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HEADEND EQUIPMENT



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PRD-3100

Receiver Decoder



INTRODUCTION

The PRD-3100 is a cost effective professional integrated receiver decoder. It is widely used in the satellite, cable and terrestrial TV network with different tuner frontend DVB-S2/S, DVB-C and DVB-T. It demodulates the RF signal to the transport stream with optional ASI output or Analog output. With dual DVB common slots, PRD-3100 works with most of the well known CAS in the market and decrypts multiple services in a transport stream. The on board decoder can process a variety of digital video and audio formats in MPEG-4 AVC/H.264 and MPEG-2, in Standard Definition and in High Definition. The TV channel is decoded to digital and analog outputs, HDMI, YPbPr, CVBS, balanced and un-balanced audio. The powerful demodulation, decryption and decoding capabilities, combined with user friendly WEB GUI and SNMP based remote control makes this equipment one of the most competitive professional IRD in the market.

MAIN FEATURES

- Multiple tuner inputs DVB-S2/S, DVB-C, and DVB-T
- 2x DVB-CI Slots, Multi Programs, BISS-1 and BISS-E decryption
- Transport stream output from ASI (optional)
- SD/HD MPEG-2 and MPEG-4/H.264 digital video decoding
- Two digital audio channel decoding of MPEG1 Layer II and AAC
- Rich Analog and Digital Outputs including, CVBS, YPbPr, HDMI, XLR
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- Dynamic PMT auto detection and updating
- Support VBI TELETEXT, EBU/ DVB Subtitle, Closed Caption
- Configuration save and load after power off

SPECIFICATIONS OVERVIEW

DVB-S/S2 Tuner Input

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	5~45MBaud/s for QPSK 10~31MBaud/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, 8/10 DVB-S2 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
LNB Polarity Selection vtg.	0, 13V, 18V selectable
LNB Band Selection 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 outp.
Input Frequency	48~860MHz
Input Level	45~75dBμV
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16/32/64/128/256QAM
Bandwidth	6MHz/7MHz/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	104~862MHz (VHF/UHF)
Input Level	-20~-70dBm (Quasi Error Free, QEF)
Constellation	DVB-T: QPSK/16-QAM/64-QAM
Bandwidth	6MHz/7MHz/8MHz
FFT Mode	DVB-T: 2K/8K
Guard Interval	DVB-T: 1/4, 1/8, 1/16, 1/32
FEC Code Rate	DVB-T: 1/2, 2/3, 3/4, 5/6, 7/8
Input Return Loss	7dB (typ.)

TS Processing

Descrambler	DVB Common Scrambling Algorithm(CSA)
BISS Mode	BISS-1, BISS-E
Common Interface	Dual PCMCIA slots, compatible with major CA CAMs in the market

ASI Output

Connector type	2×BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9

HDMI Output

Standard HDMI	1×HDMI 1.3 interface (no 1080p)
Video Resolution	1080i×30, 1080i×29.97, 1080i×25, 720p×60, 720p×59.94, 720p×50, 480p×60, 576p×50, 576i×25, 480i×29.97
Audio Embedded	one digital audio pass through

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)
Video PID Bit Rate	< 80Mb/s

Digital Audio Processing

Number of Outputs	2×digital audio PIDs are decoded
Sampling Rate	32, 44.1 and 48KHz
Audio Bit Rate	32, 64, 96, 128, 160, 192, 224, 256, 288, 320, 352, 384, 416 and 448 kb/s for MPEG-1 Layer I 32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320 and 384 kb/s for MPEG- 1 Layer II

Analog Video Output

YPbPr Connector	1 set of RCA, 75Ω
CVBS Connector	1×BNC 75Ω, 1×RCA 75Ω
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	1.0 Vp-p±5%
Frequency Response	<± dB, at 5.5 MHz for PAL/SECAM, 4.2MHz for NTSC and 15MHz for HD YPbPr
Chroma-Luma Delay	<±30 ns
Field Time Distortion	<2%
Line Time Distortion	<1%
Short Time Distortion	<2%
Differential Gain	<3%
Differential Phase	<2°
Signal to Noise Ratio	>55 dB (luminance weighted)

Analog Audio Output

Connector type	1×XLR Male Socket, 2 pairs of RCA audio
Output Impedance	600Ω (balanced)
Output mode	Left, Right, Dual Mono, Stereo
Number of Outputs	2 pairs of stereo audio outputs (2 Audio PIDs are decoded)

Baseband Data Output

Subtitle	DVB/EBU
VBI	Teletext, WSS, VFD, VPS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708

Control & Monitoring

Connector Type	1×RJ-45, 10/100 Base-T for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS Network System Management Software
Local Control	LCD display and 6-key keypad
Serial Port	1×RS-232 9-pin D-sub, for debug use only
Equipment Upgrade	FTP loader or USB

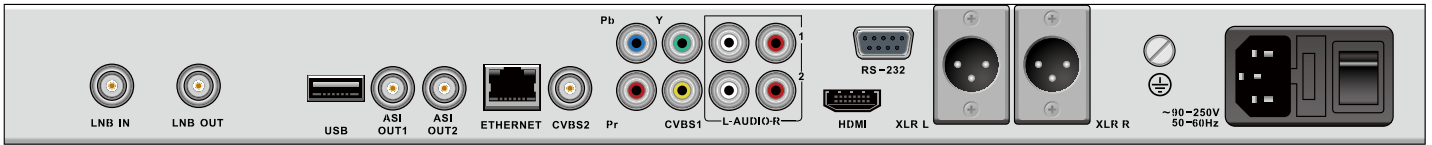
Physical

Dimension	44mm×483mm×255mm
Weight	2.4Kg Net, 4.4Kg Gross
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	24W
Operating temperature	0~45°C
Storage temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

Certification

EMC: EN 55024:1998+A1:2001+A2:2003, EN 55022:2006+A1:2007, EN 61000-3-2:2006, EN 61000-3-3:2008
FCC: Part 15 Class B
LVD: EN 60950-1:2006 + A11:2009

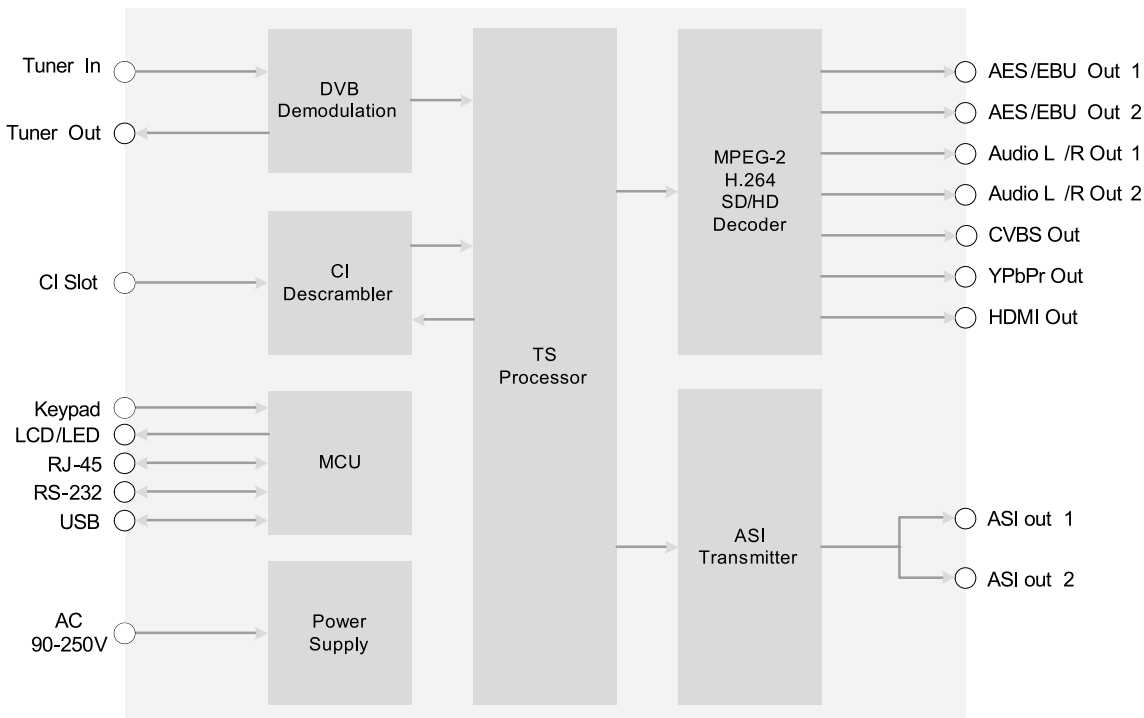
BACK PANEL INTERFACE



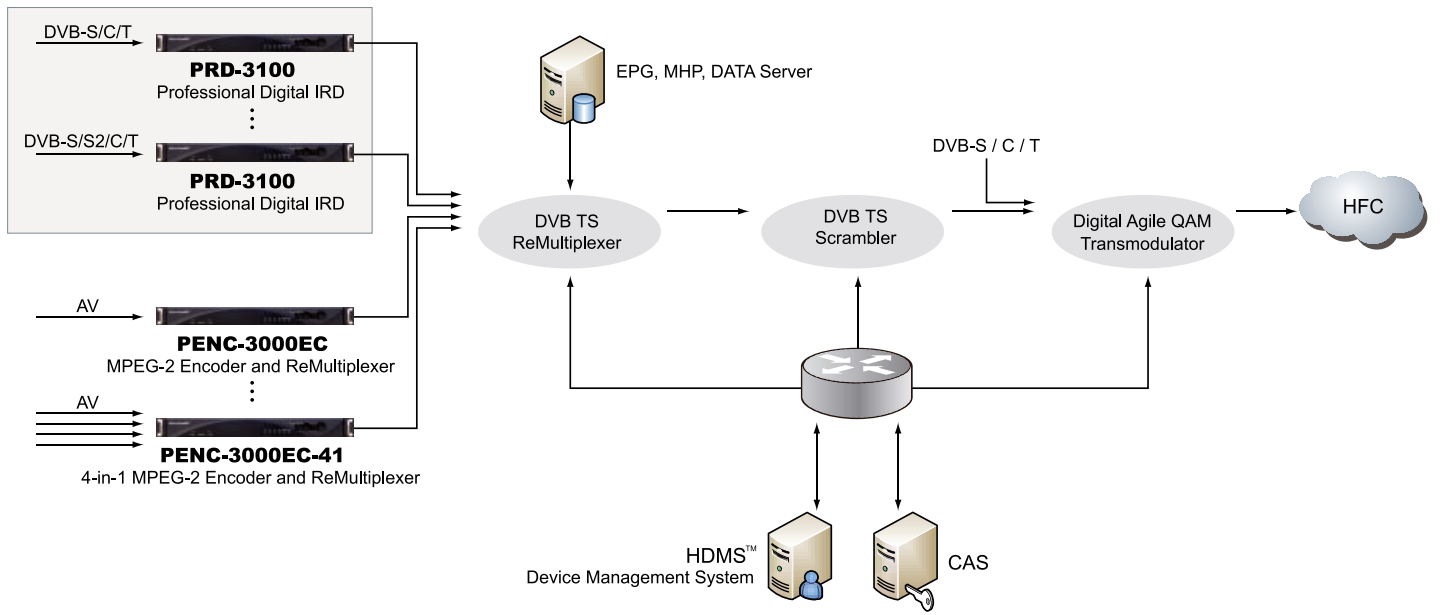
ORDERING INFORMATION

Model	PRD-3100-10X				PRD-3100-20X			
Tuner	DVB-C	DVB-T	DVB-S2	A	DVB-C	DVB-T	DVB-S2	A
ASI IN	×1				×1			
Common Interface	×2	×2	×2	×2	×2	×2	×2	×2
ASI-Output					×2	×2	×2	×2
HDMI	×1	×1	×1	×1	×1	×1	×1	×1
CVBS	×2	×2	×2	×2	×2	×2	×2	×2
YPbPr	×1	×1	×1	×1	×1	×1	×1	×1
Audio L/R	×2	×2	×2	×2	×2	×2	×2	×2
Balanced audio XLR	×1	×1	×1	×1	×1	×1	×1	×1
USB	×1	×1	×1	×1	×1	×1	×1	×1

BLOCK DIAGRAM



APPLICATION



PRD-201

Receiver decoder with transport stream processor



INTRODUCTION

PRD-201 is a professional integrated receiver decoder together with a built-in transport stream processor. Equipped with a wide range of inputs of DVB-T/T2,S/S2,C tuner, ASI and TS/IP, it can be used in the satellite, cable, terrestrial and IP networks. It provides a powerful transport stream processing engine for re-multiplexing, descrambling, TS over IP encapsulation. It has 2 DVB common interface slots capable of working with most of well known CAS in the market to de-encrypt multiple pay TV services. Its re-multiplexing capability enables creation of customized SPTS and MPTS output to IP and ASI ports. The PRD-201 is also a professional a broadcast quality decoder for MPEG-2 Standard Definition format, and provides a wide range of industry standard digital analog video and audio outputs, CVBS, Component, AES/EBU, and SDI. This unique multi function architecture makes the PRD-201 an ideal product for digital TV broadcast network.

