

## VSB TV modulator MT32C

### PRODUCT DESCRIPTION

The MT32C is intended to form TV channels of B/G/D/K/Au STEREO A2/DUAL/MONO and I/L MONO standards in VHF and UHF ranges.

Broadcasting signal has vestigial sideband modulation.

The modulator is intended for indoor use only. Suitable for moderate and tropical climates.

RoHS compliant.

### SAFETY INSTRUCTIONS

Installation of the modulator must be done according national safety standards.

The modulator is powered from mains 230V~. This voltage is dangerous to life.

Any repairs must be done by a qualified personnel.

To avoid the electric shock follow these instructions:

do not remove the cover of the power supply section, without disconnecting the unit from the mains supply;

do not plug the modulator into the mains supply if the power cord or plug are damaged;

do not plug the modulator into the mains supply until all cables have been connected correctly;

to disconnect the modulator from the mains completely, disconnect plug from the mains socket;

the mains socket must be easily accessible;

modulator shall not be exposed to dripping or splashing water and no objects filled with liquids, such as vases, shall be placed on it;

avoid placing modulator next to central heating components and in areas of high humidity;

before connecting the modulator to multimedia system, be sure that system is installed in accordance to national safety standards;

devices of multimedia system should have easy access to disconnect them from the mains supply;

no naked flame sources, such as lighted candles, should be placed on modulator;

if the modulator has been kept in cold conditions for a long time, keep it in a warm room no less than 2 hours before plugging into the mains;

the ventilation should not be impeded by covering the ventilation openings with items, such as newspapers, table-cloths, curtains;

mount the modulator in vertical position with power supply located on the top;

from top, front and bottom of installed modulator must be at least 10 cm free space.

### EXTERNAL VIEW AND OPERATING CONTROLS

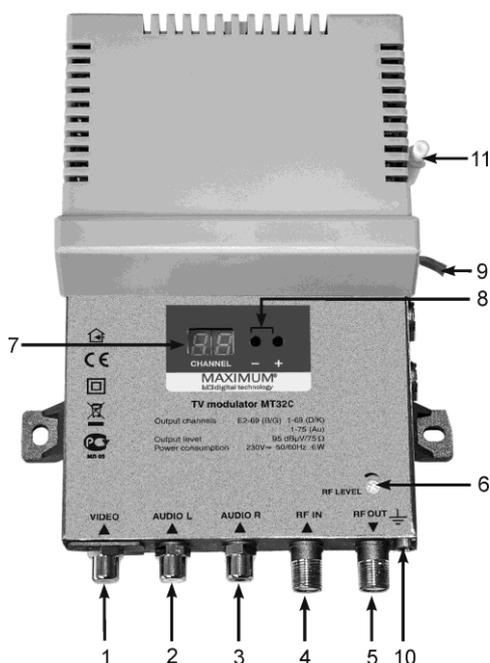


Figure 1. External view of modulator

- 1 - VIDEO - video signal input connector (RCA type)
- 2 - AUDIO L - audio left channel signal input connector (RCA type)
- 3 - AUDIO R - audio right channel signal input connector (RCA type)
- 4 - RF IN - RF signal input connector (F type)
- 5 - RF OUT - RF signal output connector (F type)
- 6 - RF LEVEL - RF output signal level regulator
- 7 - two-digit LED display
- 8 - control buttons
- 9 - power cord
- 10 - functional grounding clamp
- 11 - screwdriver

### INSTALLATION INSTRUCTIONS

Read the safety instruction first.

If RF IN connector on the modulator is not used, connect the 75 Ω load supplied.

To wall mount the modulator - screw the modulator to the wall.

Output levels of the modulators must be equalized when they are cascading. Video signal must be connected to the modulators inputs when the levels are adjusting. The difference of levels must not exceed ±2 dB. Adjacent channel operation is possible. If modulators form adjacent channels, it is advisable to adjust V/A signals ratio 16 dB.

