Compact Modular Digital TV Headend

NKD-1 is a compact modular digital TV headend that includes professional MPEG-2 and MPEG-4 AVC/H.264 SD/HD IRD, MPEG-2 and MPEG-4 AVC/H.264 SD/HD Encoder/Transcoder, Re-Multiplexer, QAM/COFDM Trans-Modulator, Dual Channel Analog Modulator, DVB Scrambler and so on. Within a 4U×19" chassis, it provides 8 slots for any type of modules and 2 redundant power supply units. Thanks for its flexibility and high density, NKD-1 offers operators the advanced headend architectures in the marketplace for delivering analog and digital broadcast services to their subscribers. Coming with more new modules, NKD-1 is most suitable for future multiple network architectures: streaming and multiplexing of digital content over IP based networks and conversion of digital content for analog networks.

Independent Hot-Swappable Functional Modules

Five hot-swappable fans assembly for longer MTBF

Redundant power supply unit

Main Feature

- DVB-S2/S, DVB-S, DVB-C, DVB-T2/T IRD modules with CI
- DVB-S/S2T/T2 to DVB-C QAM and DVB-T COFDM trans-modulator module
- MPEG-2, H.264 HD/SD encoder and trans-coder module
- 8 Way re-multiplexer module
- DVB Simulcrypt, BISS-1, BISS-E scrambler module
- Rich interface with ASI, IP, SDI, YPbPr, CVBS, XLR
- Web, SNMP Remote Control or handheld programmer unit local control
- 4RU 19" chassis compact modular design, supporting up to 8 modules
- Functional module hot-swappable
- Redundant power supply
- Intelligent cooling system with temperature
- Stand alone function of each module
- Cost-saving by backward compatible with new modules
- On site software update through IP

Product List

Product name	Model No.	Description
Professional IRD and Processor	NKD-12P	Professional MPEG-2 SD IRD and Processor Module
	NKD-14P	Professional MPEG-2 SD IRD and Processor Module
	NKD-15P	Professional Multi-format HD/SD IRD and Processor Module
Digital TV Modulator and Trans-Modulator	NKD-13TM	Digital TV Trans-modulator and Processor Module
Digital TV SD/HD Encoder	NKD-13EC	Professional MPEG-2 SD Encoder Module
	NKD-14EC	Professional H.264 SD Encoder/Trans-coder Module
	NKD-15EC	Professional H.264 HD Encoder/Trans-coder Module
Re-Multiplexer and DVB Scrambler	NKD-13MX	Re-multiplexer Module
	NKD-23TP	DVB Scrambler Module
IPTV Encoder	NKD-14IE NKD-141IE	SD DVB IRD and H.264 Encoder

Compact Modular Digital TV Headend
Chassis

NKD-1MF Main Chassis

- Standard 4 RU chassis with 8 slots for functional modules and 2 slots for Power Supplies
- Hot-backup power supply unit
- Intelligent cooling system with temperature sensor
- Wall mounted or Rack mounted
- Compatible with new successive modules
- Power Supply: AC 90V-250V, 150Watts, 50-60Hz
- Optional Build-in IP Switch
- Dimension: L=340mm, W=483mm, H=178mm (4U)
- Operating temperature: 0 ~ 45□ (for all modules)
- Storage temperature: -10 ~ 60□ (for all modules)

NKD-1CU Handheld Programmer Unit

- 2× 20 LCD display screen and 6-key keypad
- No external power nor battery needed
- Easy and quick on site system configuration without PC
- Compatible with new modules
- Dimension 170× 70× 22 mm

NKD-1PS Power supply

- Hot-backup power supply unit
- Power Supply: AC 90V-250V, 50-60Hz
- High reliability & efficiency
- 150Watts stable output power
- Dimension 343× 110 × 47.5 mm

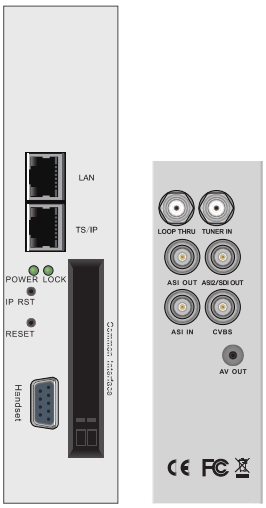
Compact Modular Digital TV Headend

Professional IRD and Processor

NKD-12P/14 Series

Professional MPEG-2 SD IRD and Processor Module

- Multiple inputs DVB-S2/S/C/T, TS/IP and ASI
- SD MPEG-2 MP@ML digital Video decoding
- Flexible built-in re-multiplexing between ASI, Tuner and TS/IP Inputs
- 2x DVB-CI Slots, Multi Programs, BISS-1 and BISS-E decryption
- Dynamic PMT detection and automatic updating
- UDP, RTP Multicast / Unicast IP output, supports up to 32 independent channels
- PCM audio embedded in SDI output
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- RSSI, received Eb/No & BER monitoring
- On Site software update through IP