MAIN FEATURES

- Multiple inputs DVB-S2/S/C/T,TS/IP, ASI, DS3(optional)
- SD MPEG-2 (MP@ML) digital Video decoding
- Digital audio embedded in SDI output
- Multiple Analog and Digital Outputs, ASI, CVBS, YPbPr, SD-SDI, AES/EBU , TS/IP
- Flexible re-multiplexing between ASI, Tuner and TS/IP Inputs
- RSSI, received Eb/No & BER monitoring
- 2× DVB-CI Slots, multiple TV programs decryption
- Dynamic PMT detection and automatic updating
- Support VBI TELETEXT, EBU/ DVB Subtitle
- UDP/RTP & Unicast/Multicast SPTS and MPTS over IP I/O
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software

SPECIFICATION

DVB-S/S2 Tuner Input

Connector type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
Input frequency range	950~2150MHz
Input level	-25~-65dBm
Symbol rate	5~45MBaud/s for QPSK 10~31MBaud/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, 8/10 DVB-S2 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
LNB Polarization voltage	0, 13V, 18V selectable
LNB Band selection 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 outp.
Input frequency range	48~860MHz
Input level	45~ 75dBμV
Symbol rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16/32/64/128/256QAM
Bandwidth	6MHz/7MHz/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	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	6MHz/7MHz/8MHz
FFT mode	DVB-T: 2K/8K
Guard interval	DVB-T: 1/4, 1/8, 1/16, 1/32
FEC code rate	DVB-T: 1/2, 2/3, 3/4, 5/6, 7/8
Input return loss	7dB (typ.)

ASI Input

Connector type	1×BNC, 75Ω
Standard	DVB-ASI, EN50083-9
Input bit rate	≤ 100Mb/s

DS3 Input (Option)

Connector type	2×BNC Female, 75Ω, including loop through
Standard	Compliant with ITU-T G.703
Frame structure	Compliant with ITU-T G.752 and ITU-T G.804
Bit rate	44.736Mb/s

TS over IP

Connector Type	1×RJ-45, 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&demux among Tuner / DS3 (optional), ASI and TS/IP Inputs
Service and PID mgmt. PSI/SI	Remux, filtering and remapping 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	Dual 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 TS Re-multiplexing from tuner, TS/IP and ASI input (1 for mirror)

Digital Video Processing

Video Standard	MPEG-2(MP@ ML)
SDI Video Resolution	PAL, NTSC, SECAM
Video Bit Rate	< 80Mb/s

SD-SDI Output

Connector type	1×SDI output, BNC Female, 75Ω
Serial interface	SMPTE 259M, 270 Mb/s (10bit)
Single level	800mV p-p

Analog Video Output

YPbPr Connector	1 set of RCA, 75Ω
CVBS Connector	1×BNC 75Ω, 1×RCA 75Ω
Video Standard	NTSC, PAL, and SECAM
Signal Level	1.0 Vp-p±5%
Frequency Response	<±1 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	XLR Male Socket
Output Impedance	600Ω (balanced)
Output mode	Left, Right, Dual Mono, Stereo
Number of Outputs	1 pair of stereo audio output

Ancillary Data Processing

Subtitle	DVB/EBU
VBI	Teletext, WSS, VFD, VPS

Control & Monitoring

Connector type	1×RJ-45, 10/100M, for equipment IP Control
Remote control	SNMP, HTTP Web, Proprietary HDMS Network System Management Software LCD display and 6-key keypad
Local control	1×RS-232 9-pin D-sub, for debug use only
Serial port	FTP loader
Equipment upgrade	

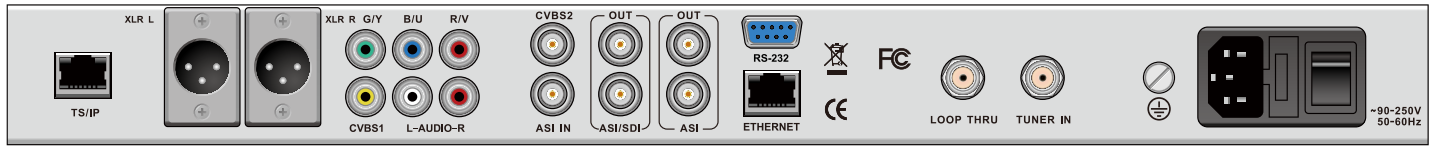
Physical

Dimension	44mm × 483mm × 255mm
Weight	3.4Kg Net, 5.4Kg Gross
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	24W
Operating temperature	0~45°C
Storage temperature	-10~50°C
Operating Humidity	10~90%, non-condensed

Certification

EMC: EN 55024:1998+A1:2001+A2:2003, EN 55022:2006+A1:2007, EN 61000-3-2:2006, EN 61000-3-3:2008
FCC: Part 15 Class B
LVD: EN 60950-1:2006 + A11:2009

BACK PANEL INTERFACE

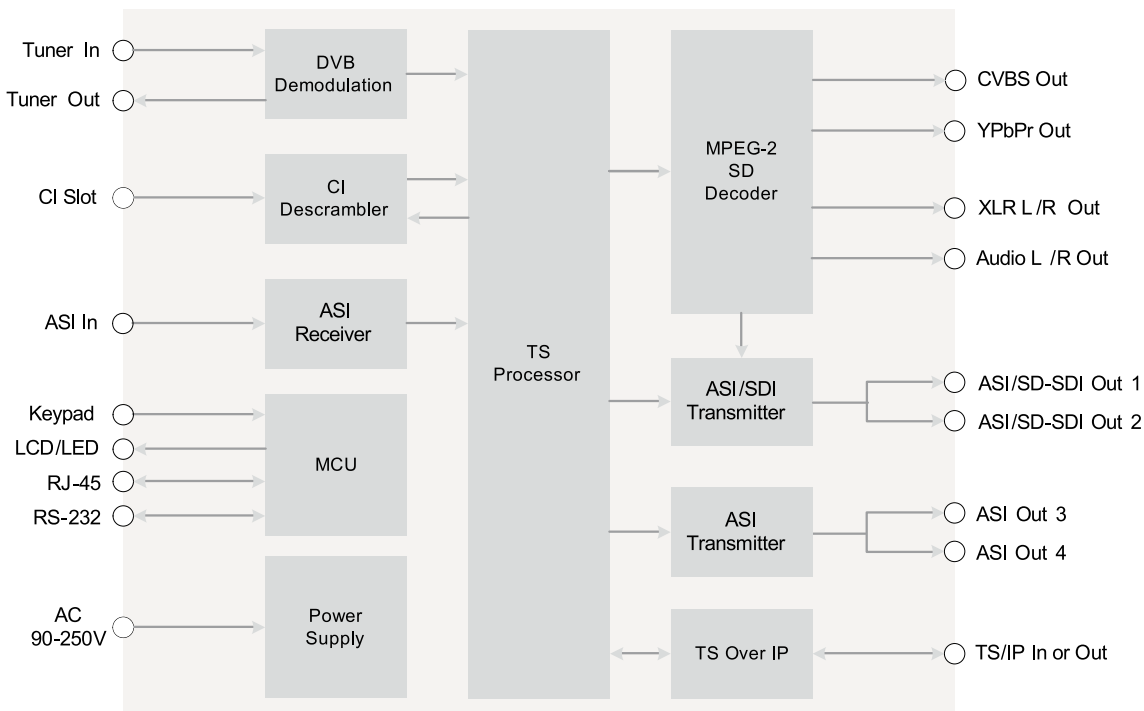


ORDERING INFORMATION

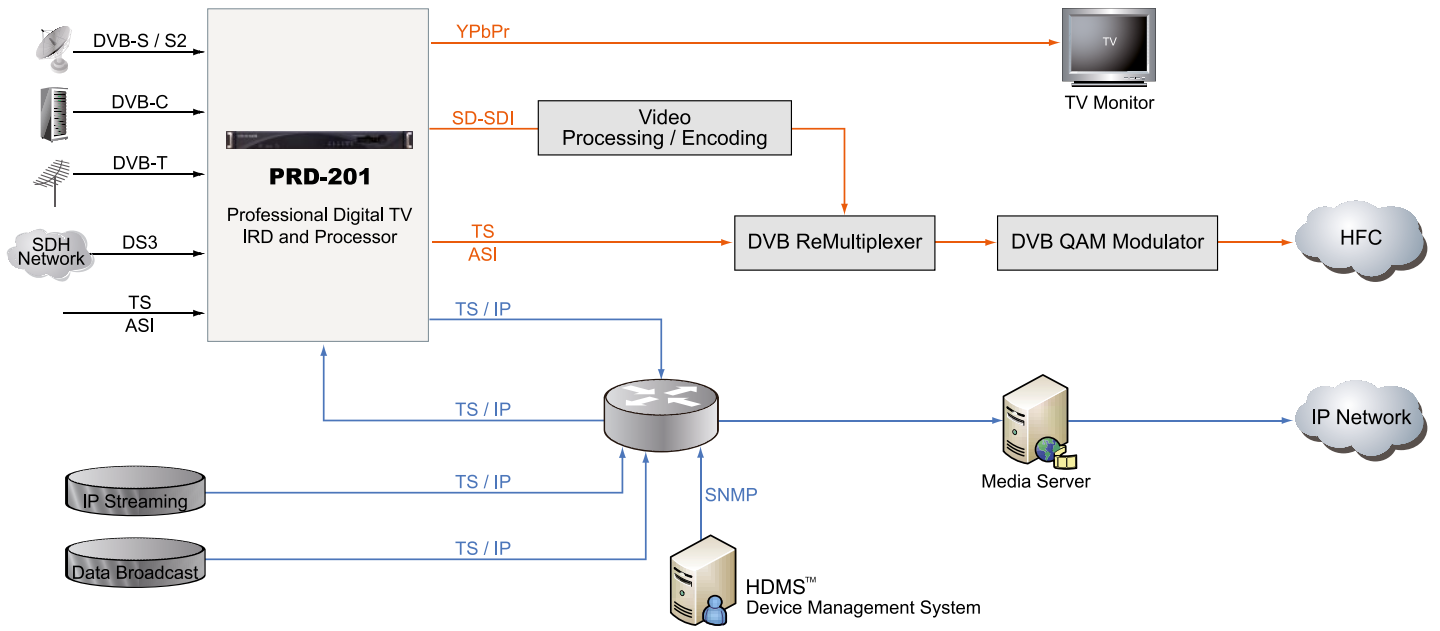
Model	PRD-201-30X	PRD-201-43X	PRD-201-44X
Tuner Input	X = Tuner option:	.T: DVB-T .C: DVB-C .S: DVB-S	.S2: DVB-S2 .D : DS3
ASI Input	×1	×1	×1
DVB Common Interface	×2	×2	×2
Built-in Remultiplexer	•	•	•
ASI Output (mirrored)	×2	×2	×2
SDI Output (mirrored)	×2	×2	×2
Audio L/R (RCA)	•	•	•
YUV/RGB (RCA)	•	•	•
CVBS (BNC)	×1	×1	×1
CVBS (RCA)	×1	×1	×1
×10/×100M TS/IP Extension board (Dual RJ-45,6 Channel)		•	
×10/×100M TS/IP Extension board (Single RJ-45, 32 Channel)			•

• Standard

BLOCK DIAGRAM



APPLICATION



PRD-204

IRD and Processor



INTRODUCTION

The PRD-204 IRD and Processor provides operators an ideal solution for receiving, remultiplexing, descrambling and decoding operations. Equipped with a variety of inputs that ensures compatibility with all transmission media. The PRD-204's remultiplexing capabilities enable creation of new transport streams that are subsets of the original stream. Customized services may be output as multiple SPTS or MPTS over IP, as well as over ASI. By the dual DVB common interfaces, PRD-204 could decrypt multiple services in one transport stream or two. PRD-204 is also a professional IRD that features a broadcast quality decoder for MPEG-2 and MPEG-4 AVC/H.264 in both Standard Definition and High Definition formats, and provides a variety of industry standard digital and analog outputs, including CVBS video, AES/EBU Audio, analog Audio, SD-SDI and HD-SDI. The unit also performs HD down-conversion and aspect ratio adaptation of HD programs to generate professional quality baseband analog video and audio outputs for easy integration with existing cable network infrastructure. This all-in-one architecture makes the PRD-204 an ideal product for distribution and contribution networks.