**Do not connect TV antennas to modulator RF IN connector directly. If you intend to combine TV signals of antennas and the modulator, plug in booster with output-to-input isolation  $\pm 20$  dB between antenna output and RF IN connector.**

#### DEFAULT SETTINGS

1. Output channel E02;
2. Audio subcarrier deviation  $\pm 50$  kHz (when audio signal level 1 kHz is 775 mV);
3. B/G standard; audio subcarrier 5.5 MHz (Preset b5);
4. Test pattern generator OFF (Preset no);
5. Frequency shift none (Preset 0);
6. P/S ratio -16 dB (Preset l6);
7. Output signal on (Preset on);
8. Sound subcarriers deviation regulator (Preset 0);
9. Sound mode STEREO (Preset St).

#### OPERATING

**ATTENTION!** A symbol "LO" appears in locked mode (see chapter "PROTECTION FROM UNAUTHORIZED ACCESS").

#### CHANGING OF SETTINGS

The modulator has two modes of operating:

1. normal: sets after plug in;

Output channel can be selected in normal mode by pressing buttons "-" or "+" (see tables 2-8).

2. setting: to enter the setting mode press and hold "-" and "+" buttons simultaneously for 1 second, to exit setting mode press and hold "-" and "+" buttons simultaneously for 1 second.

Select of necessary to change parameter by pressing button "-" and set necessary mode by pressing "+" button.

1. TV system setting:

- a) after switching settings mode, indicator displays current TV system (see table 1);
- b) set necessary TV system by pressing "-" button (see tables 2-8);
- c) after TV system changing, modulator sets to first channel of selected TV system (see tables 2-8), other settings remains unchanged.

2. test pattern generator:

- a) press "-" button;
- b) switching between OFF and ON by pressing button "+", "no" - test pattern generator OFF, "t5" - test pattern generator ON.

3. fine tuning of video carrier frequency:

- a) press button "-";
- b) shift video carrier frequency by pressing button "+" (see table 9).

4. picture/sound ratio switching:

- a) press button "-";
- b) switching between 12 dB and 16 dB by pressing button "+".

5. output signal switching:

- a) press button "-";
- b) switching between RF ON and RF OFF by pressing button "+", "on" - RF ON, "oF" - RF OFF.

6. sound subcarriers deviation regulation:

- a) press button "-";
- b) set necessary deviation by pressing button "+" (see table 10).

7. STEREO/DUAL/MONO mode switching:

- a) press button "-";
- b) switch between STEREO/DUAL/MONO mode by pressing button "+", "5t" - stereo, "dU" - dual, "nO" - mono.

#### PROTECTION FROM UNAUTHORIZED ACCESS

To prevent unauthorized access press buttons "-" and "+" simultaneously twice in 0.5 sec. "LO" will briefly be displayed. To revert to normal operation, repeat above procedure. "UL" will briefly be displayed. The symbol "LO" appears, if you try to change settings in locked mode.

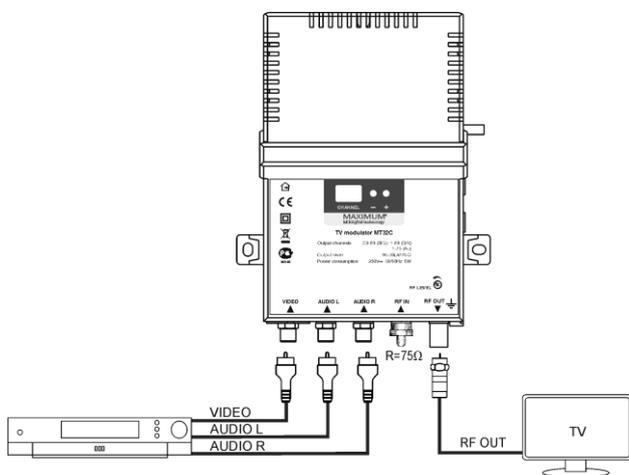
#### SOUND SUBCARRIER DEVIATION SETTING

The factory set sound subcarrier deviation is  $\pm 50$  kHz for an input signal 1 kHz/775 mV in both audio inputs (Preset 0). Use software control for audio deviation regulation  $\pm 6$  dB (see table 10).