Specifcation

Tuner Input	
DVB-S/S2 Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	DVB-S QPSK: 5~45MS/s; DVB-S2 8PSK 10~31MS/s
Roll-off Factor	DVB-S QPSK: 0.35; DVB-S2 8PSK: 0.35, 0.25, 0.2
FEC Code Rate	DVB-S2 8PSK: 2/3, 3/4, 3/5, 5/6, 8/9, 9/10
	DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 6/7, 7/8
LNB Polarization	0, 13V, 18V selectable
LNB Band Switching Tone	0/22KHz selectable
DVB-S Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	2 ~ 45MS/s
Roll-off Factor	0.35
Puncture Rate	1/2, 2/3, 3/4, 5/6, 7/8
LNB Polarization	0, 13V, 18V selectable
LNB Band Switching Tone	0/22KHz selectable
DVB-C Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	48~860MHz
Symbol Rate	1 ~ 7MS/s (ITU J.83 Annex A)
Constellation	64/128/256 QAM
Input Level	-15 ~ 15dBmV
Bandwidth	6/7/8MHz
Input Return Loss	7dB (typ.)
DVB-T Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	174 ~ 230MHz (VHF); 470~860MHz (UHF)
Input Level	-20 ~ -70dBm
Constellation	QPSK, 16-QAM, 64-QAM
Carrier Bandwidth	6/7/8 MHz
FTT Mode	2K/8K
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
ASI Input	
Connector	1× BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s

Package Length	188 or 204 Bytes
TS over IP (for 1400P series)	
Connector Type	1× RJ45, 10/100M for TS/IP
Useful bit rate	70Mb/s for 10/100M
Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP
TS Processing	
TS Input Management	Remux and demux between Tuner, ASI and TS/IP Inputs
TS Output Management	Remux and demux for 2 mirror ASI outputs
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
Descrambler	DVB Common Scrambling Algorithm (CSA)
Common Interface	Double PCMCIA slots, compatible with major CA CAMs in the market
ASI Output	
Connector Type	2× BNC Female, 75Ω (one connector is shared with SDI output)
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 99Mb/s
Digital Video Processing	
Video Standard	MPEG-2(MP@ ML)
SDI Video Resolution	576i× 25, 480i× 29.97
Video Bit Rate	< 80Mb/s
SD-SDI Output	
Connector Type	1× BNC Female, 75Ω (share with one of the two ASI outputs)
Serial Interface	SMPTE 259M, 270 Mb/s (10bit)
Level	800mV p-p
Audio Embedded	Yes
Digital Audio Processing	
Number of Output	1 pair of stereo audio output (1 Audio PID is decoded)
Analog Video Output	
CVBS Connector	1× BNC, 1× 2.5mm phone jack (with phone jack to RCA adaptor)
Video Standard	NTSC, PAL, and SECAM
Analog Audio Output	
Connector Type	1× 2.5mm phone jack for CVBS and stereo audio
Number of Output	1 pair of stereo audio
Control & Monitoring	
Connector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS Network System Management Software
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader

Compact Modular Digital TV Headend

Professional IRD and Processor

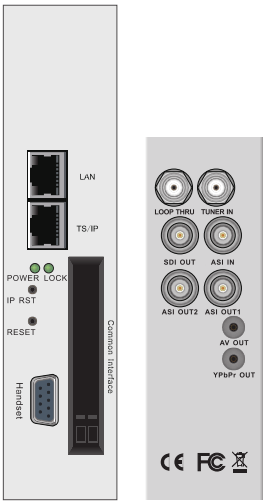
Order Information

Model / Interface	NKD xx-xx											
	12P-S	12P-S2	12P-C	12P-T	14P-S	14P-S2	14P-C	14P-T	14P-44S	14P-44S2	14P-44C	14P-44T
Tuner	-S	-S2/S	-C	-T	-S	-S2/S	-C	-T	-S	-S2/S	-C	-T
ASI Input	•	•	•	•	•	•	•	•	•	•	•	•
Common Interface	× 2	× 2	× 2	× 2	× 2	× 2	× 2	× 2	× 2	× 2	× 2	× 2
Built-in Re-mux	•	•	•	•	•	•	•	•	•	•	•	•
ASI-Output	•	•	•	•	•	•	•	•	•	•	•	•
SDI	•	•	•	•	•	•	•	•	•	•	•	•
YPbPr	•	•	•	•	•	•	•	•	•	•	•	•
Audio L/R	•	•	•	•	•	•	•	•	•	•	•	•
CVBS	•	•	•	•	•	•	•	•	•	•	•	•
TS/IP(Max.6 SPTS or MPTS output)					•	•	•	•				
TS/IP(Max.32 SPTS or MPTS output)									•	•	•	•

NKD-15 Series

Professional Multi-format HD/SD IRD and Processor Module

- Multiple inputs DVB-T2/S2/S/C/T/T2, TS/IP and ASI
- Redundant inputs between Tuner, ASI and TS/IP
- SD/HD MPEG-2 and MPEG-4/H.264 digital Video decoding
- Digital Audio decoding and loop through via
- Multiple Analog and Digital Outputs, ASI, CVBS, YPbPr, SDI, TS/IP
- Flexible re-multiplexing between 2× ASI, Tuner and TS/IP Inputs
- 2× DVB-CI Slots, Multi Programs, BISS 1 and BISS E decryption
- Dynamic PMT detection and automatic updating
- Support VBI TELETEXT, EBU/ DVB Subtitle, Closed Caption
- UDP/RTP & Unicast/Multicast SPTS and MPTS over IP I/O
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- PCM audio embedded in SDI output
- On Site software update through IP
- RSSI, received Eb/No & BER monitoring



