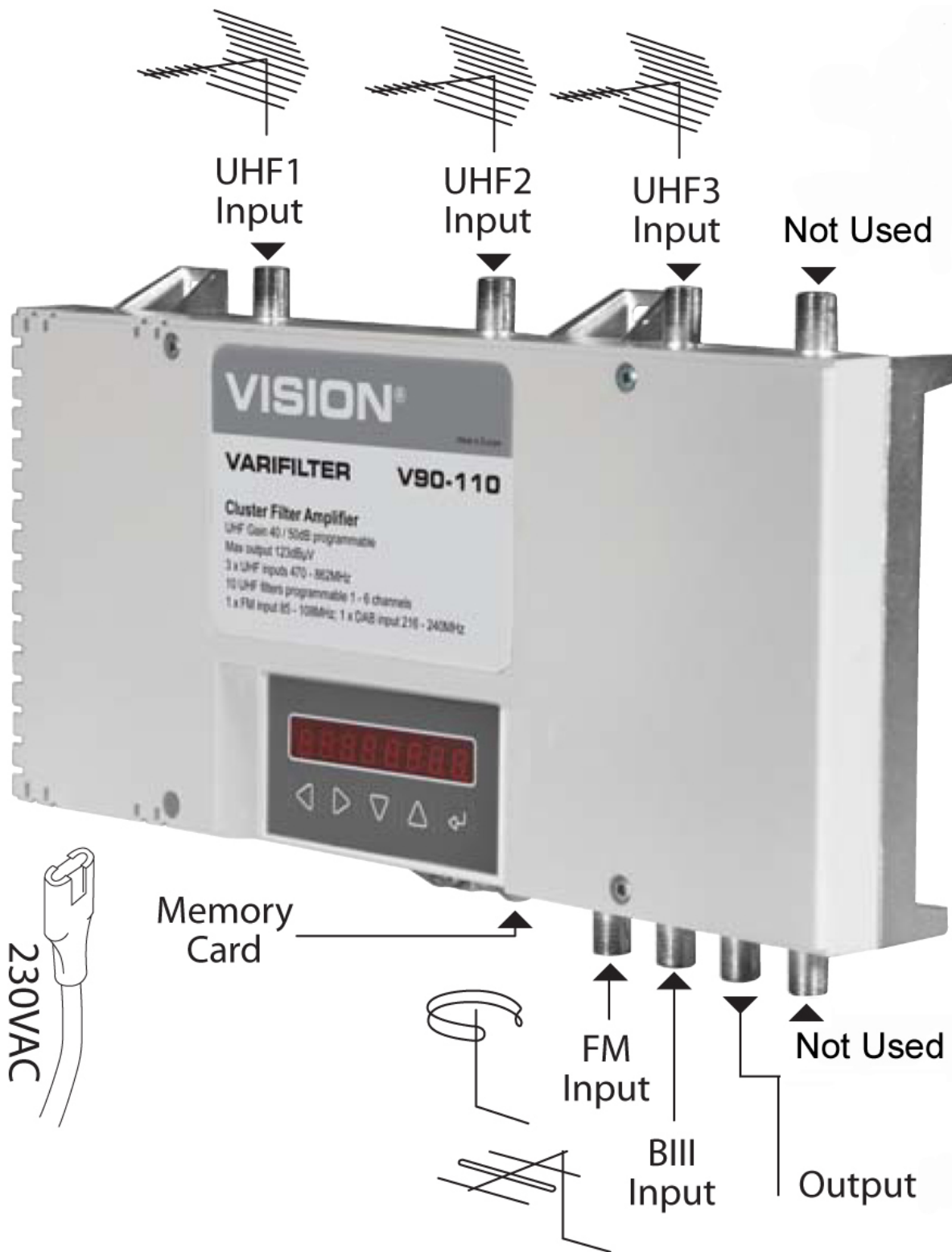


## V90-110 Varifilter

### Configuration and Installation Instructions



# VISION VARIFILTER™

## V90-110 Cluster Filter Amplifier

### **Introduction**

The Vision V90-110 Varifilter™ is a fully programmable UHF channel “cluster” filter and MATV launch amplifier with selectable 40dB to 50dB gain (in 1dB steps) and a maximum output of 123dBμV\*. It also has FM and DAB inputs each with up to 40dB gain. This microprocessor-controlled amplifier is ideal for filtering the UHF signals and equalising channel clusters for larger MATV and IRS networks. The installer can configure the 3 UHF inputs to coincide with 6, 9 or 10 channel cluster filters to allow the installer to filter and mix signals from a single or several sources.

