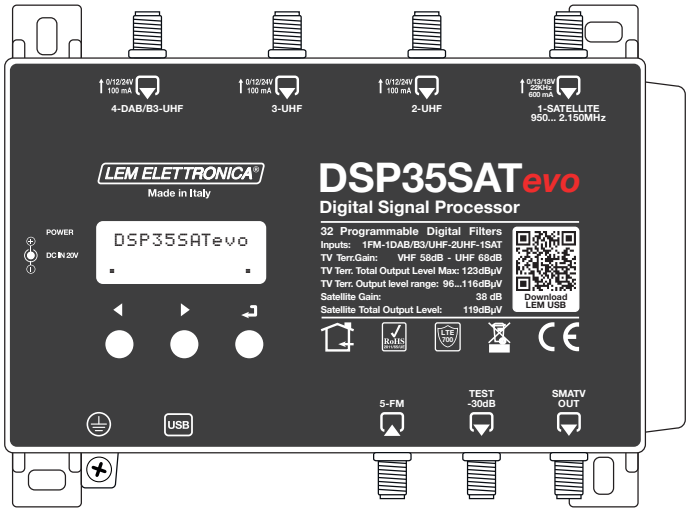
LEM ELETTRONICA®

# DSP35SATevo

## DIGITAL SIGNAL PROCESSOR

- Total output level max 123dBµV
- 50dB digital filters on adjacent channels
- Single filter selectable bandwidth
- Dual-stage input pre-amplifiers
- LTE 700 4/5G filter technology protection
- Satellite input 38 dB gain
- Autotuning for automatic channel scanning




Programmable compact multi-input multiband amplifier to digitally filter, convert and equalize DVB-T / T2 channels. The built in high output amplifier allow the use in medium or large multi dwelling units.

AUTO TUNING

LEM USB

RED COMPLIANT

5 YEARS WARRANTY

| MODEL | | DSP35SATEVO |
|---|---|---|
| **TV TERRESTRIAL** | | |
| NUMBER OF INPUTS | 4 | 1 FM; 1 VHF/UHF; 2 UHF |
| INPUTS FREQUENCY RANGE | MHz | FM (87.5... 108) / DAB (170... 240)<br>VHF (170... 230) - UHF (470...694) |
| SINGLE CHANNEL FILTERS | | 32 |
| NUMBER OF CHANNEL PER FILTER | | 1 (with channel to channel conversion) |
| INPUT TOTAL LEVEL RANGE | dBµV | FM 35... 90 / DAB 35... 90 - BIII 40... 110 - UHF... 45... 110 |
| FM/DAB INPUT ATTENUATOR | dB | 30 (adjustable 0... -30) |
| VHF/UHF INPUT AMPLIFIERS | dB | 0/+15/+30 |
| BIII/DAB/UHF INPUTS A.C.G. RANGE | dB | 40 dB |
| DIGITAL FILTERS SELECTIVITY | dB | ≥50 (Adjacent channels) |
| SELECTABLE FILTER MODE | | Standard (8MHz) / Narrow (-500KHz) / Wide (+750KHz) |
| GAIN | dB | VHF 58 - UHF 68 |
| OUTPUT LEVEL RANGE | dBµV | 96... 116 |
| BIII/DAB ADJUSTABLE GAIN | dB | 0... -10 |
| UHF ADJUSTABLE SLOPE | dB | 0... -10 |
| MAX TOTAL VHF-UHF OUTPUT LEVEL | dBµV | 123 (IM3 DIN 45004B - 60 dBc) |
| MAX OUTPUT LEVEL WITH 6 MUX | dBµV | 116 |
| MAX REMOTE POWER BIII/DAB-UHF | | 12V / 24V 100 mA |
| **SATELLITE** | | |
| NUMBER OF INPUT | 1 | 950... 2.150MHz |
| SAT INPUT TOTAL LEVEL RANGE | dBµV | 60... 100 |
| GAIN | dB | 38 |
| ADJUSTABLE GAIN | dB | 0... -15 |
| ADJUSTABLE SLOPE | dB | 0... -7 |
| MAX TOTAL OUTPUT LEVEL | dBµV | 119 |
| MAX LNB REMOTE POWER | | 13/18V 22KHz 600mA |
| **COMMON** | | |
| RETURN LOSS IN/OUT | dB | >12 |
| TEST OUTPUT | | 1 (-30 dB) |
| USB CONNECTOR | | USB 1.0 / 2.0 Type B |
| MAXIMUM CONSUMPTION | | 20Vcc 0,45A-9 W (+ Remote power) |
| OPERATING TEMPERATURE | °C | -5... 50 |
| DIMENSIONS | mm | 193 x 149 x 36 |

# Pictograms / symbols description


The DSP35SATevo 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 DSP35SATevo 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 24of Legislative Decree No. 49 of 14 March 2014 “Implementation of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)”.

