

DSP40

DIGITAL SIGNAL PROCESSOR

- ▶ 24 Digits LCD display
- ▶ 5 Inputs
- ▶ Auto-Tuning function
- ▶ Selectable Lte 4G/5G SAW filters
- ▶ Up to 64 High Selectivity Filters with ACG
- ▶ Converts up to 32 single channels
- ▶ Zamak die casting chassis

High selectivity programmable compact headend to digitally filter, convert and equalize DVB-T / T2 channels. The built in high output amplifier allow the use in small or medium installation plants.



5
WARRANTY YEARS

LEM
GUI

SAW
FILTER
PROTECTED

AUTO
TUNING

Firmware rel. 1.3
Hardware rel. 3.0

MODEL		DSP40
NUMBER OF INPUTS	5	1 FM; 2 BIII-DAB/UHF; 2 UHF
INPUTS FREQUENCY RANGE	MHz	FM (40... 108 MHz) VHF (170... 240 MHz) UHF 470... 694/790/862
SINGLE CHANNEL FILTERS		32
NUMBER OF CHANNEL PER FILTERS		1... 2
INPUT LEVEL RANGE	dBμV	FM 35... 90 - BIII/DAB 40... 110 - UHF... 40... 110
FM INPUT ATTENUATOR	dB	FM 0...-30
BIII-DAB / UHF ATTENUATORS	dB	0... -20
A.C.G. RANGE	dB	40 dB
SELECTIVITY	dB	35 @1MHz
INTERSTAGE ATT. (1 dB STEP ADJUST.)	dB	0...-20
VHF GAIN	dB	40
UHF GAIN	dB	50
MAX OUTPUT LEVEL	dBμV	120 (IM3 DIN 45004B - 60 dBc)
RETURN LOSS IN/OUT	dB	>12
TEST OUTPUT		1 (-30 dB)
USB CONNECTOR		USB 1.0 / 2.0 Type B
REMOTE POWER SUPPLY VHF-UHF		12V / 24V 100 mA
POWER SUPPLY		230 VAC +/-20% 16W Max (External power supplier DC 20 Volt 2,25A)
OPERATING TEMPERATURE	C°	-5... 50
DIMENSIONS	mm	192 x 217 x 37