Key features are: -

- 3 UHF configurable inputs + separate FM and DAB inputs
- Configurable 40dB to 50dB maximum gain in 1dB steps
- Programmable 30dB attenuation in 100 steps for each filter
- Each of the 10 filters can be set between 1 and 6 channels wide
- 119/123dBμV\* maximum output, 85dBμV maximum input
- Easy to read programming display
- Memory card copy and clone facility
- PIN code lockable to avoid tampering
- High quality fully screened die-cast housing
- Built-in switch-mode-power-supply

Before installing the Varifilter we recommend the installer familiarises themselves with this instruction manual.

(\*Note: Maximum output - 119dBμV at 40dB gain, 123dBμV at 50dB gain. EN50083-3 IMD<sup>3</sup>-60)

### **Precautions**

The Varifilter is mains powered and designed for indoor installation only. It should be mounted vertically to maximise ventilation through the case. If mounted in a “portrait” position make sure the power supply is at the top so that any heat can escape away from the unit. Do not mount the Varifilter in areas of high humidity or near any source of moisture or heat. Ensure that it remains properly ventilated and cannot be covered by any form of insulation. When mounted in a cabinet it may be necessary to install ventilation fans to force a flow of air through the Varifilter. For best practice the Varifilter should be mounted on a baseboard rather than directly to a wall. Do not allow the Varifilter to hang on its cables as this may cause damage to the connectors or circuit board inside which will not be covered by warranty

The Varifilter should be connected to a fused (3A) mains supply. A mains lead with UK plug fused at 3A is provided for this purpose.

Make sure that all coaxial connections are made before connecting the mains supply. If disconnecting any coaxial connections, disconnect the mains supply first. This unit and any coaxial cable network connected to it must be earth bonded for safety in accordance with current legislation and codes of practice. For a full range of earth-bonding accessories consult your Vision supplier.

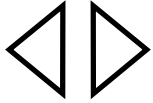
### **Important**

**The maximum signal input level to the Varifilter is 85dBμV**

It is possible to overload and damage the amplifier if this level is exceeded. The Varifilter is delivered from the factory with the gain set to minimum to avoid accidental damage, however care should be taken, as with any amplifier, not to exceed the rated specification.

**Channel Planning & Configuration**

It is important to consider the local transmitter channel plan and other required signal sources before programming the Varifilter. The Varifilter **must** be programmed before use, using the four cursor-keys in the keypad and the 8-digit LED display.




The left and right arrows of the keypad will move the cursor dots under the parameter to be set.




The up & down arrows of the keypad change the value of each selected parameter.


**Setting the gain and input configurations for the filters**

After powering up the Varifilter, the display will temporarily show the software version after which the display will go blank and the setup mode can be entered.

Press the “ENTER” key 


Four dots will flash in the last 4 segments

Press the “UP” arrow           
0 0 0. 0. will appear in the display.

Press the “ENTER” key for the 1<sup>st</sup> programme menu 

The display shows the status of the amplifier. The 0.0. Indicates “amplifier mode” and the “4 0” in segments 3 and 4 indicates a maximum 40dB of gain. The 1 1 1 indicates filters 1-6, 7-9 and filter 10 are all connected to **UHF input 1**

**Setting the gain**

Press the “RIGHT” arrow 

The cursor dots will move to segments 3 and 4.

Press the “UP” arrow to adjust the maximum gain in 1dB steps.