MAIN FEATURES

- Variety of input options DVB-T2/S2/S/C/T/DTMB/ATSC/ISDB-T, DS3/E3, TS/IP and ASI
- Supports DVB-S2 Input Stream Identifier (ISI, optional) and DVB-T SFN MIP pass through
- Redundant backup among Tuner, ASI and TS/IP with configurable priority
- SD/HD MPEG-2 and MPEG-4 AVC/H.264 digital video decoding
- Two Audio PIDs decode or pass through (compressed) in SDI output
- Multiple Analog and Digital Outputs, ASI, CVBS, YPbPr, HDMI, SD/HD-SDI, AES/EBU Audio, TS/IP
- Built-in TS re-multiplexer receives ASI, Tuner and TS/IP Inputs
- 2xDVB-CI Slots, multi-program decryption, BISS-1 and BISS-E decryption
- Dynamic PMT detection and automatic updating
- Supports VBI TELETEXT, EBU/DVB Subtitle, Closed Caption
- UDP/RTP, Unicast/Multicast, and SPTS/MPTS over IP (full duplex, optional)
- Remote Control and Supervision by SNMP, HTTP WEB and Proprietary HDMS software
- PCM audio embedded in SDI and HDMI outputs
- PCM audio output on two AES/EBU audio output ports
- On Site software update through IP
- RSSI, received Eb/No & BER monitoring

SPECIFICATION

DVB-S/S2 Tuner Input (ISI Factory Optional)

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
Input frequency range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	2~45MBaud
Roll-off Factor	DVB-S QPSK: 0.35 DVB-S2 8PSK: 0.35, 0.25, 0.2
FEC Code Rate	DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 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 Selection Tone	0/22KHz selectable
Satellite Selection Command	DiSEqC 1.0
ISI ID	1~255 user configurable

DVB-C Tuner Input

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
Input Frequency Range	51~862MHz
Input Level	51~75dBμV
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Bandwidth	6MHz, 7MHz, 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 outp.
Input Frequency	104 ~ 862MHz (VHF/UHF)
Input Level	-20 ~ -70dBm
Constellation	DVB-T: QPSK, 16QAM, 64QAM DVB-T2: QPSK, 16QAM, 64QAM, 256QAM
Bandwidth	6MHz, 7MHz, 8MHz
FFT Mode	DVB-T: 2K, 8K DVB-T2: 1K, 2K, 4K, 8K, 16K, 32K
Guarding 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.)

DTMB Tuner Input

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
Input Frequency Range	46.5~866MHz
Input Level	-87~-29dBm
Symbol Rate	7.56MBaud
Bandwidth	6MHz/7MHz/8MHz
Constellation	4QAM-NR, 4QAM, 16QAM, 32QAM, 64QAM
Guard Interval	PN420, PN595, PN945
Roll-off Factor	0.05
Interleaving Depth	240, 720
FEC Code Rate	0.4, 0.6, 0.8

ATSC Tuner Input

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
Input Frequency Range	54~864MHz
Input Level	-75~-7dBm(ATSC 8VSB)
Symbol Rate	10.762MBaud
Constellation	8VSB
Roll-off Factor	0.115
Bandwidth	6MHz

ASI Input

Connector Type	1×BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s

DS3 Input (Option)

Connector Type	2×BNC female, 75Ω, including loop through
Standard	Compliant with ITU-T G.703
Frame Structure	Compliant with ITU-T G.752 and ITU-T G.804
Bit Rate	44.736Mb/s

TS over IP

Connector Type	1×RJ-45, 10/100 Base-T or 100/1000 Base-T for TS/IP
Effective Bit Rate	70Mb/s for 10/100/1000 Base-T
Protocol	UDP / RTP, Multicast / Unicast, IGMPv3, ARP

TS Processing

TS Input Management	Demux and Remux among Tuner / DS3(optional) / E3 (optional), ASI and
TS/IP Inputs	Demux and Remux for 2 independent ASI outputs
TS Output Management	Remux, filtering and remapping PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation DVB Common Scrambling Algorithm (CSA) BISS-1, BISS-E Double PCMCIA slots, compatible with major CA CAMs in the market
Service and PID Mgmt. PSI/SI	
Descrambler	
BISS Mode	
Common Interface	

ASI Output

Connector Type	2 pairs of BNC female, 75Ω
Standard	DVB-ASI, EN50083-9
Output Bit Rate	≤ 99Mb/s
TS Processing	2 Independent TS Re-multiplexed from tuner, TS/IP and 2 ASI inputs

HDMI Output

Standard	1×HDMI 1.3 interface (up to 1080i)
Video Resolution and Frame Rate	1080i×30, 1080i×29.97, 1080×25, 720p×60, 720p×59.94, 720p×50, 480p×60, 576p×50, 576i×25, 480i×29.97
Audio Embedded	1×stereo

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 PID Bit Rate	< 80Mb/s

HD/SD-SDI Output

Connector Type	1 pair of BNCs (mirrored), female, 75Ω
SD Standard	SMPTE 259M, 270 Mb/s (10bit)
HD Standard	SMPTE 292M, 1.485 Gbit/s (10bit)
Level	800mV p-p

Digital Audio Processing

Connector Type	2×D-sub 9 male with XLR adaptor cables
Number of Output	2×audios are decoded or passed through
Audio Sampling Rate	32, 44.1 and 48 KHz
Audio Bit Rate	32, 64, 96, 128, 160, 192, 224, 256, 288, 320, 352, 384, 416 and 448 Kb/s for MPEG-1 Layer I, 32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320 and 384 Kb/s for MPEG-1 Layer II
Nominal Output Level	1V p-p (with standard test stream)
Output Format	AES/EBU
Load Impedance	110Ω (with XLR adaptor cables)

Analog Video Output

CVBS Connector	2×BNC female 75Ω
CVBS Standard	NTSC, PAL, and SECAM
CVBS Resolution	576i×25, 480i×29.97
Nominal Output Level	1.0 Vp-p±5% (with standard test stream)
Frequency Response	<±1 dB, at 5.5 MHz for PAL/SECAM, 4.2MHz for NTSC
Chroma-Luma Delay	<±30 ns
Field Time Distortion	<2%
Line Time Distortion	<1%
Short Time Distortion	<2%
Differential Gain	<3%
Differential Phase	<2°
Signal to Noise Ratio	>55dB (luminance weighted)

Analog Audio Output

Connector Type	2×D-sub 9 male, with XLR adaptor cable
Output Impedance	600Ω (balanced)
Output Mode	Left, Right, Dual Mono, Stereo
Number of Output	2 pairs of stereo audio outputs (2 Audio PIDs or 4 channels are decoded)
Cross Talk Among Channels	>70dB
THD	<0.3% @ 400Hz, 1KHz test tone
Frequency Response	±0.5dB over 20Hz ~ 18KHz
Output Level	0dBm in 600Ω (0dBu), adjustable range ±10dB

Ancillary Data Processing

Subtitle	DVB, EBU
VBI	Teletext, WSS
Closed Caption	EIA 608, EIA 708, EIA 608-to-708

Redundancy

Redundancy Port	among Tuner, ASI input and TS/IP input
Switching Condition	TS Sync Loss
Switching Mode	Main, Spare

Control & Monitoring

Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP, HTTP (Web Interface) , Proprietary HDMS (Headend Device Management System)
Local Control	LCD display and 6-key keypad
Serial Port	1×RS-232 D-sub female, for debug use only
Equipment Upgrade	Embedded FTP loader and Telnet

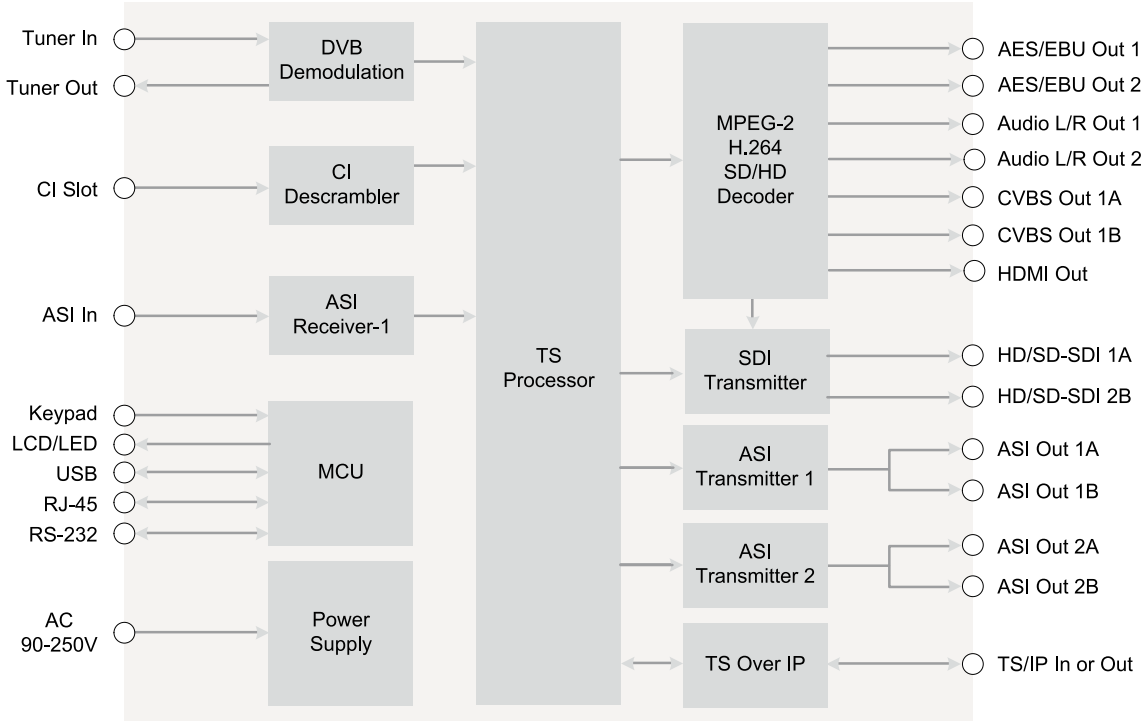
Physical

Dimension	44mm × 483mm × 255mm
Weight	3.4Kg Net, 5.4Kg Gross
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	24W (exclusive of LNB power)
Operating temperature	0~45°C
Storage temperature -	10~60°C
Operating Humidity	10~90%, non-condensed

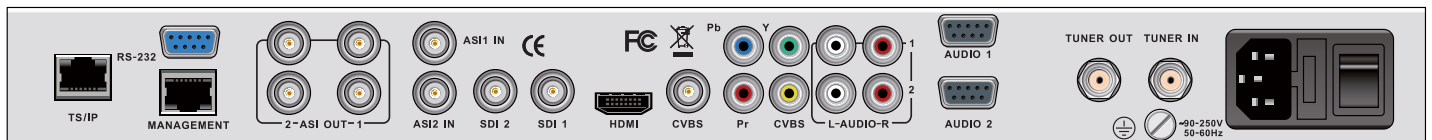
Certification

EMC: EN 55024:1998+A1:2001+A2:2003, EN 55022:2006+A1:2007, EN 61000-3-2:2006, EN 61000-3-3:2008
 FCC: Part 15 Class B
 LVD: EN 60950-1:2006 + A11:2009

BLOCK DIAGRAM



BACK PANEL INTERFACE

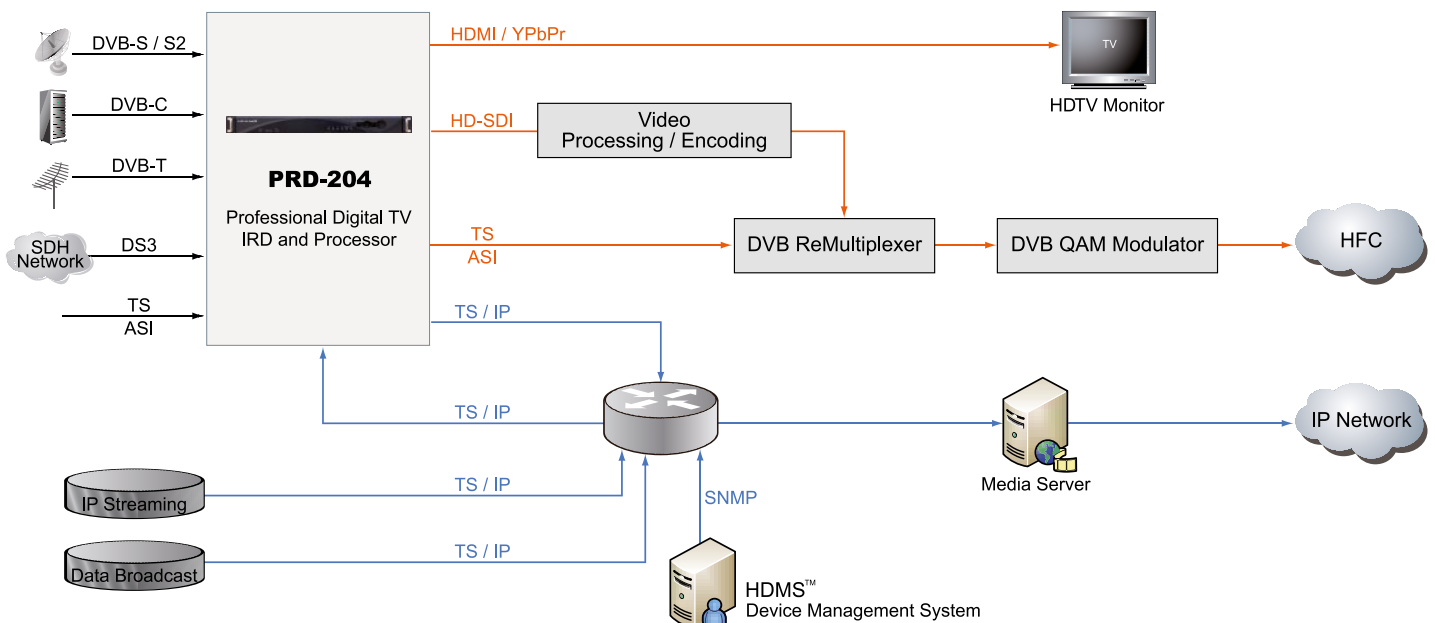


ORDERING INFORMATION

Model			PRD-204-10 Series				PRD-204-20 Series				PRD-204-30 Series			
			10X	12X	14X	16X	20X	22X	24X	26X	30X	32X	34X	36X
Interface	CVBS	2×BNC, Mirrored	•	•	•	•	•	•	•	•	•	•	•	•
	AUDIO	2×R/L	•	•	•	•	•	•	•	•	•	•	•	•
	HD-VIDEO	1×HDMI	•	•	•	•	•	•	•	•	•	•	•	•
Digital Video/Audio	SDI	2×BNC									•	•	•	•
	AES/Balanced	2×D9, with extended cable adaptor									•	•	•	•
TS Input	ASI IN	1×BNC									•	•	•	•
TS Output	ASI OUT	4×BNC (2×2 redundant)					•	•	•	•	•	•	•	•
IP	100M Base-T / 6×Multicast	2×RJ45, Mirrored		•				•				•		
	100M Base-T / 32×Multicast	1×RJ45			•				•				•	
	GbE	1×RJ45				•			•					•
Control/Upgrade	Management	1×RJ45	•	•	•	•	•	•	•	•	•	•	•	•
	Upgrade	2×USB	•	•	•	•	•	•	•	•	•	•	•	•
	RS-232	1×D9	•	•	•	•	•	•	•	•	•	•	•	•
	ALARM/RELAY	1×D9	•	•	•	•	•	•	•	•	•	•	•	•
X = Tuner Frontend option	C	DVB-C	Factory default option: X=S2											
	T	DVB-T												
	S2	DVB-S2												
	T2	DVB-T2												
	D	DS3												
	M	STM-1												
	A	Extended ASI port												
	N	No tuner frontend												