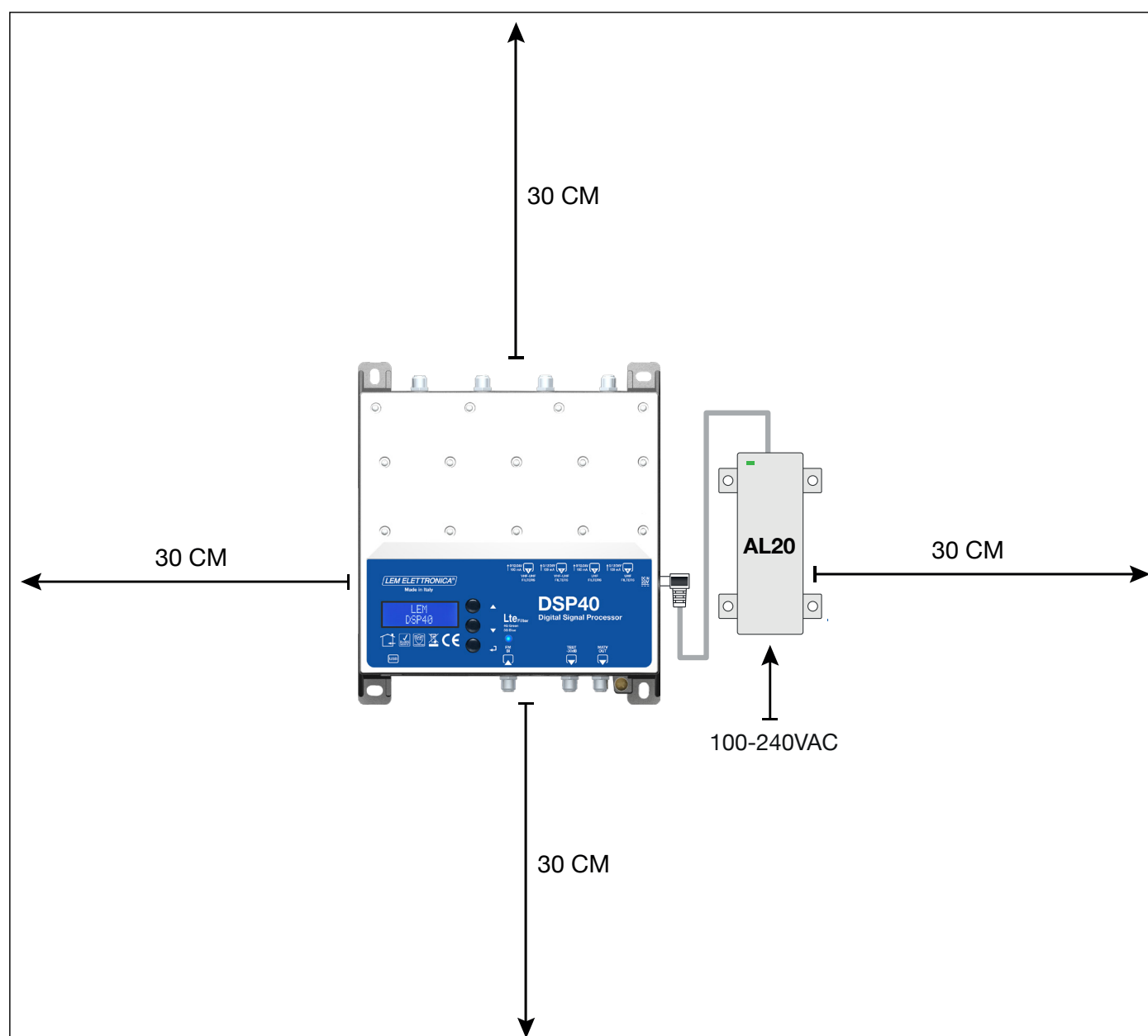
Safety instructions

- Do not expose the amplifier to extreme temperatures.
- Place the amplifier in a dry and well-aired location.
- Install the unit on a vertical wall, or in a waterproof cabinet to a minimum IP55 rating, and fix it safely using the special through holes supports.

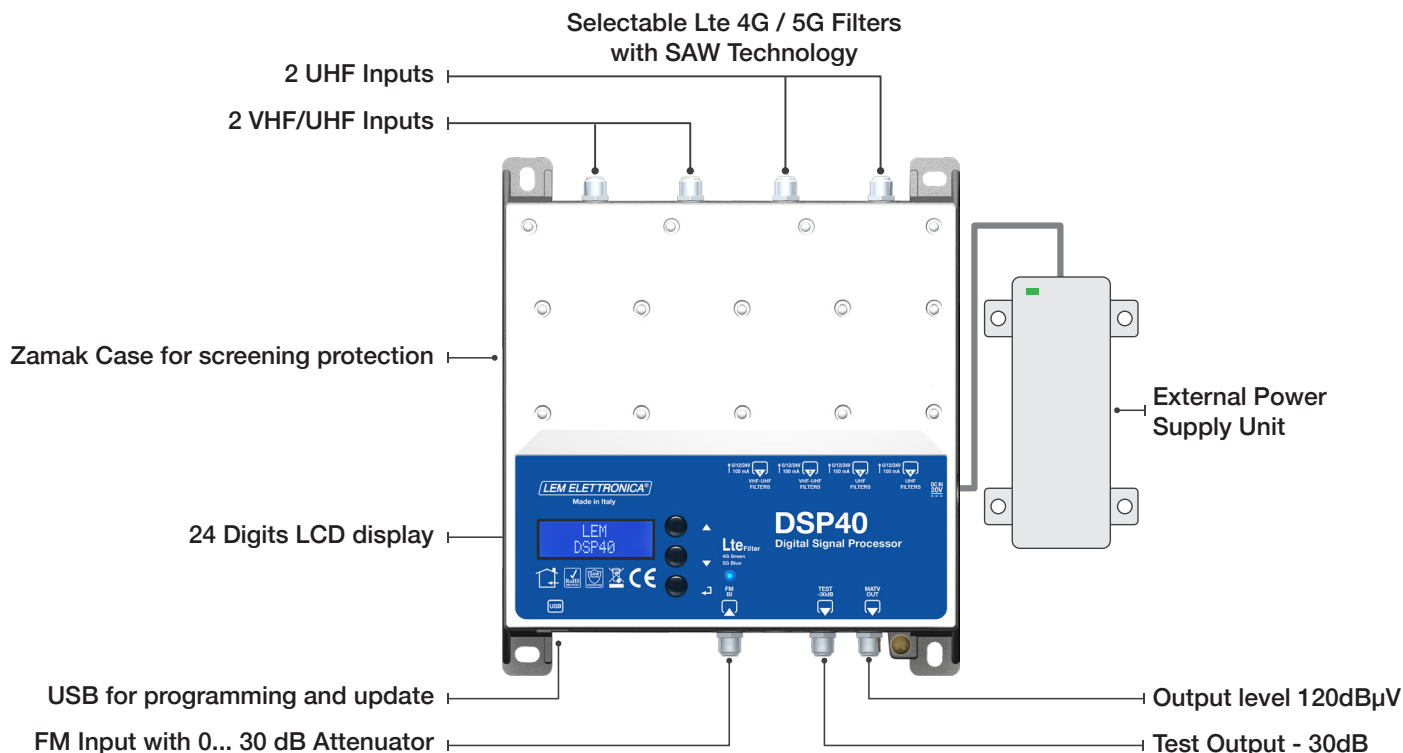
IMPORTANT!

