	67 dB
Adjacent channel	74 dB	70 dB
Wideband	78 dB	75 dB
IF		
Picture IF Output Frequency	45.75 MHz	
Picture IF Output Level	35 dBmV nominal	
Sound IF Output Frequency	41.25 MHz	
Sound IF Output Level	10 to 30 dBmV	
CW IF Output Frequency	45.75 MHz	
CW IF Output Level	52 dBmV ±5.0 dB	
GENERAL		
Power Requirements	40 Watts	
Weight	12.8 lbs (5.8 kgs)	
Dimensions	19"Wx1.75"Hx17"D (48.07 cm x 4.42 cm x 43.01 cm)	
VIDEO		
Standard Baseband Input level range	0.5 to 2.0 V P-P for 87.5% modulation	
Encoded Video Input Level	1.75 V P-P nominal for 87.5%	
Video Input Impedance	75 Ohms	
Video Input Return Loss	30 dB Minimum	
K Factor	2% Maximum with 2T pulse	
S/N Ratio (Lum weighted)	64 dB Minimum per NTC-7, 3.16	
Chroma Delay, relative to std. precorrection		
15° to 25° C	±50 nSec	
0° to 50° C	±65 nSec	
Frequency Response	±0.5 dB Maximum from 25 Hz to 4.1 MHz	
Differential Gain	87.5% mod. ±3%	
Differential Phase	1 Degree p-p Maximum.	
Hum and Noise	–60 dB at 87.5% mod.	
Tilt	1.0% Maximum per NTC-7, 3.3	
AUDIO		
Input Level Range	Dual input range selectable	
Range 1	–10 to +10 dBm	
Range 2	+5 to +25 dBm	
Input Impedance	Dual input range selectable	
Low Impedance	600 Ohms balanced	
High Impedance	Greater than 10k Ohms	
Frequency Response	±1.0 dB Maximum from 30 Hz to 15 kHz as ±25 kHz deviation.	
Harmonic Distortion	1.0% Maximum from 30 Hz to 15 kHz at ±25 kHz dev.	
FM hum and noise	–60 dB Maximum with respect to ±25 kHz deviation	
Subcarrier Frequency	4.5 MHz ± 500 Hz	

Specifications subject to change without notice.

S450R-MSI

Multi-Standard International Satellite Receiver



FEATURES

- **COMMERCIAL-QUALITY PERFORMANCE ON NTSC, PAL, AND SECAM SIGNALS**
- **AFC TRACKING CIRCUIT WITH CONTINUOUS FINE TUNING ABILITY TO CORRECT FOR LNB DRIFT**
- **TWO IF BANDPASS FILTERS (27 MHz = WIDE BANDWIDTH, 18 MHz = NARROW BANDWIDTH)**
- **AGC TUNING VOLTAGE FOR ANTENNA PEAKING**
- **FIVE-SEGMENT BAR GRAPH RF SIGNAL METER**
- **MICROPROCESSOR-CONTROLLED SINGLE CONVERSION PLL RF TUNING**
- **MULTI-STANDARD FREQUENCY AGILE AUDIO DEMODULATOR**

The S450R-MSI is a multi-standard, international, commercial-quality 950-2050 MHz satellite receiver. It incorporates a fully synthesized PLL tuning circuit. The tuning logic provides continuous tuning AFC and microprocessor control with 100 KHz accuracy.

The multiple video low pass filters and de-emphasis networks provide commercial-quality performance for NTSC, PAL, SECAM, and MAC operation, along with all known video scrambling formats. The multi-tap power supply with two voltage settings reduces heat and decreases power consumption. It is designed for continuous operation 24 hours a day.

You can select a microprocessor-controlled 24-channel frequency, or dial the desired frequency directly. The S450R-MSI automatically tracks all known LNBs without conversion charts.

The flexible receiver design is an open architecture with field-installable options. The S450R-MSI can be ordered with the ASD-NDB option that provides expanded audio functionality.

SD-NBD OPTION

This option provides a second audio channel (#2 audio subcarrier) with PLL frequency agile audio demodulator. When set at 110 KHz bandwidth, this option supports Panda 1® 15 kHz audio only.

NEXTLEVEL™

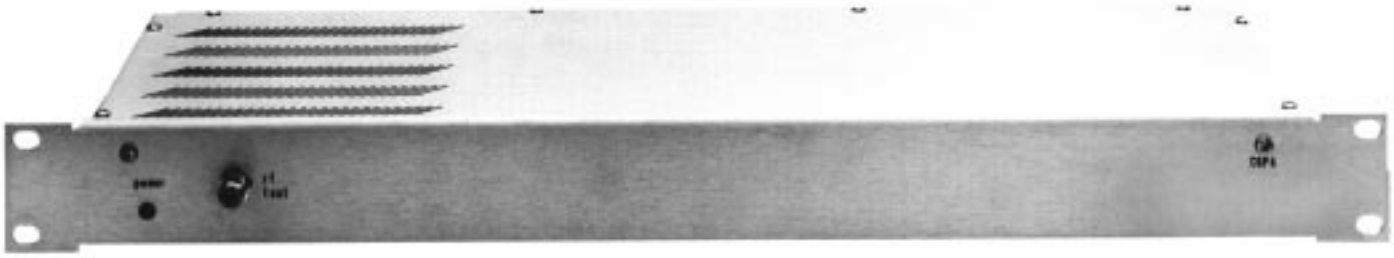
Specifications

RF		
RF Frequency Range	950 - 2050 MHz	
Input Impedance	75 Ohms	
Input Level	–20 to –60 dBm	
Input Return Loss	≥12 dB	
Noise Figure	≤13 dB	
Tuning	1.0 MHz	
Fine Tuning Resolution	±2.0 MHz	
AFC Capture Range	±3.0 MHz	
Static Threshold	<7 dB	
IF		
IF Frequency	479.5 MHz	
IF Bandwidth		
Wide	27 MHz	
Narrow	18 MHz	
FM Static Threshold	≤7 dB	
VIDEO		
Frequency Response	10.0 to 27.6 MHz p-p	9.0 to 24 MHz p-p
Deviation Range for 1.0 V p-p	1.5	1.5
Chroma/luma Delay	±33 nS	±33 nS
DIF Gain	≤4.0%	4.0%
DIF Phase	4.0°	4.0°
Luminance Non-Linearity	±5.0%	<5.0%
COMPOSITE VIDEO		
Deviation Range for 1.0 V p-p Output	10.0-27.6 MHz	9.0-24.0 MHz
AUDIO		
Audio Thd	1.5%	
Subcarrier Frequency	5.0 - 8.5 MHz	
Output Level	≥18 dBm	
Output Impedance	600 Ohms balanced	
Frequency Response 20 Hz - 15 kHz	±1.5 dB	
Hum and Noise	≥68 dB	
GENERAL		
AC Voltage	110, 220	
AC Line Frequency	50-60 Hz	
Power	28 W Maximum	
Temperature	32°F-120°F (0°C-50°C)	
Dimensions	1.75"Hx19"Wx12"D (4.42 cm x 48.07 cm x 30.36 cm)	
Weight	8.5 lbs (3.86 kgs)	

Specifications subject to change without notice.

C6PA

COMMANDER 6®
Headend Post Amplifier



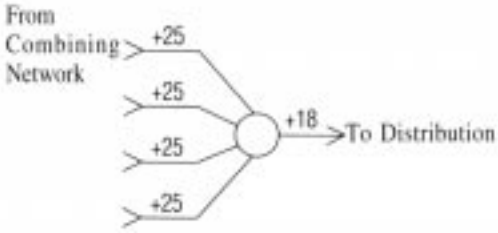
FEATURES

- **22 dB GAIN**
- **FEEDFORWARD TECHNOLOGY FOR LOW DISTORTION**
- **1.75 INCHES HIGH**
- **550 MHz**

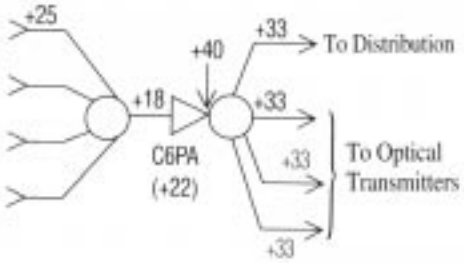
The Commander 6® headend post amplifier, model C6PA, is a rack-mounted, broadband amplifier designed to provide maximum performance to overcome system combining losses and supply low distortion input signals for fiber optic transmission. Feedforward amplifier technology was selected for its gain and distortion characteristics to minimize the impact on overall system performance.

The C6PA is a broadband 550 MHz amplifier designed to easily fit existing headend systems. The unit is packaged in a 1.75" rack-mounted chassis with rear panel "F" connections for the RF input and output. A front panel −20 dB test point is provided for monitoring of the RF output. A LED indicator for POWER ON is located on the front panel for status checks.

TYPICAL APPLICATION
Existing Combining Network



Revised Combining Network



NEXTLEVEL™

Specifications

ELECTRICAL SPECIFICATIONS:	
RF Input Return Loss	16 dB Typical
RF Output Return Loss	16 dB Typical
–20 dB test Point Return Loss	16 dB Typical
RF in to out gain	22 dB
Maximum input level	+25 dBmV
Maximum output level	+47 dBmV
Noise Figure	11.0 dB Maximum
CTB @ +42 dBmV out	–80 dBc Typical
X-mod @ +42 dBmV out	–74 dBc Typical
SSO @ +42 dBmV out	–80 dBc Typical
CONNECTIONS:	
RF input, F-type	Rear Panel
RF output, F-type	Rear Panel
–20 dB test point, F-type	Front Panel
AC outlet fuse (removable)	Rear Panel
LED power on indicator	Front Panel
GENERAL SPECIFICATIONS:	
Power Requirements	100-135 V, 50 to 60 Hz, 35W Maximum
Dimensions	19" W x 1.75" H (48.07 cm x 4.42 cm)
Operating Temperature Range	32°F to 120°F (0°C to 50°C)

Specifications subject to change without notice.