• Standard

APPLICATION



PRD-3006AV

6-Channel Multi-format HD Digital TV Receiver



INTRODUCTION

PRD-3006AV is a highly integrated 6-Channel Multi-format HD Digital TV Receiver that provides various options for up to 6 DVB-S2/S and DVB-T signals reception. Each on board decoder can work independently and process a variety of digital video and audio formats in MPEG-4 AVC/H.264 and MPEG-2, in Standard Definition or in High Definition. The TV channel is decoded into both digital and analog, and output via HDMI and CVBS respectively. Stable easy-to-use user interface via On Screen Display (OSD) and first-class picture quality make PRD-3006AV a very cost effective solution for digital TV signal reception system.

MAIN FEATURES

- Factory options for DVB-S/S2 and DVB-T tuner frontend
- Fully comply with MPEG-4 AVC/H.264, MPEG2 standard
- VBI Teletext (DVB ETS 300 706) and EBU/DVB Subtitle supported
- Up to 6 common interface for descrambling (available on PRD-3006AV-CI)
- CVBS and HDMI output
- BISS 1 and BISS E decryption supported
- NTSC/PAL/AUTO TV standard conversion
- Easy-to-use On Screen Display (OSD) menu
- Automatic parameters storage and recovery
- Software upgrade via USB

ORDERING INFORMATION

Interface	PRD-3006AV-S2	PRD-3006AV-T	PRD-3006AV-CIS2	PRD-3006AV-CIT
Tuner input	6×DVB-S2	6×DVB-T	6×DVB-S2	6×DVB-T
Loop thru	×6	×6	×6	×6
Common Interface			×6	×6
HDMI output	×6	×6	×6	×6
USB port for upgrade	×6	×6	×6	×6
A/V output	×6	×6	×6	×6

SPECIFICATION

DVB-S/S2 Tuner (PRD-3006AV-S2)

Connector Type	6 × F type female 75Ω for Input 6 × F type female 75Ω for loop through
Input Frequency Range	950~2150MHz
Input Level	-65~-25dBm
Symbol Rate	DVB-S QPSK: 1~45MBauds/s DVB-S2 QPSK: 1~45MBauds/s DVB-S2 8PSK: 1~45MBauds/s
Roll-off Factor	DVB-S: 0.35 DVB-S2: 0.35, 0.25, 0.2
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
Satellite Selection Command	DiSEqC 1.0

DVB-T Tuner (PRD-3006AV-T)

Connector Type	6×F type female 75Ω for Input 6×F type female 75Ω for loop through
Input Frequency Range	174~230MHz, 470 ~ 860MHz
Input Level	-65~-25dBm
Bandwidth	6MHz/7MHz/8MHz
Symbol Rate	DVB-T: 3.6~6.952Mbaud
FFT Mode	DVB-T: 2K/8K
Guard Interval	DVB-T: 1/4, 1/8, 1/16, 1/32
FEC Code Rate	DVB-T: 1/2, 2/3, 3/4, 5/6, 7/8

Digital Video/Audio Decoding

Video Standard	MPEG-2 MP@HL H.264/AVC MP@L4.1, HP@L4.1, MP@HL, AP@L3
Video PID Bit Rate	Max. 60Mbit/s
Aspect Ratio	4:3, 16:9, Automatic
Video Resolution	480i, 576i, 1080i, 480p, 720p, 1080p
Video Format	NTSC/PAL/AUTO
Audio Standard	MPEG-1 layer I/II, MP3, MPEG-2 layer II, Dolby Digital, HE-AAC
Sampling Rate	32, 44.1, 48KHz

Common Interface

Type	6x PCMCIA (available on PRD-3006AV-CI)
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Composite Video Output

Connector Type	RCA x1
Output Impedance	75Ω
Output Level	1.0V±30mVp-p
Frequency Response	±0.5dB (4.8MHz)
Differential Gain	≤5%
Differential Phase	≤5°
Chroma-Luma Delay	≤30ns

HDMI Output

Connector Type	HDMI 1.1 x1
----------------	-------------

Audio Output

Output mode	RCA x2
Audio Standard	Mono, Stereo
Output Impedance	100Ω
Output Level	±6dB
Frequency Response	±0.5dB (20Hz~18Hz)
Signal to Noise Ratio (SNR)	≥70dB

USB Interface

Connector Type	USB Type A
Usage	Firmware upgrade

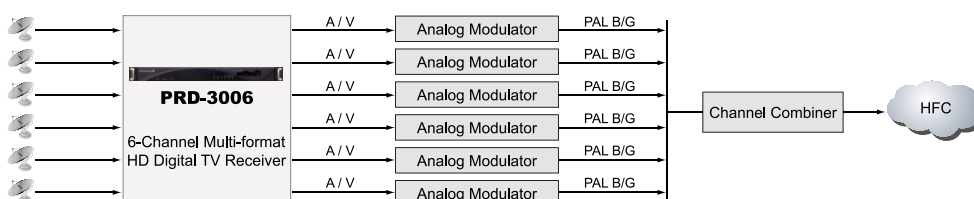
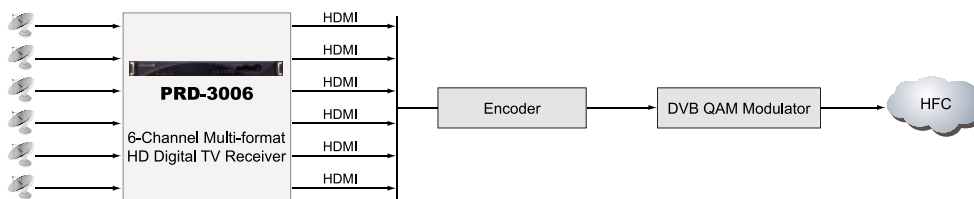
General

Dimensions	483mm × 237mm × 45mm
Net Weight	3.7Kg
Temperature	Work Temperature: 0~40°C Storage Temperature: -25~55 °C
Humidity	10%~90%
Power Supply	AC 90~256V 50Hz/60Hz, 25W

BACK PANEL INTERFACE

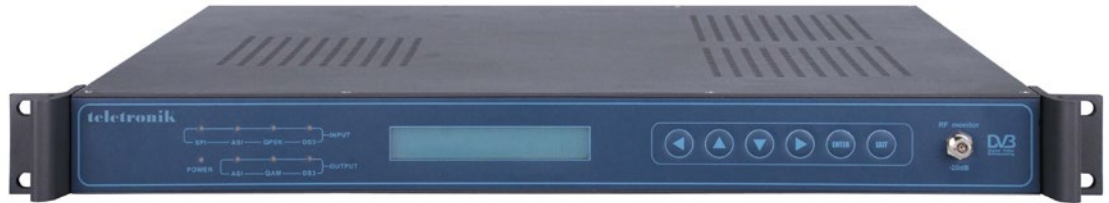


APPLICATION



PENC-3000EC

Real-time single program 4:2:0 MPEG-2 encoder



INTRODUCTION

PENC-3000EC is a real-time single program 4:2:0 MPEG-2 encoder. It provides both analog and digital audio/video inputs like CVBS, S-Video and SDI. By making compression of the base band TV signal, the encoder outputs a single program transport stream (SPTS) to the ASI output port. Furthermore, PENC-3000EC has an ASI input port which can re-multiplex the encoded SPTS with an external MPTS and generate a new MPTS. As an option, the MPTS of the encoder can also be outputted through RJ-45 port over IP. User can use SNMP for equipment remote control and supervision. The configuration of an encoder with built-in re-multiplexer makes PENC-3000EC an ideal product for the digital TV Headend Equipment where the high quality stable video/audio compression is needed.

MAIN FEATURES

- Compliant with 4:2:0 MPEG-2 MP@ML video compression standard
- Multiple video inputs S-Video, SDI, ASI and CVBS
- Multiple audio inputs Stereo, Balanced audio, and SDI embedded audio input
- Support PAL, NTSC, and SECAM analog TV standards
- User-configurable 4:3/16:9 aspect ratio
- Video compression bit rate from 1.5Mbps to 20Mbps
- Configurable GOP
- Built-in two-way Re-multiplexer
- Support PAT, PMT and SDT generation and NIT insertion
- SNMP based remote control system
- LCD display and user friendly operation menu
- Up to 6 MPTS or SPTS over multicast or unicast IP streaming output

ORDERING INFORMATION

Model	PENC-3000EC-10	PENC-3000EC-30	PENC-3000EC-40
S-Video Input	•	•	•
CVBS Input (BNC)	•	•	•
SDI Input (BNC)		•	•
Balanced Audio XLR Input	•	•	•
ASI Input		•	•
Built-in Remultiplexer	•	•	•
ASI Output (mirrored)	•	•	•
10/100M TS/IP Extension Board (Single RJ-45, 6 Channel)			•

- Standard

SPECIFICATION

Video Compression

Analog Input	Analog NTSC, PAL and SECAM
Digital Input	SD-SDI (SMPTE-259M)
Compression Standard	MPEG-2 MP@ML
Video Resolution	480i (720×480) @29.97Hz: SMPTE125M 576i (720×576) @25Hz: ITU-R BT.656-4
Aspect Ratio	4:3/16:9 selectable
Video Compression bit rate	1.5~20Mb/s

Audio Compression

Audio Channels	1 pair of stereo
Compression Standard	MPEG-1 Layer II
Audio Mode	Stereo, Joint Stereo, Dual Mono, Mono
Audio Sampling Rate	32, 44.1, 48 KHz
Audio Compression bit rate	32, 64, 128, 192, 256, 384 Kb/s

Audio/Video Input Interface

Analog Audio	Balanced Audio XLR L / R
Analog CVBS	1×BNC female, 75Ω
S-Video	1×S-Video female, 75Ω
SD-SDI	1×BNC female, 75Ω
SDI embedded audio	Group 1 to 4 selectable

ASI Input

Connector Type	1×BNC Female, 75Ω
Input bit rate	≤ 100Mb/s
Packet Mode	Byte or Burst
Packet Length	188/204 Bytes

TS Processing

TS Input Management	Remux and demux between ASI input and the SPTS encoded
Service and PID mgmt.	Remux, filtering and remapping PSI/SI PSI/SI table generation, NIT and SDT edition

TS over IP Output

Connector Type	1×RJ-45, 10/100 Base-T for TS/IP
Useful bit rate	70Mb/s min
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%
Source	Any one of Built-in Re-mux, ASI input and Encoder

Control & Monitoring

Connector Type	1×RJ-45, 10/100 Base-T, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS Software
Local Control	Front Panel
Software	Upgrade Built-in FTP server + Telnet