Order Information

Model / Interface	NKD XX-XX							
	15P-30S2	15P-30C	15P-30T	15P-30T2	15P-44S2	15P-44C	15P-44T	15P-44T2
Tuner	-S2/S	-C	-T	-T2	-S2/S	-C	-T	-T2
ASI Input	•	•	•	•	•	•	•	•
Common Interface	× 2	× 2	× 2	× 2	× 2	× 2	× 2	× 2
Built-in Re-mux	•	•	•	•	•	•	•	•
ASI Output	× 2	× 2	× 2	× 2	× 2	× 2	× 2	× 2
SDI	•	•	•	•	•	•	•	•
YPbPr	•	•	•	•	•	•	•	•
Audio L/R	•	•	•	•	•	•	•	•
CVBS	•	•	•	•	•	•	•	•
TS/IP(Max.32 SPTS or MPTS output)					•	•	•	•

Compact Modular Digital TV Headend

Professional IRD and Processor

Specifcation

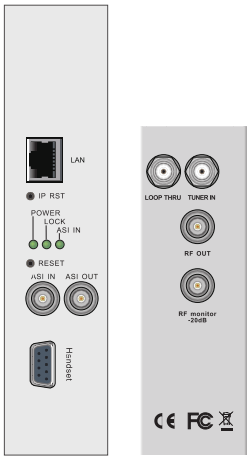
Tuner Input	
DVB-S/S2 Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	5 ~ 45MS/s for QPSK 10 ~ 31MS/s for 8PSK
Roll-off Factor	DVB-S QPSK: 0.35; DVB-S2 8PSK: 0.35, 0.25, 0.2
Punctured Rates	DVB-S QPSK□ 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/1
	DVB-S2 8PSK□ 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
LNB Polarization	0, 13V, 18V selectable
LNB Band Switching Tone	0/22KHz selectable
DiSEqC	DiSEqC 1.0
DVB-C Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	48 ~ 860MHz
Input Level	45 ~ 75dBuV
Symbol Rate	1 ~ 7MS/s (ITU J.83 Annex A)
Constellation	64/128/256 QAM
Bandwidth	6/7/8MHz
Input Return Loss	7dB (typ.)
DVB-T/T2 Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency	104 ~ 862MHz (VHF/UHF)
Input Level	-20 ~ -70dBm (Quasi Error Free, QEF)
Constellation	DVB-T: QPSK/16-QAM/64-QAM
	DVB-T2: QPSK, 16QAM, 64QAM, 256QAM
Bandwidth	6/7/8 MHz
FTT Mode	DVB-T: 2K/8K
	DVB-T2: 1K, 2K, 4K, 8K, 16K, 32K
Guard Interval	DVB-T: 1/4, 1/8, 1/16, 1/32
	DVB-T2: 1/4, 5/32, 1/8, 5/64, 1/16, 1/32, 1/64, 1/128
FEC Code Rate	DVB-T: 1/2, 2/3, 3/4, 5/6, 7/8
	DVB-T2: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Input return loss	7dB (typ.)
ASI Input	
Connector Type	1× BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s
Package Length	188 or 204 Bytes
TS over IP	
Connector Type	1× RJ45, 10/100M for TS/IP
Useful bit rate	70Mb/s for 10/100M
Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP
TS Processing	
TS Input Management	Remux and demux between Tuner, ASI and TS/IP Inputs
TS Output Management	Remux and demux for 2 independent ASI outputs
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
Descrambler	DVB Common Scrambling Algorithm (CSA)
BISS Mode	BISS-1, BISS-E

Common Interface	Double PCMCIA slots, compatible with major CA CAMs in the market
ASI Output	
Connector Type	2× BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
TS Processing	2 Independent TS Re-multiplexing from tuner, TS/IP and 2 ASI inputs
Digital Video Processing	
Video Standard	MPEG-2(MP@ ML for SD, MP@HL for HD)
	MPEG 4/H.264 AVC Part 10 (MP@L3 for SD, HP@L4.1 for HD)
SDI Video Resolution	1080i× 30, 1080i× 29.97, 1080i× 25, 720p× 60
	720p× 59.94, 720p× 50, 576i× 25, 480i× 29.97
Video Bit Rate	< 80Mb/s
SDI Connector Type	1× BNC Female, 75Ω
SD-SDI Serial Interface	SMPTE 259M, 270 Mb/s (10bit)
HD-HDI Serial Interface	SMPTE 292M, 1.485 Gbit/s (10bit)
Level	800mV p-p
Digital Audio Processing	
Number of Output	1 pair of audio outputs
Analog Video Output	
YPbPr Connector	1× 2.5mm phone jack, 75Ω (with phone jack to RCA adaptor,)
CVBS Connector	1× 2.5mm phone jack, 75Ω (with phone jack to RCA adaptor,)
Video Standard	NTSC, PAL, and SECAM
YPbPr Resolution	1080i× 30, 1080i× 29.97, 1080i× 25, 720p× 60, 720p× 59.94,
	720p× 50, 480p 60, 576p 50, 576i 25, 480i 29.97
Signal Level	I.0 Vp-p± 5%
Frequency Response	< ± I dB at 5.5 MHz
Chroma-Luma Delay	<± 30 ns
Field Time Distortion	<2%
Line Time Distortion	<1%
Short Time distortion	<2%
Differential Gain	<4%
Differential Phase	<2°
Signal to Noise Ratio	>55 dB (luminance weighted)
Analog Audio Output	
Connector type	1× 2.5mm phone jack, 75Ω (with phone jack to RCA adaptor,)
Output mode	Left, Right, Dual Mono, Stereo
Baseband Data Output	
Subtitle	DVB/EBU
VBI	Teletext, WSS, VFD, VPS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708
Redundancy	
Redundancy Port	between Tuner, ASI inputs and TS/IP
Switching Condition	TS Sync Loss
Switching Mode	Main, Spare
Control & Monitoring	
Connector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS Network System Management Software
Local Control	Handheld Programmer Unit
Equipment Upgrade	FTP loader

