

## HDMI CVBS Encoder -> DVB-C/T Modulator



A compact agile HDMI - A/V encoder with DVB-C/T compliant QAM /COFDM one channel modulator with selectable CVBS or HDMI Full-HD Input. Easy configuration

### BLANKOM HDM-901C /T

DVB-C/T compliant HDMI to QAM/COFDM Modulator as add-on Channel to existing CATV networks or serving Information-Channels or Digital Signage by Cable-TV.

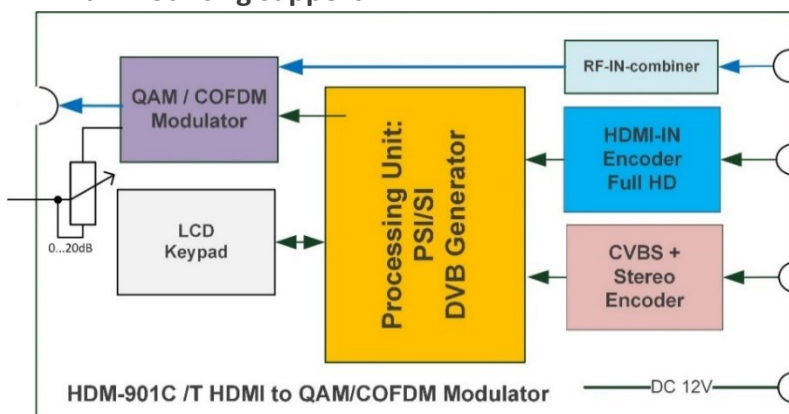
Full HD h.264 compatible in Distribution of SD, HD TV channels through the existing CATV Coax network using state-of-art CVBS or HDMI to QAM DVB-C or DVB-T technology from almost any kind of video format inputs up to 1080p60.

TV distributions in home entertainment, surveillance control, hotels, digital signage, shops, bars, etc.

Excellent Video and Audio quality. High reliability.

No regular service and maintenance needed during operation. Settings stored in EEPROM.

- Input: 1x HDMI or FBAS/CVBS + Stereo
- Output: CATV –Coax RF signal
- MPEG4 AVC/H.264 Encoder up to 1080p60
- Audio encoding MPEG1 Layer2
- Nominal RF Output power max. 94dB $\mu$ V, Range: 1...899MHz but practically > FM range – use 113MHz for the lowest Center Frequency depending on Country and CATV ranges of the receivers (TV)
- 0...20dB adjustable attenuation, integrated combiner
- DVB-C QAM: 8MHz, Symbol Rate up to 9000 16, 64, 128, 256QAM modulation modes
- DVB-T COFDM: 6,7, 8MHz max. 1/32 GI, FFT 2k/8k
- Information channels in Hotels or public spaces by Coax
- Applications like CCTV, Media-Player, PC, ... to DVB-C/T
- Wall mounting support

