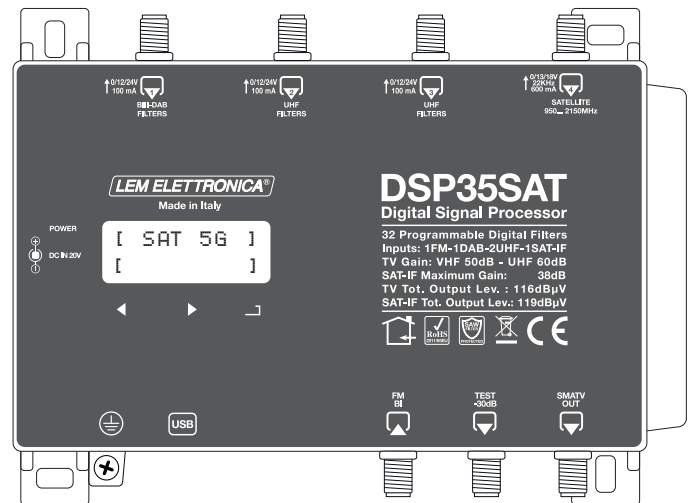


# DSP35SAT-5G

## DIGITAL SIGNAL PROCESSOR

- ▶ 24 Digits LCD display
- ▶ 3 TV Terrestrial inputs
- ▶ 1 Satellite 950... 2.200MHz input
- ▶ 1 FM input
- ▶ Auto-Tuning function
- ▶ SAW filters against Lte 5G / 4G interferences
- ▶ A.C.G. in each filter
- ▶ 32 high selectivity digital filters
- ▶ Zamak chassis for high screening protection

Programmable compact multi-input multiband head-end to digitally filter, convert and equalize DVB-T / T2 channels. The built-in amplifier with adjustable output allows the use in small or medium multi dwelling units.



MODEL		DSP35SAT-5G
<b>TV TERRESTRIAL</b>		
NUMBER OF INPUTS	4	1 FM; 1 BIII/DAB; 2 UHF
INPUTS FREQUENCY RANGE	MHz	FM (40... 108) BIII / DAB (170... 240) UHF (470... 694)
SINGLE CHANNEL FILTERS		32
NUMBER OF CHANNEL PER FILTERS		1... 2
INPUT TOTAL LEVEL RANGE	dBμV	FM 35... 90 - BIII/DAB 40... 110 - UHF... 45... 100
BI/FM INPUT ATTENUATOR	dB	0/-12/-24
INPUT AMPLIFIERS		VHF 0/+20 (OFF/ON) - UHF 0/+10 (OFF/ON)
BIII/DAB - UHF INPUTS A.C.G. RANGE	dB	40 dB
DIGITAL FILTERS SELECTIVITY	dB	35 @1MHz
SELECTABLE FILTERS AMPLITUDE	MHz	6/7/8/9/10
GAIN	dB	VHF 50 - UHF 60
OUTPUT LEVEL RANGE	dBμV	93... 113
BIII/DAB ADJUSTABLE GAIN	dB	0... -10
UHF ADJUSTABLE SLOPE	dB	0... -5
MAX TOTAL VHF-UHF OUTPUT LEVEL	dBμV	120 (IM3 DIN 45004B - 60 dBc)
MAX OUTPUT LEVEL WITH 6 MUX	dBμV	113
MAX REMOTE POWER BIII/DAB-UHF		12V / 24V 100 mA 2,4W
<b>SATELLITE</b>		
NUMBER OF INPUT	1	950... 2.200MHz
SAT INPUT TOTAL LEVEL RANGE	dBμV	60... 100
GAIN	dB	38
ADJUSTABLE GAIN	dB	0... -20
ADJUSTABLE SLOPE	dB	0... -7
MAX TOTAL OUTPUT LEVEL	dBμV	119
MAX LNB REMOTE POWER		13/18V 22KHz 600mA 10,8W
<b>COMMON</b>		
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 (13,2W)
OPERATING TEMPERATURE	°C	-5... 50
DIMENSIONS	mm	193 x 148 x 36