#### OUTPUT SIGNAL LEVEL ADJUSTMENT

Use a regulator (figure 1, position 6) to adjust an output level.

#### INTERCONNECTION EXAMPLE OF ASSOCIATED APPARATUS



## TECHNICAL CHARACTERISTICS

Video input	frequency range	20 Hz - 6 MHz
	level/impedance	1 V ± 0.1 V/75 Ω
	DC offset	0...2 V
Audio input	frequency range	20 Hz - 15 kHz
	level adjustment pr.	± 6 dB by 2 dB step
	level/impedance	775 mV/10 k Ω
RF output	level (typical) /impedance	95 dBμV/75 Ω
	level adjustment	0 ÷ -15 dB
	output channels pr.	B/G/D/K/Au stereo A2, I/L mono
	according channels charts	
	frequency range pr.	45-862 MHz
Sound subcarrier frequency pr.		5.5 MHz, 6.0 MHz, 6.5 MHz
Second sound subcarrier frequency pr.		5.742 MHz*/6.258**
Fine tuning range of video carrier frequency pr.		±2.25 MHz max. by 0.25 MHz step
Combining through loss		2.5 dB
Frequency range of RF combining		45-862 MHz
A/V ratio pr.		12/16 dB
Amplitude modulation depth, typical		81 %
Signal/noise ratio, weighted		≥ 55 dB
II, III order intermodulation distortion		< -60 dB
Supply voltage limit values, power consumption		198-250 V~ 50/60 Hz 6 W
Operating temperature range		-10° ÷ + 50° C
Dimensions/Weight (packed)		133x180x52 mm/0.74 kg

\* B/G/Au stereo A2

\*\* D/K stereo A2

pr. software control

## TV SYSTEM SETTING

Table 1.

TV system	Displayed	Audio subcarrier	Video standard
B/G	b5	5.5 MHz	PAL
D/K	d6	6.5 MHz	PAL, SECAM
Australia	Au	5.5 MHz	PAL
I	I6	6.0 MHz	PAL
L	L6	6.5 MHz	SECAM

## VHF BAND I, III CHANNELS

Table 2

SYSTEM: B, G		b5	
Band	Displayed	Channel	Vision C. Audio C.
	01	E1	45,25 50,75
	02	E2	48,25 53,75
BI	03	E3	55,25 60,75
	04	E4	62,25 67,75
	03.	S3	119,25 124,75
	04.	S4	126,25 131,75
	05.	S5	133,25 138,75
	06.	S6	140,25 145,75
	07.	S7	147,25 152,75
	08.	S8	154,25 159,75
	09.	S9	161,25 166,75
BIII	10.	S10	168,25 173,75
	05	E5	175,25 180,75
	06	E6	182,25 187,75
	07	E7	189,25 194,75
	08	E8	196,25 201,75
	09	E9	203,25 208,75
	10	E10	210,25 215,75
	11	E11	217,25 222,75
	12	E12	224,25 229,75

