DSP20evo

LEM ELETTRONICA®
Satellite and TV reception equipment

Digital Signal Processor

TV Terrestrial programmable amplifier

- Total output level max 100dBµV
- ≥50dB digital filters on adjacent channels
- Single filter selectable bandwidth
- Channel to channel conversion
- UHF inputs with high rejection Lte 700 filters
- Dual-stage input amplifiers
- DAB filter 174... 230MHz
- Auto-tuning for automatic channel scanning
- Display and Android / Windows APP programming

AUTO TUNING · LEM USB · RED COMPLIANT · WARRANTY 5 YEARS

TECHNICAL SPECIFICATIONS		
NUMBER OF INPUTS	5	1 FM; 3 UHF; 1 DAB/B3-UHF
FM INPUT FREQUENCY RANGE	MHz	FM (87,5... 108);
UHF1	MHz	470... 694
UHF2	MHz	470... 694
UHF3	MHz	470... 694
DAB/B3-UHF4	MHz	170... 240; 470... 694/862
SINGLE CHANNEL FILTERS		32
NUMBER OF CHANNEL PER FILTERS		1 (with channel to channel conversion)
INPUT LEVEL RANGES	dBµV	FM 35... 90 - B3/DAB 40... 110 - UHF 45... 110
FILTERS SELECTIVITY	dB	≥50 (Adjacent channels)
AUTOMATIC CONTROL GAIN RANGE	dB	40 dB
VHF/UHF INPUTS AMPLIFIER GAIN		OFF / +15 / +30
FM GAIN	dB	10 (Adjustable 0... -30dB)
VHF GAIN	dB	40
UHF GAIN	dB	48
SELECTABLE FILTERS BANDWIDTH		Standard (8MHz) / Narrow (-500KHz) / Wide (+750MHz)
OUTPUT LEVEL RANGE	dBµV	70... 90
UHF ADJUSTABLE SLOPE	dB	0... -10 (1 dB step)
VHF ADJUSTABLE OUTPUT	dB	0... -10 (1 dB step)
MAX TOTAL VHF-UHF OUTPUT LEVEL	dBµV	100 DIN 45004B
INPUTS REMOTE POWER		12V / 24V 100 mA
RETURN LOSS IN/OUT	dB	>12
AMPLIFIER POWERING		100...240VAC 50/60Hz (External power supply 15VDC / 1,25A)
MAX AMPLIFIER CONSUMPTION	W	8
MAX AMPLIFIER CONSUMPTION + REMOTE POWER	W	10
OPERATING TEMPERATURE	°C	-5... 50
DIMENSIONS	mm	193 x 149 x 36

Pictograms / symbols description

The DSP20evo amplifier is covered by an extended 5-year warranty from the date of manufacture.

The programmable amplifier complies with the RED 2014/53/EU directive.

The DSP20evo amplifier can also be programmed via a free graphic application available for Windows and Android OS.

The AUTO-TUNING scanning function serves to speed up the programming procedure by automatically storing DVB-T/T2 Channels.

The UHF inputs are protected by filters against Lte 5G and 4G interference.

Heed the warning and safety instructions.

Hints and tips on the use of the product.

Symbols and electrical safety

Product complies with CE marking requirements.

For indoor use only.

Symbol indicating earth terminal

Symbol indicating that the supplied mains power supply complies with the safety requirements for class II devices.

To avoid risk of fire or electrocution, do not open the mains power supply provided.

RoHS 2011/65EU compliant product.

Pursuant to Article 24 of Legislative Decree No. 49 of 14 March 2014 “Implementation of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)”.