# Package Contents

01 **DSP35SATevo** programmable amplifier

01 Power supply YS50-2002500

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 DSP35SATevo 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.

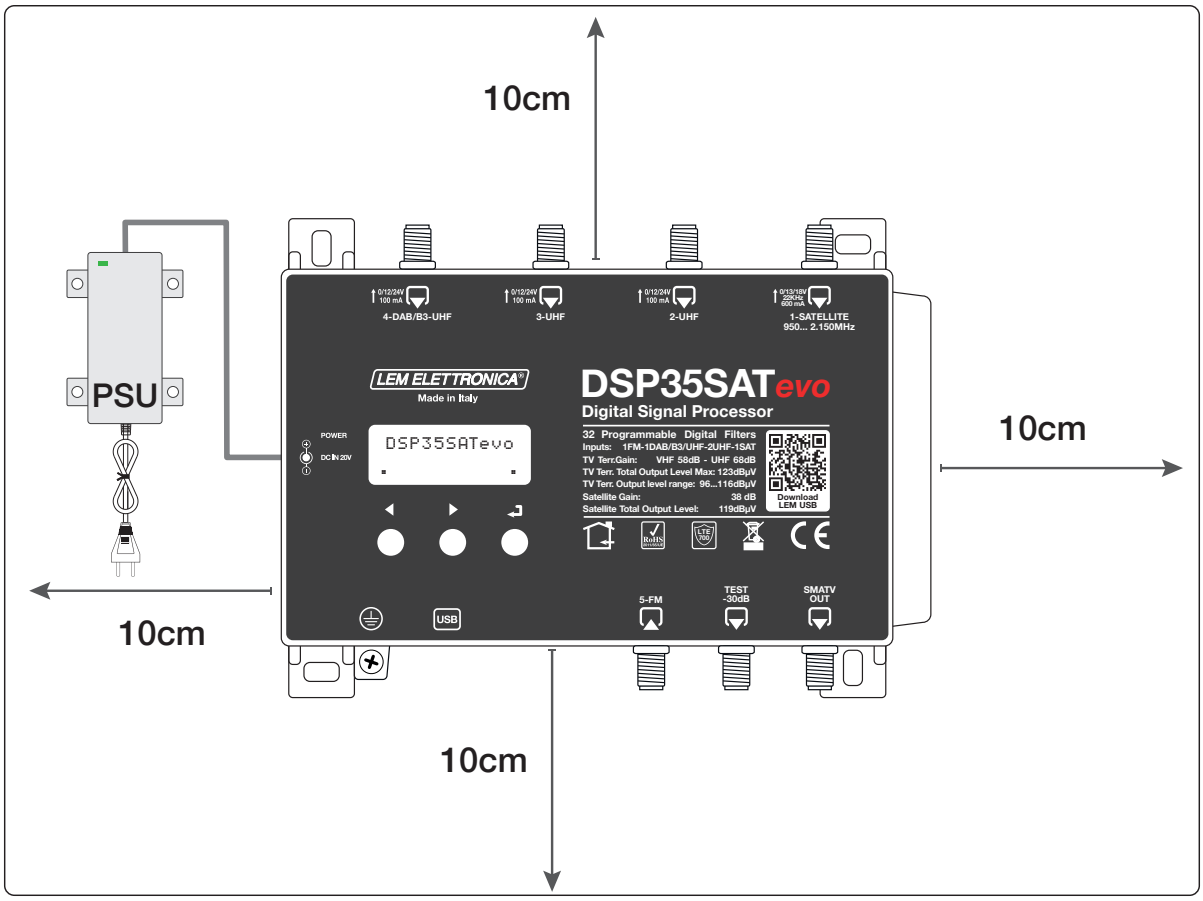
# Connections and start-up

1) Proceed with the connection of the coaxial input and output cables equipped with their own earth terminal block.