Compact Modular Digital TV Headend
Digital TV Modulator and Trans-Modulator

NKD-13TM Series
DigitalTrans-modulator and Processor Module

- DVB-S2/S, DVB-C or DVB-T Tuner Input
- ASI input and output
- Flexible re-multiplexing between ASI and Tuner inputs
- PSI/SI adapting and re-generation, including NIT insertion, LCN insertion etc.
- Service Drop or PID filtering and Re-mapping
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- On Site software update through IP
- RSSI, received Eb/No & BER monitoring



Specifcation

Tuner Input	
DVB-S/S2 Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	DVB-S QPSK: 5~45MS/s; DVB-S2 8PSK 10~31MS/s
Roll-off Factor	DVB-S QPSK: 0.35; DVB-S2 8PSK: 0.35, 0.25, 0.2
Punctured Rates	DVB-S2 8PSK: 2/3, 3/4, 3/5, 5/6, 8/9, 9/10
	DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 6/7, 7/8
LNB Polarization	0, 13V, 18V selectable
LNB Band Switching Tone	0/22KHz selectable
DVB-C Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	48 ~ 860MHz
Symbol Rate	1 ~ 7MS/s (ITU J.83 Annex A)
Constellation	64/128/256 QAM
Input Level	-15 ~ 15dBmV
Bandwidth	6/7/8MHz
Input Return Loss	7dB (typ.)
DVB-T Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	174 ~ 230MHz (VHF); 470 ~ 860MHz (UHF)
Input Level	-20 ~ -70dBm
Constellation	QPSK, 16-QAM, 64-QAM
Carrier Bandwidth	6/7/8 MHz
FTT Mode	2K/8K
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
ASI Input	
Connector Type	1× BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s
Package Length	188 or 204 Bytes

TS Processing	
TS Input Management	Remux and demux between Tuner and ASI Inputs
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
ASI Output	
Connector Type	1× BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
TS Processing	2 mirror TS Re-multiplexing from Tuner and ASI inputs
DVB-C Re-Modulation	
Constellation	J.83 Annex A: 16/32/64/128/256QAM; J.83 Annex B: 64/256QAM
Symbol Rate	3 ~ 7.2MS/s
I/Q Amplitude Error	< 0.3%
I/Q Phase Error	< 0.3°
Phase jitter	< 0.5° RMS
MER	> 35dB
DVB-T Re-Modulation	
Constellation	QPSK/16QAM/64QAM
Bandwidth	5/6/7/8MHz
FFT Mode	2K
Guard Interval	1/4, 1/8, 1/16, 1/32
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	>36dB
RF Output	
Connector Type	F type female, 75Ω
Output Frequency Range	48 ~ 860MHz agile, step by 10 KHz
Output Level	97 ~ 110dBμ V, step by 1dBμ V
Spurious Rejection	55dB (typ.)
Output Return Loss	12dB (typ.)
Control & Monitoring	
Connector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS Network System Management Software
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader

Order Information

Model / Interface	NKD XX-XX							
	13TM-S2C	13TM-CC	13TM-TC	13TM-AC	13TM-S2T	13TM-CT	13TM-TT	13TM-AT
Tuner	-S2/S	-C	-T		-S2/S	-C	-T	
ASI Input	•	•	•	•	•	•	•	•
Built-in Re-mux	•	•	•	•	•	•	•	•
ASI Output	•	•	•	•	•	•	•	•
QAM Modulation	•	•	•	•				
COFDM Modulation					•	•	•	•

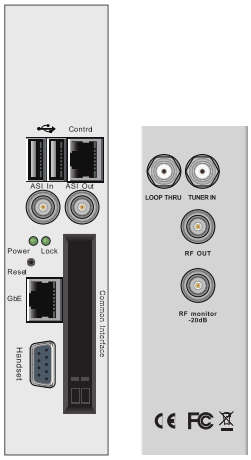
Compact Modular Digital TV Headend

Digital TV Modulator and Trans-Modulator

NKD-14PM Series

Professional IRD and Trans-modulator Module

- Multiple inputs DVB-S2/S/C/T/T2, TS/IP, and ASI optional
- DVB-C QAM or DVB-T COFDM RF modulation output
- Supports 2K/4K/8K FFT Mode for DVB-T COFDM modulation
- Giga UDP/RTP, Unicast/Multicast, and SPTS/MPTS over IP(full duplex)
- Flexible re-multiplexing among Tuner, ASI and TS/IP inputs
- ASI input and output
- Service Drop or PID filtering and Re-mapping
- PSI/SI adapting and re-generation, including NIT, LCN insertion etc.
- 2 x DVB-CI slots, Multiple TV program decryption
- Remote Control and supervision by SNMP, HTTP WEB and proprietary HDMS software
- RSSI, received Eb/No & BER monitoring
- On Site software update through IP or USB