Package Contents

01 DSP20evo programmable amplifier

01 Power supply YS25-1501250 (100... 240VAC 50/60Hz 0.5A - 15VDC 1.25A)

08 Dowels 6x30mm with screws 4.5x40mm

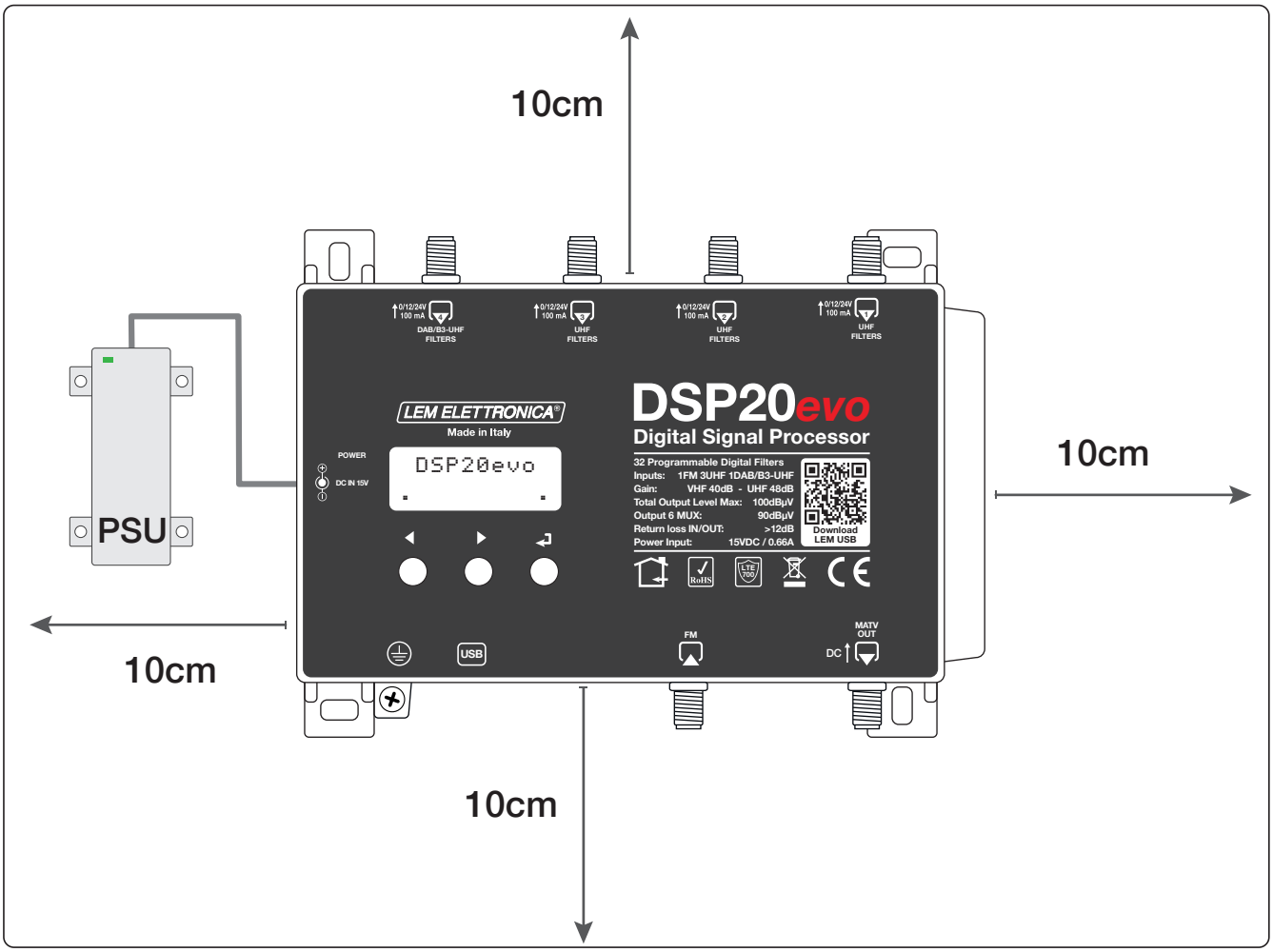
01 User Manual

Installation warnings

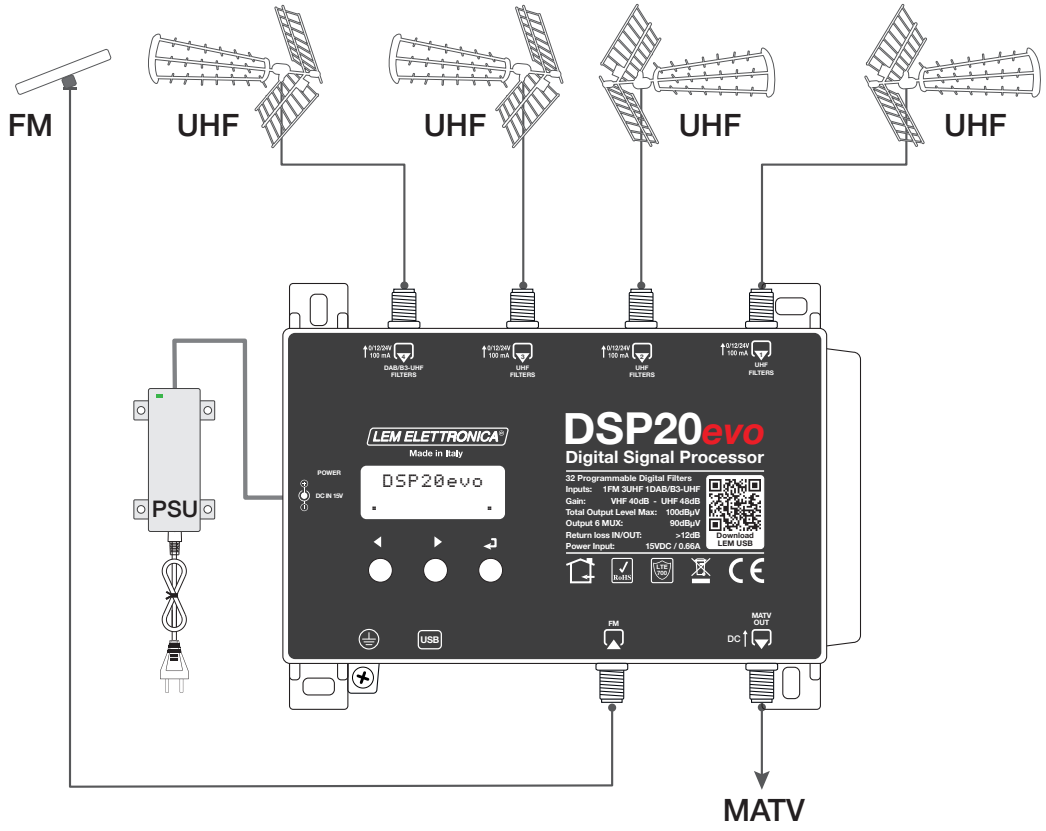
- Use only the supplied power supply unit.
- To ensure adequate cooling and ventilation, the DSP20evo unit and power supply unit must be securely fixed to a vertical wall.
- To avoid the risk of fire or electrocution, do not expose the products to rain or moisture.
- Products must not come into contact with water or be wetted by liquids.
- Do not place products near heat sources or in places with moisture.
- In the case of installation in a cabinet or recessed compartment, provide adequate ventilation and observe the minimum distances given in the drawing below.
- Prepare the mains connection in accordance with the regulations in force in the country of installation and in such a way that the power supply unit can be easily disconnected from the power source.

