

# WHX-6410EM/6411EM

4-Channel H.264 SD/HD Encoder and Modulator



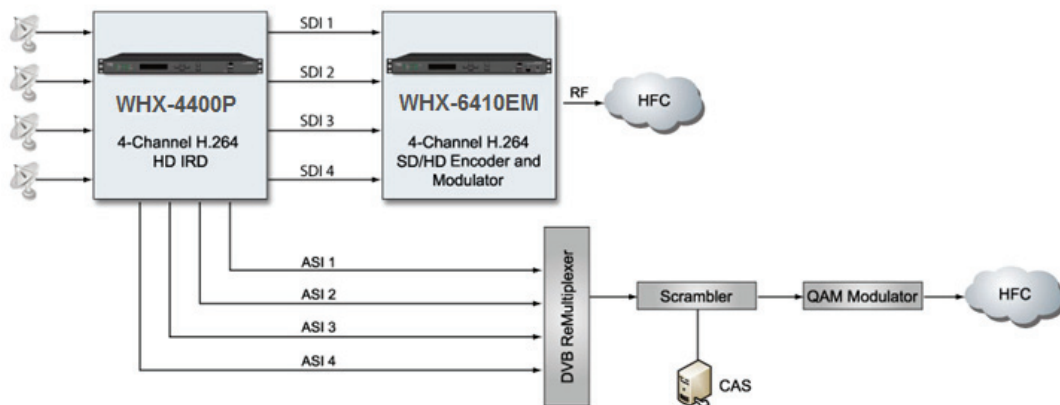
WHX-6410EM/6411EM is an integrated 4-channel real-time encoder re-multiplexer modulator. Four sets of A/V inputs are encoded and generated 4 Transport Streams (TS) independently. TS streams from the internal encoders, ASI input and TS/IP (TS\_over\_IP) input (duplex mode only) could be re-multiplexed into one MPTS ( Multiple Program TS), then modulated onto one DVB RF carrier, QAM or COFDM. This MPTS is also available at the ASI output & TS/IP output simultaneously. There are up to 5 streams encapsulated onto TS/IP output when TS/IP is configured as Multi-output mode. In this mode, all 4 TS streams from internal encoder could be sent through the TS/IP port while the fifth IP slot could be fed with the internal re-multiplexer or ASI input. With a built-in RF back-up relay switch, any external RF signal could be fed to the main output for back-up in cases of internal malfunction (main RF level < 75dBuV) or power supply lost.

WHX-6410EM/6411EM series are accommodated in 1U x 19" standard chassis with 2 redundant power supply modules.

## Main Feature

- Comply with H.264/AVC HP@L4.1
- 4 independent real-time encoders
- Integrated 6-input TS reMUX, (4 for encoders, 1 for ASI in, 1 for TS/IP in)
- ASI & TS/IP outputs
- Up to 5 TS/IP output streams (200Mb/s Max.)( 4 for encoders, 1 for ASI mirrored or reMUX)
- 480i/NTSC, 576i/PAL, 720p,1080i & 1080p
- Constant Bit Rate (CBR) & Variable Bit Rate (VBR)
- DVB-C/QAM (ITU J.83 Annex A/C) or DVB-T/COFDM RF out, selectable
- 50MHz ~ 996MHz RF carrier output frequency adjustable
- 120dBμV Total Output Level
- RF Back-up loop through input (RF relay)
- SNMP & HTTP remote control & monitor
- Software could be upgraded with Web interface
- EIA 1U x 19" standard chassis with 2 redundant power supply modules

## Application Case



## Specification

<b>Video Input &amp; Encoding</b>	
Input type	HD-SDI×4 BNC Female 75Ω (see ordering info.)
Encoding Standard	H.264/AVC High Profile, up to Level 4.1
Y/Cb/Cr Sampling Format	4:2:0
Video Resolution & Recommended Bit Rate (see ordering info.)	1080p (1920×1080) @25Hz, 29.97Hz, 30Hz: SMPTE274M: 6~40Mb/s 1080i (1920×1080) @25Hz, 29.97Hz, 30Hz: SMPTE274M: 6~20Mb/s 720p (1280×720) @25Hz, 29.97Hz, 30Hz: SMPTE296M: 6~20Mb/s 480i (720×480) @29.97Hz: BT.656: 2~15Mb/s 576i (720×576) @25Hz: BT.656: 2~15Mb/s
Other Video Resolution & Down Scaler	Full D1, Half D1, SIF, QSIF Vertical & Horizontal Pixel down scalable respectively (with frame rate not changed)
Aspect Ratio	4:3 or 16:9 adjustable
<b>Audio Input &amp; Encoding</b>	
Audio Input type	Analog Stereo×4 pairs of BNC Female, HD-SDI Embedded (see ordering info)
Standard & Recommended Bit Rate	MPEG1 Layer II, Mono: 32~192Kb/s, Stereo: 64~384Kb/s AAC-LC 2ch, Stereo: 128~512Kb/s (WHX-6410EM-X only)
Sampling Rate	48KHz
<b>DVB-ASI Input</b>	
Interface Type	BNC Female, 75Ω
Maximum Effective Bit Rate	200 Mb/s
Data type	Byte
Packet Length	188/204 Bytes
Valid Receiving Amplitude	200~880mVp-p
<b>DVB-ASI Output</b>	
Interface Type	BNC Female, 75Ω
Maximum Effective Bit Rate	200Mb/s
Data type	Byte
Packet Length	188/204 Bytes
Output Waveform Level	800±80mVp-p
<b>TS/IP Gigabit Ethernet (Duplex mode)</b>	
Physical Layer Standard	IEEE 802.3, 10/100/1000 Base-T
Maximum Effective Bit Rate	Input: 200Mb/s, Output: 200Mb/s
Data Encapsulation	UDP, RTP, SPTS, MPTS
Other Protocols	ICMP, ARP, IGMPv2
<b>TS/IP Multiple Stream, Output Only</b>	

