



Digital multiband amplifier

WWK 951+

Operating Manual

1. Purpose and characteristics of the amplifier

WWK 951+ is a digital multi-band amplifier. It is intended for use in antenna systems for the reception of digital terrestrial television programmes (DVB-T/T2), in single-family houses, residences, boarding houses, hotels, resorts, schools, hospitals, etc. It is perfectly applicable in places with difficult reception conditions, where the received signals (VHF, UHF) have different levels and come from different directions. In such situations, the amplifier, selecting the desired channels, equalises their levels, amplifies and sends them aggregated further into the system.

The **WWK 951+** is TELKOM-TELMOR 's latest development in the field of multiband amplifiers. It has built-in LTE / 5G filters and surge and short-circuit protection. The amplifier is suitable for FM, DAB, DVB-T/T2 (VHF and UHF) bands.

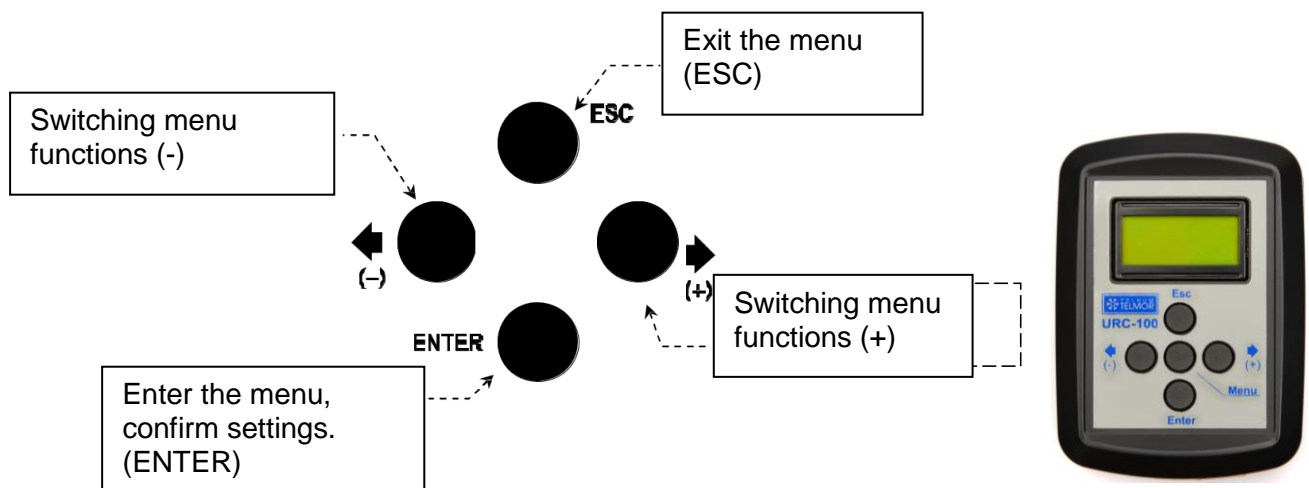
With the new technology, we have also added new functionality:

- **AGC - automatic output level control**
- **Measuring the power of received signals**
- **Smart SCAN - automatic programme search**

2. Control

The device is regulated via an external URC 100 programmer, connected via a USB type A port located on the input side of the antenna signals.

The logic for navigating the menu of the WWK 951+ itself is outlined below:



3. Starting the amplifier

The WWK-951 amplifier should be connected and started after installation and proper alignment of receiving antennas. The antennas should be set optimally in terms of signal quality from a given transmit direction. It is recommended to use a signal level meter to align the antennas.

1. The amplifier does not have any channels programmed as standard, so it does not distribute signals received by VHF and UHF antennas.
2. Connect the antennas to the appropriate amplifier inputs:
 - FM antenna (87,5...108MHz) to the FM input;
 - antenna for DAB or VHF signals (174...230MHz) to the VHF DAB input;

- antenna for IV/V band signals (470...694,790 or 862MHz) to the UHF1 or UHF2 input,

IMPORTANT!!! Unused inputs should be terminated with a 75 Ω terminating resistor.

The VHF/UHF1/UHF2 inputs can be connected to antennas equipped with TV preamplifiers.

The preamplifier can be supplied with 12V DC at a maximum of 80mA, The amplifier is capable of supplying a maximum of 200mA to all VHF/UHF paths. The setting is adjusted in the "**POWER ANT.: xx**" menu. There, the power supply of the selected value can be switched on individually for each input.