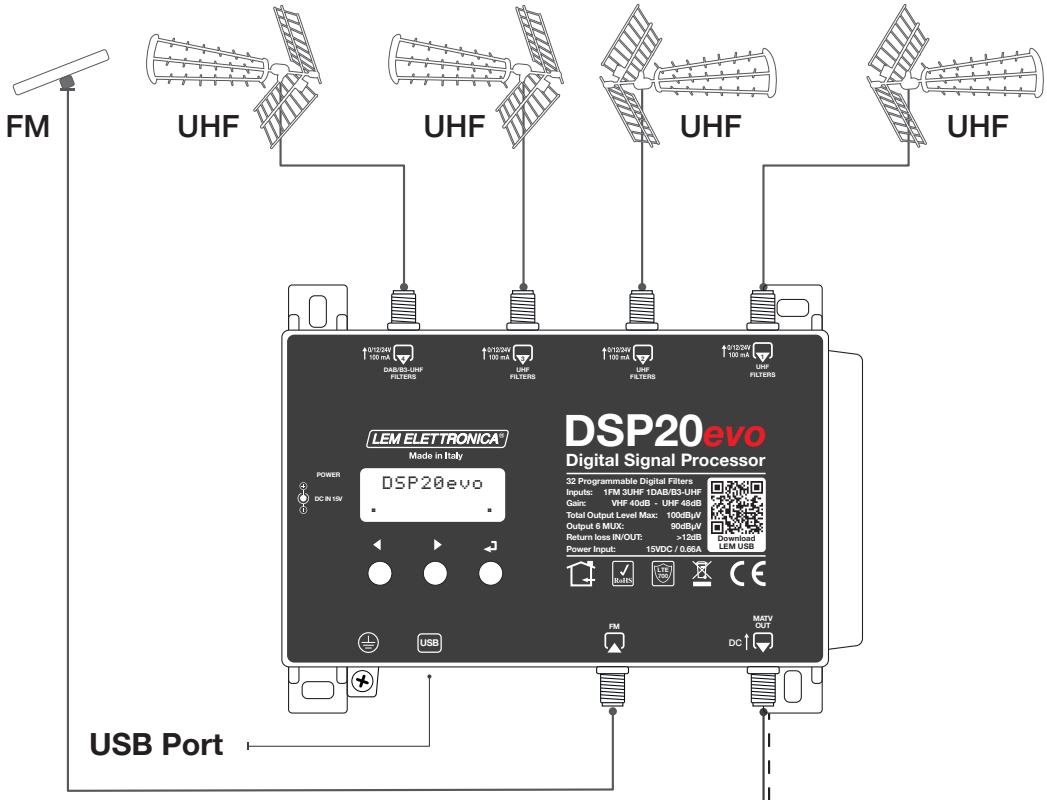
Connections and start-up

1) Proceed with the connection of the coaxial input and output cables equipped with their own earth terminal block.
2) Close the unused inputs with 75Ω terminations (code RCS75).
3) Connect the power supply to the mains socket only after all other connections have been made.



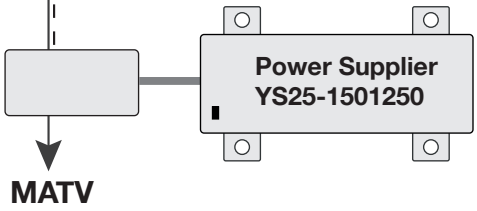
Application examples





The amplifier DSP20evo can also be powered over coaxial cable through the use of a coaxial voltage injector*.

* sold separately



Device Programming

The **DSP20evo** programmable amplifier can be configured in two different ways:

1) using the display and navigation keys integrated into the control unit.

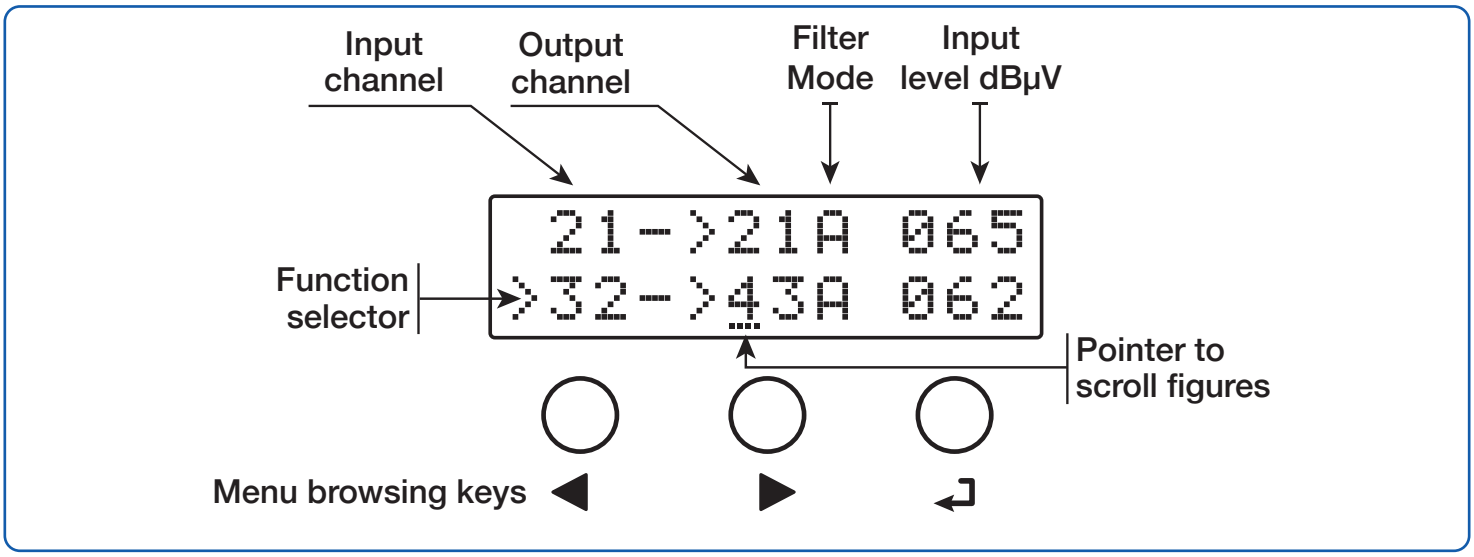
2) using the application **LEM USB** available for Android OS and Windows OS.