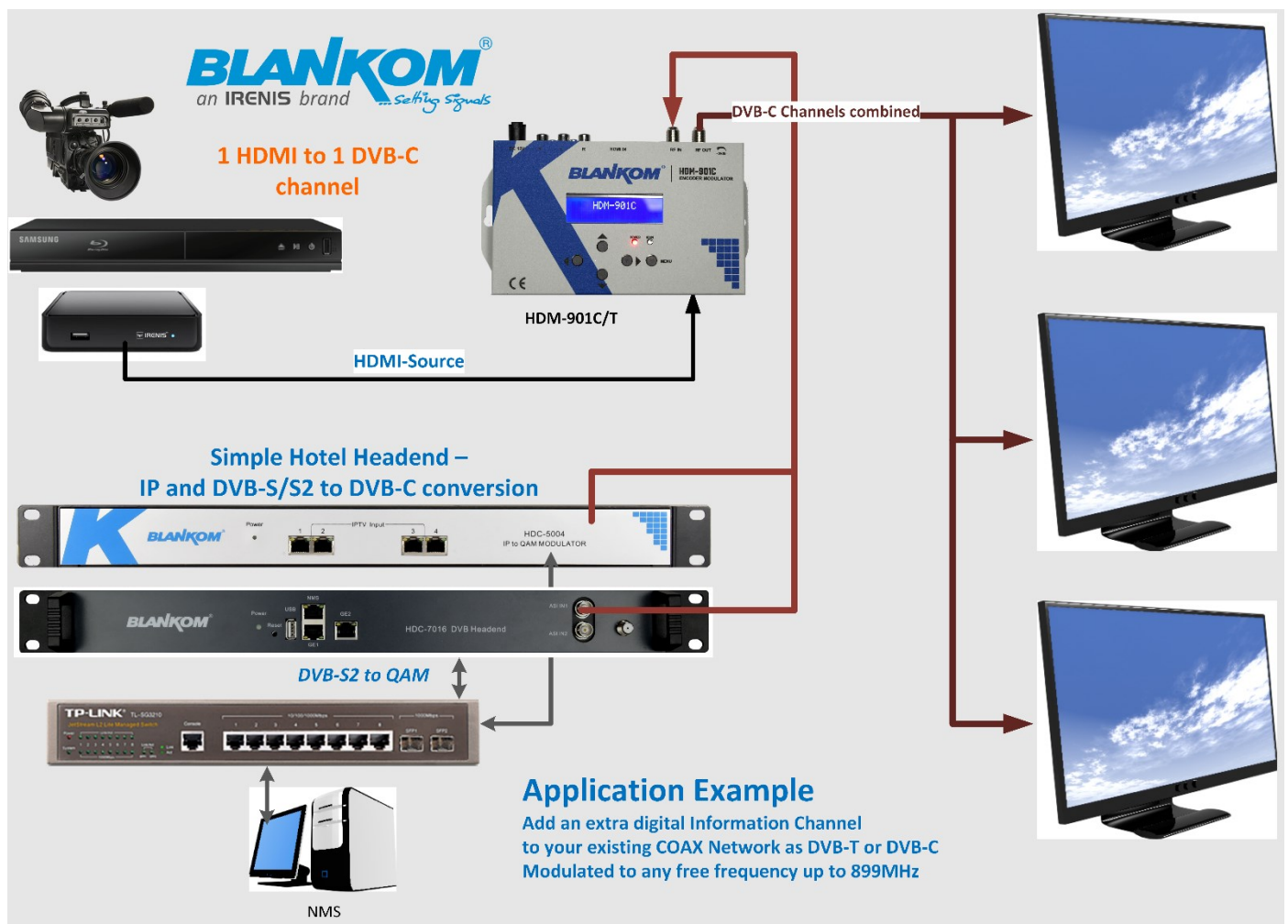


## Technical Specifications (subject to changes w/o further notice)

Parameter	Symbol	Description	Unit	Remark
<b>Mechanical dimensions</b>				
Height	H	35	mm	Weight 400g
Width	W	175	mm	
Depth	D	135	mm	
<b>HDMI IN</b>				
	SD	HD		Max encoding bitrate 25Mbps
Input format encoding	PAL,NTSC	720@50p,720@60p 1080@50i/p,1080@60i/p		Output – RF channel h.264 max. 1080@60p
Audio codecs		MPEG-1 Layer2, AAC	48kHz	
<b>RF IN- &amp; Output</b>				
Impedance	-	75	$\Omega$	
Connector	-	F-female		Internal combiner
Frequency	-	50...950	MHz	
Output level	-	>100	dB $\mu$ V	Adjustable (0...20dB)
<b>Modulation Specification DVB-C Annex A/C</b>				
Modulation scheme	-	16...256	QAM	
Bandwidth	BW	8	MHz	
MER	-	$\geq 35$	dB	Typ.
Symbol Rate	SR	5000...7000	kS/s	(up to 9000)
Effective bit rate	-	$\leq 51.6$	Mbps	SR=7Mbaud, 256QAM
Standard:		ITU-T J.83A/C		
<b>Modulation Specification DVB-T COFDM</b>				
Code Rate	FEC	1/2, 2/3, 3/4, 5/6, 7/8		
Bandwidth	BW	6, 7, 8	MHz	
Constellation		QPSK, 16QAM, 64QAM		
Guard Interval		1/4, 1/8, 1/16, 1/32		
FFT		2k / 8k		
<b>Parameter</b>	<b>Symbol</b>	<b>Min.</b>	<b>Max.</b>	<b>Unit</b>
Supply Voltage	V	12	14	VDC
Supply Frequency	F	49	51	Hz
Power Consumption	C		12 (12V/1A)	W
Operating Temperature	Tw	0	+50	$^{\circ}$ C
Storage Temperature	Ts	-25	+55	$^{\circ}$ C
Operating Humidity	H	0	45	%



## Application Example and corresponding Devices:



Designed and tested to operate with almost all BLANKOM products.

### Examples:

- HDC-5016 IP to QAM and IGS-900 streamer
- HDC-7016 DVB-S/S2 to QAM
- Professional Encoder: EMU 8xxx series
- All our boxed Decoder, IPTV SetTopBoxes, ...