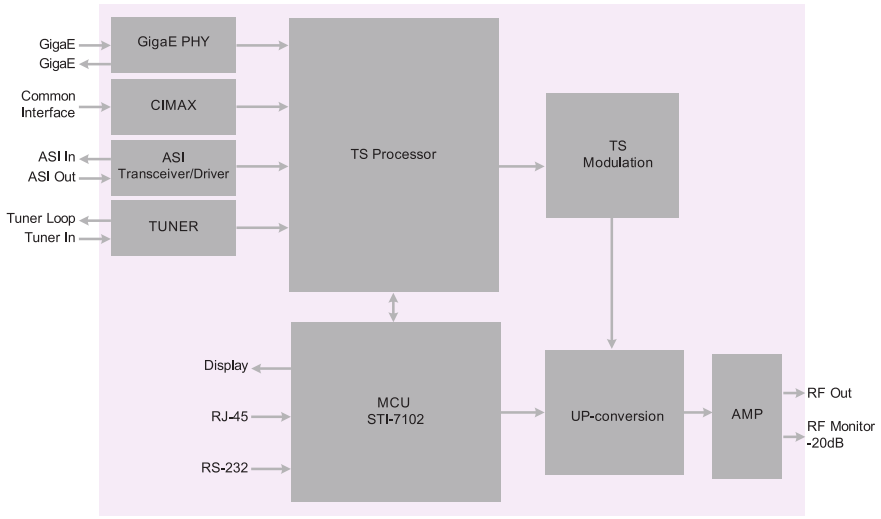
Specifcation

Tuner Input	
DVB-S/S2 Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	DVB-S: 2~45MBauds/s for QPSK
	DVB-S2: 2~45MBauds/s for QPSK, 8PSK
Roll-off Factor	DVB-S: 0.35
	DVB-S2: 0.2, 0.25, 0.35
FEC Code Rate	DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 6/7, 7/8
	DVB-S2 QPSK: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
	DVB-S2 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
LNB Polarity Selection Voltage	0, 13V, 18V selectable
LNB Band Switching Tone	0/22KHz selectable
Satellite Selection Command	DiSEqC 1.0
DVB-C Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	48 ~ 862MHz
Input Level	45~ 75dBμ V
Symbol Rate	1 ~ 7MS/s (ITU J.83 Annex A)
Constellation	16/32/64/128/256QAM (ITU J.83 Annex A)
Bandwidth	6/7/8 MHz
Input Return Loss	7dB (typ.)
DVB-T Tuner Input	
Connector Type	1× F type female 75Ω for Input, 1× F type female 75Ω for loop through output
Input Frequency Range	174 ~ 230MHz (VHF); 470 ~ 860MHz (UHF)
Input Level	-20 ~ -70dBm
Modulation	QPSK, 16-QAM, 64-QAM
Carrier Bandwidth	6/7/8 MHz
FTT Mode	2K/8K
Guard Interval	1/4, 1/8, 1/16, 1/32
Viterb Error Correction Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
ASI Input	
Connector Type	1× BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s
Package Length	188 or 204 Bytes
TS over IP	
Connector Type	1 x RJ-45, 1000 Base-T
Effective Bit Rate	800Mb/s
Protocol	Unicast/Multicast, UDP/RTP, IGMPv2, ARP

TS Processing	
TS Input Management	Remux and demux among Tuner, ASI and TS/IP inputs
TS Output Management	Remux and demux for mirrored ASI outputs
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
Descrambler	DVB Common Scrambling Algorithm (CSA)
BISS Mode	BISS-1, BISS-E
Common Interface	Double PCMCIA slots, compatible with major CA CAMs in the market
ASI Output	
Connector Type	1× BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
TS Processing	Can output TS Re-multiplexing from Tuner, ASI and TS/IP inputs
DVB-C Re-Modulation	
Constellation	J.83 Annex A: 16/32/64/128/256QAM; J.83 Annex B: 64/256QAM
Symbol Rate	3 ~ 7.2MS/s
I/Q Amplitude Error	< 0.3%
I/Q Phase Error	< 0.3°
Phase jitter	< 0.5° RMS
MER	> 35dB
DVB-T Re-Modulation	
Constellation	QPSK/16QAM/64QAM
Bandwidth	5/6/7/8MHz
FFT Mode	2K/4K/8K
Guard Interval	1/4, 1/8, 1/16, 1/32
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	>36dB
RF Output	
Connector Type	1x F type female, 75Ω (primary output) 1x F type female 75Ω (-20dB for monitoring)
Output Frequency Range	48 ~ 860MHz agile, step by 10 KHz
Output Level	95~110dBμ V, step by 1dBμ V
Spurious Rejection	55dB (typ.)
Output Return Loss	12dB (typ.)
Control & Monitoring	
Connector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP (Web Interface), Proprietary HDMS (Headend Device Management System)
Local Control	Handheld Programmer Unit
Software Upgrade	Embedded FTP loader and Telnet