S2	11.	S11	231,25	236,75
	12.	S12	238,25	243,75
	13.	S13	245,25	250,75
	14.	S14	252,25	257,75
	15.	S15	259,25	264,75
	16.	S16	266,25	271,75
	17.	S17	273,25	278,75
	18.	S18	280,25	285,75
	19.	S19	287,25	292,75
	20.	S20	294,25	299,75
	21.	S21	303,25	308,75
	22.	S22	311,25	316,75
	23.	S23	319,25	324,75
	24.	S24	327,25	332,75
	25.	S25	335,25	340,75
	26.	S26	343,25	348,75
	27.	S27	351,25	356,75
	28.	S28	359,25	364,75
	29.	S29	367,25	372,75
	30.	S30	375,25	380,75
	31.	S31	383,25	388,75
	32.	S32	391,25	396,75
	33.	S33	399,25	404,75
	34.	S34	407,25	412,75
	35.	S35	415,25	420,75
	36.	S36	423,25	428,75
	37.	S37	431,25	436,75
	38.	S38	439,25	444,75
	39.	S39	447,25	452,75
	40.	S40	455,25	460,75
	41.	S41	463,25	468,75

Table 3

SYSTEM: D, K		d6	
Band	Displayed	Channel	Vision C. Audio C.
	01	C1	49,75 56,25
	02	C2	59,25 65,75
	03	C3	77,25 83,75
	04	C4	85,25 91,75
	05	C5	93,25 99,75
	01.	SR1	111,25 117,75
	02.	SR2	119,25 125,75
	03.	SR3	127,25 133,75
	04.	SR4	135,25 141,75
	05.	SR5	143,25 149,75
	06.	SR6	151,25 157,75
	07.	SR7	159,25 165,75
	08.	SR8	167,25 173,75
	06	C6	175,25 181,75
	07	C7	183,25 189,75
	08	C8	191,25 197,75
	09	C9	199,25 205,75
	10	C10	207,25 213,75
	11	C11	215,25 221,75
	12	C12	223,25 229,75
	11.	SR11	231,25 237,75
	12.	SR12	239,25 245,75
	13.	SR13	247,25 253,75
	14.	SR14	255,25 261,75
	15.	SR15	263,25 269,75
	16.	SR16	271,25 277,75
	17.	SR17	279,25 285,75
	18.	SR18	287,25 293,75
	19.	S19	295,25 301,75
	20.	S20	303,25 309,75
	21.	S21	311,25 317,75
	22.	S22	319,25 325,75
	23.	S23	327,25 333,75
	24.	S24	335,25 341,75
	25.	S25	343,25 349,75
	26.	S26	351,25 357,75
	27.	S27	359,25 365,75
	28.	S28	367,25 373,75
	29.	S29	375,25 381,75
	30.	S30	383,25 389,75
	31.	S31	391,25 397,75
	32.	S32	399,25 405,75
	33.	S33	407,25 413,75
	34.	S34	415,25 421,75
	35.	S35	423,25 429,75
	36.	S36	431,25 437,75
	37.	S37	439,25 445,75
	38.	S38	447,25 453,75
	39.	S39	455,25 461,75
	40.	S40	463,25 469,75

Table 4

SYSTEM: B, Australia	Au
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Band	Displayed	Channel	Vision C.	Audio C.
01		D1	57,25	62,75
02		D2	64,25	69,75
03		D3	86,25	91,75
04		D4	95,25	100,75
05		D5	102,25	107,75
03.		S3	119,25	124,75
04.		S4	126,25	131,75
05.		S5	133,25	138,75
06.		S6	140,25	145,75
07.		S7	147,25	152,75
08.		S8	154,25	159,75
09.		S9	161,25	166,75
10.		S10	168,25	173,75
06		D6	175,25	180,75
07		D7	182,25	187,75
08		D8	189,25	194,75
09		D9	196,25	201,75
10		D10	210,25	215,75
11		D11	217,25	222,75
12		D12	224,25	229,75
11.		S11	231,25	236,75
12.		S12	238,25	243,75
13.		S13	245,25	250,75
14.		S14	252,25	257,75
15.		S15	259,25	264,75
16.		S16	266,25	271,75
17.		S17	273,25	278,75
18.		S18	280,25	285,75
19.		S19	287,25	292,75
20.		S20	294,25	299,75
21.		S21	303,25	308,75
22.		S22	310,25	315,75
23.		S23	317,25	322,75
24.		S24	324,25	329,75
25.		S25	331,25	336,75
26.		S26	338,25	343,75
27.		S27	345,25	350,75
28.		S28	352,25	357,75
29.		S29	359,25	364,75
30.		S30	366,25	371,75
31.		S31	373,25	378,75
32.		S32	380,25	385,75
33.		S33	387,25	392,75
34.		S34	394,25	399,75
35.		S35	401,25	406,75
36.		S36	408,25	413,75
37.		S37	415,25	420,75
38.		S38	422,25	427,75
39.		S39	429,25	434,75
40.		S40	436,25	441,75
41.		S41	443,25	448,75