FEATURES:

- **AUTO-SENSING INPUT FOR 110 OR 220 Vac APPLICATIONS**
- **FRONT PANEL PLUG-IN MODULE WITH PLUG-N-PLAY OPERATION**
- **MODULE STATUS ALARM INDICATION**
- **PROVIDES REGULATED +5, +12, AND +24 Vdc**
- **FRONT PANEL TEST POINTS AND STATUS LEDS**

DESCRIPTION

The AM-OMNI-PS/AC power supply module provides all required DC voltages for the OmniStar equipment shelf. Operational input voltage is auto-ranging from 95 to 264 Volts AC, the module is suited for 110 Vac and 220 Vac applications. The power supply protects against AC input surges, and over-current and over-voltage for the DC outputs. As with all OmniStar modules, a tri-state status LED is conveniently located on the front panel to reference the module's operational condition. And, for module interrogation, DC voltage LEDs and test points are located on the front panel.

The AM-OMNI-PS/AC occupies the first two slots in the OmniStar shelf and should be deployed when using an AC input voltage source. The unique design of the sub-assembly module allows easy access and replacement from the front of the OmniStar shelf facilitating low Time-To-Repair (TTR).

Power is applied to the power supply through an auxiliary connector and filter assembly called the AC Power Input Unit, model AM-OMNI-PIU/AC. The power input unit is mounted on the rear of the OmniStar shelf and interfaces to the power supply module through the use of a blind-mate connector.

NEXTLEVEL™

Specifications

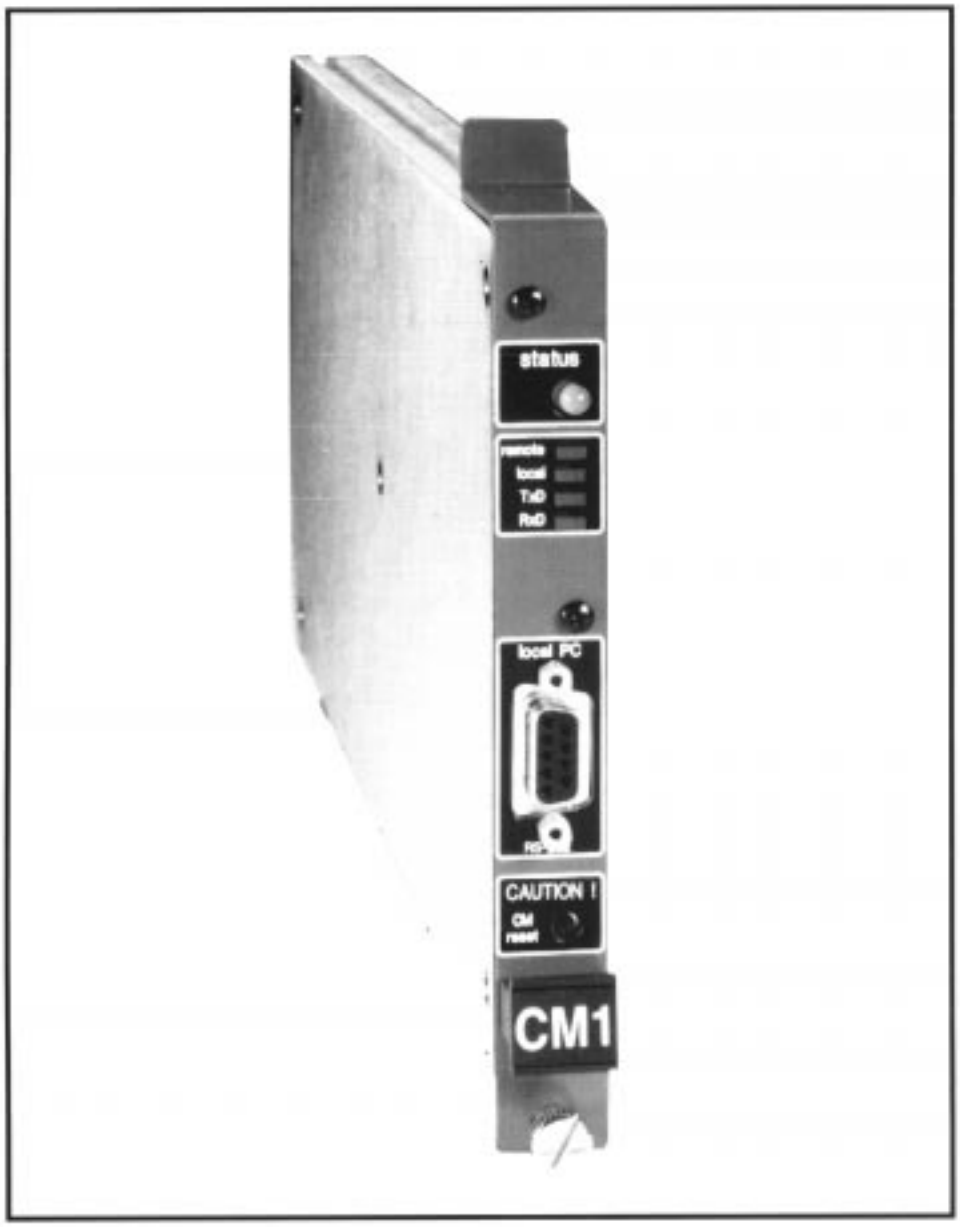
Power Requirements:	
AC Voltage Input Range	95 to 264 Vrms, auto sensing
AC Voltage Frequency Range	47 Hz to 63 Hz
AC Current:	
– @ 95 V	4.0 Amps rms Maximum
– @ 117 V	3.3 Amps rms Maximum
- @ 264 V	1.4 Amps rms Maximum
Efficiency	72% Minimum at full load
Power Consumption *	Operational 220 Watts, Maximum 380 Watts
Surge Protection	Transzorbs and EMI/RFI Filter
Fuse (circuit breaker)	250 V, 9 Amps (resetable, push button breaker located on the AC Power Input Unit)
Output Power:	
Output Voltages:	
+5 Vdc Range	4.9 to 5.1 Vdc
+12 Vdc Range	11.8 to 12.2 Vdc
+24 Vdc Range	23.7 to 24.3 Vdc
Output Current:	
+5 Vdc min/max	1.5 Amps/13.1 Amps
+12 Vdc min/max	0.5 Amps/4.4 Amps
+24 Vdc min/max	0.75 Amps/6.0 Amps
Environmental:	
Operating Temperature Range	0° to 50°C (+32° to 122°F)
Storage Temperature Range	-40° to 80°C (-40° to 176°F)
Physical Properties:	
Dimensions	3.0" W x 6.5" H x 14.25" D (2 OmniStar modules wide) (7.62 cm x 16.51 cm x 36.20 cm)
Weight	8.3 lbs (3.7 kgs)
Mounting	AM-OMNI-HSG*/AC equipment shelf, slot 1 and 2

Specifications subject to change without notice.

Notes:
* Power consumption is based on powering a fully loaded shelf with 8 laser modules.

OMNISTAR®
AM-OMNI-CM1

Cableoptics®
Master Control Module



FEATURES:

- **CONTINUOUSLY MONITORS CRITICAL PARAMETERS FOR ALL CHASSIS MODULES**
- **LOCAL AND REMOTE INTERFACES FOR STATUS MONITORING AND CONTROL**
- **SHELF SUMMARY ALARM INDICATORS**
- **FRONT PANEL PLUG-IN MODULE WITH PLUG-N-PLAY OPERATION**

DESCRIPTION

The OmniStar Control Module (CM1) continuously monitors the critical parameters of all chassis modules and provides a convenient front panel summary status/alarm indicator. The AM-OMNI-CM1 provides a digital control interface across the chassis Serial Peripheral Interface bus and an external computer connected to either of its two communication ports. The unit contains an RS-232D Local-Control PC interface for single chassis and an RS-485 Remote-Control interface for multiple chassis. The user controls and monitors operating performance parameters through either or both the local or remote PC interface. With the LIFEnet™ Headend Control Software - an element level Network Monitoring System - status information for any of the modules within an OmniStar shelf is displayed and control functions are executed right at the PC.

The AM-OMNI-CM1 controls chassis and module alarm indication and rear chassis alarm contact closures. Shelf alarm conditions are dislpayed. The Control Module also monitors power supply voltages, including minor and major alarm reporting, and DC currents for the cooling fans.

In addition, to the interrogation of all modules and status reporting, the OmniStar Control Module performs self diagnostics and fault identification. It is the perfect interface medium for operating program, module identities and other critical system information.

NEXTLEVEL

Specifications

Communications Interface:	
RS-232D Communications Port	
Data Format	Asynchronous, 8 bits plus 1 stop bit
Data Rate	38.4 kb/sec
Connector	DB9, female
Port Format	DCE, Data Communication Equipment
RS-485 Communications Port	
Data Format	Asynchronous, 8 bits plus 1 stop bit
Data Rate	38.4 kb/sec
Connector	RJ-11, offset latch
Alarm Relay	Contact closure, 250 mA/40 Vac or Vdc Maximum
User Interface:	
Control	Control Module Reset, push button
Status Indicators	Tri-state LED, OmniStar shelf status
Operational Indicators	Condition LED's - Remote, Local, TxD, and RxD
Power Requirments:	
24 Vdc	50 mA, supplied by OmniStar Power Supply Module
12 Vdc	200 mA, supplied by OmniStar Power Supply Module
12 Vdc (back-up)	450 mA, supplied by OmniStar Power Supply Module
5 Vdc	250 mA, supplied by OmniStar Power Supply Module
Environmental:	
Operating Temperature Range	0° to 50°C (+32° to 122°F)
Storage Temperature Range	-40° to 80°C (-40° to 176°F)
Physical Properties:	
Dimensions	0.75" W x 6.5" H x 13.5" D (1.9 cm x 16.5 cm x 34.29 cm)
Weight	1 lb (453 g)
Mounting	AM-OMNI-HSG® equipment shelf, slot 11

Specifications subject to change without notice.