SpecifcationBlock Diagram

Function Block Diagram



Order Information

Model / Interface	NKD 14PM-XX					
	-S2C	-CC	-TC	-S2T	-CT	-TT
Tuner type	DVB-S2	DVB-C	DVB-T	DVB-S2	DVB-C	DVB-T
ASI input	•	•	•	•	•	•
Built-in Re-mux	•	•	•	•	•	•
ASI Output	•	•	•	•	•	•
Giga IP port	•	•	•	•	•	•
QAM Modulation	•	•	•			
COFDM Modulation				•	•	•

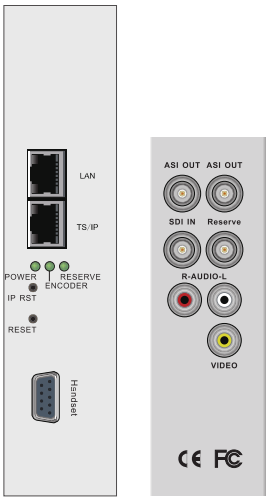
Compact Modular Digital TV Headend

Digital TV SD/HD Encoder

NKD-13EC Series

Professional MPEG-2 SD Encoder Module

- Digital SDI with embedded digital audio input
- Analog Composite Video for PAL/NTSC/SECAM Input
- MPEG-2 MP@ML Video encoding
- User configurable GOP
- User configurable 4:3/16:9 aspect ratio
- PAT, PMT and SDTgeneration and NIT Insertion
- 10/100M IP Output, UDP/RTP & Unicast/Multicast SPTS and MPTS
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software



Specifcation

Video Compression	
Analog Input	Analog NTSC, PAL and SECAM
Digital Input	SD-SDI (SMPTE-259M)
Compression Standard	MPEG-2 MP@ML
Video Resolution	480i (720x480) @29.97Hz: SMPTE125M
	576i (720x576) @25Hz: ITU-R BT.656-4
Aspect Ratio	4:3/16:9 selectable
Video output Bit rate	1.5 ~ 20Mb/s
Audio Compression	
Audio Channels	1 pair of stereo
Audio Sampling Rate	32, 44.1, 48 KHz
Audio Output Bit rate	32, 64, 128, 192, 256, 384 Kb/s
Audio/Video Input Interface	
Analog Audio	RCA female, Stereo L/ R
Analog CVBS	RCA female, 75Ω
SD-SDI	1× BNC female, 75Ω
SDI embed audio	Group 1 to 4 selectable
TS Processing	

TS Output Management	Remux and demux for mirror ASI outputs
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition
TS over IP Output	
Connector Type	1× RJ45, 10/100M for TS/IP
Useful bit rate	70Mb/s for 10/100M
Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP
ASI Output Interface	
Connector Type	2× BNC Female, 75Ω
Output bit rate	≤ 99Mb/s
Packet Length	188 / 204 Bytes
Signal Level	800mVpp± 10%
Control & Monitoring	
onnector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS networ Management Software
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader

Order Information

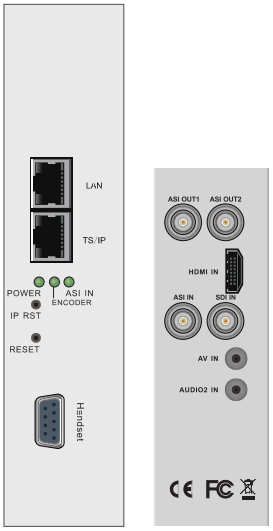
Model / Interface	NKD 13XX-XX	
	13EC-30	13EC-40
CVBS	•	•
SD-SDI Input	•	•
ASI Output	× 2	× 2
TS/IP Output		•

Compact Modular Digital TV Headend

Digital TV SD/HD Encoder

NKD-14EC Series
Professional H.264 SD Encoder / Trans-coder Module

NKD-15EC Series
Professional H.264 HD Encoder / Trans-coder Module



- Multiple video resolution including 1080i, 720p, 576i and 480i
- Multiple inputs HDMI, HD/SD-SDI, and CVBS for encoding
- ASI and IP Input for Trans-coding
- Support 10/100M TS/IP SPTS and MPTS
- Built-in re-multiplexer for encoder loop
- Support VBR and CBR encoding mode
- Digital audio pass through for trans-coding
- Support 2 pairs of analog stereo audio encoding with optional extension board
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software

Specifcation

Video Compression	
Video Resolution	1080i (1920/1440× 1080) @25Hz, 29.97Hz, 30Hz: SMPTE274M (for 1500EC only)
	720p (1280× 720) @50Hz, 59.94Hz, 60Hz: SMPTE296M (for 1500EC only)
	480i (720× 480) @29.97Hz: SMPTE125M
	576i (720× 576) @25Hz: ITU-R BT.656-4
Compression Standard	H.264, High Profile Level 4.0
Aspect Ratio	4:3/16:9 selectable
Video Encoding bit rate	2Mb/s-20Mb/s
Audio Compression	
Audio Input	Embedded Audio, Analog audio
Audio Channels	1 pair of stereo
Sampling rate	48KHz
Audio compression bit rate	16 ~ 256Kb/s
Audio/Video Input Interface	
Analog Audio	1× 2.5mm phone jack, Stereo L/ R (with phone jack to RCA adaptor)
Analog CVBS	1× 2.5mm phone jack (with phone jack to RCA adaptor)
HD-SDI	1× BNC Female, 75Ω (for 1500EC)
SD-SDI	1× BNC Female, 75Ω (for 1400EC)
HDMI	1× HDMI 1.3 interface (for 1500EC)
ASI Input	
Connector Type	1× BNC Female, 75Ω