Use only the power pack supplied together with the amplifier.

The use of other power packs can cause malfunctioning and irreversible damages which will invalidate any warranties.





Connections Schematic



Installation and start-up

- Connect an earth wire to grounding clamp
- Connect the TV aerial(s) to the amplifier's inputs.
- Terminate the unused inputs with 75Ω terminators.
- Connect the power supplier unit and than connect the amplifier to the mains plug

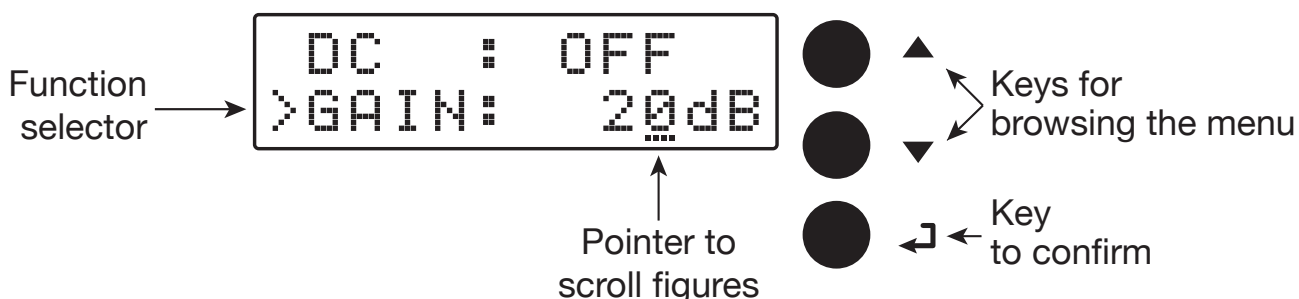
Programming via display

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

Firmware rel. 1.3
Hardware rel. 3.0

LEM
DSP40

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 resume to continue.



Automatic channel scan and memorization

AUTO-TUNING

```
TUNING
AUTO      MAN
```

To start the automatic programming, **AUTO-TUNING**, place the pointer --- below **AUTO**. Press **↵** to proceed. The amplifier **DSP40** will start scanning the MUX on input [1] for UHF band and on input [2] for III° band.

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

```
TUNING
>      >      >
```

Wait for the **AUTO-TUNING** procedure to end, which depends on the number of MUX received from the antenna.

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

When the **AUTO-TUNING** procedure is completed the display will show the total output level depending on the number of MUX automatically 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.

Manual programming

```
TUNING
AUTO      MAN
```

Position the pointer --- on **MAN** to start the manual programming through the Δ key and press \leftarrow to continue.

FM INPUT

```
INPUT FM
```

Press \leftarrow to enter the menu to set the **FM** input parameters.

FM REMOTE POWER SUPPLY

```
INPUT FM
>DC : OFF
```

Press \leftarrow to start the pointer --- to scroll options then press $\nabla \Delta$ to select **ON** or **OFF** to enable the remote power supply on the **FM** input. Press \leftarrow to confirm.

