

USER MANUAL

(v1.0.3, September 2009)

QUATTRON VSB

FULL BAND

SMATV MODULATORS
(4-8 CHANNELS, 19" 2U, SINGLE SIDE BAND)
(1-2 CHANNELS, 19" 1U, SINGLE SIDE BAND)









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Caution Statements

Please observe the following safety requirements before operating the equipment.

 <p style="text-align: center;">Precautions to Avoid Electric Shock</p>	 <p style="text-align: center;">Avoid Moisture</p>
<p>Thoroughly check your electrical grounding of your mains network and connectors prior to power on the device. Make sure that all power plugs are grounded type to ensure proper grounding. If the equipment will not be used for a long time, disconnect the power plug.</p> <p>Disconnect the power plug from mains outlet under the following conditions:</p> <ol style="list-style-type: none"> 1. Damage on power cord or plug, 2. Equipment gets wet or substantial moisture enters the chassis, 3. Equipment exposed to rain or water, 4. Equipment is dropped or damaged, 5. You detect some irregularity or abnormal situation on the device. 	<p>Do not use this equipment in high moisture environment.</p>
	 <p style="text-align: center;">No Heavy Stacking</p> <p>Do not stack many equipments without spacing. Allow proper ventilation.</p>
	 <p style="text-align: center;">Do Not Touch with Bare Hands</p> <p>Do not touch the equipment which operates for long time; it may be too hot.</p>
 <p style="text-align: center;">Do Not Open</p> <p>Unless being authorized by the manufacturer:</p> <ol style="list-style-type: none"> 1. Do not open the chassis of device. 2. Do not try to repair defected device by yourself. <p>Also, even though you are entitled by manufacturer to repair the equipment, do not use unauthorized part for repairing.</p>	 <p style="text-align: center;">General Cautions</p>
	<ol style="list-style-type: none"> 1. Read the entire User Manual prior to usage. 2. Do not place this equipment on an unstable support. 3. Do not place objects on top of the equipment which block the ventilation holes. 4. Do not place any radioactive object on top, adjacent or near to the equipment. 5. Provide proper room ventilation during operation of this equipment. 6. After the equipment is serviced, receive approval from authorized service personnel for reliability of putting back the equipment to operation.

1. Overview

Quattron VSB Full SMATV Modulators are single side band (VSB) TV modulators to built SMATV systems, to add channels to existing SMATV systems or to be integrated with similar CCTV systems, which converts the audio and video (AV) signals generated by satellite receivers, security cameras, computers etc. electronic peripherals to TV standard in VHF, S-Band and UHF (S03 – E69) channels.

2. Features

- Single side band (VSB),
- Digital programming and adjustable output channel,
- Operated in entire TV broadcasting band (S03 – E69),
- PAL picture standard compatible,
- 90-92 dB μ V combined output signal level and level adjustment (-20...0 dB),
- Independent output level adjustment per each module (-7...0 dB),
- Internal combiner,
- 90 – 240 VAC Universal SMPS power supply,
- Modular internal and external structure within 19" 2U and 19" 1U rack type housings,
- F type RF, RCA type AV connectors.

3. Safety Warnings

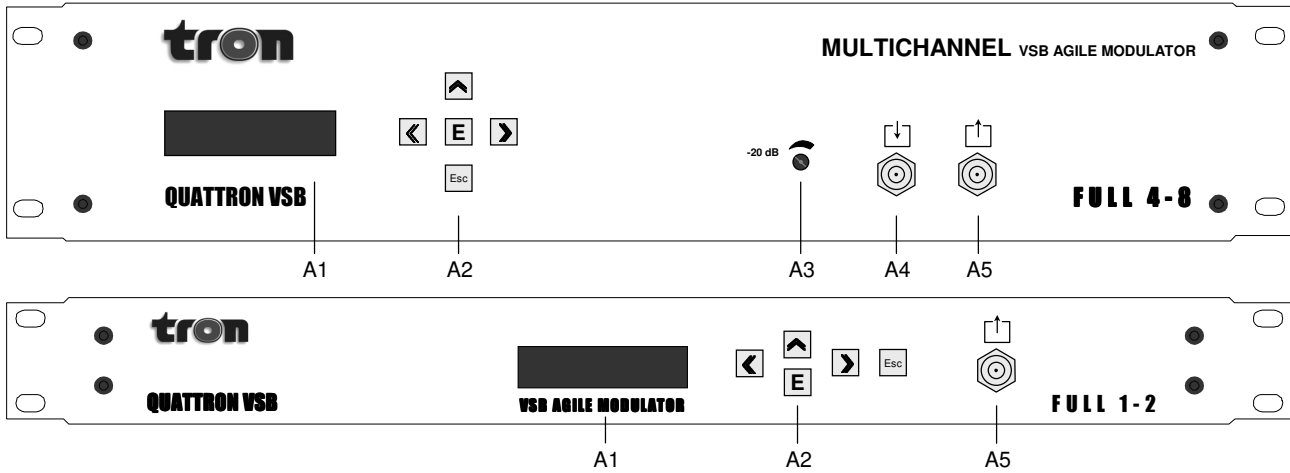
1. Quattron VSB shall be operated in ventilated environment and away from heat sources. Ventilation grids should not be blocked by any object.
2. Do not open or disassemble the outer chassis of the device in order to prevent electric shock. Opening the chassis will also void the warranty.
3. Do not insert anything into the case of the device, otherwise electric shock may occur or fire danger may depend on short-circuit condition.
4. Before plugging/unplugging the cables from satellite receivers, cameras etc. to/from AV inputs, plug off both Quattron VSB and other devices from mains.
5. Please use a soft cloth and a mild washing liquid (i.e. water) to clean the outer chassis.