OMNISTAR®
AM-OMNI-LM*750A/860D

Cableoptics®
DFB Laser Module

***OMNISTAR* 860 MHz Laser Module for 750 MHz Analog Transmission**

FEATURES:

- **50 - 860 MHz PASSBAND**
- **HIGH PERFORMANCE DFB LASER WITH INTERNAL ISOLATOR AND LEADING EDGE PREDISTORTION**
- **FRONT PANEL PLUG-IN MODULE WITH PLUG-N-PLAY OPERATION**
- **INTEGRATED PRE-AMP FOR RF INPUT LEVEL OF ONLY +13.5 dBmV WITH 110 ANALOG CHANNELS**
- **BROADCAST AND NARROWCAST INPUTS**
- **AVAILABLE IN 8 OUTPUT POWER RANGES**

DESCRIPTION

The OmniStar 750A/860D laser module offers unparalleled performance for applications requiring increased analog channel transmission. The AM-OMNI-LM*750A/860D family consists of eight models with optical power ranging from 2 mW (4 dBm) to over 16 mW (12 dBm) offering choice for the most cost effective solution based on designed loss budget, performance criteria and splitting ratio considerations. The 750A/860D laser has an integrated pre-amp allowing for a fixed RF input level of only 13.5 dBmV per channel with 110 NTSC channels applied while maintaining superior distortion performance. All laser modules have separate broadcast and narrowcast RF inputs eliminating the need for external combiners.

As an integrated unit providing all optical, RF signal processing, and control functions, each laser module features an internal optical isolator and RF linearization circuitry to provide superior carrier-to-noise and distortion performance. Optical performance of each laser is characterized at the factory where its optimal operating point is stored in non-volatile memory so that user adjustment of RF or laser drive levels is unnecessary. The link performance is guaranteed upon power-up. The three user controlled modes of operations are ***preset*** - factory set AGC for optimal laser performance, ***set*** - user adjustable AGC, and ***manual*** - user adjustable fixed gain. The set and *manual* modes let the user customize the RF drive level for desired carrier-to-noise and distortion performance based on channel loading and system requirements. Continuous wave and video signal input modes are also user selective.

NEXTLEVEL™

OMNISTAR 860 MHz Laser Module for 750 MHz Analog Transmission

SPECIFICATIONS

RF Characteristics:	
Operational Bandwidth	50 - 860 MHz
RF Input Impedance	75 Ohms
RF Input Return Loss	14 dB min.
RF Connector Type	G-type
Optical Characteristics:	
Optical Wavelength	1310 nm +/- 20 nm
Distortion Performance	(see link performance specs.)
Optical Connector Type	SC/APC
Laser Shutdown	Enable/Disable via. Control Module using LIFEnet™ Software
Eye Protection	Optical Safety Shutter
Power Requirements:	
DC Currents Minimum/Maximum	
+5 Vdc	90 mA/1.7 A
+12 Vdc	350 mA/450 mA
+24 Vdc	400 mA/550 mA
Power Consumption	25 watts
User Interface:	
Front Panel	Tri-state Module Status LED
Operational Mode	Push-button Selectable, LED display indication
Optical Power Test Point	5 mW/1 V, Scaled DC Voltage of Optical Output Power
RF Test Point	+14 dBmV, ± 0.5 dB, per channel with 110 NTSC channel loading
Data/Control Interface	Serial Peripheral Interface (SPI) using LIFEnet™ Software
Environmental:	
Operating Temperature Range	-20° to 65°C (-4° to 149°F)
Storage Temperature Range	-40° to 80°C (-40° to 176°F)
Over Temperature Laser Protection	Software and Hardware active
Physical Properties:	
Dimensions	1.5" W x 6.5" H x 14.25" D (3.81 cm x 16.51 cm x 36.20 cm)
Weight	4.0 lbs (1.8 kgs)
Mounting	AM-OMNI-HSG* equipment shelf, any of slots 3 - 10

Specifications subject to change without notice.

OMNISTAR 860 MHz Laser Module for 750 MHz Analog Transmission

LINK PERFORMANCE SPECIFICATIONS

Operational Bandwidth		50 - 860 MHz (50 - 750 MHz Analog, 750 - 860 MHz Digital)
Optical Wavelength		1310 nm +/- 20 nm
Input Signal Level:		
Broadcast	Analog	+ 13.5 dBmV, 50 - 750 MHz, 110 NTSC channels + 15.5 dBmV for models AM-OMNI-LM-11LD/750 and 12LD/750
	Digital	3.5 dBmV, 750 - 860 MHz
Narrowcast	Analog/Digital	22 dB above Broadcast input levels

CABLEOPTICS LINK DISTORTION PERFORMANCE

CTB	-64 dB worst case
CSO	-60 dB worst case

CARRIER-TO-NOISE PERFORMANCE (dB):

		OPTICAL LOSS (dB)											
LASER MODEL	**OUTPUT POWER (Min - Max) mW/dBm**	4	5	6	7	8	9	10	11	12	13	14	15
LM-4/750	2-3.2/3-5	50.5	49.5	48.5	47.5	46.5							
LM-6/750	2.5-4/4-6		51.0	50.0	49.0	48.0	47.0						
LM-7/750	4-6.3/6-8				50.5	49.5	48.5	47.5	46.5				
LM-9/750	6.3-10/8-10						50.0	49.5	48.5	47.5	46.5		
LM-11/750	10-14/10-11.5								50.0	49.0	48.0	47.0	46.0
LM-11LD/750	10-14/10-11.5								50.0	49.0	48.0	47.0	46.0
LM-12/750	12.6-20/11-13									50.5	49.5	48.5	48.0
LM-12LD/750	14-22.4/11.5-13.5									50.5	49.5	48.5	48.0

Specifications subject to change without notice.

Notes:
Link performance specifications are based on 50-750 MHz All Analog (110 NTSC channels).
C/N specifications measured using RM-9 receiver and are worst case, add 1 dB for typical performance.
Specifications are measured using CW carriers per NCTA.
AM-OMNI-LM-4 specifications are for optical link budgets that include a maximum of 7.5 km of fiber (0.4 dB/km).
AM-OMNI-LM-6,-7,-9,-11LD, and -12LD specifications are for all fiber (0.4 dB/km) optical loss budgets and include 1 dB for connector loss.
AM-OMNI-LM-11 specifications are for optical link budgets that include a maximum of 20 km of fiber (0.4 dB/km).
AM-OMNI-LM-12 specifications are for optical link budgets that include a maximum of 15 km of fiber (0.4 dB/km).
AM-OMNI-LM-11LD, and 12LD require an input level of +15.5 dBmV for 50-550 MHz Analog (110 NTSC channels).
All link budgets include 1 dB for connector loss and meter inaccuracy.

NEXTLEVEL™

AM-1 550-TX1/SD
AM-1 550-OA/*

MEGASTAR'"
1550 nm Externally Modulated Transmitter and Optical Amplifier

ADVANTAGES OF 1550 NM WINDOW

- ***Lower fiber attenuation (0.25*** dB/km @ 1550 nm vs. 0.35 dB/km @ 1310 nm)
- Optical amplification allows repeating without distortion degradation
- ***Higher output powers*** allow for longer reach or increase number of nodes served
- Increases network architecture flexibility

BENEFITS OF AM-1550-TX1 AND AM-1550-DA

- Proprietary SBS suppression circuitry enables higher direct launch power (17 dBm) into the fiber, increasing the ability to serve remote locations and reducing overall system cost by reducing the number of optical amplifiers required.
- Easy set-up and operation; no specific application "tweaking" required
- 13 dBm and 17 dBm launch powers increase system design flexibility
- Low noise, telecom proven reliable EDFA technology
- Automatic output power compensation increases system reliability (dual pump OA model)

APPLICATION OVERVIEW:

The MegaStar 1550 nm products are designed to complement NextLevel's OmniStar® 1310 and 1550 nm platform, providing the most cost-effective network solution to both transport and distribution applications. The MegaStar 1550 nm product family is ideally suited for applications that exceed the limitations of 13 10 nm products such as Headend to Hub interconnect (point-to-point or point to multi-point), long-haul and redundant ring architectures. MegaStar optical amplifiers are used as launch amplifiers or in-line amplifiers to repeat the optical signal with minimal performance degradation. The high optical output power can also be split for the distribution of signals in broadcast applications. If no narrowcast services are required, the broadcast signals can be optically amplified at the hub site and directly transmitted to the node. In headend consolidation applications, broadcast analog signals are transported from one central headend facility to other headend or hub sites in a metropolitan/ regional network. The broadcast signals can then be combined with local origination and target service signals at the hub and then transmitted to the node using 13 10 **nm** DFB technology.

NEXTLEVEL™

AM-1 550-TX1/SD
AM-1 550-OA/

MEGASTAR™
1550 nm Externally Modulated Transmitter and Optical Amplifier

PRODUCT DESCRIPTION:

MegaStar is a 1550 nm fiber optic analog transmission product family that supports advanced Broadband Hybrid Fiber/Coax Telecommunications systems. The AM-1550-TX1 transmitter and AM-1550-OA optical amplifier family of products incorporate the latest state-of-the-art 1550 nm technology. These products have been optimized for the stringent requirements of analog signal transmission and for use with standard 1310 nm optical fiber (non-dispersion shifted).