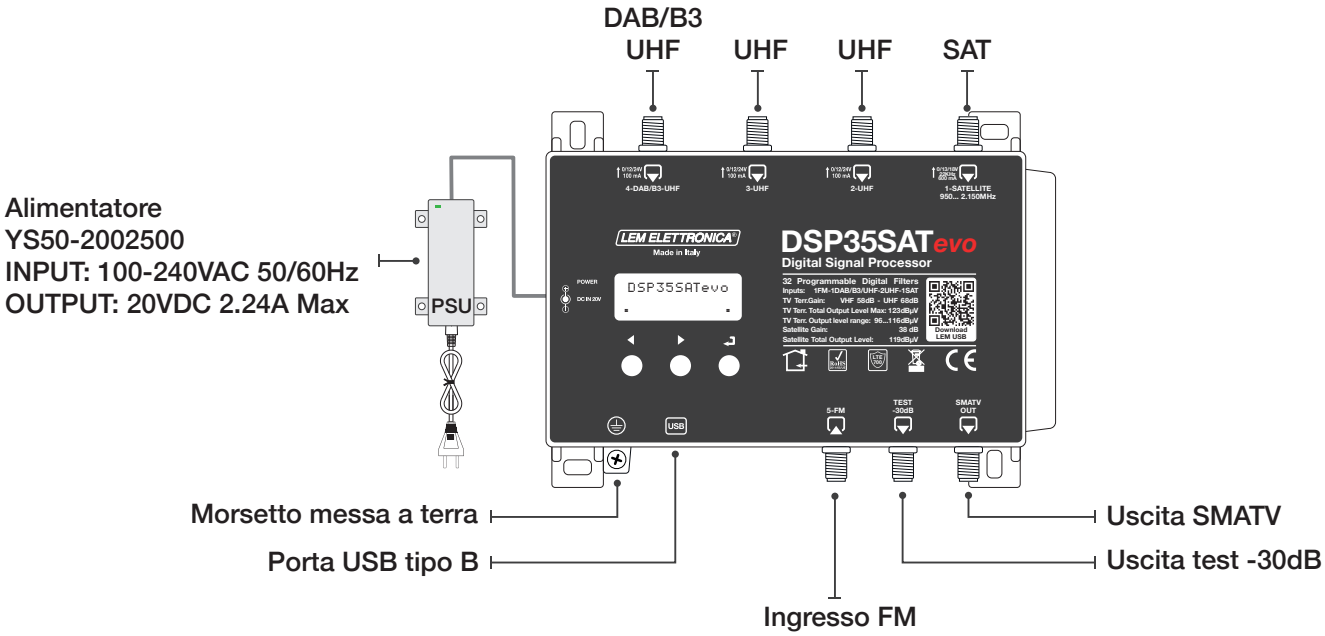
2) Close the unused inputs with 75Ω terminations (code RCS75).

3) Connect the power supply to the mains socket only after all other connections have been made.

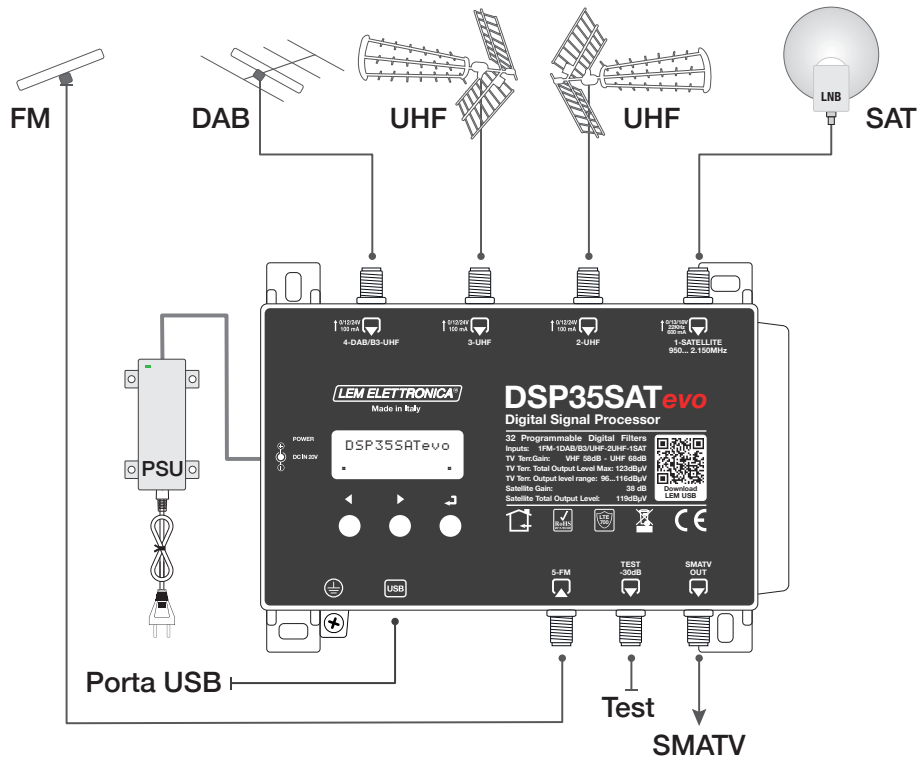
4) Always use the test output for connecting measuring instruments.