**Setting the filters to the required input**

**Segment 6 = Filters 1 to 6**

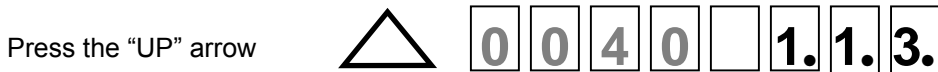
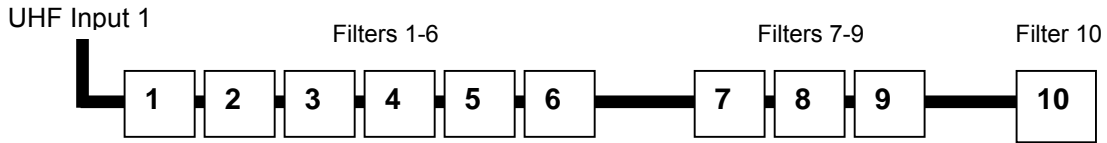
**Segment 7 = Filters 7 to 9**

**Segment 8 = Filter 10**

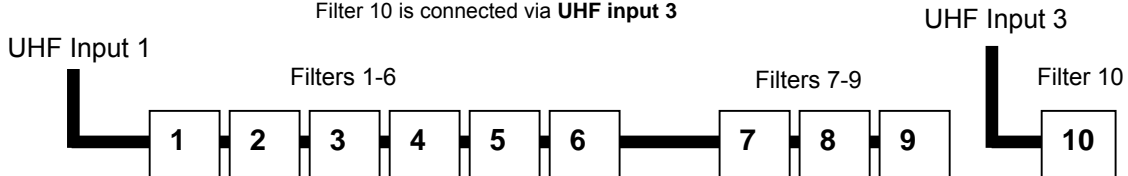
The following input configurations allow the installer to filter signals from different sources. There are 10 filters. Each group of filters is "connected" to each of the 3 UHF inputs in the following sequences: -



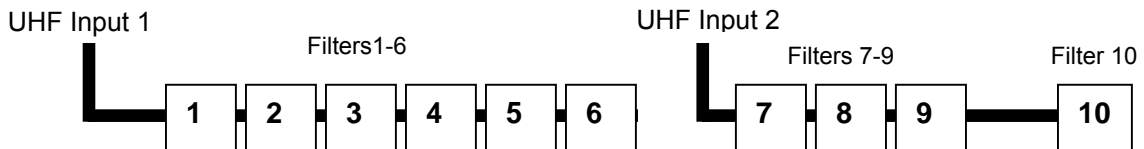
When display segments 6, 7 and 8 are as shown **all filters are connected via UHF input 1**



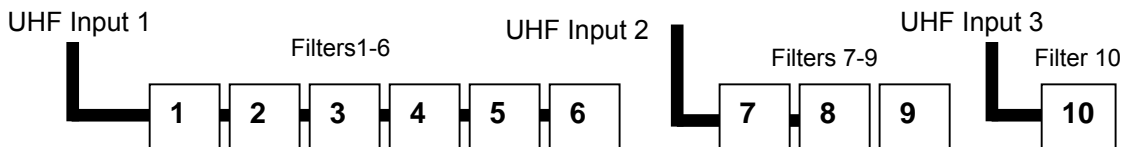
Filters 1 to 6 connected via **UHF input 1**  
 Filters 7 to 9 connected via **UHF input 1**  
 Filter 10 is connected via **UHF input 3**



Filters 1 to 6 connected via **UHF input 1**  
 Filters 7 to 9 connected via **UHF input 2**  
 Filter 10 is connected via **UHF input 2**



Filters 1 to 6 connected via **UHF input 1**  
 Filters 7 to 9 connected via **UHF input 2**  
 Filter 10 is connected via **UHF input 3**

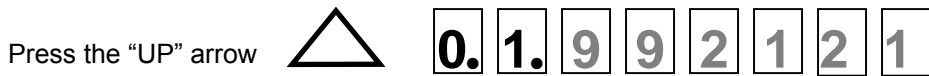


This is the most common UK input configuration where up to 6 clusters of channels are required from the local transmitter and connected to input 1. Inputs 2 and 3 can be used for other signal sources or terminated at 75Ω.

### Setting the channels and levels for each cluster filter

This section explains how to select each filter, change the filter bandwidth, set the channels numbers and attenuation for each cluster of channels.

Having chosen which input configuration is required press the right arrow to move the cursor to the first 2 segments of the display so that the filter mode can be entered.



Display segments 1 and 2 indicate which filter is selected.