Input bit rate	≤ 100Mb/s
Packet Mode	Byte
Packet Length	188/204 Bytes
TS Processing	
TS Input Management	Remux and demux between ASI input and the SPTS encoded
TS Output Management	Remux and demux for mirror ASI outputs
Service and PID management	Remux, filtering and remapping
PSI/SI	PSI/SI table regeneration, NIT and SDT edition
TS over IP	
Connector Type	1× RJ45, 10/100M for TS/IP
Useful bit rate	70Mb/s for 10/100M
Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP
Source	Built-in Re-mux, ASI input, Encoder
ASI Output Interface	
Connector Type	2× BNC Female, 75Ω
Output bit rate	≤ 99Mb/s
Packet Length	188 / 204 Bytes
Signal Level	800mVpp± 10%
Control & Monitoring	
Connector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS network Management Software
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader

Order Information

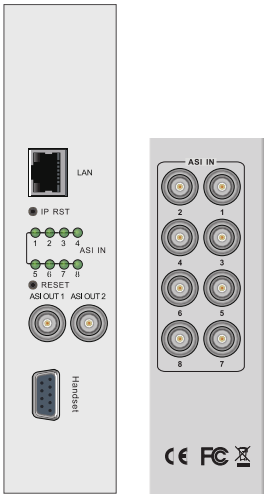
Model / Interface	NKD XX-XX	
	14EC-30	15EC-30
HD-SDI Input		•
SD-SDI Input	•	•
HDMI Input	•	•
CVBS	•	•
ASI Input	•	•
Built-in Re-mux	•	•
ASI Output	× 2	× 2
TS/IP I/O	•	•

Compact Modular Digital TV Headend

Re-Multiplexer and DVB Scrambler

NKD-13MX
Re-multiplexer Module

- 8-way SPTS or MPTS ASI inputs
- Redundant ASI outputs
- PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
- Remote Control and Supervision by SNMP and Proprietary HDMS software
- On Site software update through IP

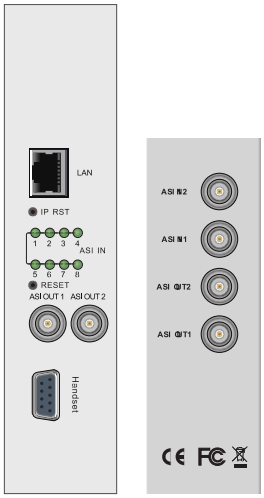


Specifcation

ASI Input	
Connector Type	8× BNC Female, 75Ω
Input Bit Rate	≤ 100Mb/s
Data transmission mode	BYTE or BURST mode auto-detection
Packet Length	188 /204 bytes, auto-detection
ASI Output	
Connector Type	2× BNC Female, 75Ω
Output bit rate	≤ 99Mb/s
Data transmission mode	Byte
Packet Length	188 or 204 Bytes
Signal Level	800mVpp± 10%
Control & Monitoring	
Connector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, Proprietary HDMS network Management Software
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader

NKD-23TP
DVB Scrambler Module

- Compliant with DVB Common Scrambling
- Support BISS1, BISS-E and Simulcrypt Modes
- 2× ASI inputs for scarambing indepandently
- 2× ASI scrambling output
- 2× ASI loop-through clear output
- 48× EMM and ECM processing
- Processing bit rate from 0.2Mbps to 70Mbps
- PSI/SI regeneration



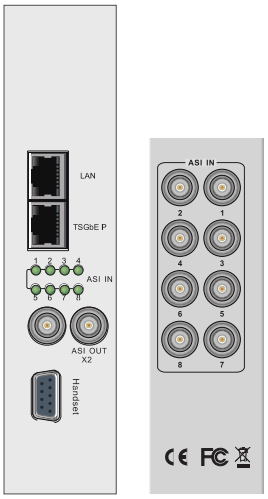
Specifcation

ASI Input	
Connector Type	2× BNC Female, 75Ω
Input Bit Rate	≤ 60Mb/s
Packet Mode	188/204 Bytes
TS Processing	
Scrambler Type	DVB Common Scrambling
Scrambler Mode	BISS-1, BISS-E and Simulcrypt
EMM/ECM Number	48 Max
EMM/ECM Port	RJ-45, UDP/TCP
ASI Output	
Connector Type	2× BNC Female, 75Ω , ISO13818-1
Output Bit Rate	1-54Mbps adjustable
Packet Mode	188/204 Bytes
Control & Monitoring	
Connector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web
Local Control	Handheld Programmer Unit
Software Upgrade	FTP Loader

Compact Modular Digital TV Headend
Re-Multiplexer

NKD-14MX
Re-multiplexer Module

- 8-way SPTS or MPTS ASI inputs
- Redundant ASI outputs
- Gigabit Ethernet for TS over IP Output
- PSI/SI table regeneration, NIT, EIT and SDT edition, LCN Edition and Re-generation
- Remote Control and Supervision by SNMP and Proprietary HDMS software
- On Site software update through IP