# Connection Diagram




# Application examples



# Device Programming

The **DSP35SATevo** programmable amplifier can be configured in two different ways:

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

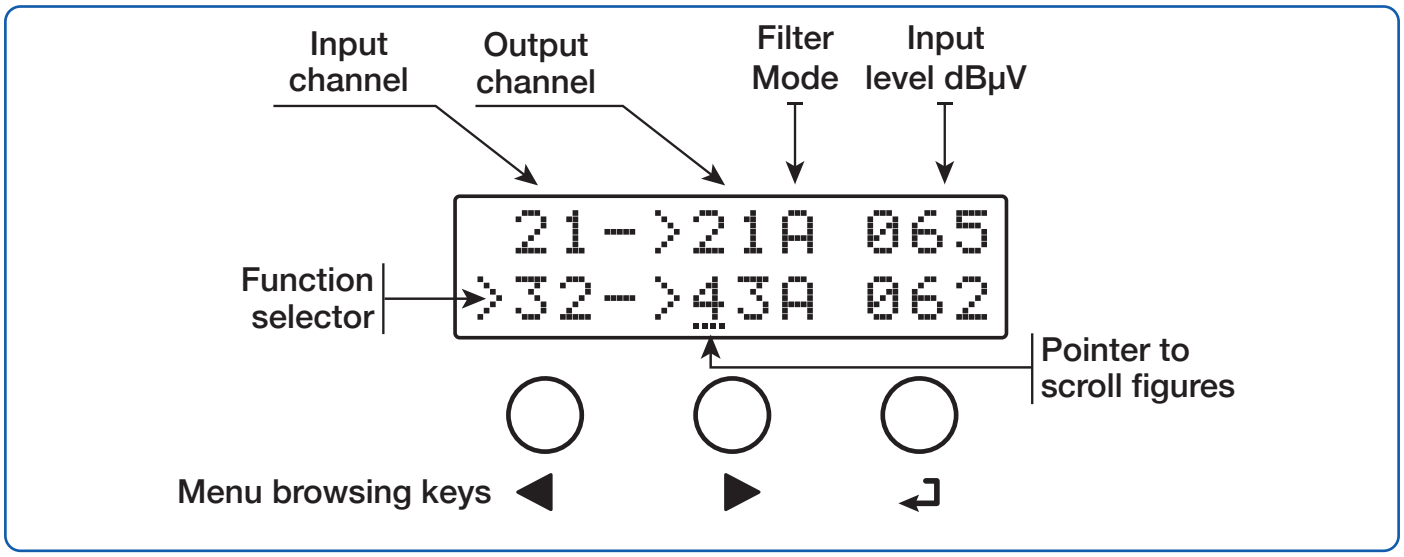
2) using the application **LEM USB** available for Android OS and Windows OS.

**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**

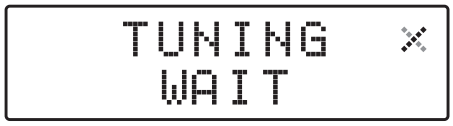
# Automatic Channel Programming

To speed up programming operations, it is possible to use the **AUTO-TUNING** function. By activating this function, the **DSP35SATevo** amplifier will scan the inputs and automatically store the DVB-T/T2 signals present on the antenna. The remote power supply voltage is activated automatically only if a current draw is detected, indicating the presence of an external preamplifier or an active antenna.