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

FM GAIN

```
DC : ON
>GAIN: 30dB
```

Adjustable from 0 to 30dB

Position the function selector > on **Gain** and press \leftarrow to start the pointer --- to scroll options, select the desired output level through the keys $\nabla \Delta$ and press \leftarrow to confirm.

```
INPUT FM
```

Press Δ twice then \leftarrow to go back to the main menu.

INPUT [1] VHF-UHF

```
INPUT V/U 1
```

To set the **INPUT V/U 1** parameters press \leftarrow to enter the menu.

INPUT V/U 1 Processable channels

VHF = E5... E13 - DAB

UHF 21... 60 with filter Lte 4G selected

UHF 21... 48 with filter Lte 5G selected

UHF 21... 69 with filter Lte OFF

The selection of the Lte filter is available in the **ADVANCED** menu.



In any position of the menus **INPUT V/U 1**; **INPUT V/U 2**; **INPUT U 3**; **INPUT U 4** press the keys $\nabla \Delta$ at the same time to go back to main menu.

REMOTE POWER SUPPLY

```
INPUT V/U 1
>DC : OFF
```

Press \leftarrow to start the pointer --- to scroll options then press $\nabla \Delta$ to select **ON** or **OFF** to enable the remote power supply on the **FM** input. Press \leftarrow to confirm.

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

INPUT GAIN

```
INPUT U/U 1
>GAIN: 20dB
```

Adjustable from 0 to 20dB

SINGLE MUX FILTERING

```
GAIN: 20dB
>ADD 1 CH
```

```
GAIN: 20dB
>21->21 L 65
```

```
GAIN: 20dB
>21->21 L 65
```

Position the function selector > on **Gain** and press \leftarrow to start the pointer --- to scroll options, select the desired output level through the keys $\nabla \Delta$ and press \leftarrow to confirm.

Press $\nabla \Delta$ to position the function selector > on **ADD 1 CH** and press \leftarrow .

To activate only the filtering function on a single MUX set the desired channel through the $\nabla \Delta$ keys then press \leftarrow twice to confirm.

The L figure shows the input level of the selected MUX in dB μ V.

MUX CONVERSION

```
GAIN: 20dB
>36->36 L 65
```

```
GAIN: 20dB
>36->41 L 65
```

To activate the filtering and conversion function on a single MUX set the desired channel through the $\nabla \Delta$ keys then press \leftarrow to confirm the input channel. Adjust the conversion channel through the $\nabla \Delta$ keys then press \leftarrow to confirm.



Regardless of the selected Lte 4G or 5G filter, output conversions up to the UHF channel 69 are permitted.

TWO MUX FILTERING

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

```
GAIN: 20dB
>21<>22 L 65
```

To add a filter for two channels with two adjacent MUX press ∇ and select **ADD 2 CH**. Press \leftarrow to confirm. Select the first channel with the $\nabla \Delta$ keys. The second channel will automatically appear in second position. Press \leftarrow to confirm.

DELETE FILTER

```
CH DELETED
```

Position the function selector > on **MUX filtering** or **MUX conversion** using $\nabla \Delta$ then press \leftarrow for five seconds.

```
>INPUT U/U 1
DC : OFF
```

INPUT [2] VHF-UHF

INPUT V/U 2

To set the **INPUT V/U 2** parameters, press **←** to enter the menu.

The procedures described for input 1 apply to all settings.

INPUT V/U 2 Processable channels

BIII° = E5... E13 - DAB

UHF 21... 60 with filter Lte 4G selected

UHF 21... 48 with filter Lte 5G selected

UHF 21... 69 with filter Lte OFF

INPUT [3] UHF

INPUT U 3

To set the **INPUT 3 U** parameters press **←** to enter the menu.

The procedures described for input 1 apply to all settings.

INPUT V/U 3 Processable channels

UHF 21... 60 with filter Lte 4G selected

UHF 21... 48 with filter Lte 5G selected

UHF 21... 69 with filter Lte OFF

INPUT [4] UHF

INPUT U 4

To set the **INPUT 4 U** parameters press **←** to enter the menu.