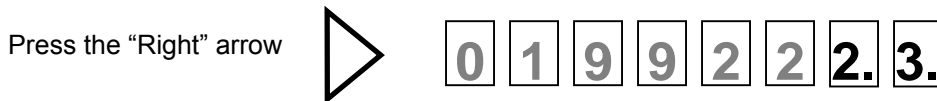
Segments 1 and 2 indicate filter 1.  
Segments 3 and 4 display the gain level shown in %. (E.G 99% gain)  
Segment 5 and 6 indicates the start channel for filter 1. (E.G. 21)  
Segment 7 and 8 indicate the stop channel for filter 1. (E.G. 21)



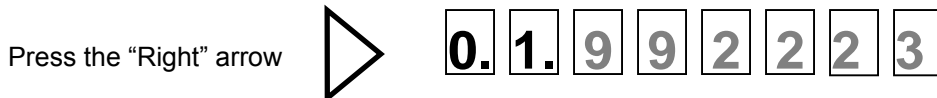
To move the cursor dots under the start channel for filter 1.



Press the "UP" arrow to change the start channel for filter 1 to the desired channel. Each press of the "UP" arrow will change the channel by 1. **If a channel is duplicated, the display will flash.**



This moves the cursor dots under the "end channel" for that filter. Set the stop channel of filter 1 to the desired last channel in that channel cluster.



This will move the cursor dots back to the selected filter displayed in segments 1 and 2.




Filter 2 is now displayed. Repeat the setting of the desired start and stop channels for channel cluster 2.


Note: Each cluster filter can be set from 1 channel wide to a maximum 6 channels wide. Channel clusters cannot overlap, as the Varifilter will not permit duplicated channels. Channel cluster planning will vary for each transmitter but normally there are 5 or 6 clusters of UHF channels. Most clusters of digital and analogue channels are normally 2 or 3 UHF channels wide but there may be local variations.

**Radio Set up**


**FM Filter**

The FM input filter is a full band 88 -108MHz filter with a maximum 40dB of gain and 18dB of adjustment. The FM filter bandwidth cannot be programmed. The gain setting can be set as follows: -

Using the "Right" arrow move the cursor dots under display segments 1 and 2. 

Press the "UP" arrow  1. 2. 0 0

This indicates filter 12 is selected which is the FM filter.

Press the "RIGHT" arrow  1 2 0. 0.

The cursor dots indicate the FM gain setting from 0 to 9 (0 to 18dB adjustment). One step of the display is approximately 2dB of adjustment.

Press the "UP" and "DOWN"   arrows to adjust the gain to the required amount.

The gain can be adjusted to a maximum of 18dB of regulation with a total available gain of 40dB.

**DAB / Band III Filter**

The DAB / Band III input filter is a full band 174 -230MHz filter with a maximum gain of 40dB and 18dB of adjustment. The DAB / Band III filter bandwidth cannot be programmed. The gain setting can be set as follows: -

Using the "Right" arrow move the cursor dots under display segments 1 and 2. 

Press the "UP" arrow  1. 3. 0 0

This indicates filter 13 is selected which is the DAB / Band III filter.

Press the "RIGHT" arrow  1 3 0. 0.

The cursor dots indicate the DAB / Band III gain setting from 0 to 9 (0 to 18dB adjustment). One step of the display is approximately 2dB of adjustment.

Press the "UP" and "DOWN"   arrows to adjust the gain to the required setting.

The gain can be adjusted to a maximum of 18dB of regulation with a total available gain of 40dB.



### **Memory Card**

The V90-110 Varifilter is fitted with a memory card slot in the lower edge of the case next to the FM input connector. The memory card is a bespoke Vision memory card, which can store all of the parameters programmed into a Varifilter. These parameters can be then copied into another Varifilter.

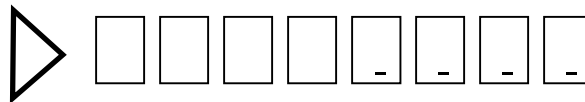
A Varifilter can “save to” or “read from” the external memory card. Up to 10 sets of Varifilter configuration parameters can be stored on a single memory card.

To operate the memory card simply insert it into the slot. The Varifilter will detect the card automatically and the display will show the corresponding menu. To exit the memory card menu simply remove the card from the slot where the Varifilter will detect the removal and return to its previous state.