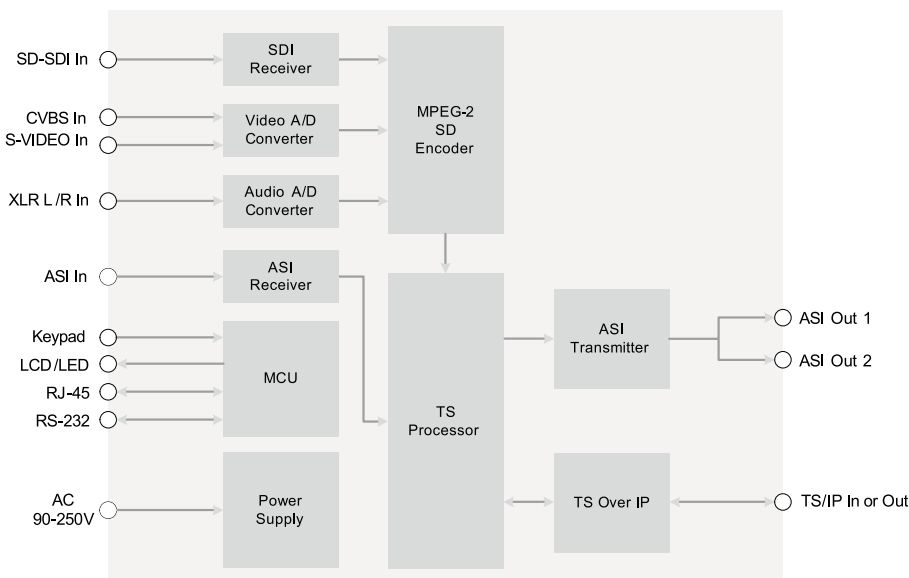
Physical

Dimension	44mm × 483mm × 240mm
Net weight	2.8Kg
Power Supply	AC 90V~250V, 50/60Hz
Power Consumption	Maximum 20W
Operating Temperature	0~45°C
Storage Temperature	-10~6°C
Operating Humidity	10~90%, non-condensed

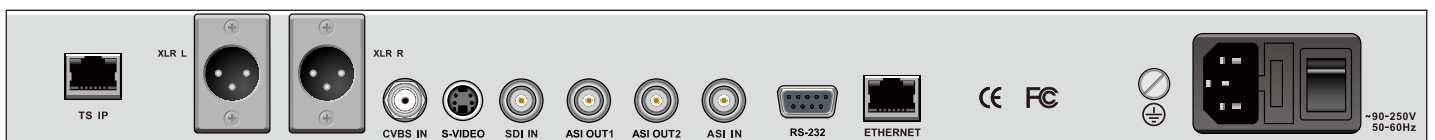
Certification

EMC: EN 55024:1998+A1:2001+A2:2003, EN 55022:2006+A1:2007, EN 61000-3-2:2006, EN 61000-3-3:2008
FCC: Part 15 Class B
LVD: EN 60950-1:2006 + A11:2009

BLOCK DIAGRAM



BACK PANEL INTERFACE



PENC-5100EC

High definition MPEG4/H.264 encoder/transcoder



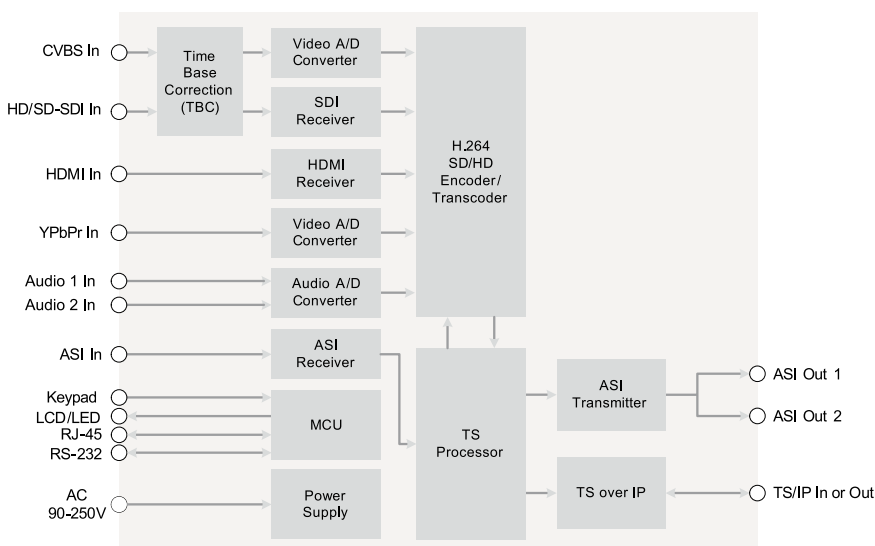
INTRODUCTION

The PENC-5100EC is a high quality single channel high definition MPEG4/H.264 encoder/transcoder. It has a wide range of digital/ analog video and audio inputs: CVBS, HD-SDI, HDMI, YPbPr and stereo audio. The compressed MPEG4/H.264 signal is output to the ASI and IP ports. It can also be used as MPEG-2 to H.264 transcoder from IP or ASI ports. The PENC-5100EC's re-multiplexing function enables creation of a new transport stream between the TS of encoder and the TS from ASI or IP port. The encoder/transcoder output can be multiple SPTS or MPTS over IP, as well as over ASI. In trans-coding mode, the digital audios are looped through and time stamping is automatically implemented to ensure the synchronization between video and audio. This unique encoder/transcoder with built-in re-multiplexer architecture makes the PENC-5100EC one of the best solutions to meet the MPEG2 to MPEG4/H.264 migration requirement in today's digital TV broadcast market.

MAIN FEATURES

- Video encoding bit rate from 2Mb/s to 20Mb/s
- Multiple inputs HDMI, HD-SDI, YPbPr, and CVBS for encoding
- ASI and TS/IP Input for Trans-coding
- Built-in re-multiplexer for TS from encoder and TS from ASI and IP
- Support 10/100M TS/IP SPTS and MPTS
- Built-in Time Base Correction
- 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

BLOCK DIAGRAM



SPECIFICATION

Video Compression

Video Resolution	1080i (1920/1440×1080) @25Hz, 29.97Hz, 30Hz: SMPTE 292M 720p (1280×720) @50Hz, 59.94Hz, 60Hz: SMPTE 292M 480i (720×480) @29.97Hz: SMPTE 259M 576i (720×576) @25Hz: SMPTE 259M
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
Compression Standard	MPEG-1 Layer II
Audio Mode	Stereo, Joint Stereo, Dual Mono, Mono
Audio Sampling Rate	48KHz
Audio Compression Bit Rate	32~384Kb/s

Audio/Video Input

Analog Audio	1×D-sub 9 Female male with XLR adaptor cables
Analog CVBS	1×BNC Female, 75Ω
SD-SDI	1×BNC Female, 75Ω
YPbPr	3×BNC Female, 75Ω
HDMI	1×HDMI 1.3

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 mirrored ASI outputs
Service and PID mgmt.	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

Connector Type	2×BNC Female, 75Ω
Output Bit Rate	≤ 99Mb/s
Packet Length	188 / 204 Bytes
Signal Level	800mVpp±10%
Source	Built-in Re-mux, ASI input, Encoder

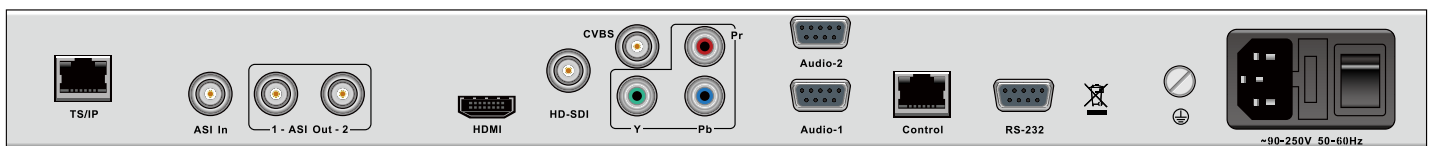
Control & Monitoring

Connector Type	1×RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS (Network Management Software)
Local Control	LCD display and 6-key keypad
Software Upgrade	Built-in FTP loader and Telnet

Physical

Dimension	44mm × 483mm × 340mm
Net weight	3.2Kg
Power supply	AC90 ~ 250V, 50Hz/60Hz
Power Consumption	Maximum 20W
Operating Temperature	0~45°C
Storage Temperature	-10~60°C
Humidity	10~90%, non-condensed

BACK PANEL INTERFACE



ORDERING INFORMATION

Functionality		PENC-5100EC-30	PENC-5100EC-32	PENC-5100EC-40	PENC-5100EC-42
Input	ASI	•	•	•	•
	CVBS	•	•	•	•
	SDI	•	•	•	•
	YPbPr	•	•	•	•
	HDMI	•	•	•	•
	Audio 1	•	•	•	•
	Audio 2	•	•	•	•
Output	ASI x2	•	•	•	•
	10/100M TS Over IP (6 Multicasts)	•	•	•	•
	Management	•	•	•	•
	RS-232	•	•	•	•

• Standard

PENC-5800/5801EC

8-Way H.264 HD/SD Encoder



INTRODUCTION

PENC-5800/5801EC is a series of high density real-time H.264 HD/SD Encoders that can support up to eight High Definition (HD) A/V signals compressing and encoding simultaneously. These A/V signals can be fed into the unit via 8x HDMI or 8x SDI input ports as different factory options. The encoded streams can be then remultiplexed and output over its GbE IP and ASI ports. All models support Time Base Correction (TBC) to ensure the audio and video synchronization, the features necessary for the professional TV signal flow. The series provide two TS/IP operation modes. The first is "Full Duplex", which allows one MPTS or SPTS inputted over 1 multicast/unicast to make up a new MPTS with local encoders, then sends out the new one over 1 multicast/unicast. In the second mode "Multiple output" which delivers up to 9 streams over IP. There are 8 un-stuffed SPTS (lower bit rate but less PCR accurate than normal SPTS, from local encoders) and 1 MPTS (from internal reMultiplexer) over the IP with different Unicast or Multicast IP addresses. PENC-5800/5801EC allows user to configure, monitoring and manage over the informative front panel and keypad, or Web interface, or SNMP based management software from 3rd party. This Encoder family presents brilliant picture quality, high density design, high stability system architecture, and the hot-swappable power supply.

MAIN FEATURES

- Compile with H.264/AVC HP@L4.0
- MPEG1 Layer II, MPEG2 AAC-LC, MPEG4 AAC-LC audio compression
- 8-way real time encoder with re-multiplexed integrated
- Built-in re-Mux accepts up to 10 SPTS/MPTS (8 from local encoders, 2 from external input over IP and ASI) 1 ASI input (for daisy chain) & Redundant
- ASI output
- Full duplex Gigabit TS over IP I/O (under Full duplex operation mode)
- Up to 9 multicast/unicast output (under Multiple output operation mode)
- VBR and CBR encoding mode
- Free resolution downscale at same frame rate
- SNMP & HTTP WEB
- Redundant Power Supplies
- 19" x 1 U EIA standard chassis

SPECIFICATION

Video input & compression

Number of input ports	HDMI x 8 or HD-SDI x 8
Compression Standard	H.264/AVC HP@L4.0
Video Sampling Format	4:2:0, 8-bit, YCbCr
Video Encoding Bit Rate	2~30Mbps for each channel
Video Resolution & Recommended Bit Rate	1080p (1920×1080) @ 59.94 Hz, 50Hz: SMPTE296M: 6~30Mb/s 1080 (1920×1080) @25Hz, 29.97Hz, 30Hz: SMPTE274M: 6~24Mb/s 1080i (1440×1080) @25Hz, 29.97Hz, 30Hz: SMPTE274M: 5~24Mb/s 720p (1280×720) @50Hz, 59.94Hz, 60Hz: SMPTE296M: 4~24Mb/s 480i (720×480) @29.97Hz: SMPTE656M: 2~10Mb/s 576i (720×576) @25Hz: SMPTE656M: 2~10Mb/s
Other Video Resolution	Free resolution downscale at same frame rate
Aspect Ratio	4:3/16:9 Selectable

Audio Input & compression

Input	HDMI or SDI Embedded audio
Audio Compression	MPEG1 Layer II, MPEG2 AAC-LC, MPEG4 AAC-LC (option)
Sampling Rate	48KHz
Compression Bit Rate	32~192Kbps(Mono), 64~384Kbps (Stereo), 128~512Kbps(AAC LC)

DVB-ASI Input

Interface	BNC Female, 75Ω
Maximum Input Bit rate	100 Mb/s
Data Transfer type	Byte
Packet Length	188 or 204 Bytes
Signal Level	200 ~ 880mVp-p

DVB-ASI Output

Interface	BNC Female, 75Ω
Max. Effective Data Rate	120 Mb/s
Data Transfer type	Byte
Packet Length	188 or 204 Bytes
Signal Level	800±80mV

Gigabit TS over P (Full Duplex Mode)

Standard	IEEE 802.3, 10/100/1000 Base-T, Full Duplex
Max. Effective Bit Rate	80Mb/s
Data Protocol	UDP or RTP, SPTS or MPTS
Control Protocol	ICMP, ARP, IGMPv2

Gigabit TS over IP Output (Multi-Channel IPTV Mode)

Standard	IEEE 802.3, 10/100/1000 Base-T,
Max. Effective Bit Rate	200Mb/s
Data Protocol	UDP or RTP, SPTS or MPTS
Control Protocol	ICMP, ARP, IGMPv2

Rear Panel

ASI In	1 x BNC Female, 75Ω
HD-SDI In	8 x BNC Female, 75Ω (PENC-5800/5801EC-S)
HDMI In	8 x HDMI Male, 75Ω (PENC-5800/5801EC-H)
ASI Out	2 x BNC Female, 75Ω (1 Backup)