## ICONS DESCRIPTION



High rejection SAW filters for optimal protection against Lte 5G interferences



In addition to the easy to use built-in LCD display, programming applications are available for PC Windows and Android devices



Self programming Auto-tuning function to scan and detect DVB-T/T2 signals from the VHF/UHF inputs and allocate a single digital filter for each transponder

## DESCRIPTION OF SYMBOLS AND ELECTRICAL SAFETY



The equipment complies with the CE requirements



The equipment is designed for indoor use only



Equipment grounding terminal



This symbol indicates that the equipment complies with the safety requirements for class II equipment



To avoid the risk of electric shock, do not open the equipment.



The equipment is compliant with RoHS 2011/65EU



Dispose according to local authorities recycling processes

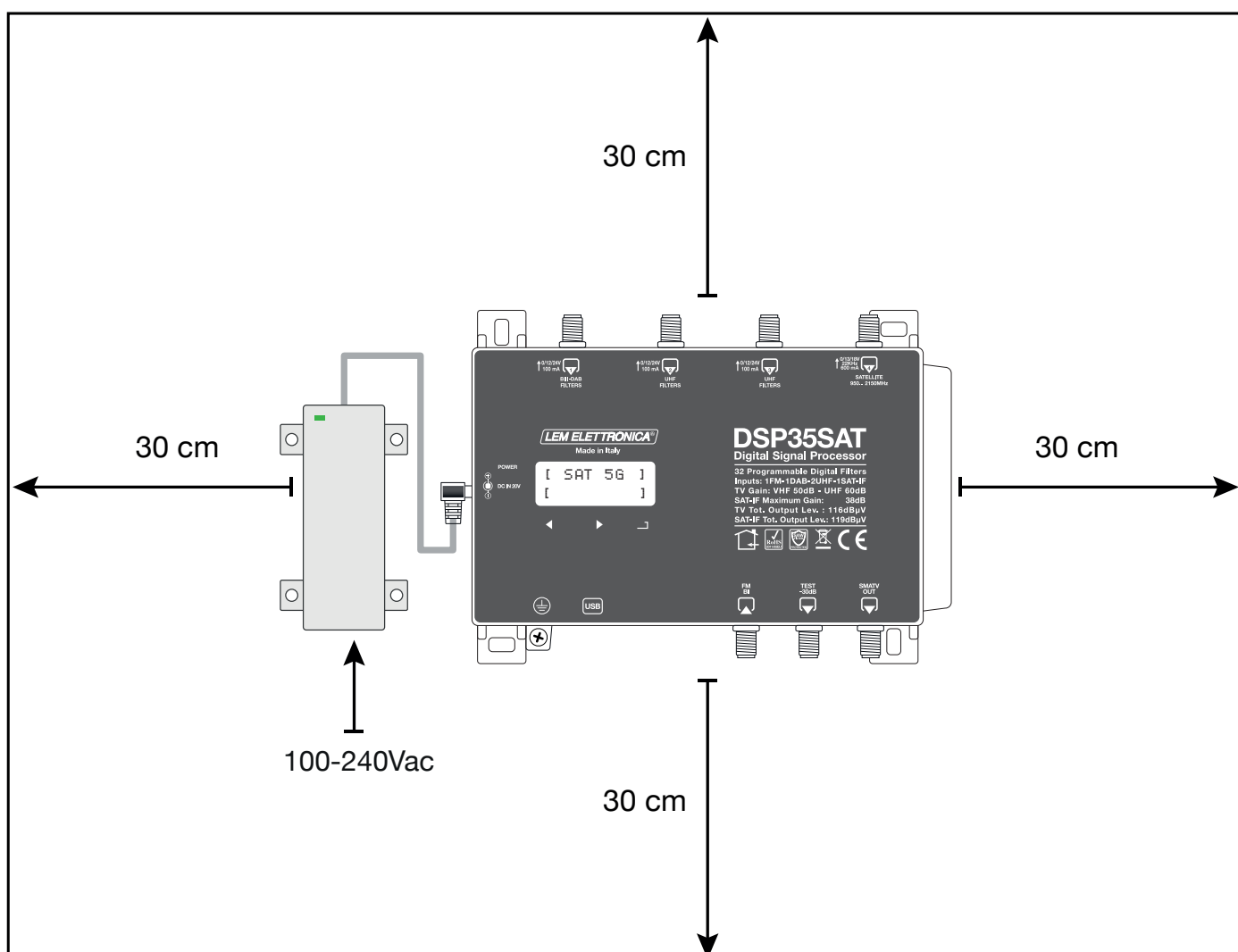


## Safety instructions

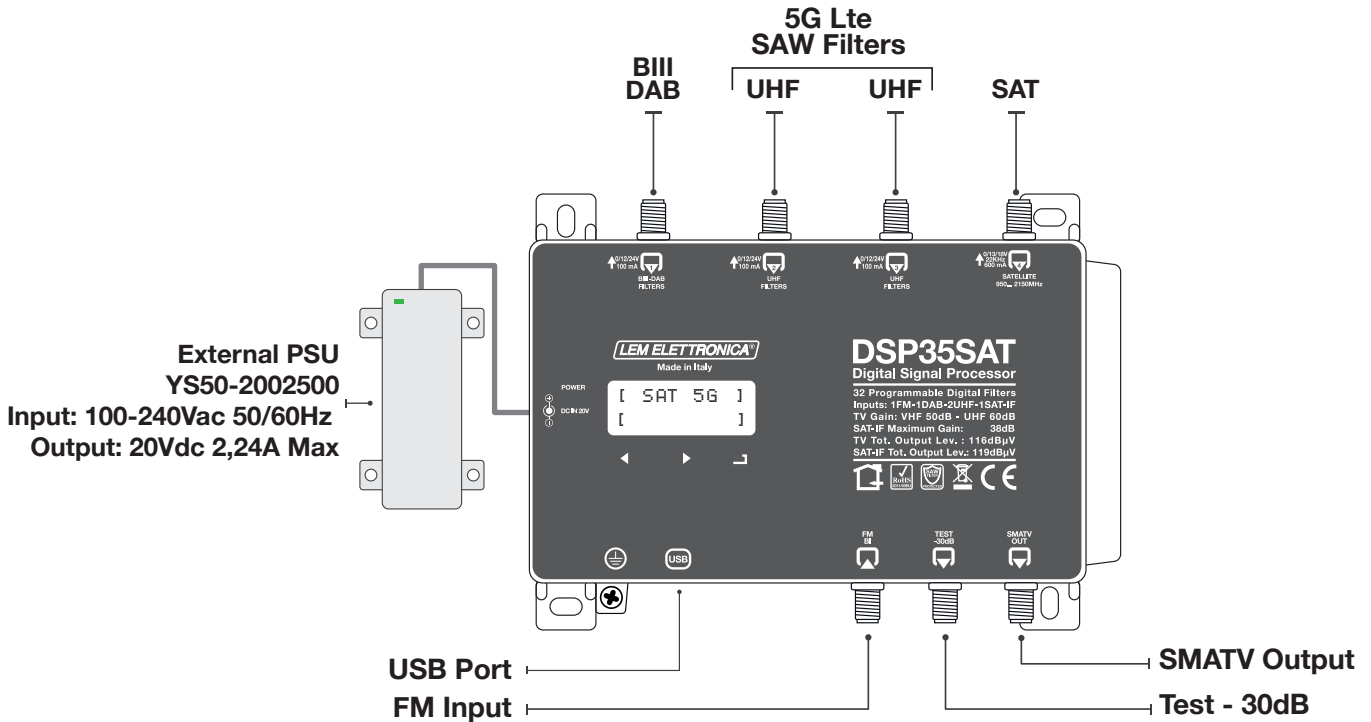
1. Do not expose the amplifier to extreme temperatures.
2. Place the amplifier in a dry and well-aired location.
3. Install the unit on a vertical wall, or in a waterproof cabinet with a minimum IP55 rating, and fix it safely using the provided fixing plugs.
4. Connect the power adapter cord to a detachable power supply socket.