Table 5

SYSTEM: L, France

L

Band	Displayed	Channel	Vision C.	Audio C.
05		L05	176,00	182,50
06		L06	184,00	190,50
07		L07	192,00	198,50
08		L08	200,00	206,50
09		L09	208,00	214,50
10		L10	216,00	222,50
01.		IB1 (B)	116,75	123,25
02.		IB2 (C)	128,75	135,25
03.		IB3 (D)	140,75	147,25
04.		IB4 (E)	152,75	159,25
05.		IB5 (F)	164,75	171,25
06.		IB6 (G)	176,75	183,25
07.		IB7 (H)	188,75	195,25
08.		IB8 (I)	200,75	207,25
09.		IB9 (J)	212,75	219,25
10.		IB10 (K)	224,75	231,25
11.		IB11 (L)	236,75	243,25
12.		IB12 (M)	248,75	255,25
13.		IB13 (N)	260,75	267,25
14.		IB14 (O)	272,75	279,25
15.		IB15 (P)	284,75	291,25
16.		IB16 (Q)	296,75	303,25

Table 6

SYSTEM: I

I

Band	Displayed	Channel	Vision C.	Audio C.
04		C4	175,25	181,25

05	C5	183,25	189,25
06	C6	191,25	197,25
07	C7	199,25	205,25
08	C8	207,25	213,25
09	C9	215,25	221,25
10	C10	223,25	229,25
11	C11	231,25	237,25
12	C12	239,25	245,25
13	C13	247,25	253,25

**UHF BAND IV AND BAND V CHANNELS**

Table 7  
SYSTEMS: G, H, I, K, L

Band	Channel	Displayed	Vision C.	Audio C. Stand.G,H	Audio C. Stand.I	Audio C. Stand.K,L
IV	21	21	471.25	476.75	477.25	477.75
	22	22	479.25	484.75	485.25	485.75
	23	23	487.25	492.75	493.25	493.75
	24	24	495.25	500.75	501.25	501.75
	25	25	503.25	508.75	509.25	509.75
	26	26	511.25	516.75	517.25	517.75
	27	27	519.25	524.75	525.25	525.75
	28	28	527.25	532.75	533.25	533.75
	29	29	535.25	540.75	541.25	541.75
	30	30	543.25	548.75	549.25	549.75
	31	31	551.25	556.75	557.25	557.75
	32	32	559.25	564.75	565.25	565.75
	33	33	567.25	572.75	573.25	573.75
	34	34	575.25	580.75	581.25	581.75
	35	35	583.25	588.75	589.25	589.75
	36	36	591.25	596.75	597.25	597.75
	37	37	599.25	604.75	605.25	605.75
V	38	38	607.25	612.75	613.25	613.75
	39	39	615.25	620.75	621.25	621.75
	40	40	623.25	628.75	629.25	629.75
	41	41	631.25	636.75	637.25	637.75
	42	42	639.25	644.75	645.25	645.75
	43	43	647.25	652.75	653.25	653.75
	44	44	655.25	660.75	661.25	661.75
	45	45	663.25	668.75	669.25	669.75
	46	46	671.25	676.75	677.25	677.75
	47	47	679.25	684.75	685.25	685.75
	48	48	687.25	692.75	693.25	693.75
	49	49	695.25	700.75	701.25	701.75
	50	50	703.25	708.75	709.25	709.75
	51	51	711.25	716.75	717.25	717.75
	52	52	719.25	724.75	725.25	725.75
	53	53	727.25	732.75	733.25	733.75
	54	54	735.25	740.75	741.25	741.75
	55	55	743.25	748.75	749.25	749.75
	56	56	751.25	756.75	757.25	757.75
	57	57	759.25	764.75	765.25	765.75
	58	58	767.25	772.75	773.25	773.75
	59	59	775.25	780.75	781.25	781.75
	60	60	783.25	788.75	789.25	789.75
	61	61	791.25	796.75	797.25	797.75
	62	62	799.25	804.75	805.25	805.75
	63	63	807.25	812.75	813.25	813.75
	64	64	815.25	820.75	821.25	821.75
	65	65	823.25	828.75	829.25	829.75
	66	66	831.25	836.75	837.25	837.75
	67	67	839.25	844.75	845.25	845.75
	68	68	847.25	852.75	853.25	853.75
	69	69	855.25	860.75	861.25	861.75