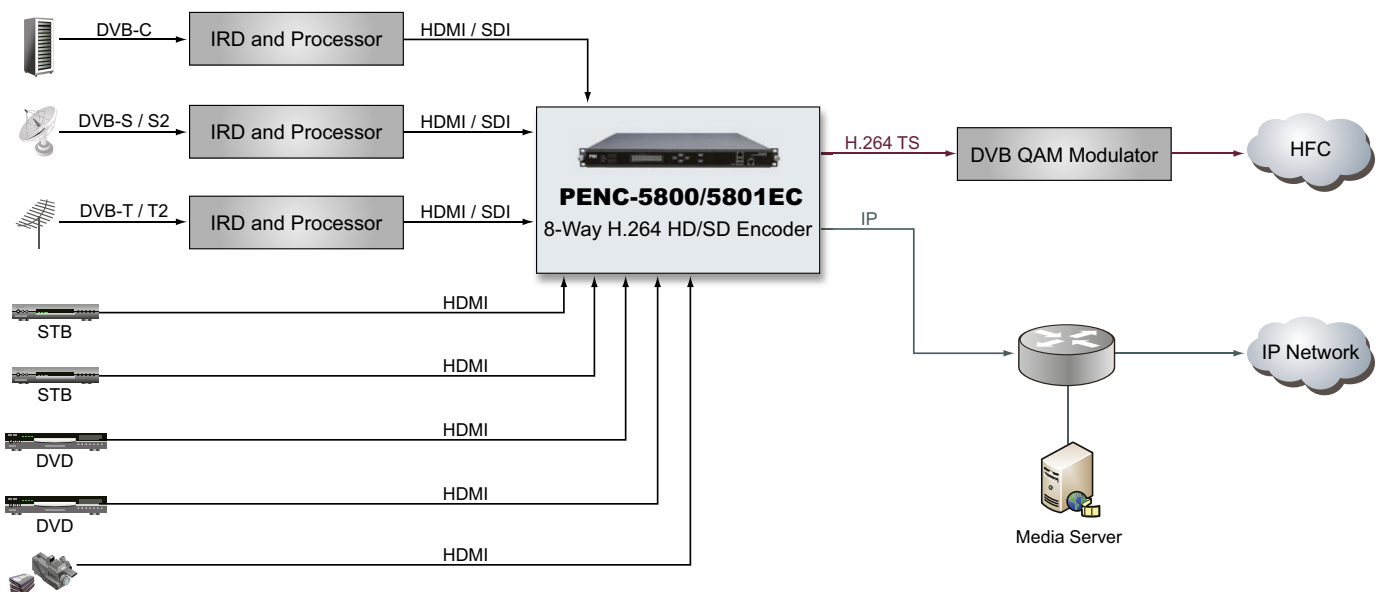
Front Panel

Control	1×RJ-45, 10/100 Base-T
TS/IP	1×IP (GbE), RJ-45, 10/100/1000 Base-T
Display	2 x 20 LCD Display

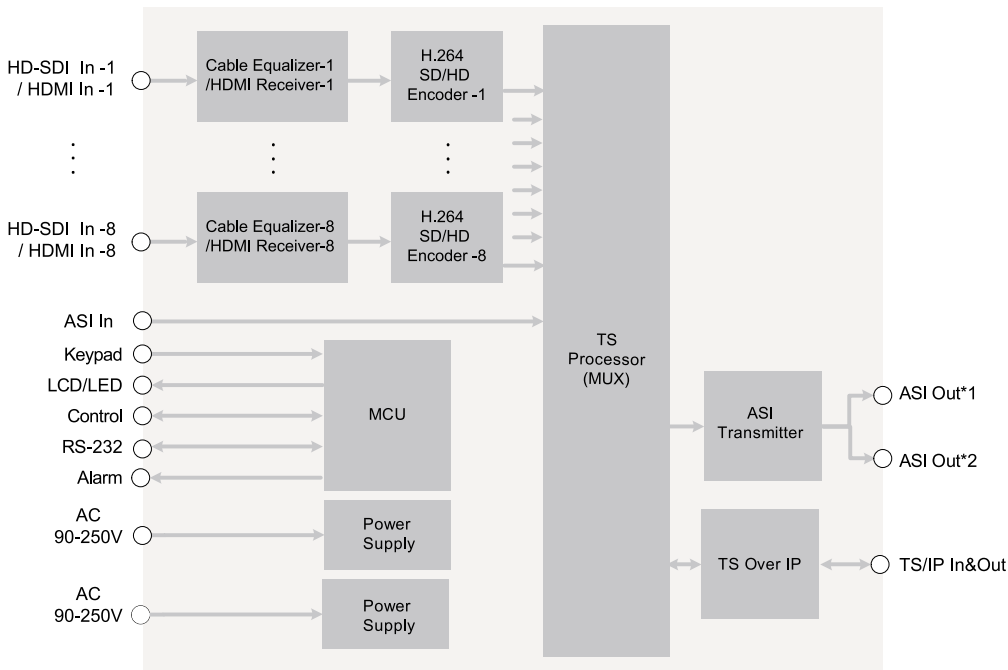
Others

Power Supply	AC90~260V 50/60Hz
Operating Temperature	0 ~ 45°C
Storage Temperature	-10 ~ 60°C
Operation Humidity	10 ~ 90%, (Non-condensed)

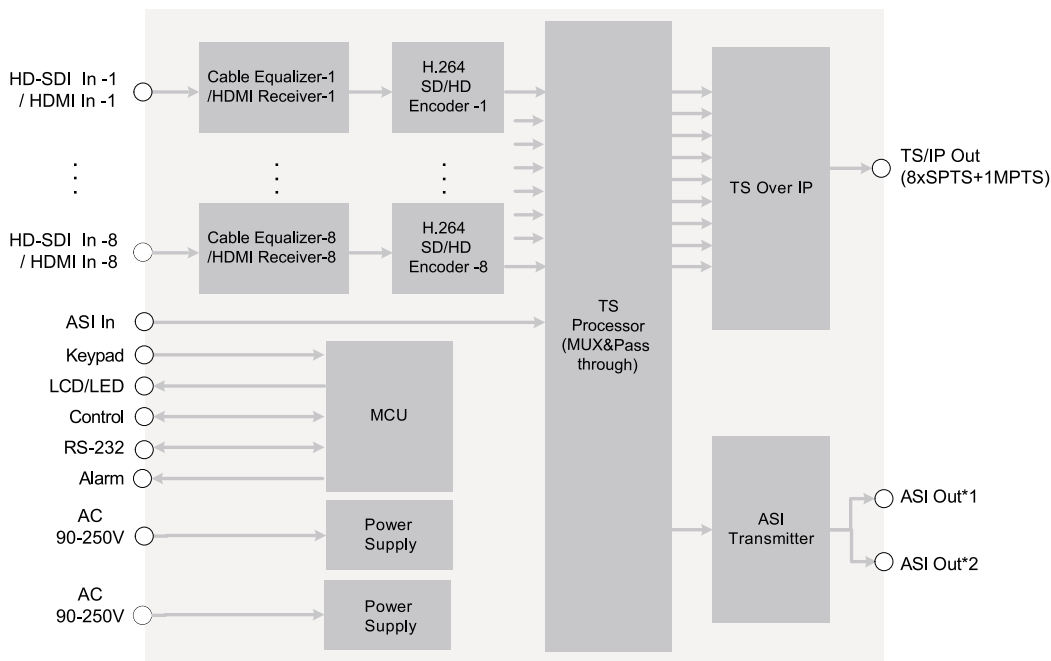
APPLICATION



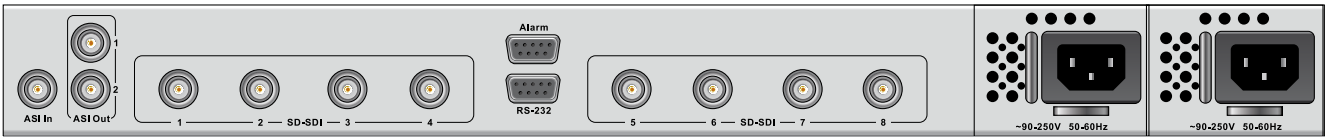
BLOCK DIAGRAM - FULL DUPLEX



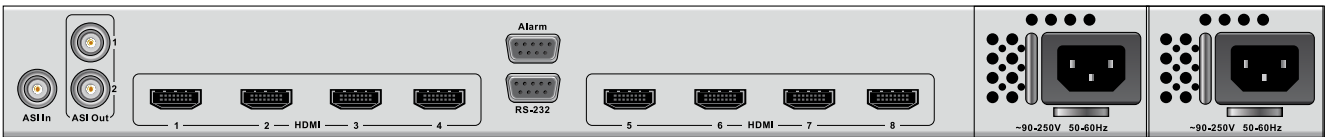
BLOCK DIAGRAM - MULTI CHANNEL



BACK PANEL INTERFACE / PENC-5800EC-S



BACK PANEL INTERFACE / PENC-5800EC-H



ORDERING INFORMATION

Functionality		PENC-5800EC-H	PENC-5801EC-H	PENC-5800EC-S	PENC-5801EC-S
Input	HDMI	x8	x8		
	HD-SDI (BNC)			x8	x8
	ASI (BNC)	•	•	•	•
	TS/IP (under full duplex mode)	•	•	•	•
Output	ASI x2 (1x backup)	•	•	•	•
	TS/IP (GbE)	•	•	•	•
AAC-LC Audio		•		•	
Alarm		•	•	•	•
Control		•	•	•	•
RS-232		•	•	•	•

• Standard

PTM-4100PM

Integrated professional IRD and digital TV modulator



INTRODUCTION

The PTM-4100PM is built with an integrated professional IRD and digital TV modulator. It can provide to broadcaster and operator with multiple functions of digital TV signal reception, re-multiplexing, descrambling, decoding and re-modulation. It supports a wide range of tuner input DVB-S/S2, DVB-T/T2, DVB-C and is used in digital satellite, cable and terrestrial TV networks. The re-multiplexing function enables creation of new SPTS or MPTS from tuner and ASI inputs. This new transport stream may be output to QAM or COFDM modulator, IP and ASI ports. By using the dual DVB common interfaces, PTM-4100PM can decrypt multiple pay TV services in each of the 2 slots. For security application, this equipment can be configured as a TS switch among tuner, ASI and TS/IP. The equipment can be controlled and supervised by SNMP, HTTP WEB and proprietary HDMS software.

MAIN FEATURES

- Multiple inputs DVB-S2/S/C/T, TS/IP, ASI and DS3/E3 (optional)
- DVB-C QAM or DVB-T COFDM RF modulation output
- Redundant TS inputs among Tuner, ASI and TS/IP
- 100M UDP/RTP, Unicast/Multicast, and SPTS/MPTS over IP (half duplex)
- ASI input and output
- Service Drop or PID filtering and Remapping
- Flexible re-multiplexing among ASI, Tuner and TS/IP inputs
- PSI/SI adapting and re-generation, including NIT, LCN insertion etc.
- 2×DVB-CI Slots, Multiple TV program decryption
- Remote Control and Supervision by SNMP,
- HTTP WEB and Proprietary HDMS software
- On Site software update through IP
- RSSI, received Eb/No & BER monitoring

SPECIFICATION

DVB-S/S2 Tuner Input

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
Input Frequency Range	950~2150MHz
Input Level	-25~-65dBm
Symbol Rate	2~45MBaud
Roll-off Factor	DVB-S QPSK: 0.35 DVB-S2 8PSK: 0.35, 0.25, 0.2
FEC Code Rate	DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 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 outp.
Input Frequency Range	48~862MHz
Input Level	45~75dBμV
Symbol Rate	1~7MBaud (ITU J.83 Annex A)
Constellation	16/32/64/128/256QAM
Bandwidth	6MHz/7MHz/8MHz
Input Return Loss	7dB (typ.)

DVB-T Tuner Input (DVB-T2 in option)

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
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
FFT 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 x BNC Female, 75Ω
Standard	DVB-ASI, EN50083-9
Input Bit Rate	≤ 100Mb/s
Package Length	188 or 204 Bytes

DS3 Input (Option)

Connector Type	2×BNC female, 75Ω, including loop through
Standard	Compliant with ITU-T G.703
Frame Structure	Compliant with ITU-T G.752 and ITU-T G.804
Bit Rate	44.736Mb/s

TS over IP

Connector Type	1×RJ-45, 10/100M or 100/1000M for TS/IP
Effective Bit Rate	70Mb/s for 10/100M/1000M
Protocol	UDP / RTP, Multicast / Unicast, IGMPv2, ARP

TS Processing

TS Input Management	Remux and demux among Tuner / DS3 (optional) / E3 (optional), ASI and TS/IP Inputs
TS Output Management	Remux and demux for mirrored ASI outputs
Service and PID mgmt.	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	mirrored 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
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	1×F type female, 75Ω (primary output) 1×F type female 75Ω (-20dB for monitoring)
Output Frequency Range	48~860MHz agile, step by 10 KHz
Output Level	95~120dBμV, step by 1dBμV
Spurious Rejection	55dB (typ.)
Output Return Loss	12dB (typ.)