LEM USB for Android can be downloaded from Google Play.

LEM USB for Windows can be downloaded from the download page of www.lemelettronica.it

Description of display use

- To activate the display, briefly press the ↵ key.
- To access the menus, press and hold the ↵ key for 3 seconds.
- To make a value in the display modifiable, place the function selector > using the navigation keys ∇ Δ. Pressing ↵ will activate the pointer ___ under the data, which can be modified with ∇ Δ keys. To confirm the change press ↵.



Note: after 3 minutes of inactivity the display switches off but the menu remains open on the last selected function. To resume press any key.

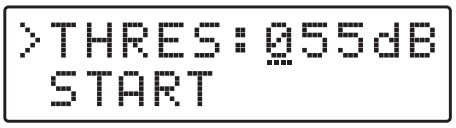
To return to the main level menu from any sub-menu, simultaneously press the ∇ Δ

Automatic Channel Programming

To speed up the programming process, you can use the **AUTO-TUNING** function. When this function is activated, the **DSP20evo** amplifier will automatically scan the inputs (1; 2; 3; 4) and store only DVB-T/T2 signals.

To start the **AUTO-TUNING** procedure select **AUTO** and press ↵. For best results, you will be asked to confirm some parameters before starting the scan.

THRESHOLD LEVEL

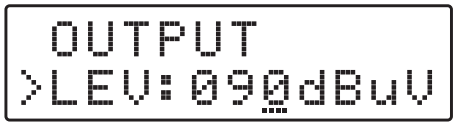


The 55dBµV factory threshold is optimal for most situations, but it is possible to change it.

Note: Lower values of 55 increase scanning sensitivity. Values higher than 55 decrease scanning sensitivity.

AUTO-TUNING START

Select **START** to start automatic channels scanning. The duration of the **AUTO-TUNING** procedure depends on the number of channels received from the connected antennas.



Once the **AUTO-TUNING** procedure is complete, the display will show the total output level calculated according to the number of channels found in the scan. To confirm and complete the procedure press the ↵ key. If you wish to change the value of the output level, use the ∇ Δ keys and confirm by pressing the ↵ key.

If no channel/MUX is found, the display will show the message **NO MUX FOUND**. Check that the connections to the TV antennas are correct or decrease the **THRES** value and repeat the search.

If the number of channels/MUXes found after the AUTO-TUNING scan is lower than expected, repeat the procedure with a lower THRES value. If unwanted filters are activated, increase the THRES value. A lower THRES value enhances search sensitivity.

Manual Programming

```
TUNING
AUTO      MAN
```

To start manual programming, select MAN using the ∇ key and press ↵.

INPUT (1) UHF

```
IN (1)  UHF
```

To set input parameters (1) press ↵.

INPUT REMOTE POWER

```
 IN (1) UHF
>DC:OFF
```

To enable or disable the remote power feed from input (1) press ↵ and use the ∇ Δ keys to select **ON / OFF** and confirm by pressing ↵ again.