Physical Layer Standard	IEEE 802.3, 10/100/1000 Base-T
Maximum Effective Bit Rate	Output: 200Mb/s
Data Encapsulation	UDP, RTP, SPTS, MPTS
Other Protocols	ICMP, ARP, IGMPv2
<b>QAM Modulation</b>	
Standard of System	ETSI EN300 492, ITU J.83, Annex A/C: 16/32/64/128/256QAM
Symbol Rate	3~7.2MS/s
I/Q Amplitude Error	≤ 0.1%
I/Q Phase Error	≤ 0.1%
Phase Jitter	< 0.5°RMS
MER	36dB min., 42dB typ. (with tester equalizer "off")
<b>COFDM Modulation</b>	
Standard of System	ETSI EN 300 744
Constellation	QPSK/16QAM/64QAM
Bandwidth	5/6/7/8MHz
FTT carrier number	2K, 8K
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC rate	1/2, 2/3, 3/4, 5/6, 7/8
MER	36dB min., 40dB typ.
<b>RF Output</b>	
Interface	F-type Female, 75Ω
Carrier Central Frequency	50~996MHz adjustable, step by 10 KHz
Output Level	90~120dBμV, step by 1dB
Spurious	≥60dBc @ 120dBuV
Return Loss	≥12dB(typ.)
<b>Rear Panel</b>	
ASI In	1×BNC Female, 75Ω
HD-SDI In	4×BNC Female, 75Ω (WHX-6411EM-S only)
ASI Out	2×BNC Female, 75Ω (mirrored contents)
RF Out	1×F Type Female, 75Ω
Back-up RF In	1×F Type Female, 75Ω
<b>Front Panel</b>	
Control	1×RJ-45, 10/100 Base-T
TS/IP	1×IP(GbE), RJ-45, 10/100/1000 Base-T
Display	20×2 character VFD
RF Monitor -20dB	1×F Type Female, 75Ω
<b>Others</b>	
Operating Input Voltage	AC100~260V 50/60Hz
Operating Temperature	0~40°C
Storage Temperature	-10~60°C
Operating Humidity	10~90%, Non-condensed

## Back Panel Interface

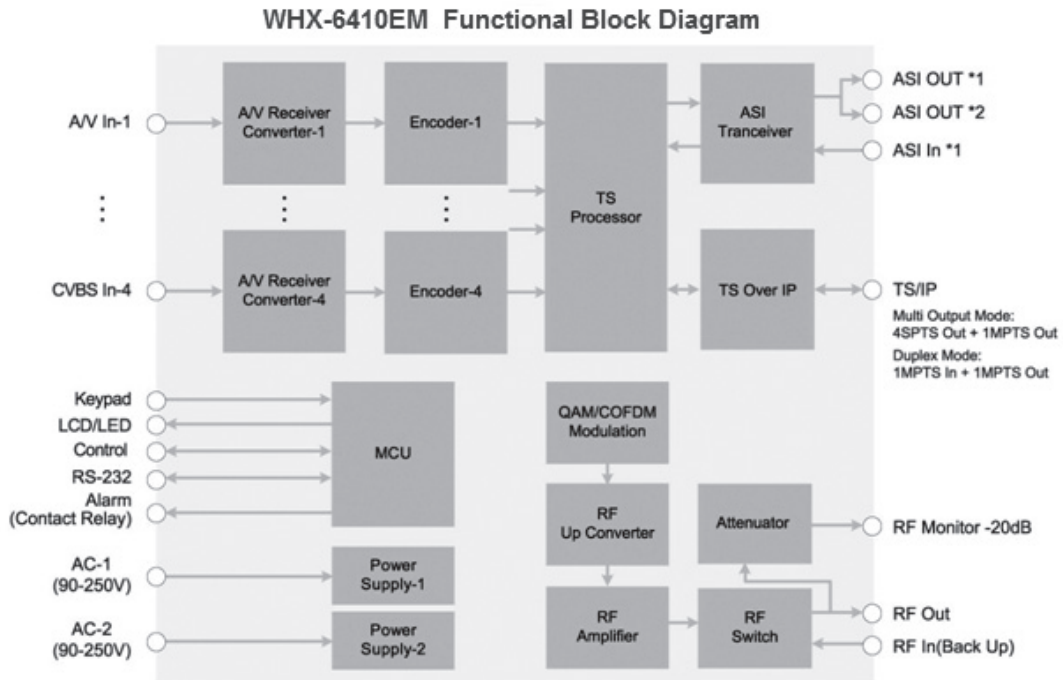
WHX-6410/6411EC-S



WHX-6410/6411EC-H



## Block Diagram



## Order Information

Function / Model	WHX-6410EM-S	WHX-6411EM-S
Video Compression	H 264 / AVC	H 264 / AVC
Audio Compression	MPEG + AAC	MPEG
CVBS & Audio x4 (BNC)		
HDMI x4 (A type)		
HD-SDI x4 (BNC)	•	•
ASI (BNC)	•	•
TS/IP (GbE, RJ45)	•	•
Back-up RF In (F-female)	•	•
ASI x2 (BNC)	•	•
TS/IP (GbE, RJ45)	•	•
RF Out QAM/COFDM	•	•
RF Monitor-20dB	•	•
Alarm (Contact Relay)	•	•
IP Control port (RJ45)	•	•
RS-232	•	•