Control & Monitoring

Connector Type	1×RJ-45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP (Web Interface), Proprietary HDMS (Headend Device Management System)
Local Control	LCD display and 6-key keypad
Serial Port	1×RS-232 D-sub female, for debug use
Software Upgrade	FTP loader and Telnet

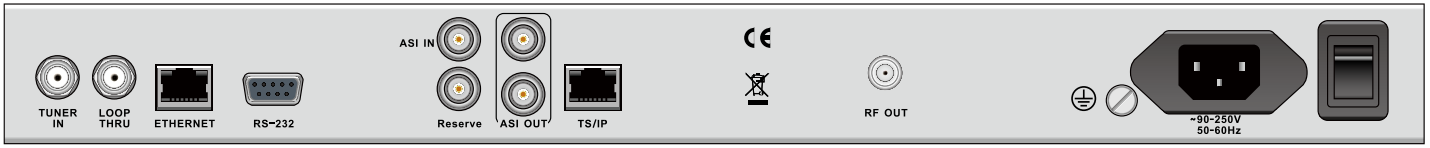
Physical

Dimension	483 × 399.7 × 44mm
Weight	6Kg
Power Supply	AC 90V ~ 250V 50Hz/60Hz
Power Consumption	30W
Operating Temperature	0~45°C
Storage Temperature	-10~60°C
Operating Humidity	10~90%, non-condensed

Certification

EMC: EN 55024:1998+A1:2001+A2:2003, EN 55022:2006+A1:2007, EN 61000-3-2:2006, EN 61000-3-3:2008
FCC: Part 15 Class B
LVD: EN 60950-1:2006 + A11:2009

BACK PANEL INTERFACE

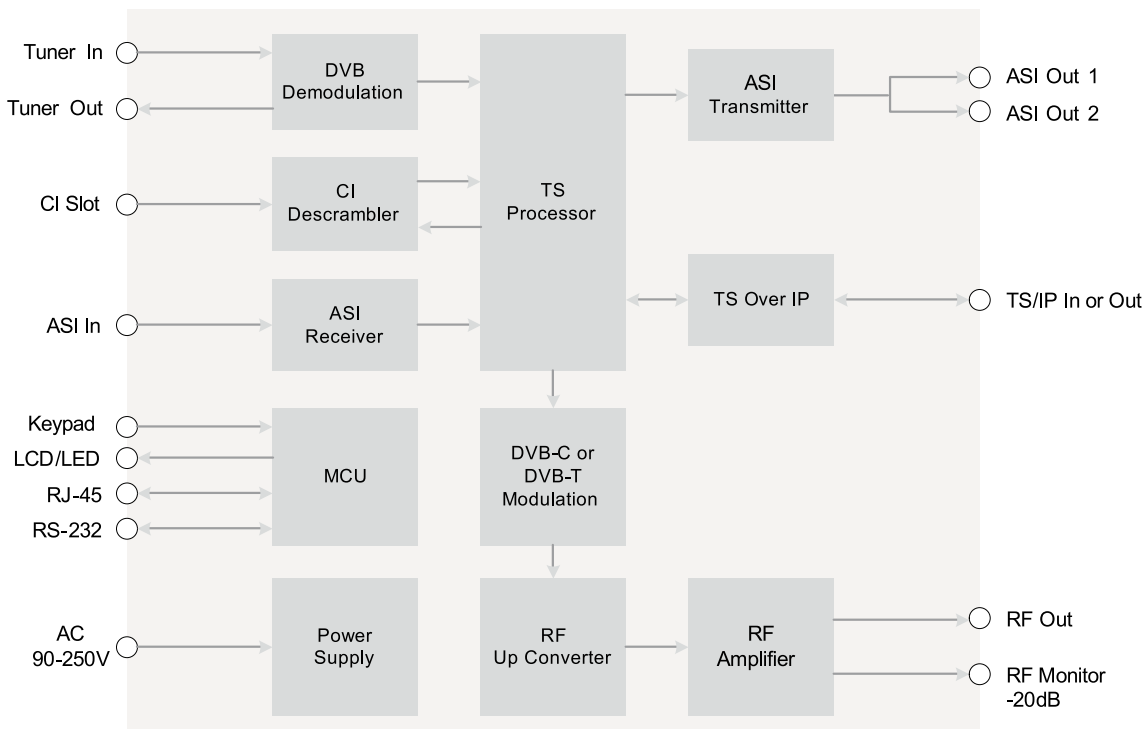


ORDERING INFORMATION

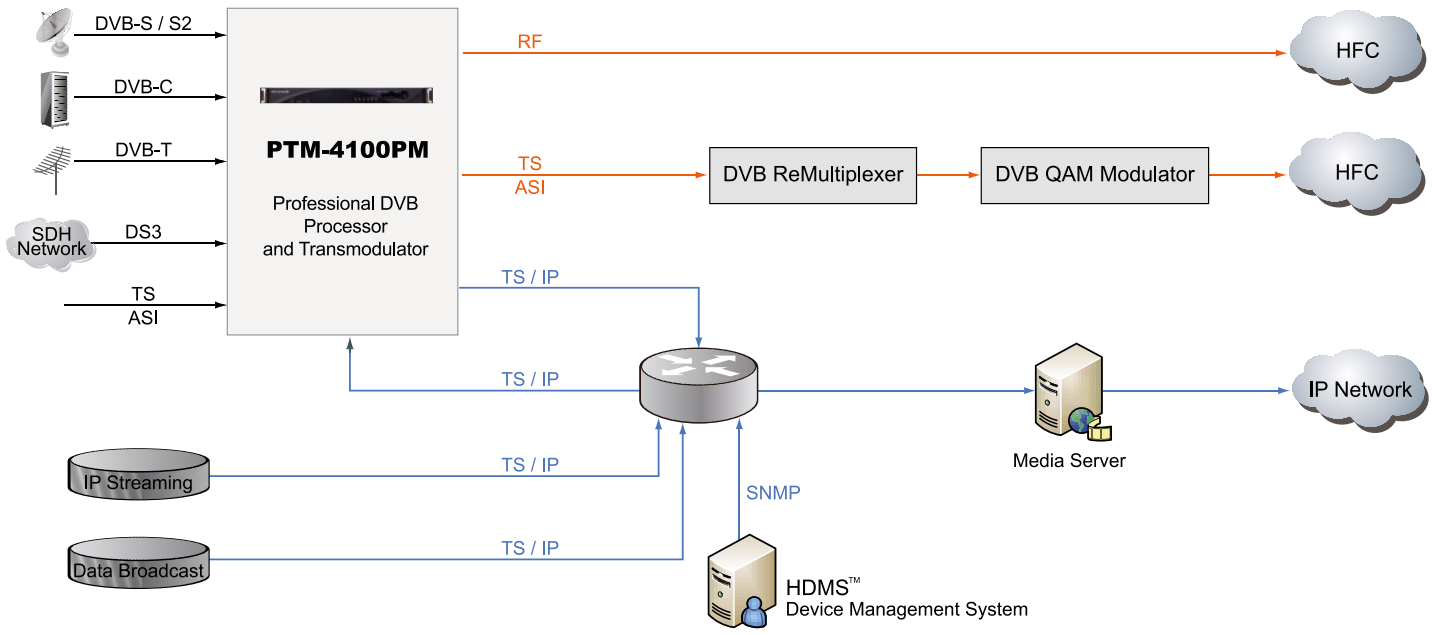
Model	-S2C	-CC	-TC	-DC	-S2T	-CT	-TT	-DT
Tuner Type	DVB-S2	DVB-C	DVB-T	DS3/E3	DVB-S2	DVB-C	DVB-T	DS3/E3
ASI Input	•	•	•	•	•	•	•	•
Built-in Re-mux	•	•	•	•	•	•	•	•
ASI Output (mirrored)	•	•	•	•	•	•	•	•
100M TS/IP Extension Board	•	•	•	•	•	•	•	•
QAM Modulation	•	•	•	•				
COFDM Modulation					•	•	•	•

•Standard

BLOCK DIAGRAM



APPLICATION



TMH-100AS

Compact modular SMATV Headend Equipment



INTRODUCTION

TMH-100AS is a compact modular SMATV headend, supporting up to 16 channels in one 19" 4U chassis. It integrates multiple functions including DTV signal reception, descrambling, decoding and analog modulation. TMH-100AS has various options for RF input front end, such as DVB-S/S2/T/T2/C, ATSC, ISDB-T and DMBT etc., moreover, analog AV and IP input are also available. Equipped with dual DVB-CI, the TMH-100AS module can decrypt multiple pay TV services and loop through the TS to the neighbor modules through internal cables for further processing. Each TMH-100 AS module can process two MPEG-2 or H.264 HD/SD services and downscale the HD content to SD, then modulate and output via two adjacent analog RF channels. TMH-100AS supports various analog modulation standard, such as PAL B/G, PAL D/K, NTSC, and SECAM etc. Each TMH-100AS module can be controlled and supervised by SNMP and HTTP WEB.

MAIN FEATURES

- Support various analog modulation standard, such as PAL B/G, PAL D/K, NTSC, and SECAM etc.
- DVB-S/S2/T/T2, ATSC, ISDB-T, DMBT front end option
- Support IP input and analog AV input
- MPEG-2, H.264 HD/SD decoding
- Two adjacent analog RF channel output per module
- Dual DVB-CI for multi-decryption
- TS loop through between modules
- Functional module hot-swappable
- Web, SNMP remote control or handheld programmer unit local control
- 19" 4RU chassis compact modular design, supporting up to 8 modules in one chassis
- Redundant power supply
- Intelligent temperature control cooling system
- Stand alone function of each module
- Cost-saving by backward compatible with new modules
- On site software update through IP or USB

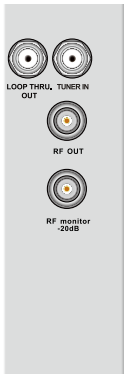
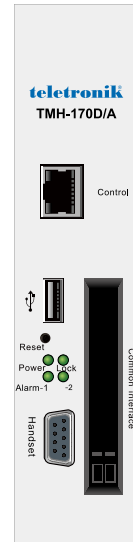
ORDERING INFORMATION

Product name	Model No.	Model No. Description
Professional IRD and Analog Modulator Module	TMH-170D/A	Dual Channel IRD and Analog Modulator Module
Professional Analog Modulator Module	TMH-170I/A	Dual Channel IPTV Decoder and Analog Modulator Module
Professional IPTV Decoder and Analog Modulator Module	TMH-170PALmod	Dual Channel PAL/NTSC/SECAM modulator

TMH-170D/A

DVB Tuner to Analog Trans-modulator

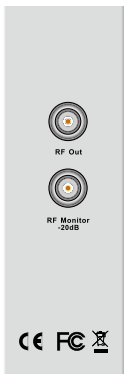
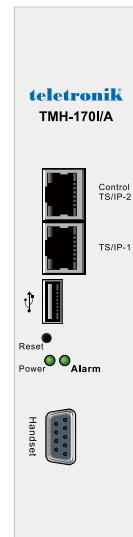
- Multiple RF input front end option DVB-S2/S/C/T/T2, ATSC, ISDB-T, DMBT
- Two adjacent analog channels output in range of 48-860MHz
- Output level 100dBµV per channel
- Support MPEG-2, H.264 SD/HD decoding
- Remote Control and Supervision by SNMP and HTTP WEB
- Support BISS-1, BISS-E descrambling
- Dual DVB-CI for multi-decryption
- Dynamic PMT detection and automatic updating



TMH-170I/A

Twin TS/IP to Analog Trans-modulator

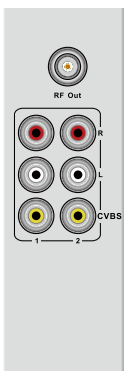
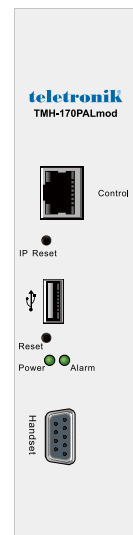
- Two IP multicast/unicast input ports
- Two adjacent analog channels output in range of 48-860MHz
- Supports MPEG-2, H.264 SD/HD decoding
- Output level 100dBµV per channel
- Remote Control and Supervision by SNMP and HTTP WEB



TMH-170PALmod

Twin Analog Modulator

- 2 analog AV input
- Two adjacent analog channels output in range of 48-860MHz
- Modular design for easy installation and maintenance
- Output level 100dBµV per channel
- Remote Control and Supervision by SNMP and HTTP WEB



TMH-100

Compact modular digital TV Headend Equipment



INTRODUCTION

TMH-100 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, TMH-100 offers operators the advanced headend architectures in the marketplace for delivering analog and digital broadcast services to their subscribers. Coming with more new modules, TMH-100 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.