## Quick-start:

This might vary because of different steps in development before this document was finished.

## LCD OPERATING INSTRUCTIONS:

For setting configurations you can use the LCD control panel. The device will initialize to the main interface after power on, and press "Enter" into the main menu.

The LCD turns off automatically after some seconds.

### Some settings:

Source	Press ◀ ▶ key to select HDMI/CVBS
Standard	Press ◀ ▶ key to select DTV standard DVB-C/DVB-T
Freq(Frequency)	Press ◀ ▶ key to move cursor and press ▼▲ to change numbers
Bandwidth	Press ◀ ▶ key to select 6,7,8 MHz, <b>apply to DVB-T ONLY</b>
Sym. Rate	Symbol Rate, set from 5.000 to 9.000 Msps, <b>apply to DVB-C ONLY</b>
MOD	Set mode range 64QAM, 128QAM, 256QAM, <b>apply to DVB-C ONLY</b>
LCD	Press ◀ ▶ key to edit
Service Name	Shown service ID, Enter and set up to 15 alphanumeric characters
Audio Format	Press ◀ ▶ key to select MPEG-1 Layer2/AAC
Network	Enter to set the IP Address/Subnet Mask/ Default Gateway
Advanced	Enter to set more TS setting
Theme	Change the LCD background theme

**Remark:** CVBS source for devices with CVBS Input only.

**Reset:** Press ESC key 3 seconds to Restore factory settings.

The Menu with the LCD/Keypad is nearly self-explaining...

Audio encoding can be AAC or MPEG1L2 Stereo. If you change that, you're receiving Decoder (TV or STB) need to be re-tuned to recognize the changes. Please set the PIDs and IDs accordingly to not conflict or harmonize with your existing COAX –DVB-Channels.



## Some recommendations:

DVB-C QAM settings:

Modulation	256QAM
Symbol Rate (K)	16QAM
Channel Number	32QAM
	64QAM
	128QAM
	256QAM

256 is a good choice because of best data rates.

Symbol Rate (K)	6875
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Symbolrate SR should be 6750-6900 max.

Frequency(KHz)	474000
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Frequency should be in the range of the CELENEC Channel plan. See end of this document...

IN DVB-T mode:

System	DVB-T	Modulation	64QAM
Frequency(KHz)	474000	Bandwidth (MHz)	8
RF Attenuation (dB)	0	Logic Channel Number	1
Service Name	HD1	Guard Interval	1/32
FFT	8K		
Code Rate	5/6		

FFT= 2000 or 8000 carrier, so best quality with 8K..., you can play with code-rates and so on if you have distortions detected in the receiver unit.

Guard Interval can be lowest 1/32 in Coax networks (not for over the air recommended).

Bandwidth 6, 7, or 8MHz...

Please note, that many TV sets/Receiver can only tune up to 862 MHz.

## Encoder

Bitrate	19000	⬆️⬇️⬆️
Audio Encoder	MPEG	⌵
Half FPS	Off	⌵
FHD Output	Auto	⌵

Higher bitrates assure higher picture

qualities...

Half FPS can be used to change the FPS from source to re-encode... FHD output can be chosen to interlace mode or Automatic according to the input.

Half FPS	On	⌵
FHD Output	Interlace	⌵

An appropriate LCN can be set like to 1 if your channel should be the first to tune in TV sets supporting that. You should check whether you're other DVB-Network channels crossing that in their NIT (Network Information Table).