The procedures described for input 1 apply to all settings.

INPUT V/U 4 Processable channels

UHF 21... 60 with filter Lte 4G selected

UHF 21... 48 with filter Lte 5G selected

UHF 21... 69 with filter Lte OFF

OUTPUT LEVEL SELECTION

OUTPUT

Press **∇** to select the menu **OUTPUT** and press **←** to confirm and check the selected output level.

Adjustable from 93 to 113dBμV

OUTPUT
>LEV: 105dBμV

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

OUTPUT
>LEV: 105dBμV

To exit the submenu position the pointer **>** on **OUTPUT**, press the **Δ** key and **←** to confirm.

>OUTPUT
LEV: 105dBμV

ADVANCED SETTINGS

ADVANCED



In any position of the **ADVANCE** menu press the keys $\nabla \Delta$ at the same time to go back to main menu.

Lte Filter 4G or 5G

ADVANCED
>LTE: 4G

ADVANCED
>LTE: 4G

ADVANCED
>LTE: 5G

ADVANCED
>LTE: OFF

Press \leftarrow and the $\nabla \Delta$ keys to select the SAW Filter Lte 4G or 5G. Press again \leftarrow to confirm.

LTE FILTER	UHF CH	FREQ. RANGE	LED STATUS
5G	21... 48	470... 694 MHz	Blue
5G	21... 60	470... 790 MHz	Green
OFF	21... 69	470... 862 MHz	Green Blinking

REMOTE POWER SUPPLY

LTE: 4G
>DC: 12V

LTE: 4G
>DC: 24V

Select the **DC** voltage setting function and press \leftarrow , press the $\nabla \Delta$ keys to select the 12Volt or 24Volt tension then press \leftarrow to confirm.

PROTECTION PASSCODE

DC : 12V
>PSW: 000

DC : 12V
>PSW: 000

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

AUTO-TUNING INPUTS THRESHOLD

PSW: 000
>THR: 55dBuV

Adj. from 45 to 90dB μ V

PSW: 000
>THR: 59dBuV

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

RESET DSP40

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

```
RESET?  
YES      NO
```

```
RESET OK
```

Select the **RESET** function and press **↵** to enter a second safety menu **RESET?**

If you want to cancel all setting and restore the original settings, confirm YES by pressing **↵**. The display will show **RESET OK** for a few second to confirm the operation.

If you wish to cancel the operation select **NO** by pressing **▽** then press **↵** to confirm.

S/N DSP40

```
RESET  
>SNBR: 00001
```

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

EXIT

```
EXIT
```

```
EXIT  
YES      NO
```

To close the procedure select **EXIT** and press **↵**. Select **YES** by pressing the **▽ Δ** keys and press **↵** to confirm.

If you wish to cancel the operation, select **NO** by pressing **▽** then press **↵** to confirm and carry on your setting procedure.

LEM Graphic User Interface (GUI)

From the download area in our website <http://www.lemelettronica.it>. it is possible to download a special free PC compatible software conceived to operate with the DSP40 amplifier from your PC.

Hardware requirements

PC Windows compatible with USB interface.

Processor 800MHz or more.

256Mb RAM

USB A-B cable.

Software minimum requirements

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

Installation procedure

Close all the active applications (included antivirus programs)

Start the Setup.exe program

Follow the guided procedure until the installation is completed

The program needs the Framework.NET 3.5 it's usually in the PC if there is a recent version of Windows XP. If not the Framework.NET can be freely downloaded from the Microsoft website.

Technical Informations



Electrical and electronic equipments **are not household waste**. In accordance with the European directive EN50419 (corresponding to the article 11(2) of the guideline 2002/96/EC) of the European Parliament of the Council of January, 27th 2003 on used electrical and electronic equipment, it must be disposed properly. At the end of the product life cycle please take this unit and dispose it on designated public collection points.



Installation is only permitted in dry rooms and upon a non combustibile surface. Ensure that there is an adequate air circulation.



The product is in compliance with the EMC requirements in accordance to the EU product norm EN 50083-2 and the keeping of the safety requirements in accordance to the EU product norm EN 60728-11 by the CE sign.

Class A This product meets the more stringent screening requirements according to **EN 50083-2, quality grade A**.

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