DSP40

User Manual

AUDAC

www.audac.eu

POWER SUPPLY AND POWER CORD REQUIREMENTS

Power supply class I grounding requirements:
For protection from fault currents, the equipment shall be connected to a grounding terminal. Plug the system power cord into an AC outlet that provides a ground connection. Substitute cords may not provide adequate fault protection. Only use the power cord supplied with this product or an authorized/equivalent replacement

Safety notices:

Denmark:
Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord.

Finland:
Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan.

Norway:
Apparatet må tilkoples jordet stikkontakt.

Sweden:
Apparaten skall anslutas till jordat uttag.

ATTENTION

The fuse (T500mAL/250V) provides a safeguard function to the device. When replacing the fuse, make sure that the value of the replacement matches the value of the original fuse. Identification of a suitable replacement component or substitute shall be done by qualified technicians.

ADDITIONAL INFORMATION

This manual is put together with much care, and is as complete as could be on the publication date. However, updates on the specifications, functionality or software may have occurred since publication. To obtain the latest version of both manual and software, please visit the Audac website @ www.audac.eu.

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Introduction
Professional DAB/DAB+ & FM tuner

The DSP40 is a professional DAB/DAB+ & FM tuner which provides access to a wide variation of radio stations while guaranteeing a high–quality audio reproduction. Station selection can be done manually or automatically, while up to 10 preferred channels can be internally stored and recalled.

The front panel of the system accommodates a 2.8" TFT display in combination with a push rotary function dial and 4 tactile push buttons. The controls and indicators on the front panel of the unit are guaranteeing an intuitive and user friendly operation, allowing hassle free operation and configuration to even unexperienced users. Information such as radio station information carried by RDS / Radio text and signal reception strength are indicated.

The signal output level is user configurable while dynamic range compression (DRC) is supported, improving the intelligibility for low volumes in applications with high levels of background noise.

Other functions such as mono/stereo (FM) switching always guarantee the best possible audio reception.

The antenna input is implemented by an F–type connector allowing connection of the included antenna cable or any other external antenna using 75Ω coaxial cabling. The balanced stereo line output is connected through two 3–pin terminal block connections.

The RS–232 communication port allows system integration with any home or industrial automation system, while an optional 2.4 GHz remote control allows handheld control while hidden out of sight.

Precautions

READ FOLLOWING INSTRUCTIONS FOR YOUR OWN SAFETY

ALWAYS KEEP THESE INSTRUCTIONS. NEVER THROW THEM AWAY

ALWAYS HANDLE THIS UNIT WITH CARE

HEED ALL WARNINGS

FOLLOW ALL INSTRUCTIONS

NEVER EXPOSE THIS EQUIPMENT TO RAIN, MOISTURE, ANY DRIPPING OR SPLASHING LIQUID. AND NEVER PLACE AN OBJECT FILLED WITH LIQUID ON TOP OF THIS DEVICE.

DO NOT PLACE THIS UNIT IN AN ENCLOSED ENVIRONMENT SUCH AS A BOOKSHELF OR CLOSET. ENSURE THERE IS ADEQUATE VENTILATION TO COOL THE UNIT. DO NOT BLOCK THE VENTILATION OPENINGS.

DO NOT STICK ANY OBJECTS THROUGH THE VENTILATION OPENINGS.

DO NOT INSTALL THIS UNIT NEAR ANY HEAT SOURCES SUCH AS RADIATORS OR OTHER APPARATUS THAT PRODUCE HEAT

DO NOT PLACE THIS UNIT IN ENVIRONMENTS WHICH CONTAIN HIGH LEVELS OF DUST, HEAT, MOISTURE OR VIBRATION

THIS UNIT IS DEVELOPED FOR INDOOR USE ONLY. DO NOT USE IT OUTDOORS

PLACE THE UNIT ON A STABLE BASE OR MOUNT IT IN A STABLE RACK

ONLY USE ATTACHMENTS & ACCESSORIES SPECIFIED BY THE MANUFACTURER

UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME

ONLY CONNECT THIS UNIT TO A MAINS SOCKET OUTLET WITH PROTECTIVE EARTHING CONNECTION

THE MAINS PLUG OR APPLIANCE COUPLER IS USED AS THE DISCONNECT DEVICE, SO THE DISCONNECT DEVICE SHALL BE READILY OPERABLE

USE THE APPARATUS ONLY IN MODERATE CLIMATES

CAUTION – SERVICING

This product contains no user serviceable parts. Refer all servicing to qualified service personnel. Do not perform any servicing (unless you are qualified to)

EC DECLARATION OF CONFORMITY

This product conforms to all the essential requirements and further relevant specifications described in following directives: 2014/30/EU (EMC) and 2014/35/EU (LVD)

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

The WEEE marking indicates that this product should not be disposed with regular household waste at the end of its life cycle. This regulation is created to prevent any possible harm to the environment or human health.