## ANNEX Channel Plan (CATV channel plan)

Bereich	Kanal	Kanal-frequenzen	Mitten-frequenz	Bild-träger	Ton-träger	Bereich	Kanal	Kanal-frequenzen	Mitten-frequenz	Bild-träger	Ton-träger	
Bands	Channel	Channel frequency	Middle frequency	Picture carrier	Sound carrier	Bands	Channel	Channel frequency	Middle frequency	Picture carrier	Sound carrier	
B I	2	47...54	50,50	48,25	53,75	B IV	21	470...478	474,00	471,25	476,75	
	3	54...61	57,50	55,25	60,75		22	478...486	482,00	479,25	484,75	
	4	61...68	64,50	62,25	67,75		23	486...494	490,00	487,25	492,75	
USB Unterer Sonder- kanal- bereich Midband channels	S 02	111...118	114,50	112,25	117,75		24	494...502	498,00	495,25	500,75	
	S 03	118...125	121,50	119,25	124,75		25	502...510	506,00	503,25	508,75	
	S 04	125...132	128,50	126,25	131,75		26	510...518	514,00	511,25	516,75	
	S 05	132...139	135,50	133,25	138,75		27	518...526	522,00	519,25	524,75	
	S 06	139...146	142,50	140,25	145,75		28	526...534	530,00	527,25	532,75	
	S 07	146...153	149,50	147,25	152,75		29	534...542	538,00	535,25	540,75	
	S 08	153...160	156,50	154,25	159,75		30	542...550	546,00	543,25	548,75	
	S 09	160...167	163,50	161,25	166,75		31	550...558	554,00	551,25	556,75	
	S 10	167...174	170,50	168,25	173,75		32	558...566	562,00	559,25	564,75	
		5	174...181	177,50	175,25	180,75		33	566...574	570,00	567,25	572,75
B III		6	181...188	184,50	182,25	187,75		34	574...582	578,00	575,25	580,75
		7	188...195	191,50	189,25	194,75		35	582...590	586,00	583,25	588,75
		8	195...202	198,50	196,25	201,75		36	590...598	594,00	591,25	596,75
		9	202...209	205,50	203,25	208,75		37	598...606	602,00	599,25	604,75
		10	209...216	212,50	210,25	215,75	B V	38	606...614	610,00	607,25	612,75
		11	216...223	218,50	217,25	222,75		39	614...622	618,00	615,25	620,75
		12	223...230	226,50	224,25	229,75		40	622...630	626,00	623,25	628,75
		S 11	230...237	233,50	231,25	236,75		41	630...638	634,00	631,25	636,75
		S 12	237...244	240,50	238,25	243,75		42	638...646	642,00	639,25	644,75
		S 13	244...251	247,50	245,25	250,75		43	646...654	650,00	647,25	652,75
OSB Oberer Sonder- kanal- bereich Superband channels	S 14	251...258	254,50	252,25	257,75		44	654...662	658,00	655,25	660,75	
	S 15	258...265	261,50	259,25	264,75		45	662...670	666,00	663,25	668,75	
	S 16	265...272	268,50	266,25	271,75		46	670...678	674,00	671,25	676,75	
	S 17	272...279	275,50	273,25	278,75		47	678...686	682,00	679,25	684,75	
	S 18	279...286	282,50	280,25	285,75		48	686...694	690,00	687,25	692,75	
	S 19	286...293	289,50	287,25	292,75		49	694...702	698,00	695,25	700,75	
	S 20	293...300	296,50	294,25	299,75		50	702...710	706,00	703,25	708,75	
		S 21	302...310	306,00	303,25	308,75		51	710...718	714,00	711,25	716,75
		S 22	310...318	314,00	311,25	316,75		52	718...726	722,00	719,25	724,75
		S 23	318...326	322,00	319,25	324,75		53	726...734	730,00	727,25	732,75
ESB Erweiterter Sonder- kanal- bereich Hyperband channels	S 24	326...334	330,00	327,25	332,75		54	734...742	738,00	735,25	740,75	
	S 25	334...342	338,00	335,25	340,75		55	742...750	746,00	743,25	748,75	
	S 26	342...350	346,00	343,25	348,75		56	750...758	754,00	751,25	756,75	
	S 27	350...358	354,00	351,25	356,75		57	758...766	762,00	759,25	764,75	
	S 28	358...366	362,00	359,25	364,75		58	766...774	770,00	767,25	772,75	
	S 29	366...374	370,00	367,25	372,75		59	774...782	778,00	775,25	780,75	
	S 30	374...382	378,00	375,25	380,75		60	782...790	786,00	783,25	788,75	
	S 31	382...390	386,00	383,25	388,75		61	790...798	794,00	791,25	796,75	
	S 32	390...398	394,00	391,25	396,75		62	798...806	802,00	799,25	804,75	
	S 33	398...406	402,00	399,25	404,75		63	806...814	810,00	807,25	812,75	
	S 34	406...414	410,00	407,25	412,75		64	814...822	818,00	815,25	820,75	
	S 35	414...422	418,00	415,25	420,75		65	822...830	826,00	823,25	828,75	
	S 36	422...430	426,00	423,25	428,75		66	830...838	834,00	831,25	836,75	
	S 37	430...438	434,00	431,25	436,75		67	838...846	842,00	839,25	844,75	
	S 38	438...446	442,00	439,25	444,75		68	846...854	850,00	847,25	852,75	
	S 39	446...454	450,00	447,25	452,75		69	854...862	858,00	855,25	860,75	
	S 40	454...462	458,00	455,25	460,75							
	S 41	462...470	466,00	463,25	468,75							