MAIN FEATURES

- Support various analog modulation standard, such as PAL B/G, PAL D/K, NTSC, and SECAM etc.
- 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 transcoder 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

ORDERING INFORMATION

Model No.	Description
TMH-100	4RU Chassis with 8 Slots
TMH-100CU	Programmer Unit
TMH-140P	Single Channel MPEG-2 SD IRD and Processor
TMH-150P	Single Channel H.264 HD IRD and Processor
TMH-130TM	Single Channel Transmodulator
TMH-130EC	Single Channel MPEG-2 SD Encoder
TMH-150EC	Single Channel H.264 HD Encoder and Transcoder
TMH-130MX	8-Way Remultiplexer

TMH-100

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°C (for all modules)
- Storage temperature: -10 ~ 60°C (for all modules)



TMH-100CU

Programmer unit

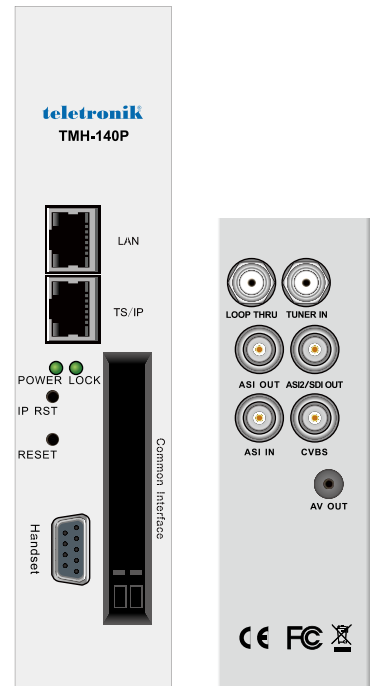
- 2×20 LCD display screen and 6-key keypad
- No external power nor battery needed
- Easy and quick on site system configuration without PC
- Compatible with new modules
- Dimension 170×70×22 mm



TMH-140P

Single Channel MPEG-2 SD IRD and Processor

- 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



SPECIFICATION

DVB-S/S2 Tuner Input

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
Input Frequency Range	950 ~ 2150MHz
Input Level	-25 ~ -65dBm
Symbol Rate	DVB-S QPSK: 5~45MS/s; DVB-S 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 outp.
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 outp.
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 outp.
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 140 P 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 table regeneration, NIT and SDT edition, LCN Edition and Re-generation
PSI/SI	DVB Common Scrambling Algorithm (CSA)
Descrambler	Double PCMCIA slots, compatible with major CA CAMs in the market
Common Interface	

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)
Video Bit Rate	SDI Video Resolution 576i×25, 480i×29.97 < 80Mb/s

SD-SDI Output

Connector Type	1×BNC Female, 75Ω (share with one of the two ASI outputs)
Serial Interface Level	SMPTE 259M, 270 Mb/s (10bit)
Audio Embedded	800mV p-p Yes

Digital Audio Processing

Number of Output	1 pair of stereo audio output (1 Audio PID is decoded)
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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

ORDERING INFORMATION

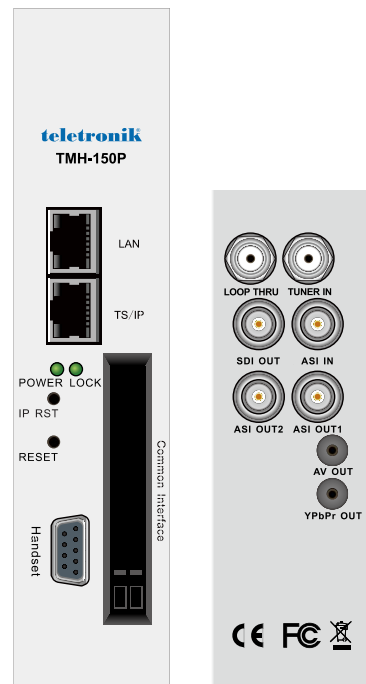
Model	140P-S	140P-S2	140P-C	140P-T	140P-44S	140P-44S2	140P-44C	140P-44T
Tuner	-S	-S2/S	-C	-T	-S	-S2/S	-C	-T
ASI Input	•	•	•	•	•	•	•	•
Common Interface	×2	×2	×2	×2	×2	×2	×2	×2
Built-in Re-mux	•	•	•	•	•	•	•	•
ASI-Output	•	•	•	•	•	•	•	•
SDI	•	•	•	•	•	•	•	•
YPbPr	•	•	•	•	•	•	•	•
Audio L/R	•	•	•	•	•	•	•	•
CVBS	•	•	•	•	•	•	•	•
TS/IP(Max.6 SPTS or MPTS output)	•	•	•	•				
TS/IP(Max.32 SPTS or MPTS output)					•	•	•	•

• Standard

TMH-150P

Single Channel H.264 HD IRD and Processor

- 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



SPECIFICATION

DVB-S/S2 Tuner Input

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
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, 8/10 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 outp.
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 outp.
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

Input return loss

DVB-T2: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6
7dB (typ.)

ASI Input

Connector Type
Standard
Input Bit Rate
Package Length

1×BNC Female, 75Ω
DVB-ASI, EN50083-9
≤ 100Mb/s
188 or 204 Bytes

TS over IP

Connector Type
Useful bit rate
Protocol

1×RJ45, 10/100M for TS/IP
70Mb/s for 10/100M
UDP / RTP, Multicast / Unicast, IGMPv2, ARP

TS Processing

TS Input Management
TS Output Management
Service and PID mgmt.

Remux and demux between Tuner, ASI and TS/IP Inputs
Remux and demux for 2 independent ASI outputs
Remux, filtering and remapping
PSI/SI PSI/SI table regeneration, NIT and SDT edition, LCN Edition and Re-generation
DVB Common Scrambling Algorithm (CSA)
BISS-1, BISS-E
Double PCMCIA slots, compatible with major CA CAMs in the market

Descrambler
BISS Mode
Common Interface

ASI Output

Connector Type
Standard
TS Processing

2×BNC Female, 75Ω
DVB-ASI, EN50083-9
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 Level	SMPTE 292M, 1.485 Gbit/s (10bit) 800mV p-p

Digital Audio Processing

Number of Output	1 pair of audio outputs
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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	1.0 Vp-p±5%
Frequency Response	< ±1 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

ORDERING INFORMATION

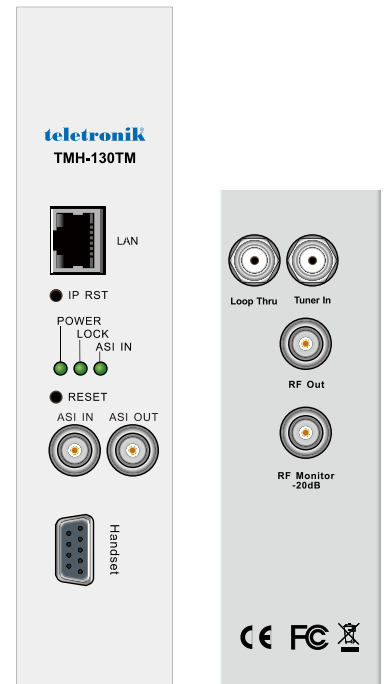
Model	150P-30S2	150P-30C	150P-30T	150P-30T2	150P-44S2	150P-44C	150P-44T	150P-44T2
Tuner	-S2/S	-C	-T	-T2	-S2/S	-C	-T	-T2
ASI Input	•	•	•	•	•	•	•	•
Common Interface	×2	×2	×2	×2	×2	×2	×2	×2
Built-in Re-mux	•	•	•	•	•	•	•	•
ASI-Output	×2	×2	×2	×2	×2	×2	×2	×2
SDI	•	•	•	•	•	•	•	•
YPbPr	•	•	•	•	•	•	•	•
Audio L/R	•	•	•	•	•	•	•	•
CVBS	•	•	•	•	•	•	•	•
TS/IP(Max.32 SPTS or MPTS output)					•	•	•	•

• Standard

TMH-130TM

Single Channel Transmodulator

- 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 sw.
- On Site software update through IP
- RSSI, received Eb/No & BER monitoring



SPECIFICATION

DVB-S/S2 Tuner Input

Connector Type	1×F type female 75Ω for Input, 1×F type female 75Ω for loop through outp.
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 outp.
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 outp.
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
FFT 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
Service and PID mgmt..
PSI/SI

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 97~110dBμV, step by 1dBμV
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)
Handheld Programmer Unit
Software Upgrade FTP loader

Remux demux between Tuner & ASI Inputs
Remux, filtering and remapping
PSI/SI table regeneration, NIT and SDT
edition, LCN Edition and Re-generation

ORDERING INFORMATION

Model	130TM-S2C	130TM-CC	130TM-TC	130TM-AC	130TM-S2T	130TM-CT	130TM-TT	150P-44T2
Tuner	-S2/S	-C	-T		-S2/S	-C	-T	-T2
ASI Input	•	•	•	•	•	•	•	•
Built-in Re-mux	•	•	•	•	•	•	•	•
ASI-Output	•	•	•	•	•	•	•	×2
QAM modulation	•	•	•	•				•
COFDM modulation					•	•	•	•

• Standard

TMH-130MX

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

SPECIFICATION

ASI Input

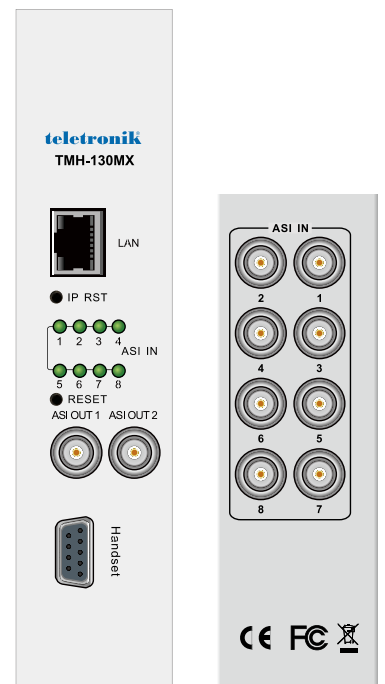
Connector Type 8×BNC Female, 75Ω
 Input Bit Rate ≤ 100Mb/s
 Data transmission mode BYTE or BURST mode auto-detection
 Packet Length 188 /204 bytes, auto-detection

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

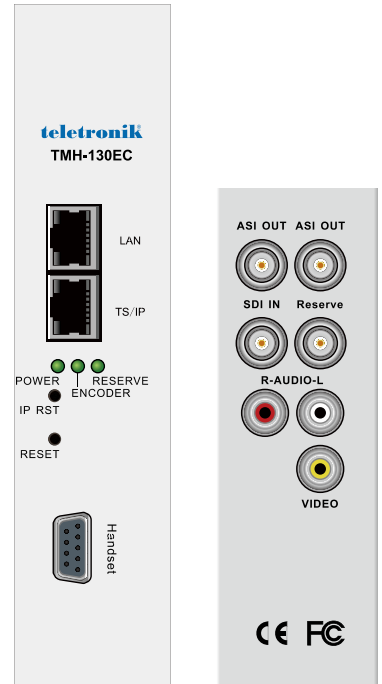
Connector Type 1×RJ45, 10/100M, for equipment IP Control
 Remote Control SNMP, Proprietary HDMS network Management Software
 Local Control Handheld Programmer Unit
 Software Upgrade FTP loader



TMH-130EC

Single Channel MPEG-2 SD Encoder

- 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 SDT generation 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



SPECIFICATION

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

Connector Type	1×RJ45, 10/100M, for equipment IP Control
Remote Control	SNMP, HTTP Web, Proprietary HDMS (Network Management Software) Handheld Programmer Unit
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader

ORDERING INFORMATION

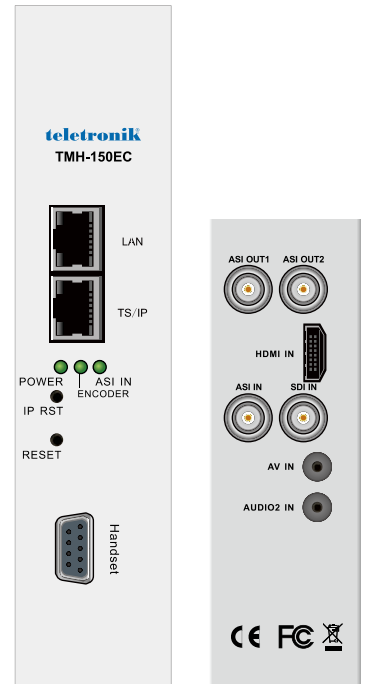
Model	130EC-30	130EC-40
CVBS	•	•
SD-SDI Input	•	•
ASI Output	×2	×2
TS/IP Output		•

- Standard

TMH-150EC

Single Channel H.264 HD Encoder and Transcoder

- 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 & Proprietary HDMS software



SPECIFICATION

Video Compression

Video Resolution	1080i (1920/1440×1080) @25Hz, 29.97Hz, 30Hz: SMPTE274M 720p (1280×720) @50Hz, 59.94Hz, 60Hz: SMPTE296M (for 150EC 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
HDMI	1×HDMI 1.3 interface

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 & demux between ASI input & SPTS
TS Output Management	Remux and demux for mirror ASI outputs
Service and PID mgmt..	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
Local Control	Handheld Programmer Unit
Software Upgrade	FTP loader

ORDERING INFORMATION

Model	150EC
HD-SDI Input	•
SD-SDI Input	•
HDMI Input	•
CVBS	•
ASI Input	•
Built-in Re-mux	•
ASI Output	×2
TS/IP I/O	•

- Standard

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