EXTERNALLY MODULATED TRANSMITTER:

The AM-1550-TX1/SD transmitter consists of a high performance 1550 nm DFB laser source, a lithium niobate (LiNb03) Mach-Zehnder electro-optic modulator, proprietary linearized RF drive circuitry, and Stimulated Brillouin Scattering (SBS) suppression circuitry. Both transmitter models have a dual minimum output power of 6 dBm that, when used in conjunction with an AM-OMNI-OA/13S or AM-OMNI-OA/17D provides an optical launch power of 13 dBm or 17 dBm respectively. The 17 dBm combination is dual pumped for increased output power and reliability. Proprietary SBS suppression circuitry allows up to 17 dBm of optical power to be launched directly into a single fiber, allowing for point-to-point transmission of 77 NTSC channels up to 65 km without signal regeneration while maintaining superior CNR and distortion performance. The integrated RF pre-amp and automatic gain control support a minimum RF input level of 18 dBmV and allow for easy user set-up. The transmitter models are available in a 3.5" (2 RU high) x 19" housing that includes a built-in microprocessor to perform continuous critical parameter monitoring, and provides front panel summary status/alarm indication through user-friendly front panel LEDs.

OPTICAL AMPLIFIER:

The AM-1550-OA/SD optical amplifier is specifically optimized for transmitting and repeating analog signals with minimal signal degradation. NextLevel optical amplifiers incorporate EDFA technology that has been deployed and proven reliable in telecommunication applications. Each optical amplifier contains one or two pump lasers, erbium-doped fiber, and control circuitry. The input and output optical power is continuously monitored to insure optimum operation. The MegaStar family includes two optical amplifiers, with output powers of 13 dBm or 17 dBm. The 13 dBm model features a single, highly reliable pump laser. The 17 dBm model features dual pump lasers, offering output power compensation in the event of pump failure or degradation. The optical amplifier models are available in a space efficient 1.75" (1RU high) x 19" housing that includes a built-in microprocessor to perform continuous parameter monitoring and provides front panel summary status/alarm indications. Operating performance parameters of the transmitters and amplifiers can be controlled and monitored by either front panel user interfaces or an RS-232 local PC interface.

MegaStar - 1550 nm Transmitter Technical Specifications
AM-1 550-TX1/SD

link Specifications[1]	77 NTSC	60 NTSC	40 NTSC	60 PAL B/G
CNR	51	52	53.5	51
c s o	-65	-65	-65	-65
CTB	-65	-65	-65	-65
XMOD	-60	-60	-60	-60

(1) Specifications are worst case and are measured using CW carriers per NCTA and include receiver and fiber degradation. CNR is measured with 0 dBm into an RM-9 receiver through 45 km (using OA/13S) or 65 km (using OA/17D) of fiber.

RF Specifications	MIN	TYP	MAX	UNITS
bandwidth	50		750	MHz
flatness p-p:				
50-550 MHz			1.25	dB (p-p)
50-750 MHz			2.0	dB (p-p)
input level w/ AGC (77 NTSC channels)	18		30	dBmV/ch
connector type		F-type		
input impedance		75		Ohms
return loss (50-750 MHz)	16			dB
hum mod	65			dB

Optical Specifications	MIN	TYP	MAX	UNITS
optical output power:“)				
with AM-1550-OA/13S	13.0	13.5	14.0	dBm
with AM-1550-OA/17D	16.0	16.5	17	dBm
maximum power into single fiber[2]			17	dBm
maximum transmission distance[3]			100	km
optical output wavelength	1550	1555	1560	nm
optical connector type	SC/APC bulkhead w/ safety shutter			

(1) measured over temperature and polarization sensitivity;
(2) limited by SBS
(3) limited hy fiber dispersion

Electrical, Mechanical, and Environmental Specifications	MIN	TYP	MAX	UNITS
power supply input voltage	100	11 0/220	240	Vac
power consumption			60	Watts
operating temperature	0		50	°C
storage temperature	-20		65	°C
dimensions	3.5"H x 19"W x 18"D (8.85 cm x 48.07 cm x 45.54 cm)			
weight	20 lbs (9.06 kgs)			

Specifications subject to change without notice

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MegaStar - 1550 nm Line Amplifier Technical Specifications
AM-1550-OA/13S and AM-1550-OA/17D

Optical Specifications	MIN	TYP	MAX	UNITS
optical input power	0	+3	+10	dBm
optical output power"'				
AM-1550-OA/13S	13.0	13.5	14.0	dBm
AM-1550-OA/17D	16.0	16.5	17	dBm
optical output wavelength	1550	1555	1560	nm
gain flatness	-1.5		+1.5	dB
number of pump lasers:				
AM-1550-OA/13S		1		
AM-1550-OA/17D		2		
optical connector type	SC/APC bulkhead w/ safety shutter			

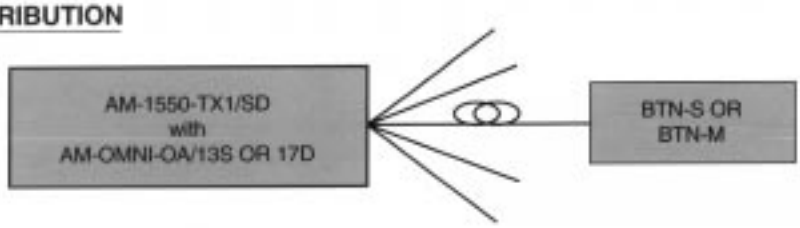
"measured over temperature, polarization sensitivity and specified input power range

Electrical, Mechanical, and Environmental Specifications	MIN	TYP	MAX	UNITS
power supply input voltage	100	110/220	240	Vac
power consumption	15		40	Watts
operating temperature	0		50	°C
storage temperature	-20		65	°C
dimensions	1.75"H x 19"W x 18"D (4.42 cm x 48.07 cm x 45.54 cm)			
weight	10 lbs (4.53 kgs)			

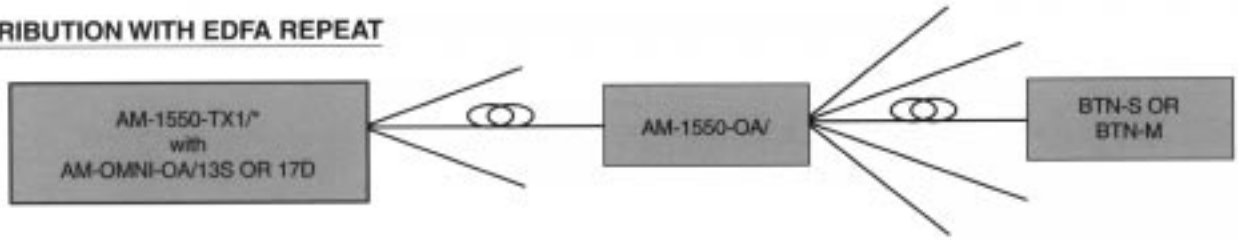
Specifications subject to change without notice.

MegaStar - Typical Product Applications

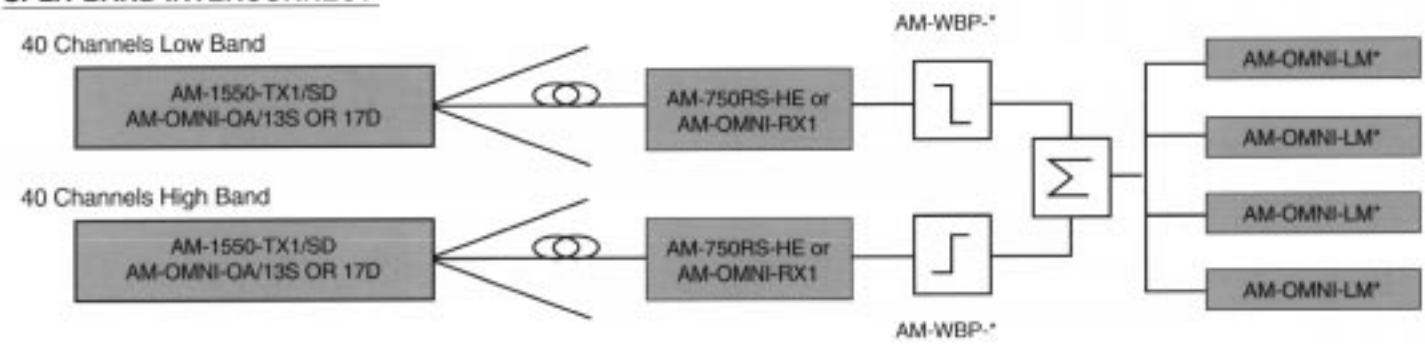
DISTRIBUTION



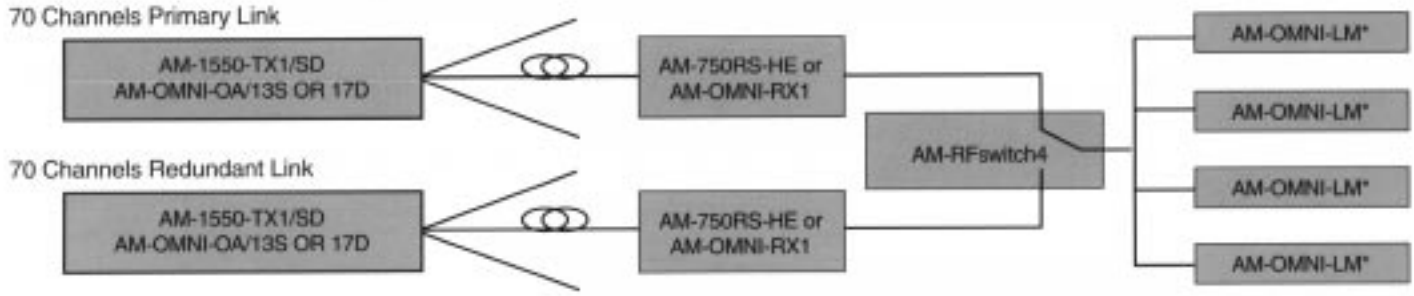
DISTRIBUTION WITH EDFA REPEAT



SPLIT-BAND INTERCONNECT



REDUNDANT INTERCONNECT



NEXTLEVEL™

FEATURES

- AUTOMATIC OR MANUAL SWITCHING BETWEEN PRIMARY OR SECONDARY SOURCES
- ADJUSTABLE SWITCHING THRESHOLD
- CONSTANT MONITORING OF BOTH PORTS
- LOCAL OR REMOTE CONTROL USING LIFEnet™ SOFTWARE
- EXTERNAL CONNECTIONS TO SWITCH BETWEEN CHASSIS
- FRONT PANEL PLUG-IN MODULE WITH PLUG-N-PLAY OPERATION