This product is developed and manufactured with high quality materials and components which can be recycled and/or reused. Please dispose this product at your local collection point or recycling centre for electrical and electronic waste. This will make sure that it will be recycled on an environmentally friendly manner, and will help to protect the environment in which we all live.

CAUTION

The symbols shown are internationally recognized symbols that warn about potential hazards of electrical products. The lightning flash with arrow point in an equilateral triangle means that the unit contains dangerous voltages. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the users manual.

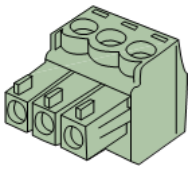
These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.

Chapter 1
Pin connections and connectors

CONNECTION STANDARDS

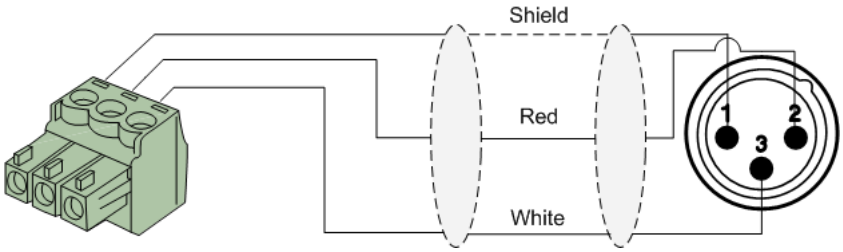
The in– and output connections for AUDAC audio equipment are performed corresponding to international wiring standards for professional audio equipment.

3–Pin Terminal Block:
For balanced in & output connections

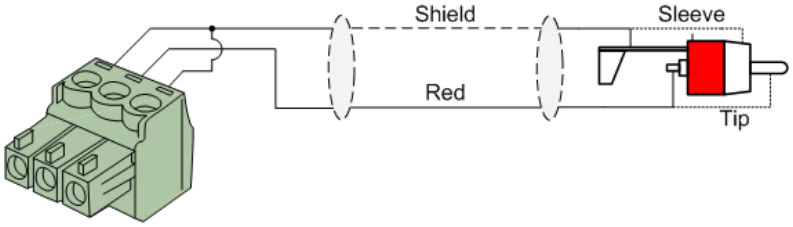


Left:	Signal –	(XLR Pin 3)
Center:	Signal +	(XLR Pin 2)
Right:	Ground	(XLR Pin 1)

For balanced line output connections:



For unbalanced line output connections:



RS232 (serial connection interface):
For connection with home automation systems, or other remote control equipment

Connection	Standard RS232
PIN 2	DSP40 TX
PIN 3	DSP40 RX
PIN 5	GND
Settings	19200 Baud
	8 Bit
	1 Stop bit
	No parity
	No Handshaking

RS232

The complete command set for controlling the DSP40 through RS–232 is available in the DSP40 commands user manual which is freely downloadable on www.audac.eu

Chapter 2
Front & rear panel

Front Panel overview

Front panel description

Graphical LCD display with tactile push buttons and rotary selection dial:
A clear system overview and intuitive user experience is offered using the 2.8” graphical LCD display accompanied with four tactile selection buttons (left side) and a rotary selection dial (right side). The true colour display offers a clear overview of the systems current operation mode with intuitive and user friendly browsing through the menu structure.

The functionality of the four tactile push buttons on the left side depends on the current mode and position in the menu structure. Icons on the left side of the display are indicating the current functionality linked with the buttons.

Parameter adjustment and browsing is made easy using the rotary function dial. This multifunctional dial allows easy one–hand operation throughout the entire menu structure. Browsing through the menu is done by rotating it while actions are made by pressing it.

Power switch:
Allows to power the system ON and OFF. The blue indicator LED illuminates when switched on.

Rear Panel overview

Rear panel description

AC Power inlet with fuse:
The mains power supply (100–240V AC – 50/60 Hz) has to be applied to this AC power inlet. The connection is made by an IEC C14 power connector and is fitted with a fuse. When replacing the fuse, make sure that the value of the replacement fuse matches the value of the original fuse. (T0.5AL/250V)

RS232 Connection:
The RS232 connection can be used to control the system through any external hardware such as home and industrial automation systems. The pinout and communication settings are described in an earlier chapter of this user manual. The complete RS232 command instruction set and configuration information can be downloaded from the AUDAC website.