### IMPORTANT!

Use only the power supplier YS50-2002500 provided with the amplifier. The use of non-original power suppliers determines the non-compliance of the product and can cause malfunctions and void the warranty.





# Standard Connections Schematic



## Installation and start-up

- 1 Connect an earth wire to grounding clamp
- 2 Connect the TV aerial(s) to the amplifier's inputs
- 3 Connect the MATV output and terminate the unused inputs with 75Ω loads
- 4 Connect the power supplier unit to the **DSP35SAT-5G** and then connect the power supplier to mains plug

# Programming via display

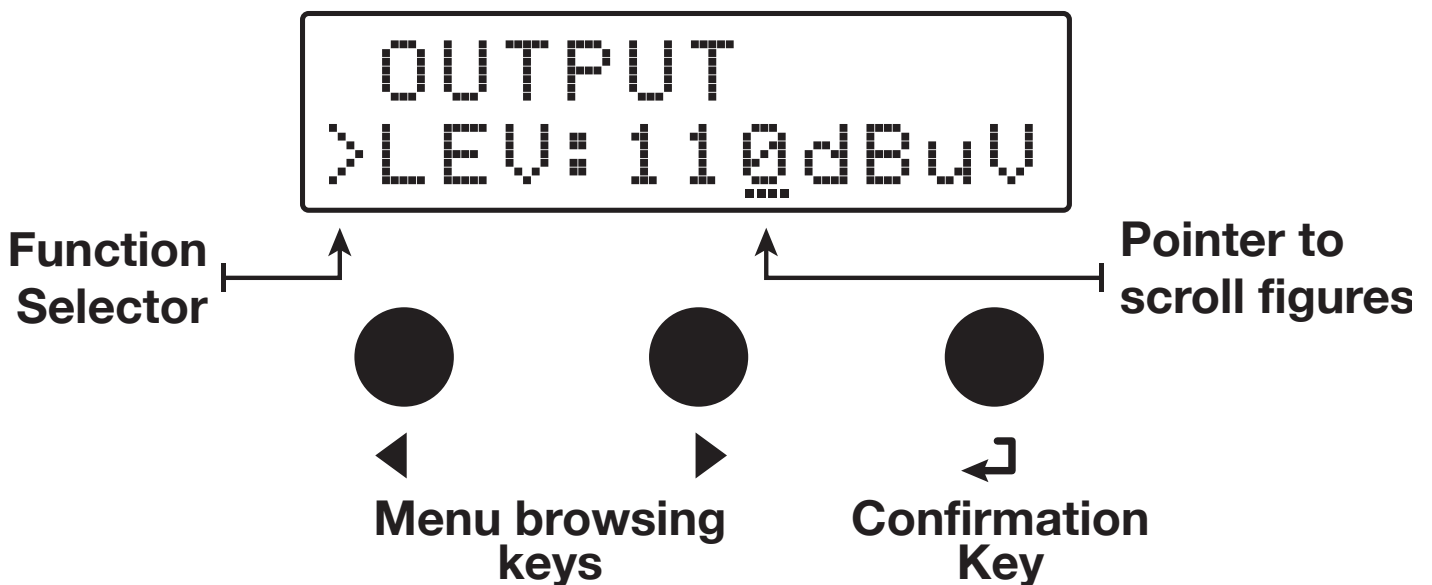
1. Press  to activate the display
2. Press  for three seconds to enter the programming menu

Firmware rel. 1.5  
Hardware rel. 4.1



**Note:** the display will go out after 3 minutes if inactive, but the menu will remain open on the last selected function. Press any key to continue.