INTRODUCTION

The AM-OMNI-SWITCH provides automatic switching between the primary and secondary signal sources during the loss or degradation of the primary signal for either the forward or return path. Constant monitoring of both inputs allows for instantaneous switching in case of primary input failure. Three independent modes of operation allow switching for any style of NextLevel fiber receiver. Automatic or manual switching is possible either by the front panel or by remote control using LIFEnet Headend Control Software.

APPLICATION

In a typical application, redundant fiber paths are fed to a hub location where they are optically received and converted to RF and applied to the AM-OMNI-SWITCH. RF detection mode is used when constant RF needs to be monitored. For heavy data monitoring where RF is not always constant such as in upconversion or internet services the digital control mode or optical detection mode will monitor the optical path. Any mode will switch between primary and secondary if the signal level changes by -6 dB or by any selected threshold using LIFEnet software. The first is the RF detection mode, the AM-OMNT-SWITCH will switch between RF in "A" and "B" on the rear panel and can be fed by any RF source. The second mode is the Digital Control mode in which the unit changes between the primary or secondary mode depending on a TTL level voltage out of the AM-OMNI-860R, AM-OMNI-BCR or the AM-OMNI-RPR/2C. The third mode is the Optical Detection Mode, similar to the digital control mode a front panel jumper from the optical received test point on any older style receiver such as the AM-OMNI-RPR/2 and the AM-750RSHE to the optical power input on the AM-OMNI-SWITCH.

NEXTLEVEL™

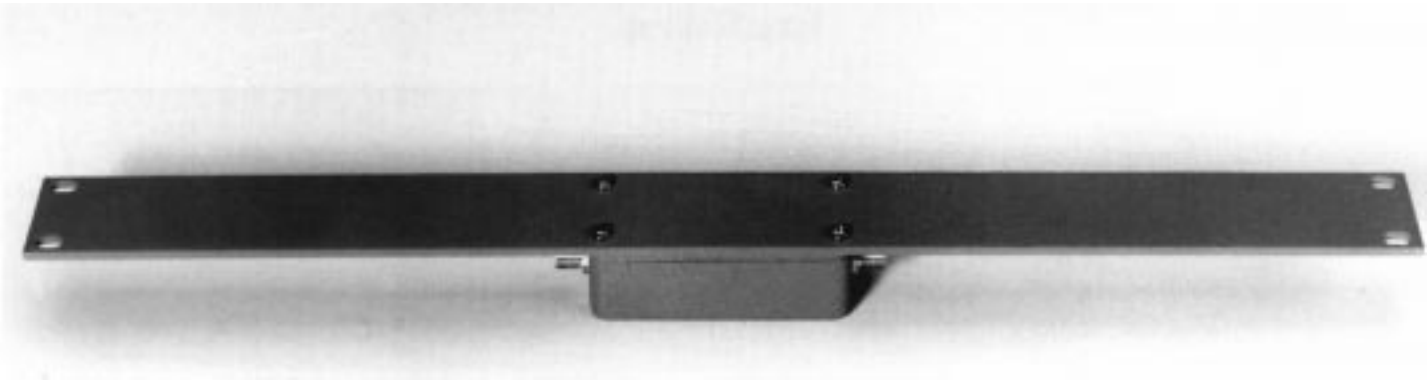
Specifications

RF Switching	
Operational Bandwidth	5 - 864 MHz (Forward and Return Frequencies)
RF Flatness	± 0.75 dB p-p from 5-864 MHz.
Insertion Loss	4.0 dB Maximum, 3 dB typical
RF Input Range	15 dBmV to 50 dBmV
Isolation (Between RF in A,B and RF Out)	-60 dB, 5-750 MHz
	-55 dB, 750-864 MHz
RF Return Loss	16 dB, 5-750 MHz
	14 dB, 750-864 MHz
RF Input Impedance	75 Ohms
Optical Switching	
Digital Control (Rear Panel)	0.5 Vdc low, 2.7 Vdc high, TTL logic Voltages
Optical Control (Front Panel)	2 Vdc to 0.05 Vdc (0 dBm to –16 dBm Received Optical Power)
User Interface:	
RF Test Point	-20 dB ± 0.5 dB
Source Select	A or B RF inputs
Normalized Optical Threshold	-6 dB from operating level
Status Indicators	Tri-state LED, Module status
Data/Control Interface	Serial Peripheral Interface(SPI)using LIFEnet™ Software
Power Requirements:	
12 Vdc	200 mA, supplied by OmniStar Power Supply Module
5 Vdc	100 mA Supplied by OmniStar Power Supply Module
Environmental:	
Operating Temperature Range	0° to +50° C (+32° to +122° F)
Storage Temperature Range	-40° to 80° C (-40° to 176° F)
Physical Properties:	
Dimensions	1.5"W x 6.5"H x 14.25"D (3.81 cm x 16.51 cm x 36.20 cm)
Weight	3.0 lbs (1.36 kgs)
Mounting	AM-OMNI-HSG* equipment shelf, any of slots 3-10

Specifications subject to change without notice.

Cableoptics®

Supertrunk Bandpass Filter



FEATURES:

- FLAT PASS BAND
- LOW INSERTION LOSS
- LOW GROUP DELAY
- 50 - 750 MHz CHANNEL SELECTION
- FACTORY ALIGNED TO SELECTED BAND SPLIT
- EXCELLENT NOISE REJECTION

DESCRIPTION:

The AM-WBP-**/** Wide Bandpass Filter is used to pass selected groups of channels and reject the remainder of the spectrum. In a Supertrunk application typical pass band splits are selected to pass only those channels in the passband, limiting the amount of channels passed per fiber link between the Headend and a Hub location. At the Hub location signals are then combined and re-transmitted to the distribution plant. Available pass band splits correspond to either an 8 fiber, 4 fiber, or 2 fiber link system.

Passband Types */*	Model No.	Passband	Center Freq.
8 fiber, band split	AM-WBP-501108	50 - 108 MHz	79 MHz
	AM-WBP-108/174	108 - 174 MHz	141 MHz
	AM-WBP-174/240	174 - 240 MHz	207 MHz
	AM-WBP-2401306	240 - 306 MHz	273 MHz
	AM-WBP-3061372	306 - 372 MHz	339 MHz
	AM-WBP-3721432	372 - 432 MHz	402 MHz
	AM-WBP-4321492	432 - 492 MHz	462 MHz
	AM-WBP-4921750	492 - 750 MHz	621 MHz
4 fiber, band split	AM-WBP-50/108	50 - 108 MHz	81 MHz
	AM-WBP-108/216	108 - 216 MHz	162 MHz
	AM-WBP-2 161384	216 - 384 MHz	300 MHz
	AM-WBP-3841750	384 - 750 MHz	567 MHz
2 fiber, band split	AM-WBP-50/282	50 - 282 MHz	166 MHz
	AM-WBP-2821750	282 - 750 MHz	516 MHz
2 fiber, band split	AM-WBP-501330	50 - 330 MHz	190 MHz
	AM-WBP-3301750	330 - 750 MHz	540 MHz

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Specifications

Impedance	**75** Ohms
Connectors	F-type (Female on both Input and Output)
Insertion Loss	1 dB Maximum across selected passband
Return Loss (Input/Output)	≥ 16 dB in pass band, typical 18 dB
Ripple	≤ 1 dB (Peak to Peak) in pass band
Stop band Rejection	≥ -10 dB ± 10 MHz from knee
	≥ -30 dB ± 20 MHz from knee
Group Delay	not to exceed 1.5 nsec.
Temperature Range	**0”** to +60°C
Dimensions	1.5” H x 4.5” W filter, mounted on a 1 U 19” rack-mount panel (3.81 cmx 11.39 cm)

Specifications subject to change without notice.