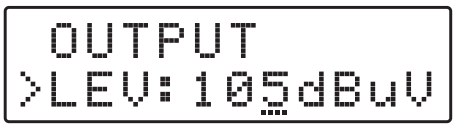

To start the **AUTO-TUNING** procedure select **AUTO** and press ↵. For best results, you will be asked to confirm some parameters before starting the scan.

**AUTO-TUNING START**


Select **START** to start automatic channels scanning.



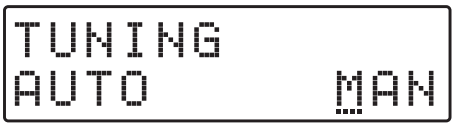

During the **AUTO-TUNING** scanning and storage operations, the message **TUNING WAIT** appears, and the LED to the right of the display flashes green. The duration of the procedure depends on the number of MUX signals received from the connected antennas.




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.

# Manual programming



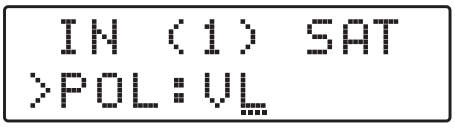

To start manual programming, select MAN using the ∇ key and press ↵.

**INPUT SATELLITE (1)**


Press ↵ to enter the menu to set the **SAT** input parameters.

**REMOTE POWER SUPPLY**


Press ↵ to enter the menu to set the **SAT** input parameters.

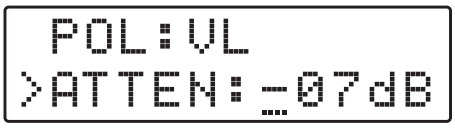



Position the function selector > on **POL** and press ↵ to enable the LNB remote power select the desired LNB voltage polarization through the keys ∇ Δ. Press ↵ to confirm.

**VL= 13Volt**
**HL= 18Volt**
**VH= 13Volt+ 22KHz tone**
**HH= 18Volt+ 22KHz tone**

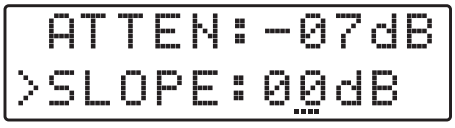

**The presence of a short circuit or overload at the inputs is signalled by the POWER LED flashing and the display will prompt ERROR OVERCURRENT!**

**SAT INPUT ATTENUATOR**




Position the function selector > on **ATTN** and press ↵ to enable the LNB remote power select the desired attenuation level through the keys ∇Δ. Press ↵ to confirm.

**SAT SLOPE**




Position the function selector > on **SLP** and press ↵ and select the desired Slope through the keys ∇Δ. Press ↵ to confirm your choice.

**Press the keys ∇ Δ at the same time to go back to the main menu from anywhere in the INPUT menu.**

## INPUT (2) UHF

```
IN (2)  UHF
```

Press ↵ to enter the menu to set the **UHF (2)** input parameters.

## REMOTE POWER

```
 IN (2) 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

```
>23->34A 061
ADD 1 CH
```

| 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

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

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** (Standard) / **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

```
 23->23A*065
>23->23A*065
```

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

## DELETE FILTER