The 12 or 24 voltage selection can be found in the ADVANCED menu.

```
 ERROR
OVERCURRENT!
```

The presence of a short circuit or overload at the inputs is signalled by the **POWER LED** flashing and the display will prompt **ERROR OVERCURRENT!**

INPUT AMPLIFIER

```
 DC:OFF
>AMPLI:HIGH
```

Press ∇ to set function switch > to **AMPLI** and press ↵ and use the ∇ Δ keys to select the proper input amplifier mode confirm by pressing ↵ again. The recommended criteria for selecting the amplifier type are shown in the diagram below

```
 DC:OFF
>AMPLI:MID
```

```
 DC:OFF
>AMPLI:OFF
```

Input amplifier mode	AMPLI: HIGH	AMPLI: MID	AMPLI: OFF
Input signals level	< 55dBµV	55 ÷ 85dBµV	> 85dBµV

CHANNEL FILTER

```
 AMPLI:MID
>ADD 1CH
```

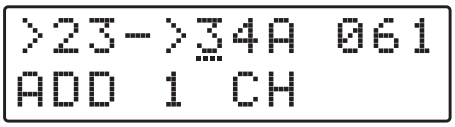
Press ∇ to position function switch > to **ADD 1CH** and press ↵. To select the channel number use the ∇ Δ keys; to confirm that the output channel is the same as the input channel press ↵ twice.

```
>21->21A 065
ADD 1 CH
```

```
>21->21A 065
ADD 1 CH
```

```
 21->21A 065
>25->25A 060
```

Channel CONVERSION



INPUT RANGE	OUTPUT RANGE
E21÷E48	E21÷E69

To convert a Channel to a different channel from the one received as input, place the pointer .... under the output filter and select the channel number using the ∇ Δ keys, press ↵ to confirm.

Useful function for converting one or more adjacent channels that interfere with each other.

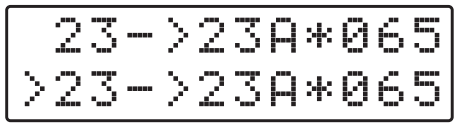
SINGLE FILTER BANDWIDTH

The default settings for the filter bandwidth is **A** (Automatic)**.** In the **ADVANCED** menu can be switched to **MAN** (Manual).

In manual mode **MAN** for each individual channel/MUX a filter with a width of your choice between **S** (Standardized) / **N** (Narrow) / **W** (Wide) can be used. To manually assign a filter bandwidth press ↵ again and use the ∇ Δ keys to choose the most suitable filter.

	Width	CHANNEL CONDITION	USE SUGGESTION
S	8MHz	Non-adjacent channels or adjacent channels with a level within 10dBµV	The **S** (Standardized) filter is the best performing filter in most cases.
N	-500KHz	Two or more adjacent channels with level difference of more than 10dBµV.	Set filter **N** (Narrow) for the channel/ channels with the lowest level.
W	+750MHz	Non-adjacent channels	The **W** (Wide) filter is suitable filter for non-adjacent channels only.

OVERLAPPING FILTERS

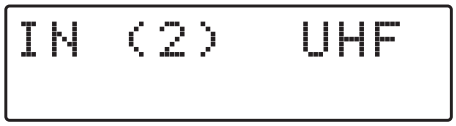


The overlapping of two or more filters with the same output channel is indicated by the symbol *****.

DELETE FILTER

Select a channel filter or conversion and press ↵ for 5 seconds to delete.

INPUT (2) UHF



INPUT RANGE	OUTPUT RANGE
E21÷E48	E21÷E69

To set the input parameters (2) press ↵ and access the menu. For programming, follow the instructions described for **INPUT (1) UHF**.

INPUT (3) UHF

INPUT RANGE	OUTPUT RANGE
E21÷E48	E21÷E69

To set input **(3)** parameters, press ↵ to access the menu. For programming, follow the instructions described for **INPUT (1) UHF**

INPUT (4) DAB/B3-UHF

INPUT RANGE	OUTPUT RANGE
E5÷E12 /E21÷E69	E5÷E12 /E21÷E69

The input (4) can filter B3 (E5... E13) channels and UHF can be extended to E69.