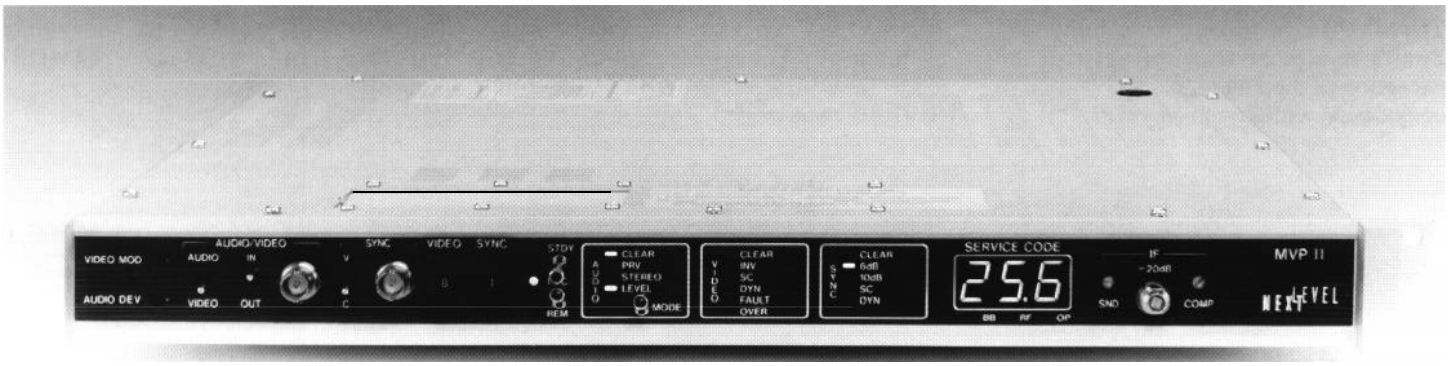
Optical Splitters

Model No.	Split Ratio	Max. Insertion Loss (dB)	Typ. Insertion Loss (dB)
AM-DC50	50% / 50%	3.7 / 3.7	3.2 / 3.2
AM-DC55	55% / 45%	4.1 / 3.2	3.7 / 2.8
AM-DC60	60% / 40%	4.7 / 2.8	4.2 / 2.4
AM-DC65	65% / 35%	5.3 / 2.4	4.7 / 2.0
AM-DC70	70% / 30%	6.1 / 2.0	5.5 / 1.6
AM-DC75	75% / 25%	6.8 / 1.7	6.3 / 1.5
AM-DC80	80% / 20%	7.8 / 1.4	7.3 / 1.2
AM-DC85	85% / 15%	9.1 / 1.1	8.4 / 1.0
AM-DC90	90% / 10%	11.2 / 0.8	10.5 / 0.7
AM-DC95	95% / 05%	15.5 / 0.6	14.0 / 0.4

General Specifications:

Physical:	Fiber Pigtail length	1.0 m
	Body length	150.0 mm
	Diameter	15.0 mm
Optical:	Spectral range	1260 - 1360 nm
		1480 - 1580 nm
	Optical Return loss	≤ -55 dB
	Directivity	≤ -55 dB
	Temperature range	-40° to 85° C

Specifications subject to change without notice.



Multiple Mode Scrambler for Impulse Systems

FEATURES

- **RF AND BASEBAND SCRAMBLING**
- **ENHANCED SECURITY MODES**
- **FRONT PANEL ADJUSTMENTS FOR VIDEO AND AUDIO MODULATION**
- **ACCEPTS STEREO AUDIO SIGNAL FROM A 4.5 MHz OR BASEBAND SOURCE**

The Modulating Video Processor II (MVP-IT) is a feature and performance enhanced version of the original MVP scrambler. The MVP-II can be used for all STARCOM pay and addressable terminal/descramblers by emulating any previous NextLevel encoder.

The MVP-II is designed to allow increased flexibility in installation and more standard operating modes primarily in the areas of compatibility and signal security.

EASY INSTALLATION

There are four user adjustments on the MVP-II: composite IF and sound IF levels, and video modulation and audio deviation adjustments.

A user reference card is provided, located on the top cover, in addition to the operation manual, to help make the task of selecting the optimum operating mode an easy one.

EASY TO USE

Along with the standard remote control interface the front and rear panel switches and display have been improved to provide operational information quickly and easily.

Set up options can be selected either at the rear panel or through an access door on the top cover.

An accessory package is included with each MVP that provides spare lugs for the terminal block as well as extra screws.

STEREO COMPATIBLE

The MVP-II provides two stereo interfaces: 4.5 MHz and composite baseband. The desired interface is chosen via a switch on the rear panel and a Stereo LED on the front panel indicates when either mode is selected.

REMOTE CONTROL OPERATION

ACC-2000, 4000 or the MVP-II can be remotely controlled from all NLS addressable controllers.

OPERATING MODES

There are three basic operating modes in the MVP-II: RF, BASEBAND, and MIXED. In the RF mode, the MVP-II scrambles the video signal by suppressing the sync information. Timing and Data information are amplitude modulated (AM) on the sound carrier. When emulating a DS/E several multi-mode scrambling algorithms can be employed to provide enhanced signal security. In the BASEBAND mode, all the features of DS/E mode are available plus several baseband video inversion modes as well as audio privacy. The Baseband mode uses an in-band data scheme that is MULTIPORT compatible and does not require AM modulating on the sound carrier. The MIXED mode is used when both RF and baseband type terminals reside in the same system. Both data ormats are transmitted and the operating modes are limited to the various sync suppression modes which are compatible with both terminal types.

Hamlin and Eagle emulation modes are both standard on all MVP's.

SECURITY MODES

The MVP-II offers many enhanced security features. Please contact your NextLevel account executive for information on enhanced security modes of operation.

MVP-II: PRODUCT RANGE

The Model MVP II- DIU is a MVP II encoder that includes a data inserter unit (DIU) option board. This option provides the capability of carrying row teletext data in video channels. These data channels are carried on two horizontal lines during the vertical blanking interval (VBI) on the video signal.

The MVPII-WLC provides compatability with Scientific Atlanta's scrambling modes and is used in conjunction with a Scientific Atlanta encoder.

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The MVPII-Z provides compatibility with Zenith modes of scrambling with the exception of the PM mode, and is used in conjunction with Zenith encoders.

The MVPII-T provides compatibility with all modes of Tocom scrambling and is used in conjunction with a Tocom (HVPIII) encoder.

The MVPII-SIF provides the scrambling interface in wireless (MMDS) transmission systems.

Specifications

Video

Input	1V p-p Pal-B standard (75 Ohm), 625 line, 50 Hz
Video AGC Range	+/- 6 dB (0.5V to 2.0 Vp-p)
Video Input Return Loss	25 dB Minimum
Video output	1 V p-p(in Standby); other modes encoded
Video output Return Loss	25 dB

Audio

Normal Input Level (attenuator off)	0 dBM (0.775 Vrms)
Normal Input Level (attenuator on)	+ 12 dBM (3.085 Vrms)
Input Attenuator	12 +/- 0.5 dB, switchable
Audio ALC Range	+/- 10 dB
Audio Pre-emphasis	50 usec +/- 5%
Audio Input Impedance	600 Ohm balanced or 50 K Ohm unbalanced, switchable
Audio Output Level	0 dB (+/-1 dB relative to the input signal in Standby)
Audio Output Impedance	600 Ohm balanced

Scrambling

Video	Clear/inverted
Sync	0 dB/ 6 dB/ 10 dB
Audio	Clear / 2H Subcarrier

Composite IF Output

Picture IF Frequency	38.9 MHz
Sound IF	33.4 MHz
Level (adjustable)	+25 dBmV to +45 dBmV
Ext. Pix to Input Level	+40 <= levels <= +50 dBmV
Intercarrier (5.5 MHz) Input Level	+10 dBmV Minimum
Return Loss	15 dB Minimum
Sound Carrier Level	-15 dB from 38.9 MHz, adjustable +/- 5 dB

Composite IF Output (continued)

Sound Carrier Deviation	+/- 50 kHz +/- 2 kHz
Video S/N	64 dB Minimum (66 dB typical)
Video Frequency Response	50 Hz to 5.0 MHz +/-1 dB
Video Group Delay	Pal B General 1/2 correction
Video DG	2.50%
Video DP	2 deg
Video Modulation at Center Detent	80% +/- 2%
Nominal Adjustment Range	+/- 35mV
Audio S/N	-70 dB
Audio THD	0.50%
Audio Frequency Response	50 Hz to 14 kHz +/- 1 dB
Audio Deviation at Center Detent	50 +/- 2 kHz
Nominal Adjustment Range	+/- 6 dB
Minimal Adjustment Range	4.5 dB

Remote Control

Bi-Phase In/Out	13,980 bps
Address	selectable (260097 to 260999)

Auxiliary IF Switch Drive

Actuator Voltage	<0.5 v
Maximum Input Voltage	+12 v
Minimum Input Voltage	-12 v

Test Point

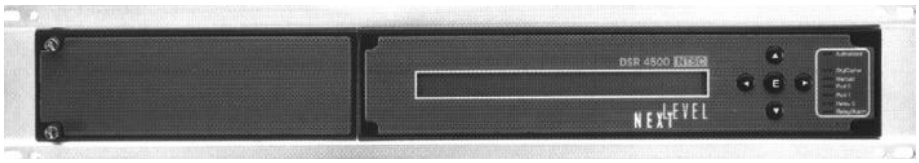
Video	Selectable In/Out
Video Test Point Level	1 V p-p into 75 Ohms
Audio	Selectable In/Out
Audio Test Level	0 dB + 1 dB relative to the input signal
Sync	Selectable Vertical/Composite
IF	-20 dB (relative to composite IF out)

Specifications subject to change without notice

DigiCipher®II DSR-4500

Functional, Hard-Working Professional IRD

the professional solution for cable operations



FEATURES:

- DIGITAL TRANSMISSIONS WITH MULTIPLE CHANNELS ON ONE TRANSPONDER
- MPEG-2 DIGITAL STANDARD COMPATIBLE, ALSO COMPATIBLE WITH DIGICIPHER®II SYSTEM ENHANCEMENTS
- OUTPUTS NTSC FORMATS WHEN NTSC IS TRANSMITTED (CAN OUTPUT PAL FROM DIGITAL SIGNALS)
- RECEIVES CLEAR ANALOG NTSC FORMATS
- ASYNCHRONOUS 1200-19200 BAUD RS-232 DATA CHANNEL
- HIGH-SPEED SYNCHRONOUS DATA CHANNEL (UP TO 9 MBPS)
- AUTO-RANGING POWER INPUT FOR INTERNATIONAL USE
- CUE-TONES VIA SUBCARRIER, DIGITAL AUDIO, OR GENERATED BY OVER-THE-SATELLITE COMMANDS
- DIGITAL STEREO DOLBY@ AC-3 AUDIO
- DISPLAYS SUBTITLES TRANSMITTED WITH PROGRAM MATERIAL
- EXTENDED RANGE TUNER, 950-1550 MHZ (OPTIONAL 2150 MHZ)
- RETUNE-READY
- TWO CLEAR ANALOG SUBCARRIERS FOR STEREO OUTPUT
- TWO LINE, 40-CHARACTER BACKLIT LCD WITH FIVE FRONT PANEL KEYS TO OPERATE MENUS
- UNIQUE ADDRESS FOR ACCESS CONTROL
- VIRTUAL CHANNEL MAPS DOWNLOADED OVER SATELLITE LINK
- OPERATING SYSTEM FIRMWARE CAN BE DOWNLOADED OVER SATELLITE LINK
- CLOSED CAPTION PASS-THROUGH, F1/F2
- CONTROLLABLE BY PCS/WORK-STATIONS OR REMOTE SITE
- INTERNALLY GENERATES VIDEO, AUDIO, AND VITS TEST SIGNALS
- FINGERPRINTING FOR PIRACY REDUCTION
- SEPARATE DIAGNOSTIC ON-SCREEN DISPLAY AND TEXT SCREENS OUTPUT
- STANDARD RACK MOUNTING
- TWO FORM C CONTACTS THAT CAN BE CONTROLLED OVER THE SATELLITE LINK OR USED AS SUMMARY ALARM
- SUPPORTS BOTH C- AND KU-BAND
- TVPASS™ CARD RENEWABLE SECURITY-READY
- ONE YEAR LIMITED WARRANTY

PRIMARY FEATURES

Meets international standards: Fully MPEG-2 compliant video and transport formats with DigiCipher®II system enhancements.

Receives two types of satellite signals: DigiCipher®II and clear analog NTSC formats

Digital stereo audio: Dolby® AC-3 CD-quality sound

Secondary language capability: Two stereo pairs for SAP

The DSR-4500 drops into current headend using existing LNB and outputs to match existing modulators. With a full complement of features, the DSR-4500 has everything you're looking for in a professional receiver for cable operations. As part of NextLevel Systems' end-to-end DigiCipher® system, the DSR-4500 receives and processes digital DigiCipher®II and clear NTSC signals. Compliant with MPEG-2 international standards for video and transport, the DSR-4500 ensures a common platform for current as well as future applications.

Feature packed and easy-to-use, the DSR-4500 is equipped with a full range of outputs including two stereo pairs — each with derived mono — and on-screen display for troubleshooting, to name a few.

The DSR-4500 combines simple operations with advanced technology. Virtual channel maps transmitted by the programmer assure simple receiver tuning in the most complex environment. All audio and data connections accept traditional CATV wiring, yet a receiver can be swapped in seconds, thanks to its quick disconnect feature. Rack mounting is standard.

Also standard is our proven security system. Security enhancements, if they are ever needed, are as simple as inserting a TvPass™ Card into the IRD.

The DSR-4500 is another fine product from NextLevel Systems, formerly General Instrument, the world leader in quality, end-to-end digital transmission systems.

NEXTLEVEL™

Specifications

RF	
Input Frequency Range	0.95-1.55 GHz, C/Ku switchable
Input Level Range	-65 to -25 dBm
RF Port Impedance	75 Ω
Return Loss	8 dB worst case
Port to Port Isolation (Lunes)	40 dB min.
VIDEO*	
Output Level	1 V p-p into 75 Ω
Frequency Response (Composite, Component Y, and OSD)	±0.75 dB, 1 kHz to 4.2 MHz
Frequency Response BB output	10 kHz - 8.5 MHz
Chrominance/Luminance Delay Inequality	±40 nsec (composite only)
Differential Gain	4% p-p max. (10-90% APL)
Differential Phase	4% p-p max. (10-90% APL)
Signal/Noise Ratio	57 dB luminance weighted
Signal Types	QPSK DigiCipher®II, clear NTSC
AUDIO	
Output Level	+16.0 dBm, ±0.1 dB into 600 Ω balanced attenuator, adjustable (0 to -15 dB)
Frequency Response	1 .O dB, 20 Hz to 20 kHz
Total Harmonic Distortion	0.3% or better RE: +10 dBm
Signal/Noise Ratio	85 dB or better at I kHz, RE: +16 dBm measured at 1 kHz
Isolation	70 dB, 20 Hz to 20 kHz
Impedance	600 Ω ±2%, balanced
Mono Level Balance	±0.5 dB Typ
ELECTRICAL/MECHANICAL	
Power Requirements	90 TO 250 Vac, 47/63 Hz, 70 W
LNB Power Supply	fixed 16 V min., 480 mA loaded
PHYSICAL ENVIRONMENT	
RF In	F-Type
Video Out	BNC
Audio	screw terminal on quick disconnect barrier strip
Auxiliary Data	screw terminal on quick disconnect barrier strip
High Speed Data	screw terminal on quick disconnect barrier strip
Relay Contacts	screw terminal on quick disconnect barrier strip
Dimensions	8.9 cm H x 48.3 cm W x 45.7 cm D
Weight With Decoder	6.6 kgs
OTHER	
Limited Warranty	one year
UL/TUV/CE	listed/approved

*The DigiCipher®II Commercial Integrated Receiver/Decoder meets the above video specifications for the composite video output when operating with a signal supplied by a component test generator (TSG 1000) to a DigiCipher® encoder, at an IRD ambient temperature of 25°C with the input static test signal supplied to all encoder channels simultaneously, and the encoder to 70 MHz output translated to the IRD input frequency (noise-free). Refer to NTC7 for measurement methods, These specifications do not apply to the composite video OSD output.

For **more** information on **the** DSR-4500 **or** the rest of the DigiCipher®II product line, please call, fax, or write us at the numbers and address listed below.

Headend Channel Assignment Reference Table

hannel Designation		Pic	e Carrier Frequency	
GI	EIA	STD	HRC	IRC
54	1	N/A	72.0036	73.2625
2	2	55.2500	54.0027	55.2625
3	3	61.2500	60.0030	61.2625
4	4	67.2500	66.0033	67.2625
5	5	77.2500	N/A	N/A
6	6	83.2500	N/A	N/A
55	5	N/A	78.0039	79.2625
56	6	N/A	84.0042	85.2625
7	7	175.2500	174.0087	175.2625
8	8	181.2500	180.0090	181.2625
9	9	187.2500	186.0033	187.2625
10	10	193.2500	192.0096	193.2625
11	11	199.2500	198.0099	199.2625
12	12	205.2500	204.0102	205.2625
13	13	211.2500	210.0105	211.2625
14	14	121.2625	120.0060	121.2625
15	15	127.2625	126.0063	127.2625
16	16	133.2625	132.0066	133.2625
17	17	139.2500	138.0069	139.2625
18	18	145.2500	144.0072	145.2625
19	19	151.2500	150.0075	151.2625
20	20	157.2500	156.0078	157.2625
21	21	163.2500	162.0081	163.2625
22	22	169.2500	168.0084	169.2625
23	23	217.2500	216.0108	217.2625
24	24	223.2500	222.0111	223.2625
25	25	229.2625	228.0114	229.2625
26	26	235.2625	234.0117	235.2625
27	27	241.2625	240.0120	241.2625
28	28	247.2625	246.0123	247.2625
29	29	253.2625	252.0126	253.2624
30	30	259.2625	258.0129	259.2625
31	31	265.2625	264.0132	265.2625
32	32	271.2625	270.0135	271.2625
33	33	277.2625	276.0138	277.2625
34	34	283.2625	282.0141	283.2625
35	35	289.2625	288.0144	289.2625
36	36	295.2625	294.0147	295.2625
37	37	301.2625	300.0150	301.2625
38	38	307.2625	306.0153	307.2625
39	39	313.2625	312.0150	313.2625
40	40	319.2625	318.0159	319.2625
41	41	325.2625	324.0162	325.2625
42	42	331.2750*	330.0165	331.2750*
43	43	337.2625	336.0168	337.2625
44	44	343.2625	342.0171	343.2625
45	45	349.2625	348.0174	349.2625
46	46	355.2625	354.0177	355.2625