Table 8  
SYSTEM: B, Australia

Band	Channel	Displayed	Vision C.	Audio C.
IV	20	20	471.25	476.75
	21	21	478.25	483.75
	22	22	485.25	490.75
	23	23	492.25	497.75
	24	24	499.25	504.75
	25	25	506.25	511.75
	26	26	513.25	518.75
	27	27	520.25	525.75
	28	28	527.25	532.75
	29	29	534.25	539.75
	30	30	541.25	546.75
	31	31	548.25	553.75
	32	32	555.25	560.75
	33	33	562.25	567.75
	34	34	569.25	574.75
35	35	576.25	581.75	
V	36	36	583.25	588.75
	37	37	590.25	595.75
	38	38	597.25	602.75
	39	39	604.25	609.75

40	40	611.25	616.75
41	41	618.25	623.75
42	42	625.25	630.75
43	43	632.25	637.75
44	44	639.25	644.75
45	45	646.25	651.75
46	46	653.25	658.75
47	47	660.25	665.75
48	48	667.25	672.75
49	49	674.25	679.75
50	50	681.25	686.75
51	51	688.25	693.75
52	52	695.25	700.75
53	53	702.25	707.75
54	54	709.25	714.75
55	55	716.25	721.75
56	56	723.25	728.75
57	57	730.25	735.75
58	58	737.25	742.75
59	59	744.25	749.75
60	60	751.25	756.75
61	61	758.25	763.75
62	62	765.25	770.75
63	63	772.25	777.75
64	64	779.25	784.75
65	65	786.25	791.75
66	66	793.25	798.75
67	67	800.25	805.75
68	68	807.25	812.75
69	69	814.25	819.75
70	70	821.25	826.75
71	71	828.25	833.75
72	72	835.25	840.75
73	73	842.25	847.75
74	74	849.25	854.75
75	75	856.25	861.75

**FINE TUNING**

Table 9

Displayed Shift  
MHz

0	0
1	+0.25
2	+0.5
3	+0.75
4	+1.0
5	+1.25
6	+1.5
7	+1.75
8	+2.00
9	+2.25
-9	-2.25
-8	-2.00
-7	-1.75
-6	-1.5
-5	-1.25
-4	-1.0
-3	-0.75
-2	-0.5
-1	-0.25

Table 10

Displayed Audio  
level, mV/dB

0	775/0
2	615/+2
4	490/+4
6	388/+6
-6	1545/-6
-4	1227/-4
-2	975/-2



Caution.



Risk of electric shock.



This product complies with the relevant clauses of the European Directive 2002/96/EC. The unit must be recycled or discarded according to applicable local and national regulations.



Equipment intended for indoor usage only.



Equipment is double insulated from the mains.



Functional grounding. Connect to the main potential equalization.