Note: within the range E21... E48 the input is protected by the LTE 4/5G filter. If in the input (4) is activated an input filter E49 or higher the LTE 4/5G filter is automatically disabled.

To set input **(4)** parameters, press ↵ to access the menu. For programming, follow the instructions described for **INPUT (1) UHF**

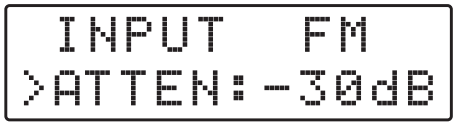
INPUT (4) DAB

To activate the input filter for the DAB band select **ON**.

Note: Switching **ON** the **DAB** filter automatically disable B3 channels E05 to E13 but does not exclude the possibility of processing UHF channels, so COMBO DAB-UHF antennas can be used.

INPUT FM

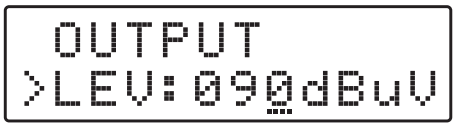
Input is dedicated to the FM radio band. To adjust the input attenuation press ↵ and use the ∇ Δ keys to set the desired level.



To return to the main level menu from any submenu, press and hold the ∇ Δ

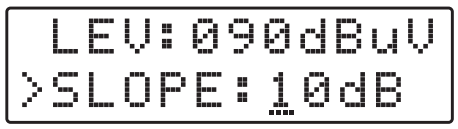
OUTPUT LEVEL

Press ∇ to select the OUTPUT menu and confirm with ↵ to access the amplifier output level setup.



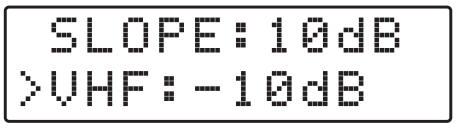
To set the output level, press ↵ and use the ∇ Δ keys to change the numerical value. To confirm, press ↵ again.

UHF SLOPE



To correct the slope of the output, set the pointer > to SLOPE and press ↵, use the ∇ Δ keys to change the value and press ↵ to confirm.

VHF OUTPUT LEVEL



To change the VHF level output, select VHF and press ↵; use the ∇ Δ keys to change the value and press ↵ to confirm.

To return to the main level menu from any submenu, press and hold the ∇ Δ

ADVANCED SETTINGS

PROTECTION PASSWORD

Select **PASSW**, press ↵ and use the ∇ Δ keys to choose the numerical value of the first digit on the right and confirm with ↵. For the next two digits, repeat the operation and press ↵ to confirm.

Code 0 0 0 equals no password protection

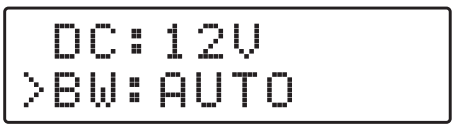
REMOTE POWERING VOLTAGE

To set the **DC** voltage press ↵ and use the ∇ Δ keys to select **12V** or **24V** voltage confirm by pressing ↵.

The selected remote supply voltage will be the same for all inputs.

FILTERS BANDWIDTH

If **MAN** (manual) mode is selected, in the **INPUT** menu each filter can be assigned as **N**arrow, **S**tandard or **W**ide.



If **AUTO** is selected, the filters will be assigned automatically.

THRESHOLD LEVEL

The **THRES** value determines the sensitivity of the **AUTO- TUNING** scan and the intervention threshold of the **MONITOR** function.

FAST FUNCTION

Activation of the **FAST** function reduces the adjusting time of the **CAG** (automatic gain control). This function is useful in the presence of unstable channels with sudden changes in their level.

MONITOR FUNCTION

Activation of the **MONITOR** function, a continuous cyclic check of all the programmed filters. This function is useful to avoid the presence of unwanted filters, disabling those that are not interested by a transmission.

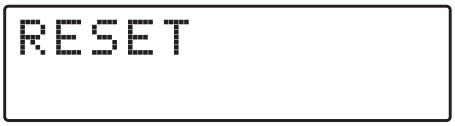
The intervention threshold for the **MONITOR** function is set by the **THRES** parameter level.