The + indicates that the voltage is on, the - indicates that the voltage is not on at the selected input.

4. SMARTSCAN function

Thanks to the SMARTSCAN function, we can quickly and efficiently search the entire VHF and UHF band from connected terrestrial antennas and programme the unit.

To start the scan, enter the "SMARTSCAN" option by pressing ENTER and then select for which inputs should be scanned. By setting "+", the WWK 951+ will scan the terrestrial signals from the respective input. A setting of "-" will omit the input in question from the scanning process.

Once all the values have been set, a menu will appear asking about the use of preamplifiers.

By default, scan the band with no preamplifiers enabled. If, after scanning, we run out of signals that should be received in a particular location, then we can repeat the process with the preamplifiers switched on.

Once the scan is complete, the device will programme the channel filters according to the signals found. What remains is a possible adjustment of the output level (individually or collectively) and a signal slope/correction setting.

5. Preamplifier

In the "Preamplifier" menu, we can determine the operating status of the built-in preamplifiers on the VHF/UHF1/UHF2 inputs. The use of preamplifiers is necessary for very weak signals from terrestrial antennas. Allows the signal strength to be increased before further processing. The preamplifier allows operation with TERR muxes as low as 40dBµV.

In the main menu, use the "<" and ">" arrows to move to the "Preamplifier" submenu, press ENTER and, one by one, the following values can be set for each input:

"+" - preamplifier on

"-" – preamplifier off

"A" - preamplifier in automatic mode - if the input signal is high, the unit will switch off the preamplifier at this input. If the input signal is low - the preamplifier will be switched on.

6. DVB-T/T2 VHF/UHF channel configuration

To select the channels you would like to amplify you need to:

1. Enter by pressing the right or left arrow until the display shows VHF or UHF1 or UHF2. Depending on which input you want to program channels from, select the appropriate menu and click ENTER.
2. The "Add Channel" message will appear. Press ENTER.
3. Now, using the right/left arrows, we can select the channel number on which we receive the DVB-T signal. For VHF input from 5th to 12th channel, for UHF1 and UHF2 inputs from the 21st to the 48/60/69th channel. Once selected, press ENTER
4. We can now observe the value of the input level measured in dB μ V. Output level range - 92..112dB μ V. Click ENTER to confirm.
5. The unit has an automatic limiter that will reduce the maximum output level as the number of programmed channels increases. **For example, for 6 MUX the maximum value is 108dB μ V.**
6. To add another channel from the same antenna, press the right arrow and programme similarly.
7. When the adjustment is complete, press BACK.
8. To delete a programmed channel, select it by entering the menu of the corresponding VHF/UHF1/UHF2 input. Then hold down the ENTER button until the "Channel deleted" message appears on the display. Then press the BACK button to return to the previous menu.

7. FM track control

The FM track is not digitally processed. They are amplified in bands. In order not to distort the amplified signal, use the built-in attenuator which will adequately suppress too high signal levels.

The value of gain and maximum output level is available in the table with technical parameters.

8. Adjustment of output level and equalization

In the unit's menu, we can set the global output level for all programmed channels from the VHF and UHF inputs. With this option, all signals will be transmitted with equal power. In addition, the device is equipped with a function of correction (slope) of signals, thanks to which you can determine the appropriate difference between the signals from the beginning and end of the band. You can distribute such inclined signals over sections with higher attenuation (longer cable sections).

Output signal adjustment:

1. Pressing the right/left arrow selects the EXIT option. Press ENTER.
2. The option "Level: xxx dB μ V" will appear. Press ENTER and use the right/left arrows to select the desired value. Confirm by pressing ENTER. The adjustment range is 20dB (from 92 to 112dB μ V). The range is reduced when more channels/filters are added.
3. By pressing the "<" and ">" arrows, go to the option "Correction: xdB"
4. Press ENTER and use the arrows to select a value from -9 to 0dB.
 - a. 0 dB means equal gain for all channels
 - b. -9 dB represents the maximum channel slope in the band between 87MHz and 694MHz. The power of the intermediate channels will be calculated automatically .
5. When the adjustment is complete, press ENTER and then BACK to return to the main MENU.