USB (Update) Connection:
The USB (Update) connection can be used for system firmware updates and/or for connection of the RF remote control (RMT40) receiver.

Balanced stereo line output:
The balanced stereo line output is implemented using two 3–pin terminal block connectors. The audio output available on this connector allows it to be fed to any amplifier or pre–amplifier.

F–type antenna connection:
The antenna (input) connection is implemented using an F–type connector whereto the supplied FM antenna should get connected. Depending of the installation conditions, location and signal strength, it can be recommended / necessary to extend the antenna using 75 Ω coaxial cable and connect an external or outdoor antenna.

Chapter 3
Using the DSP40

The DSP40 control and configuration is done through the front panel of the device which includes a 2.8” graphical LCD display, which is accompanied with four tactile push buttons (left side) and a rotary selection dial (right side). This combination allows you to navigate through the systems user interface and access all the available control and configuration possibilities of the system.

The functionality of the four tactile push buttons on the left side depends on the current mode and position in the menu structure. Icons on the left side of the display are indicating the current functionality linked with the buttons.

The rotary selection dial can be used for parameter adjustments and browsing to station lists, playlists or any other. This multifunctional dial allows easy one–hand operation throughout the entire menu structure. Browsing is done by rotating it while actions are made by pressing it.

The functionality for each icon is indicated in following table:

ICON	DESCRIPTION
◀◀	Automatic tuning to previous station
▶▶	Automatic tuning to next station
FM/DAB	Switch between FM / DAB functionality
💾	Mark / save current selection as favorite
🔧	Go to general settings
⚙	Go to DAB/DAB+ & FM tuner settings

Main screen

FM Radio station selection:

• Automatic tuning:

The currently playing FM radio station (if FM mode is enabled) is selected by pressing the ◀◀ (tuning down) and ▶▶ (tuning up) buttons. When pressed, it will automatically start searching for the next station with sufficient signal strength. The currently tuned frequency will be indicated at the center of the screen, also indicating additional carried RDS information (if available) such as the currently playing station or track name.

• Manual tuning:

The tuning frequency can be manually adjusted by rotating the function dial until the tuned frequency is highlighted in blue colour. When highlighted, confirm manual tuning adjustment by single pressing the rotary dial and adjust the tuner frequency by rotating clockwise (tuning up) or counter–clockwise (tuning down). Once tuned to the desired frequency, confirm the tuned frequency by single pressing the function dial once again.

DAB Radio station selection:

The currently playing DAB radio station (if switched to DAB mode) is selected by pressing the ◀◀ (tuning down) and ▶▶ (tuning up) buttons. When pressed, it will automatically switch to the next available station.

The currently playing station name is shown, together with additional carried Radio text station information such as the currently playing program or track name. More information such as signal reception strength, the number of available DAB radio stations and the bitrate of the currently playing station is shown on the right side of the screen.

FM/DAB switching:

Switching between DAB and FM mode is done by pressing the FM/DAB (FM/DAB) button. The current mode (FM or DAB) is shown on the display in front of the tuning frequency or station name. When switching to DAB mode for the first time, all available stations will be scanned first.

Save radio station:

The currently playing station can be stored to one of the 10 available positions. A horizontal array with numbers from 1 to 10 is indicated on the bottom of main tuner screen, representing the 10 positions whereto the presets can be saved. Rotate the function dial until the number for radio station storage is highlighted, and press the 💾 (save) icon for saving the currently selected frequency to the selected position.

Recall radio station:

A stored radio station can be recalled by rotating the function dial until the number on the horizontal array on the bottom of the main tuner screen is highlighted. When highlighted, confirm the recall of the stored frequency by single pressing the function dial. The stored frequency under this position is now recalled and the radio station will start playing.

General settings:

The 🛠 (General settings) button gets you to the general settings menu where all general settings for the device can be configured.

DSP40 Settings screen

The settings menu for DSP40 can be loaded by rotating the rotary dial until the ⚙ (settings) symbol is highlighted in blue colour. When highlighted, confirm to proceed to the settings menu by single pressing the rotary dial.

Output gain:
The gain can be adjusted within a range of +8 dB and –32 dB, allowing optimization of the output level according to the input sensitivity of the connected amplifier or pre–amplifier. For adjusting the output gain, rotate the function dial until 'Gain' is highlighted and press it for proceeding to the gain settings. The level can be adjusted by rotating clockwise (tuning up) or counter–clockwise (tuning down). Press the rotary dial for confirming the currently set output level.

Mono:
The FM reception is standard set to stereo mode, however it will switch automatically to mono mode if the signal reception strength is insufficient. This reduces the noise and improves the sound quality when having poor signal reception.