## Display LDC 2 x 12



# Automatic channel scan and memorization

To begin the **AUTO-TUNING** procedure connect the antenna(s) to the **DSP35SAT-5G** inputs, then follow the operations described below.

```
TUNING
AUTO      MAN
```

To begin the automatic programming, **AUTO-TUNING**, place the pointer --- below **AUTO**. Press **↵** to proceed.

```
>DC:      12V
DC U1:    OFF
```

Before the MUX scanning, the **DSP35SAT-5G** requires the selection of the inputs voltage 12V or 24V and the activation, if required, of the remote powering for each input. The remote powering is required in case of active antennas or external pre-amplifiers.

```
DC U2:    OFF
>DC U3:    ON
```

```
>THR: 55dBuV
START
```

If necessary set up the **THR** (minimum threshold) level or leave the default 55dB $\mu$ V.

```
THR: 55dBuV
>START
```

Press again **↵** to confirm the scanning and tuning.

```
TUNING
>      >      >
```

The amplifier **DSP35SAT-5G** will start scanning from the input [1] for BIII band and the UHF inputs [2], [3] and [4] in sequence. The scanning/tuning procedure require around two minutes.



To stop the **AUTO-TUNING** procedure press **↵** for 5 seconds.

```
OUTPUT
>LEV: 110dBuV
```

When the **AUTO-TUNING** procedure is completed the display will show the maximum output level optimized for the number of MUX automatically found and saved. Press **↵** to confirm and complete the procedure. To change the output level press the keys **◀ ▶** then press **↵** to confirm.



Setting higher output levels than the one obtained through the **AUTO-TUNING** could reduce the quality of the received signals.



If the number of the memorized MUX is lower than expected try reducing the **THR** level and restart the **AUTO-TUNING** procedure.

# Manual programming

```
TUNING
AUTO      MAN
```

Position the pointer --- on **MAN** to start the manual programming through the ► key and press ↵ to continue.



Press the keys ◀ ▶ at the same time to go back to the main menu from anywhere in the INPUT menu.

## FM/BI INPUT

```
INPUT FM/BI
```

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

## FM/BI ATTENUATOR

```
INPUT FM/BI
>ATTN: 12dB
```

Adjustable 0/12/24dB

Position the function selector > on **ATTN** and press ↵ to activate the pointer ---, select the desired attenuation level through the keys ◀ ▶ and press ↵ to confirm.

## SATELLITE INPUT

```
INPUT SAT
```

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

## REMOTE POWER SUPPLY

```
INPUT SAT
>DC: 13V
```

13V= 13Volt

18V= 18Volt

13V+22K= 13Volt+22KHz tone

18V+22K= 18Volt+22KHz tone

Position the function selector > on **DC** and press ↵ to enable the LNB remote power select the desired LNB voltage polarization through the keys ◀ ▶. Press ↵ to confirm your choice.

## SAT ATTENUATOR

```
DC: 13V
>ATTN: 0dB
```

Adjustable 0... 20dB

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

## SAT SLOPE

```
ATTN: 0dB
>SLP : 0dB
```

Adjustable 0... 7dB

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



## INPUT [1] VHF

```
INPUT VHF 1
```

### INPUT 1 VHF

Processable channels

Input: E5... E13 - DAB

Output: E5... E69

## REMOTE POWER SUPPLY

```
INPUT VHF 1
>DC : OFE
```

To set the **INPUT VHF 1** parameters press **←** to enter the menu.

Position the function selector **>** on **DC** and press **←** select **ON** to enable the remote power supply from **INPUT 1 VHF**. Press **←** to confirm.

---

The remote power supply is set on 12Volt. It can be changed to 24Volt in the **ADVANCED** menu.

---

## INPUT PREAMPLIFIER

```
DC : OFF
>PREAMP: OFE
```

OFF= 0dB

ON= 20dB

Position the function selector **>** on **PREAMP** and press **←** to activate the pointer **---**, scroll the keys **◀ ▶** end select **ON** to enable the preamplifier or **OFF** to disable it and press **←** to confirm.

## SINGLE MUX FILTERING

```
PREAMP: ON
>ADD 1 CH
```

```
PREAMP: ON
> 5- > 5 L 65
```

```
PREAMP: ON
> 5- > 5 L 65
```

Press **◀ ▶** to position the function selector **>** on **ADD 1 CH** and press **←**.