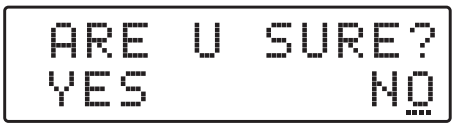
SERIAL NUMBER

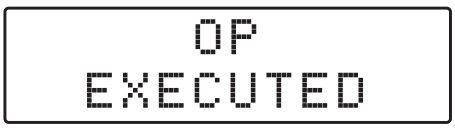
The number series to the right of **SRNBR** represents the serial number of the product.

To return to the main level menu from any submenu, press and hold the ∇ Δ

RESET

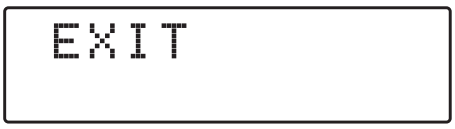


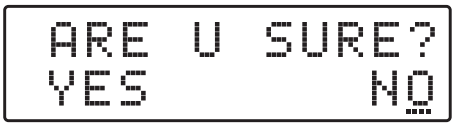




If you wish to delete all settings and restore the control unit to factory state, select **YES** and confirm ↵. The display will show the message **OP EXECUTED** to confirm the successful cancellation operation.

EXIT





To end the programming procedures select **EXIT** pressing ↵ and select with ∇ Δ **YES** press ↵ to confirm. If you wish to continue programming select **NO** and confirm with ↵.

Android SmartPhone Programming

Requirements

The **DSP20evo** can also be programmed by the **LEM USB** App available for Android smartphones, which can be downloaded free of charge from the Google Play portal.

To check whether your device's USB port supports **OTG** (On The Go) mode, please refer to the user manuals of your smartphone/tablet, failing which you can check **OTG** compatibility with a free APP called **USB OTG Checker** that can be downloaded from the Google Play portal.

The LEM USB application requires at least the Android 11 operating system or higher.

A **USB-OTG** cable or adapter is required to connect and program the amplifier.

GET IT ON Google Play

LEM USB

Setup

1 Power up the control unit and wait the end of booting until the LCD display shows **DSP20evo**

2 Connect the USB port of your Android device with the **USB** type B port integrated in the amplifier **DSP20evo** using a proper USB-OTG cable.

3 If the connection procedure was successfully completed**, the LEM USB** application will start automatically allowing all programming operations.

Microsoft Windows App Programming

Install in a PC Windows OS the latest version of the application **LEM USB for Windows** that can be found in the download page of the website www.lemelettronica.it

The LEM USB application requires at least Windows 7 operating system or higher.

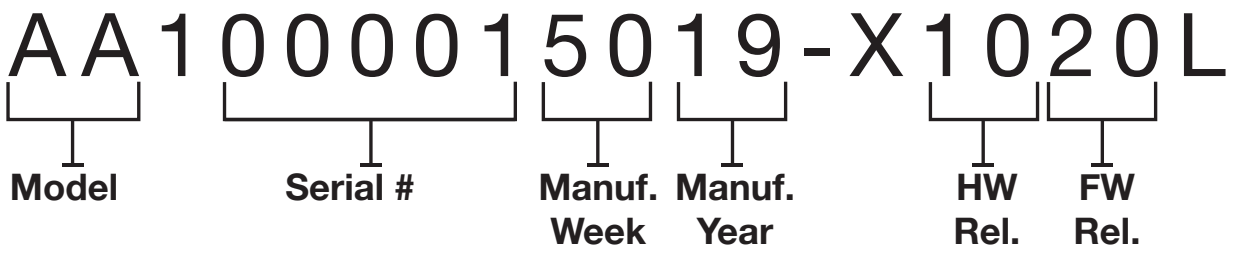
Setup

1 Power up the control unit and wait for the LCD display to show **DSP20evo.**

2 Connect the USB port type A of the Windows OS personal computer to **USB** type B port integrated in the **DSP20evo** unit using standard USB A-B cable.

3 Launch the **LEM USB** application, select the amplifier model and start to programming.

Label with serial and tracking data



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