```
CH DELETED
```

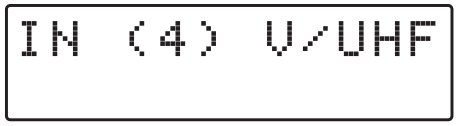
Select a channel filter or conversion and press ↵ for 5 seconds to delete.

**INPUT (3) UHF**


| INPUT RANGE | OUTPUT RANGE |
|---|---|
| E21÷E48 | E21÷E69 |

To set the input parameters (3) press ↵ and access the menu. For programming, follow the instructions described for **INPUT (2) UHF**.

**INPUT (4) DAB/B3-UHF**




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

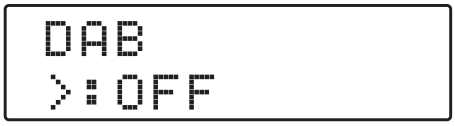
The input (4) can filter B3 (E5... E13) channels and UHF can be extended to E69.

**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 (2) UHF**

**INPUT (4) DAB**

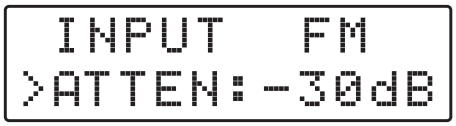

To activate the input filter for the DAB band select **ON**.




**Note: Enabling the DAB filter automatically disables B3 channels (E05 to E13) but does not prevent the processing of UHF channels. Therefore, COMBO DAB-UHF antennas can be used.**

**INPUT (5) 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**

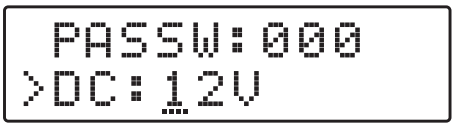
## ADVANCED SETTINGS


## 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, repate the operation and press ↵ to confirm.

**Code 0 0 0 indicates no password protection**

## REMOTE POWERING VOLTAGE

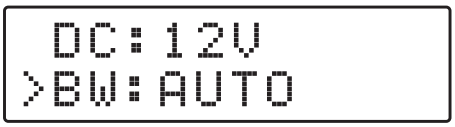



To set the **DC** voltage press ↵ and use the ∇ Δ keys to select **12V** or **24V** voltage confirm by pressing ↵.

**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.

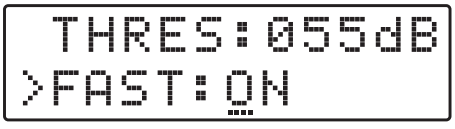



If **AUTO** is selected, the filters will be assigned automatically.

## THRESHOLD LEVEL


The **THRES** value determines the sensitivity of the 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.

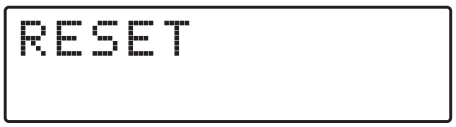
The intervention threshold for the **MONITOR** function is set by the **THRES** parameter level.

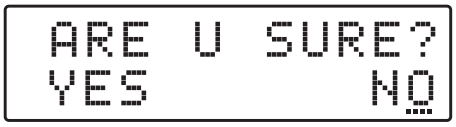
**SERIAL NUMBER**

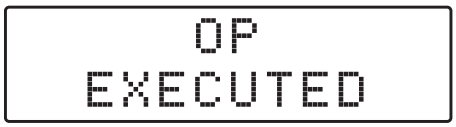

The number series to the right of **SRNBR** represents the serial number of the product.

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

**RESET**

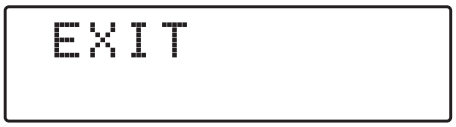


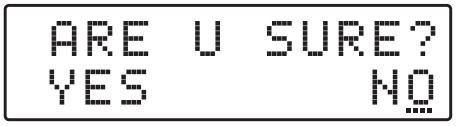




If you wish to delete all settings and restore the control unit to factory state, select **YES** and confirm ↵. The display will show the message **OP EXECUTED** to confirm the successful cancellation operation.

**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 **DSP35SATevo** 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 **DSP35SATevo**

2 Connect the USB port of your Android device with the **USB** type B port integrated in the amplifier **DSP35SATevo** 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.

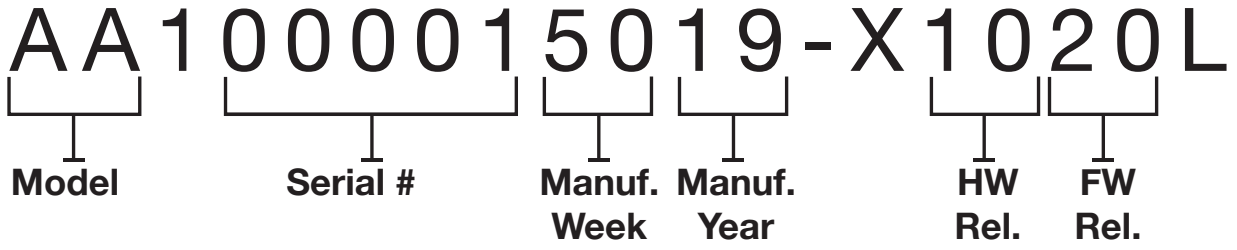
### Setup

1 Power up the control unit and wait for the LCD display to show **DSP35SATevo.**

2 Connect the USB port type A of the Windows OS personal computer to **USB** type B port integrated in the **DSP35SATevo** 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




REL. 250108

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