To activate the filtering function on a single MUX set the desired channel through the **◀ ▶** keys, then press **←** twice to confirm.

---

The **L** figure shows the input level of the selected MUX in **dBμV**.

---

## DAB FILTER

```
PREAMP: ON
> VHF-DAB
```

To activate the single 65MHz DAB filter press **▶** until the figure **VHF-DAB** is shown, then press **←** to confirm.

## MUX CONVERSION

```
PREAMP: ON
> 5- > 5 L 65
```

```
PREAMP: ON
> 5- > 8 L 65
```

To activate the filtering and conversion function on a single MUX set the desired input channel through the **◀ ▶** keys and press **←** to confirm. Select the output channel required for the conversion through the **◀ ▶** keys then press **←** to confirm.



Output conversions up to the UHF channel 69 are permitted.

## TWO MUX FILTERING

```
ADD 1 CH
>ADD 2 CH
```

```
PREAMP: ON
> 9<>10 L 65
```

## FILTERS OVERLAPPING

```
8<> 8*L 65
>10<> 8*L 70
```

## DELETE FILTER

```
CH DELETED
```

## INPUT [2] UHF

```
INPUT UHF 2
```

### INPUT 2 UHF

Processable channels

Input: 21... 48

Output: E5... E69

## INPUT [3] UHF

```
INPUT U 3
```

### INPUT 3 UHF

Processable channels

Input: 21... 48

Output: E5... E69

## OUTPUT LEVEL SELECTION

```
OUTPUT
```

Adjustable from 93 to 113dB $\mu$ V

```
OUTPUT
>LEV: 110dB $\mu$ V
```

To add a filter for two channels with two adjacent MUX press **▶** and select **ADD 2 CH**. Press **↵** to confirm. Select the first channel with the **◀ ▶** keys. The second channel will automatically appear in second position. Press **↵** to confirm.

The selection of two or more output filters with the same frequency is allowed but marked with \*

Position the function selector **▶** on MUX filtering or MUX conversion using **◀ ▶** then keep pressed **↵** for five seconds.

To set the **INPUT 2 UHF** parameters, press **↵** to enter the menu.

The same procedures described for input 1 apply for all settings.

To set the **INPUT 3 UHF** parameters, press **↵** to enter the menu.

The same procedures described for input 1 apply for all settings.

Press **▶** to select the menu **OUTPUT** and press **↵** to confirm and check the selected output level.

To adjust the output level, press **↵** and change the figure where the pointer is positioned to the required level. Press **↵** to confirm.

## UHF SLOPE

```
LEV: 110dBuV
>SLP: 5dB
```

Adjustable from 0 to 5dB

To adjust the UHF slope select **SLP** and press  $\leftarrow$ , press  $\leftarrow$   $\rightarrow$  to select the required value and press  $\leftarrow$  to confirm.

## VHF ATTENUATION

```
SLP: 5dB
>VHF: -10dB
```

Adjustable from 0 to -10dB

To adjust the VHF attenuation select **VHF** and press  $\leftarrow$ , press  $\leftarrow$   $\rightarrow$  to select the required value and press  $\leftarrow$  to confirm.

## ADVANCED SETTINGS

```
ADVANCED
```



Press the keys  $\leftarrow$   $\rightarrow$  at the same time to go back to the main menu from anywhere in the **ADVANCED** menu.

## REMOTE POWER SUPPLY

```
ADVANCED
>DC: 12V
```

Select the **DC** voltage setting function and press  $\leftarrow$ , press the  $\leftarrow$   $\rightarrow$  keys to select the voltage 12V or 24V then press  $\leftarrow$  to confirm.

```
ADVANCED
>DC: 24V
```

## PROTECTION PASSCODE

```
DC : 12V
>PSW: 000
```

Select **PSW** and press  $\leftarrow$ , press the  $\leftarrow$   $\rightarrow$  keys to select the first figure from the right. Press  $\leftarrow$  to confirm. Repeat for the other figures and press  $\leftarrow$  to confirm.

```
DC : 12V
>PSW: 000
```

## FILTERS AMPLITUDE

```
PSW: 000
>BW : 8MHz
```

Select **BW** and press  $\leftarrow$ , press the  $\leftarrow$   $\rightarrow$  keys to select a non standard filter bandwidth. Press  $\leftarrow$  to confirm.