4. Unpacking

Unpack the Quattron VSB package check to make sure that all of the following items are included in the packaging:

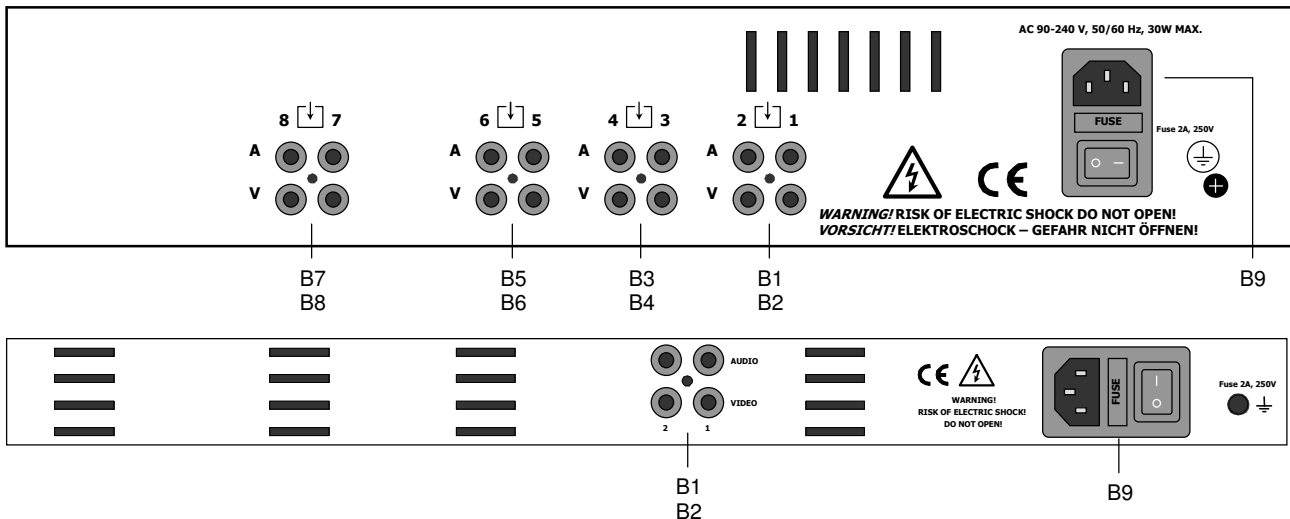
- Quattron VSB (1 piece),
- Power cord with plug (1 piece),
- User Manual (1 piece).

5. Front Panel



Sign	Item Name	Description
A1	LCD Display	Shows the status of the device, process steps and the configurations while configuring the device.
A2	Function Buttons	Used to configure the device.
A3	RF Output Level Adjustment Trimpot	Adjusts the signal level at the RF output between 0 and -20 dB range relative to max. output level.
A4	RF Input	The output from previous RF source device (e.g. Quattron VSB) is connected here. So, both the output of previous device and the RF signal generated by this device are combined.
A5	RF Output	RF signal output to be connected to distribution system or to next device in queue.