9. DAB mode

We have added special functionality for DAB-type antennas. It is designed to allow the entire DAB band to be carried to the output, without the need to programme a specific channel. In this way, newly appearing channels in the DAB/VHF band will be automatically amplified and the amplifier will not need to be reprogrammed.

In the "DAB MODE" menu you can select:

1. VHF - the VHF input features selective channel filter programming.
2. DAB - the entire DAB/VHF band is amplified.

10. MENU Configuration

In the "CONFIGURATION" menu, we have the following items to choose from:

1. Power status: XX - OK indicates the correct power supply voltage.
2. PIN - allows you to set a PIN for the device to prevent unauthorized access
3. LANGUAGE - MENU language selection.
4. VERSION - the software and hardware version.
5. Import Config - read settings from USB*
6. Export Config - save settings to USB*

* Menu visible after inserting the stick in the USB port. Flash memory should be formatted in the FAT32 standard

11. Software update

If a software firmware update is required, the following procedure should be carried out:

1. Download the software and copy it to a FAT32-formatted USB stick
2. Disconnect the WWK 951+ from the mains supply.
3. Insert the USB flash drive into the "USB Programmer" connector (USB type A)
4. Using a wire, paperclip or other thin metal tool, short the point located under the power diode on the device cover to the housing.
5. Switch on the power supply.
6. As soon as the power LED lights up red, the jumper can be removed. Do not disconnect the WWK from the mains until the update process is complete.
7. The update procedure will take less than a minute (the LED will be solid green)



12. Amplifier menu tree

WWK 951+	VHF/D	VHF		
		DAB		
	DC.PASS	1:x 2:x 3:x		
	P.AMP.	1:x 2:x 3:x		
	A.SCAN	INPUTS	1:x 2:x 3:x	
			Scan w. <u>p.amp.</u> : YES/NO	
	UHF1 UHF2 VHF	<u>Wx: Add</u> channel		
		<u>Wx: CHxx</u> <u>Lev=xxdB</u>		
	OUT	<u>Lev xxxdB</u>		
		<u>Eq xdB</u>		
	FM	<u>Gain:xxdB</u>		
	CONFIG	PWR: OK/LOW/HIGH		
		DEFAULT		NO YES
		PIN: off/on		PIN: ----
		Language:		POL ITA ENG
<u>VerYYxZZ</u> <u>x.x_x.x.x_x_xx</u>				
Import				
Export				

13. WWK 951+ Technical Specifications

Parameter	Unit	FM	VHF	UHF1 UHF2
Operating frequency	MHz	87,5 - 108	174 - 230	470 - 694
Gain	dB	30	12 - 70 (AGC)	
Gain / output level adj.	dB	20	20	
Tilt (corrector)	dB	-	0 - 9	
Selectivity of channel filters	dB	-	>35	
Separation between inputs	dB	-	>30	
Mismatch attenuation on outputs	dB	> 10	> 10	
Mismatch attenuation on outputs	dB	>10	>10	
Noise factor	dB	9,5	-	
Input level	dB μ V	50 – 100	40 – 100	
Minimum digital signal input level providing: C/N ratio	dB μ V		50	
error rate BERi	dB		≥ 30	
Modulation Error Ratio MER	/ dB		$\leq 9*10E-5$ ≥ 31	
Maximum output level (DIN 45004B: -60dBc TERR; -35dBc SAT)	dB μ V	112	112	
Maximum output level (6mux)	dB μ V	-	108	
Power supply to preamplifiers/ LNB	V/mA	-	12/ 50	
Operating temperature	$^{\circ}$ C	0 ... +50		
Power supply	Vac	100 - 240		
Power consumption (max.)	W	14		
Dimensions	mm	226x128x51		
Net weight	kg	0,7		
Packaging	/	cardboard box		
Index	/	WWZ-0200-047-01		

The technical specifications are subject to change without prior notice.

Disposal of unnecessary electrical and electronic equipment.



This symbol on the product or packaging means that the product must not be treated as household waste, but should be delivered to the appropriate collection point. The EU and other European countries have implemented separate waste disposal systems for electrical and electronic equipment. Such pro-ecological behaviour helps prevent potential adverse impacts on the environment and human health which may occur as a result of incorrect storage of the product. Recycling the waste helps save the environment.



For more detailed information about recycling and recovery of electronic materials from this product, please contact your city or municipality, your local waste recycling plant.