## AUTO-TUNING INPUTS THRESHOLD

```
PSW: 000
>THR: 55dBuV
```

Adj. from 45 to 90dB $\mu$ V

Select **THR**, the **AUTO-TUNING** and **MONITOR** minimum threshold function and press  $\leftarrow$ . Use the  $\leftarrow$   $\rightarrow$  keys to select the required value and press  $\leftarrow$  to confirm.

## FAST A.C.G.

```
THR: 55dBuV  
>FAST: OFF
```

```
THR: 55dBuV  
>FAST: ON
```

For a faster Automatic Control Gain A.C.G. action select **ON** and press **↵** to confirm.

## RESET DSP35SAT-5G

```
THR: 55dBuV  
>RESET
```

```
RESET?  
YES  NO
```

```
RESET OK
```

To restore the default settings select **RESET** and confirm **YES** pressing **↵**. The display will show **RESET OK** for a few second to confirm the operation. If you wish to skip the **RESET** select **NO** and press **↵** to confirm.



Please note with the **RESET** all the programmed settings will be lost.

## MONITOR

```
RESET  
>MONIT: OFF
```

The **MONITOR** function activates a real time monitoring procedure which check that the input level of each selected MUX is greater than the entered **THR** input threshold. If the measured level of a MUX is lower than the **THR** threshold, the corresponding filters are automatically deactivated. When the input level of the deactivated MUX return above the minimum threshold level **THR** the filter will be automatically reactivated.



Please use the **MONITOR** function with maximum care.

## S/N DSP35SAT-5G

```
RESET
>SNBR: 00001
```

Select **SNBR**. The number displayed on the right is the univocal serial number of the product.

## EXIT

```
EXIT
```

To end the programming procedure select **EXIT** and press ↵. Select **YES** to exit programming mode and press ↵ to confirm.

```
EXIT
YES      NO
```

To carry on with the programming, select **NO** and press ↵ to confirm.

## Display Error Messages

```
DC NOT VALID
```

Wrong power input voltage. Please check the power supplier.

Power Led red

```
OVERCURRENT!
```

Input short circuit or over current. Please check the input(s) with the remote power supply activated and remove the issue.

Power Led red

# PC Windows Programming GUI

1. Download the latest GUI release from our website <http://www.lemelettronica.it>
2. Install the GUI selecting the file **Setup.exe** and follow the guided procedure step by step until the installation is completed.

## Software minimum requirements

Windows 7 or more recent operating system, Microsoft Framework.NET 3.5\* or higher and langpack (free download from the Microsoft website).

\* In recent versions of Windows, Framework.NET 3.5 is usually already installed, otherwise Framework.NET can be freely downloaded from the Microsoft website.

## Hardware requirements

PC Windows compatible with USB port.

USB A-B cable.

# SmartPhone/Tablet Android Programming GUI

1. Check if your Android device supports the **USB OTG** mode. Free application like **USB OTG Checker** can help.
2. To connect the Android Smartphone/Tablet you need a **USB OTG** cable or adapter.
3. Download the application **LEMGUI** from Google play and install.
4. Switch on the **DSP35SAT-5G** and wait until the **BOOTING** procedure is completed.
5. Connect the **DSP35SAT-5G** to your Android device with the **USB-OTG** cable
6. The **LEM GUI** will start automatically and you will be ready to set up the **DSP35SAT-5G**.

## Label with serial and tracking data

AA1000015019-X1020L

AA	1000015019	X	10	20	L
Model	Serial #	Manuf. Week	Manuf. Year	HW Rel.	FW Rel.

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