6. Rear Panel



Sign	Item Name	Description
B1 – B8	AV Inputs	8 pairs of RCA connectors which the cables from satellite receivers, computers, security cameras etc. are connected. A: Audio V: Video
B9	AC Power In and Power Switch	AC power input socket (male) and simple power switch. Under the cover in the middle of this part, there is located the high current protection fuse of the device and its spare. When replacing it with a fuse other than its spare, make sure that it has the same voltage and current rating.



7. Installation Steps




1. Securely mount your Quattron VSB device inside a 19" rack carrier (cabin).
2. If this device is not the first device in your Headend system, remove the 75 ohms line terminator at the RF input connector. Instead, connect the RF coaxial cable incoming from previous device.
3. Connect the beginning of distribution system or the coaxial cable connected to the RF input of next device to the RF output connector.
4. Connect the AV cables coming from video and/or audio sources to related connectors at the rear panel.
5. Connect the power cable with plug to an outlet with appropriate voltage and current and to the AC Power Input at the rear of Quattron VSB, then power on the device via power switch on rear panel. There is 3 seconds delay during boot-up.
6. After setting the device with correct TV channel parameters, Quattron VSB could output audio and video channels to your distribution system or to your television. You can find and save the channels outputted from the device by performing a channel search on your television.

8. General Viewing and Basic Operations

After you have installed and connected the cables of the Quattron VSB, power on the device from the power switch located on the rear panel. Normally, Quattron VSB will operate stable forever. This state is called **General Viewing**. In the General Viewing state, LCD display of the device shows “**OPERATING...**” text. But, for the device outputs desired channels to your TV distribution system or television, it must be properly set up and configured. Setup operations are explained in the section “**9. Device Setup**”.

The LCD display on the device shows the running state, configurations made and its steps. While configuring the device, a blinking cursor will appear in the menus and it will indicate the item you are working on. Function buttons carries out usually these works while navigating through menus:

-  : Alters the value of item which the cursor is over.
-  : Moves the cursor over previous item.




-  : Moves the cursor over next item.
-  : Enters the menu displayed or confirms the changes.
-  : Returns to previous menu or to the General Viewing state.










Also, if you don't press any button for 15 seconds while navigating through menus to configure the device, it automatically returns to the General Viewing state.

9. Device Setup

Quattron VSB must be configured in order to output desired channels to your distribution system or television. Following steps guide the setup of the device.



9.1 Module Setup

To configure the output channels, output signal levels and test signals of the independent modulator units inside the Quattron VSB device, hold  button for 1 second while in the General Viewing state. "Programming SET MODULE 1" text will be displayed on the LCD display and the blinking cursor will be over "1" digit. This digit shows the module number which will be configured. Use  to choose the module you wish to configure. When the number of the module you wish is displayed, press  button. Some menus to make following 3 configurations will be displayed:









- 1. Set Output Channel:** Sets the output channel of the modulator unit. Output channel expression consists of 1-2 letters and 2 digits. The cursor is over the letters in beginning. To navigate through letters and digits, use  and  buttons. To alter the item the cursor is over, use  button. Use  button to confirm and to proceed to next step when you have finished this setting.
- 2. RF Output Level:** Sets the independent output level of the modulator unit. In this step, use  and  buttons to increase or decrease the number of black squares. More black squares means the higher output level. There is 7 dB difference between maximum and minimum levels. Use  button to confirm and to proceed to next step when you have finished this setting.
- 3. Test Signal:** Switches the module to show two vertical bars on the screen as the test signal instead of audio and video received from AV inputs. There are 2 options: **NO** and **YES**. Alter your selection with  button and press  button to confirm. Since this step is the last configuration in this sequence, the device will automatically return to the beginning of module setup menu.

By changing the module number, you can set up all of modules via above steps. When you alter some setting of a module, changes are automatically applied to RF output. After you complete the setup of all modules, the device will automatically return to General Viewing state.

9.2 Quick Setup



The step by step setup of modules performed in previous method can be performed via this method on a single screen and more quickly. To access the quick setup menu, hold both  and  buttons for 2 seconds while the device is on General Viewing state. Some expression similar to below will appear on the LCD display:







#1	S	03	LVL:15
#2	S	04	LVL:15

Now, you can release  and  buttons. A blinking cursor will appear over the S letter (or some different letter in same location according previously performed settings). While in current state, each line on the display shows the settings of the module whose number is adjacent to # character in the line beginning. **S 03** (or similar) expression following the module number shows the output channel, and some number in range 00 to 15 following LVL: text shows independent output signal level of modulator unit. You can move the cursor over channel letter, digits of output channel number or output signal level items with  and  buttons; alter the value of item the cursor is over with  button. If you press  when the cursor is at the end of a line, it will move over the lower line. If you press  button when the cursor is at the beginning of a line, it will move over the upper line as well. The changes you have made are saved automatically if you move the cursor over another item. You can return to General Viewing state by pressing  button when you have completed the settings, or the system will automatically return to that state after 15 seconds of inactivity.