Specifcation

ASI Input	
Connector Type	8× BNC Female, 75Ω
Input Bit Rate	≤ 200Mb/s
Data transmission mode	BYTE or BURST mode auto-detection
Packet Length	188 /204 bytes, auto-detection
ASI Output	
Connector Type	2× BNC Female, 75Ω
Output bit rate	≤ 216Mb/s
Data transmission mode	Byte
Packet Length	188 or 204 Bytes
Signal Level	800mVpp± 10%
PSI/SI generating	PAT, PMT, SDT, CAT, NIT, EIT Actual P/F, EIT Schedule
Control & Monitoring	
Connector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, Proprietary HDMS network Management Software
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader
TS over IP	
Connector Type	1× RJ-45, 100/1000 Base-T for TS/IP
Effective Bit Rate	800Mb/s for 1000 Base-T
Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP

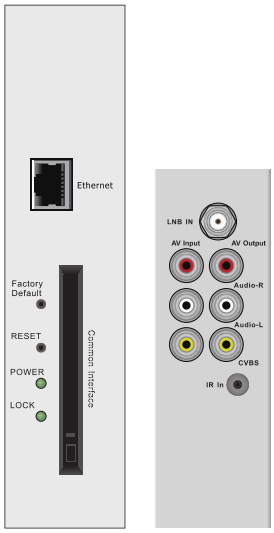
Compact Modular Digital TV Headend
IPTV Encoder

NKD-14IE / 141IE Series
SD DVB IRD and H.264 Encoder

- MPEG-2 MP@ML Video decoding
- Support H.264 video encoding
- Support UDP, RTSP and TCP/IP protocols
- Optional input types DVB-S, DVB-C, or analog AV(RCA)
- 10/100M Base-T IP Output
- Common Interface slot (PCMCIA) for CAS De-encryption
- Transparent DVB-TS sharing between modules (CAM cost saving)
- Easily downloadable Firmware via internet

NKD-14IE: Master Module, with tuner, 1x PCMCIA CI, H.264 encoder and DVB-TS sharer on one single module

NKD-141IE: Client Module, with DVB-TS I/O interface and H.264 encoder on one sibngle module



Specifcation

Tuner Input (NKD-14IE model only)	
DVB-S/S2 Tuner Input	
Connector Type	1× F type female 75Ω for Input
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol rate	5 ~ 45MBaud/s for QPSK; 10 ~ 31MBaud/s for 8PSK
Rolling off factor	QPSK: 0.35
Punctured rates	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10
LNB Polarization	0, 13V, 18V selectable
LNB Band switching Tone	0/22KHz selectable
DiSEqC	DiSEqC 1.0
DVB-C Tuner Input	
Connector Type	1× F type female 75Ω for Input
Input frequency	48~860MHz
Input level	45 ~ 75dBuV
Symbol rate	1 ~ 7MBaud ITU J.83 Annex A
Constellation	16/32/64/128/256QAM
Bandwidth	6MHz/7MHz/8MHz
Input return loss	7dB (typ.)
Audio/Video Input Interface	
Analog Audio	RCA female, Stereo L/ R
Analog CVBS	RCA female, 75Ω
Digital Video Decoding	
Video Standard	MPEG-2(MP@ ML)
SDI Video Resolution	PAL, NTSC. SECAM
Video Bit Rate	< 80Mb/s
Video Compression	
Video System	Analog NTSC, PAL
Compression Standard	H.264
Video Resolution	NTSC D1 (720× 480), CIF (352× 240), QCIF(176× 120) selectable
	PAL D1 (720× 576), CIF (352× 288), QCIF(176× 144) selectable
Aspect Ratio	4:3/16:9 selectable
Video output Bit rate	128k ~ 4Mb/s
Audio Compression	
Audio Channels	1 pair of stereo
Audio Output Bit rate	20~90 Kb/s(adjustable)
TS over IP Output	
Connector Type	1× RJ45, 10/100M for TS/IP
Useful bit rate	70Mb/s
Protocol	UDP / RTSP, TCP/IP, Multicast
Standard	IEEE 802.3
Analog Video Output	
CVBS Connector	1× RCA 75Ω
Video Standard	NTSC, PAL, and SECAM
Signal Level	1.0 Vp-p± 5%
Frequency Response	< ± 1dB at 5.5 MHz
Chroma-Luma Delay	<± 30 ns
Field Time Distortion	<2%
Line Time Distortion	<1%
Short Time distortion	<2%
Differential Gain	<4%
Differential Phase	<2°
Signal to Noise Ratio	>55 dB (luminance weighted)
Analog Audio Output	
Connector type	1× RCA 75Ω
Output Impedance	600Ω (balanced)
Output mode	Left, Right, Dual Mono, Stereo
Control & Monitoring	
Connector Type	1× RJ45, 10/100M, for equipment IP Control
Remote Control	Proprietary network Management Software

Order Information

Model / Interface	NKD XXIE	
	14IE	141IE
Tuner Input	√	×
CI Slot	√	×
CVBS input	√	√
CVBS output	√	√
IP Output	√	√