When a Varifilter detects the presence of a memory card on powering, it automatically loads “SET 1” of the stored configuration parameters. No user adjustments are required to programme the Varifilter to the pre-stored settings. This is useful where an unskilled operator is required to install or re-programme a number of Varifilters on a mass scale. This is especially useful where the frequency plan has changed in events such as the digital switch-over.

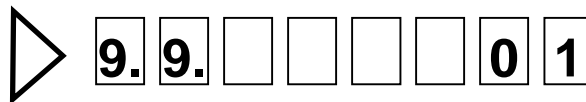
### **Read/Write Settings**

After the memory card is inserted, four dots in display segments 5, 6, 7, and 8 will flash.



Input the password PIN number if necessary.

Once the Varifilter has entered its start up routine the “read from” or “write to” menu will be displayed.



9. 9. Indicates, “Read From” the external memory card. 8. 8. Indicates “Write To” the external memory card.

0 1 in display segments 7 and 8 indicate that configuration SET 1 will be stored or read. The possible number of configurations is between 0 and 10.

There are two possibilities in this menu: -

8.8 Write to the external memory plus the memory configuration set you wish to write to 01 to 10

9.9 Read from the external memory plus the memory configuration set you wish to read from 01 to 10.

Align the cursor dots under display segments 1 and 2 using the “RIGHT” arrow button and the “UP” or “DOWN” buttons to change from 8. 8. the “Write to” menu to 9. 9. the “Read From” menu.

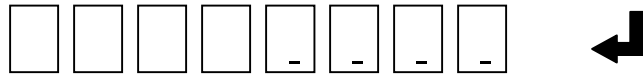
Move the cursor dots using the “RIGHT” arrow to segments 7 and 8 and using the “UP” or “DOWN” arrows, choose the memory SET 01 to 10 you wish to write to or read from.

If an error is detected or the data transfer is not completed the display will show flashing “000000”.

### Password PIN numbers

The Varifilter can be password or PIN number protected to stop unauthorised access to the programming functions.

The PIN number is a four-digit number entered from the keypad arrows. The “LEFT” and “RIGHT” keys select the number to be changed and the “UP” and “DOWN” arrows to change the desired number.



The factory default PIN number is “0.0.0.0”. Once the desired PIN number is selected press the enter key.

If the user has lost the PIN number, disconnect from the mains supply. Press both the “ENTER” and “DOWN” keys simultaneously and re-connect the mains supply. The display will show a six-digit code number. Contact your distributor with this code and they will be able to recover the PIN number from this six-digit code.

To modify the PIN number press the “ENTER” key and enter the current PIN number.

Keep the “ENTER” key depressed until the LED dots flash.

Enter the new PIN number.

To confirm the new PIN number and enter the programming menu, press the “ENTER” key once again.

To exit the programming menu simply press the “ENTER” key again.

### Specification

Model	V90-110				
Bands	FM	DAB	UHF 1	UHF 2	UHF 3
Frequencies MHz	87.7	174-230	470-862	470-862	470-862
Gain	40 dB	40 dB	Programmable 40 dB to 50dB in 1dB steps		
Gain Regulation	-18dB	-18dB	-30 dB		
Input Bandwidth	85MHz-108MHz	216MHz-240MHz	470MHz-860MHz		
Max. Input Level	85 dB $\mu$ V	85 dB $\mu$ V	85 dB $\mu$ V		
			Filter1-6	Filter 7-9	Filter 10
Input to filter Configuration (Bold indicates input programming)	-	-	Input 1 Input 1 Input 1 Input 1	Input 1 Input 1 Input 2 Input 2	Input 1 Input 3 Input 2 Input 3
Max. Output level (50dB Gain)	123 dB $\mu$ V (DIN 45004B 2 Channels)				
Max. Output level (40dB Gain)	119 dB $\mu$ V (DIN 45004B 2 Channels)				
Noise figure	6 dB	6 dB	8 dB		
Selectivity	40dB		> 22 dB @ +/- 16MHz from channel edge		
Mains power	230V AC +/-10%				
Power consumption	10 VA				
Operating temperature	0° to + 50°C up to 90% of ambient humidity				
Dimensions/Weight kg	283 x 153 x 41 mm 1.5kg				
Protection category	IP30 – Indoor mounting				

For further technical and product information on this and the whole Vision product range, contact your Vision distributor or the Vision technical support office.