Manual switching the output to mono mode is possible using this function, allowing the output to be fed to mono systems, such as 100V public address amplifiers. Toggling between mono and stereo mode can be done by single pressing the function dial.

DAB DRC:
The DRC (Dynamic Range Compression) increases the loudness of the signal in the quieter parts of the audio signal and decreases it in the louder parts. This technique allows quite parts of the audio signal still being audible in situations with high background noise without blasting out. It can be switched between Off, Low and High. DRC data is carried by an additional side channel of DAB radio station and is only functional when the selected radio station carries the DRC data.

DAB info:
Gives additional information about the currently playing DAB radio station. Displayed information includes station name, currently playing program or track name, signal reception strength, bitrate, ...

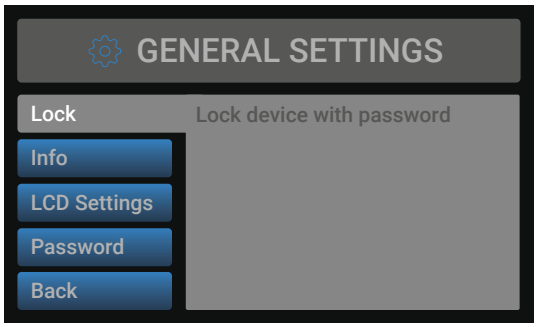
DAB search:
Clears all stored DAB channels from the memory and scans the entire bandwidth for available DAB/DAB+ channels. DAB search is automatically performed when initially switched to DAB mode, but shall be re–done when any change to available channels or position of the receiver is made.

Factory reset:
Factory reset will recall all settings to factory defaults and all previously made settings and configurations will be lost. After selecting factory reset, a confirmation will be asked whether all settings definitely need to be reset to factory defaults. When confirmed, all settings will be lost.

General settings

The general settings menu for DSP40 is loaded when pressing the (general settings) button. The general settings menu allows to configure all the global settings for the DSP40 unit, keeping aside the audio and frequency settings.

Lock:
When selecting 'Lock', the system will be locked and will require a password to be entered before any further action can be taken (if the password is enabled).



Info:
Info will give an overview of the software versions the DSP40 is running.

LCD Settings:
Adjustments for the LCD settings can be made here. The brightness can be adjusted within a range of 10% to 100% (standard is 80%). Adjusting of the LCD brightness can be convenient when the device is placed in an environment with very low or very high ambient light. Hereby the clarity of the LCD can be adjusted being clear but unobtrusive.

The backlight off time can be adjusted within an interval of 10 up to 120 minutes or never (always on), making the backlight of the LCD automatically turn off after the set time.

Password:
Password protection can be enabled, avoiding unauthorized users to make any adjustment to the system. The password is a four–digit code. In default, the password is set to '0000' which gives full access to the system without requiring any password to be entered. If the configured password is different from '0000', the user will be requested to enter the password before any access to the systems functions is provided.

The currently set password will be shown and the adjusting digit can be selected (turns red) and confirmed by turning and pressing the rotary selection dial. Consecutive digits will increase when the maximum value has been reached.

After the desired password has been selected it can be confirmed by pressing (turns red) and turning the function dial clockwise to the entire right side where the 'OK' word will appear. After pressing again the password is confirmed.

Back:
Returning to the main screen is done by selecting 'Back'.

Chapter 4
Additional information

Technical specifications

Control			Front panel
			RS-232
Inputs			F-type antenna connection (75 Ω)
FM	Tuning Range (-10 dB)		87.5 ~ 108 MHz
	Sensitivity (1W/1m)		-108 dBm
	Signal / Noise		52 dB
	THD+N (@ 1 kHz)		0.22%
	Frequency Response (± 3 dB)		30 Hz - 12.5 kHz
	Crosstalk (@ 1 kHz)		26 dB
DAB	Tuning Range (-10 dB)	Band-3	171 ~ 240 MHz
		L-Band	1452 ~ 1492 MHz
	Sensitivity (1W/1m)		-99 dBm
	Signal / Noise		81 dB
	THD+N (@ 1 kHz)		0.026%
	Frequency Response (± 3 dB)		42 Hz - 20 kHz
	Crosstalk (@ 1 kHz)		53 dB
Outputs	Type		Balanced stereo line outputs (3-pin Euro Terminal Block (Pitch-3.81 mm)
	Level		+8 dB ~ -32 dB
Power	Consumption		0.7 W
Dimensions	(W x H x D)		482 x 44 x 330 mm
Weight			3.150 kg
Mounting			19”
Unit height			1 HE
Construction			Steel
Colours			Black