Channel Designation		Pict	Carrier Freque	y
GI	EIA	STD	HRC	IRC
47	47	361.2625	360.0180	361.2625
48	48	367.2625	366.0183	367.2625
49	49	373.2625	372.0186	373.2625
50	50	379.2625	378.0189	379.2625
51	51	385.2625	384.0192	385.2625
52	52	391.2625	390.0195	391.2625
53	53	397.2625	396.0198	397.2625
62	54	403.2500	402.0201	403.2625
63	55	409.2500	408.0204	409.2625
64	56	415.2500	414.0207	415.2625
65	57	421.2500	420.0210	421.2625
66	58	427.2500	426.0213	427.2625
67	59	433.2500	432.0216	433.2625
68	60	439.2500	438.0219	439.2625
69	61	445.2500	444.0222	445.2625
70	62	451.2500	450.0225	451.2625
71	63	457.2500	456.0228	457.2625
72	64	463.2500	462.0231	463.2625
73	65	469.2500	468.0234	469.2625
74	66	475.2500	474.0237	475.2625
75	67	481.2500	480.0240	481.2625
76	68	487.2500	486.0243	487.2625
77	69	493.2500	492.0246	493.2625
78	70	499.2500	498.0249	499.2625
79	71	505.2500	504.0252	505.2625
80	72	511.2500	510.0255	511.2625
81	73	517.2500	516.0258	517.2625
82	74	523.2500	522.0261	523.2625
83	75	529.2500	528.0264	529.2625
84	76	535.2500	534.0267	535.2625
85	77	541.2500	540.0270	541.2625
86	78	547.2500	546.0273	547.2625
87	79	553.2500	552.0276	553.2625
88	80	559.2500	558.0279	559.2625
89	81	565.2500	564.0282	565.2625
90	82	571.2500	570.0285	571.2625
91	83	577.2500	576.0288	577.2625
92	84	583.2500	582.0291	583.2625
93	85	589.2500	588.0294	589.2625
94	86	595.2500	594.0297	595.2625
95	87	601.2500	600.0300	601.2625
96	88	607.2500	606.0303	607.2625
97	89	613.2500	612.0306	613.2625
98	90	619.2500	618.0309	619.2625
99	91	625.2500	624.0312	625.2625
100	92	631.2500	630.0315	631.2625
101	93	637.2500	636.0318	613.2625
102	94	634.2500	642.0321	643.2625

Headend Channel Assignment Reference Table

Channel Designation		Picture Carrier Frequency		
GI	EIA	STD	HRC	IRC
57	95	91.5000	90.0045	91.2625
58	96	97.2500	96.0048	97.2625
59	97	103.2500	102.0051	103.2625
60	98	109.2750*	108.0250	109.2750*
61	99	115.2750*	114.0250	115.2750*
103		649.2500	648.0324	649.2625
104		655.2500	654.0327	655.2625
105		661.2500	660.0330	661.2625
106		667.2500	666.0333	667.2625
107		673.2500	672.0336	673.2625
108		679.2500	678.0339	679.2625
109		685.2500	684.0342	685.2625
110		691.2500	690.0345	691.2625
111		697.2500	696.0348	697.2625
112		703.2500	702.0351	703.2625
113		709.2500	608.0354	709.2625
114		715.2500	714.0357	715.2625
115		721.2500	720.0360	721.2625
116		727.2500	726.0363	727.2625
117		733.2500	732.0366	733.2625
118		739.2500	738.0369	739.2625
119		745.2500	744.0372	745.2625
120		751.2500	750.0375	751.2625
121		757.2500	756.0378	757.2625
122		763.2500	762.0381	763.2625
123		769.2500	768.0384	769.2625
124		775.2500	774.0387	775.2625
125		781.2500	780.0390	781.2625
126		787.2500	786.0393	787.2625
127		793.2500	792.0396	793.2625
128		799.2500	798.0399	799.2625
129		805.2500	804.0402	805.2625
130		811.2500	810.0405	811.2625
131		817.2500	816.0408	817.2625
132		823.2500	822.0411	823.2625
133		829.2500	828.0414	829.2625
134		835.2500	834.0417	835.2625
135		841.2500	840.0420	841.2625
136		847.2500	846.0423	847.2625
137		853.2500	852.0426	853.2625
138		859.2500	858.0429	859.2625
139		865.2500	864.0432	856.2625
140		871.2500	870.0435	871.2625
141		877.2500	876.0438	877.2625
142		883.2500	882.0441	883.2625
143		889.2500	888.0444	889.2625
144		895.2500	894.0447	895.2625
145		901.2500	900.0450	901.2625

Channel Designation		Picture Carrier Frequency		
GI	EIA	STD	HRC	IRC
146	–	907.2500	906.0453	907.2625
147	–	913.2500	912.0456	913.2625
148	–	919.2500	918.0459	919.2625
149	–	925.2500	924.0462	925.2625
150	–	931.2500	930.0465	931.2625
151	–	937.2500	936.0468	937.2625
152	–	943.2500	942.0471	943.2625
153	–	949.2500	948.0474	949.2625
154	–	955.2500	954.0477	955.2625
155	–	961.2500	960.0480	961.2625
156	–	967.2500	966.0483	967.2625
157	–	973.2500	972.0486	973.2625
158	–	979.2500	978.0489	979.2625
159	–	985.2500	984.0492	985.2625
160	–	991.2500	990.0495	991.2625
161	–	997.2500	996.0498	997.2625

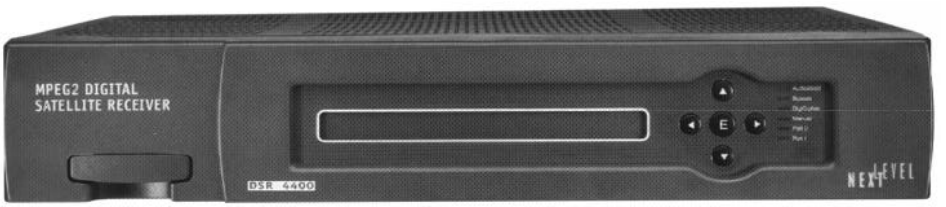
*Special Assignment

Sound carrier is 4.5 MHz above the picture carrier.
Color subcarrier is 3.579545 MHz above the picturecarrier.
EIA refers to the Electronic Industries Association, Washington, DC

DigiCipher®II DSR-4400

Economical Commercial IRD

the cost-effective solution for SMATV and basic cable operations



FEATURES:

- DIGICIPHER®II DIGITAL VIDEO
- DIGITAL TRANSMISSIONS WITH MULTIPLE CHANNELS ON ONE TRANSPONDER
- MPEG-2 DIGITAL STANDARD COMPATIBLE
- OUTPUTS NTSC FORMATS WHEN NTSC IS TRANSMITTED VIA DIGICIPHER®II
- OUTPUTS PAL FORMATS WHEN PAL IS TRANSMITTED VIA DIGICIPHER®II
- AUTO-RANGING POWER INPUT FOR INTERNATIONAL USE (OPTION)
- ASYNCHRONOUS 1200-19200 BAUD RS-232 DATA CHANNEL
- CUE-TONES VIA SUBCARRIER OR DIGITALLY GENERATED (OPTION)
- DIGITAL STEREO DOLBY® AC-3 AUDIO
- DISPLAYS BIT-MAPPED SUBTITLES
- EXTENDED RANGE TUNER, 950-1550 MHZ (OPTIONAL 2150 MHZ)
- RETUNE-READY
- TWO LINE, 40-CHARACTER BACKLIT LCD WITH FIVE FRONT
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- FINGERPRINTING FOR PIRACY REDUCTION
- STANDARD RACK MOUNTING
- SUPPORTS BOTH C- AND KU-BAND
- ONE YEAR LIMITED WARRANTY

PRIMARY FEATURES

Meets international standards: Fully **MPEG-2** compliant video and transport formats with DigiCipher®II system enhancements.

Digital stereo audio: Dolby@ AC-3 CD-quality sound

Provides bypass capability: Auxiliary inputs are routed to IRD outputs when DigiCipher® signal is unavailable.

The DSR-4400 is the affordable, easy-to-use entry to the world of digital television delivery. Compliant with MPEG-2 international standards for video and transport, the DSR-4400 is designed to deliver outstanding video and audio performance in an economical package. This outstanding player can output either NTSC or PAL baseband video formats, automatically matching the programmer's input format.

The DSR-4400 combines simple operations with advanced technology. Downloadable virtual channel maps assure consistent and accurate retune and network management. Receiver operations can be updated by downloading a new code over the satellite link.

Other features include closed caption pass-through and cue-tone generation. Rack mounting is standard. Also standard is our proven security system. Security enhancements, if they are ever needed, are as simple as inserting a TvPass™ Card into the IRD.

The DSR-4400 is another fine product from NextLevel Systems, formerly General Instrument, the world leader in quality, end-to-end digital transmission systems.

NEXTLEVEL™

Specifications

INPUT SPECIFICATIONS	
Input Frequency	0.95 to 1.55 GHz (2.15 GHz optional)
Input Impedance	75 Ω
Input Connector	one F-type
LNB power out F-connector	16 Vdc min./450mA
DIGITAL PROCESSING	
Formats	MPEG-2, DigiCipher®II
MCPC QPSK Rates	19.5, 29.3 Msps
Forward Error Correction	5/11, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 7/8
VIDEO	
Frequency Response	±1 dB, 1 kHz-4.2 MHz
Signal/Noise Ratio	57 dB min.
Differential Gain	5% max.
Differential Phase	5 deg. max.
Output Impedance	75 Ω
Output Level	1.0 V p-p
AUDIO	
outputs	1 stereo pair
Output Level	±16.0 dBm, ±1.0 dB into 600 Ω balanced attenuator, adjustable (0 to -15 dB)
Frequency Response	A.3 dB, 20 Hz to 20 kHz
Total Harmonic Distortion	0.3% or better at 1 kHz
Signal/Noise Ratio	85 dB or better at 1 kHz
Isolation, L/R	80 db, 1 kHz
Connector	screw terminals
PHYSICAL/ENVIRONMENTAL	
Temperature	0” to 40” C ambient
Humidity	95% relative, max.
Dimensions	48 cm W x 38 cm D x 7.9 cm H
Weight	6.6 kgs
Power Input	90-250 Vac, 47-63 H, 40 W (international)
	90-140 Vac, 57-63 H, 40 W (US/Canada)
UL	listed
OTHER	
Limited Warranty	one year
UL/TUV/CE	listed/approved

For more information on the DSR-4400 or the rest of the DigiCipher®II product line, please call, fax, or write us at the numbers and address listed below.

Worldwide telephone (U.S.) 215-674-4800, fax (US) 215-956-6497, website www.nlvl.com Offices in Asia, Australia, Europe, North America. and South America