9.3 System Setup

This section is intended only to guide advanced system installers to adjust channel standards.

While Quattron VSB is powered off from its power switch, hold  button and power on the device. The device will not directly go to General Viewing state and some menus to make following 3 configurations will be displayed. Proceed by releasing  button:

- 1. Set System Standard:** Choose the RF carrier signal standard. There are 4 options: **B/G**, **D/K**, **I** and **L**. Default setting is **B/G**. Use  button to alter displayed standard. When the standard you will use in your broadcasting system is displayed, press  button to confirm and to proceed to next configuration step.
- 2. Set P/S Ratio:** Choose video signal level to audio signal level ratio by dB unit. There are 2 options: **-12** and **-16**. Default setting is **-12**. Use  button to alter the configuration. Press  button to proceed to next configuration step.
- 3. Factory Settings:** Resets the device to factory default settings. There are 2 options: **NO** and **YES**. Alter your selection with  button and press  button to confirm. Since this step is the last configuration in this sequence, the device will automatically return to General Viewing state after your confirmation.

It is recommended not to change these settings unless it is necessary.

10. Technical Specifications

Feature	Sub Feature	Specification	
Model		Quattron VSB Full 4-8	Quattron VSB Full 1-2
Modulator	Number of Modules	8, 6 or 4 (shall be specified while ordering)	2 or 1 (shall be specified while ordering)
	Modulation Type	VSB – Single Side Band	
	Carrier Standards	PAL B/G, PALD/K, PAL I, PAL L	
	Video/Audio Level Ratio	-12 dB / -16 dB, digitally adjustable	
	Number of Audio Channels	1 (Mono)	
	Output Channel Range	S03 – E69 programmable (118 MHz – 862 MHz)	
	Frequency Stability	± 5 kHz	
	Output Impedance	75Ω	
	Output Level Adjustment	Digitally programmable between -7...0 dB range	
	Signal/Noise Ratio (SNR)	> 60 dB	
	TV Test Picture	On/Off selectable from menu	
	Combiner	Internal	
RF Input/Output	Number of External RF Inputs	1	-
	External RF Input Band	47 – 862 MHz	-
	External RF Input Level	80 dBμV max.	-
	External RF Input Impedance	75Ω	-
	Combined RF Output Level	92 dBμV	90 dBμV
	Combined RF Output Lvl. Adj.	-20...0 dB	-
	Combined RF Output Imp.	75Ω	
A/V Inputs	Audio Input Level	500 mV ± 6 dB (RMS)	
	Audio Input Impedance	680Ω	
	Video Input Level	2 Vpp @ 87.5% modulation depth	
	Video Input Impedance	75Ω	
Processor & Memory	Processor	Freescle MC9S08GT16	Freescle MC9S08AC8
	RAM Memory	2 kB	0.7 kB
	Flash Memory	16 kB	8 kB
General	Dimensions and Weight	483mm x 265mm x 88mm, 5.2 kg. (8 modules)	483mm x 170mm x 48mm, 2.2 kg. (2 modules)
	Mechanical Structure	Sheet Metal Housing, 19" 2U Rack Type, IP20	Sheet Metal Housing, 19" 1U Rack Type, IP20
	Operating Environment Temp.	-20°C...+55°C	
	Input/Output Elements	A/V Inputs: RCA Jack (4-8 Pairs, Rear Panel) RF Input/Output: F Type (2 Pieces, Front Panel)	A/V Inputs: RCA Jack (1-2 Pairs, Rear Panel) RF Input/Output: F Type (1 Piece, Front Panel)
	Mains Input	90-240 VAC, 50-60 Hz	
	Mains Connection	From rear panel, with IEC 320 compliant power cord	
	Power Consumption	30W	12W
	Safety Standard	EN50083-1, EN60065	

11. Contact Information

Manufacturer: TRON ELEKTRONIK SISTEMLER SAN. VE TIC. A.S.

General Distributor: TRODIO ELEKTRONIK PAZARLAMA LTD. STI.

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