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progettato,
costruito
in Italia

PRELIMINARY

bit one

Signal Interface Processor

ADVANCED MANUAL

elettromedia
audison is a part of elettromedia - 62018 Potenza Picena (MC) Italy - www.elettromedia.it

INDEX

PRODUCT DESCRIPTION

Bit One is a signal digital processor essential to maximize the acoustic performance of your Car Audio system.
It consists of a 32 bit DSP processor and 24 bit AD and DA converters.
What makes it a unique device is that it provides the ability to de-equalize car factory systems equipped with integrated audio processor, to enhance and improve any car audio factory system.
It features 10 PRE Amp Level signal inputs, 8 Speaker Level signal inputs, an optical and electrical S/PDIF digital input as well as a PHONE IN input allowing the use of cellular phones hands-free kits.
It provides 8 outputs both at a pre-amplified and a digital level.
A 32 band equalizer, an electronic crossover and a digital delay are available for each channel.
To perform the different possible adjustments a connection with a PC is required.

PACKAGING CONTENTS

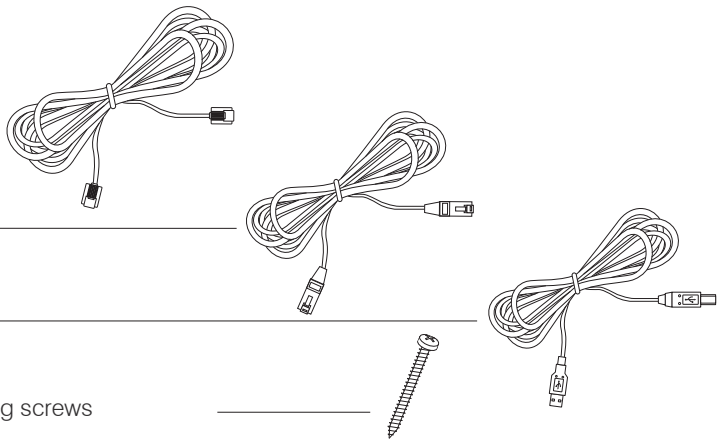
- Bit One - Signal Interface Processor

- Printed Quick Start Guide

- 5.0 m AC Link (RJ-12) cable

- 5.0 m AD Link (RJ-45) cable

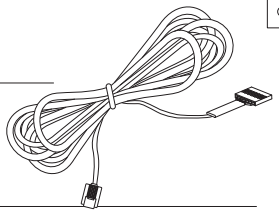
- 3.0 m USB cable



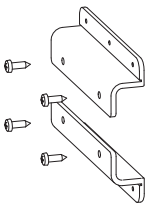
- N. 4 4,2 x 38 mm self-tapping, cross head fixing screws

- DRC (Digital Remote Control) Control Panel

- 4.5 m DRC / AC Link cable



- N. 2 fixing brackets with 2,9 x 6,5 mm self-tapping, cross head screws

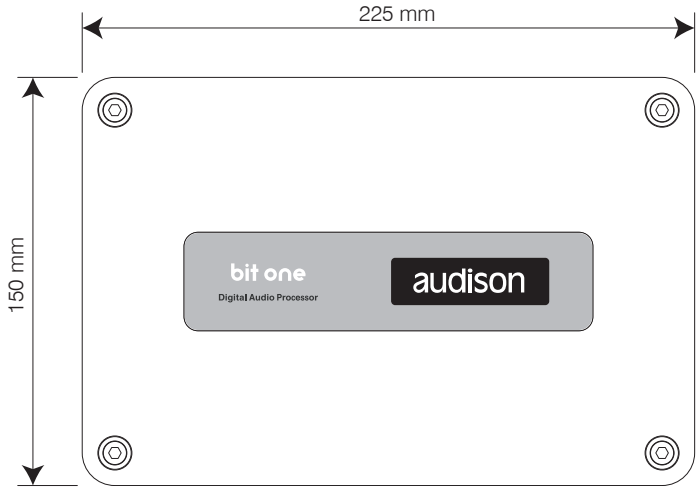


- CD ROM with:
  Bit One Software
  USB-ACNet drivers
  This Advanced Manual (.pdf format)
  Test tracks

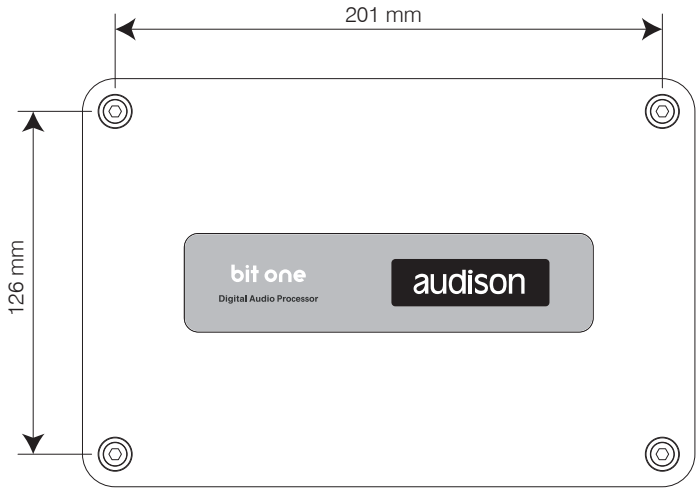
Warning: a PC provided with Windows XP operating system is required to install the software and set the Bit One.

INSTALLATION

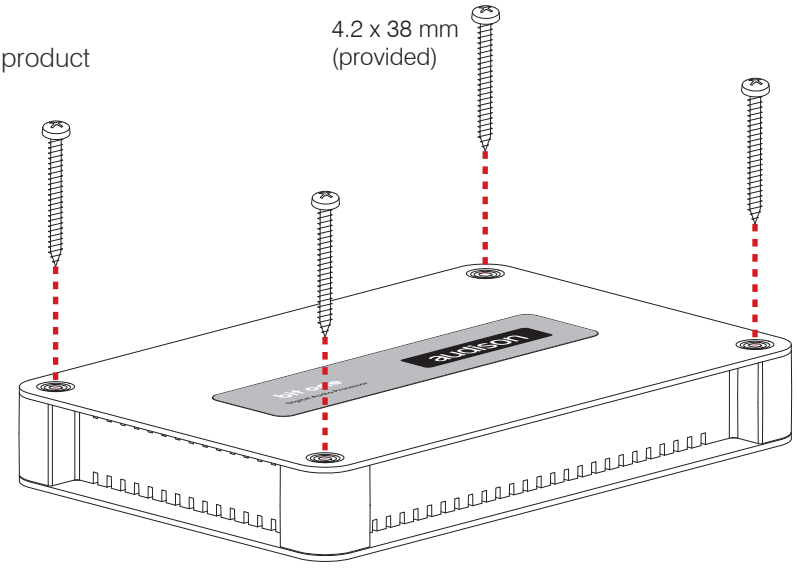
External dimensions



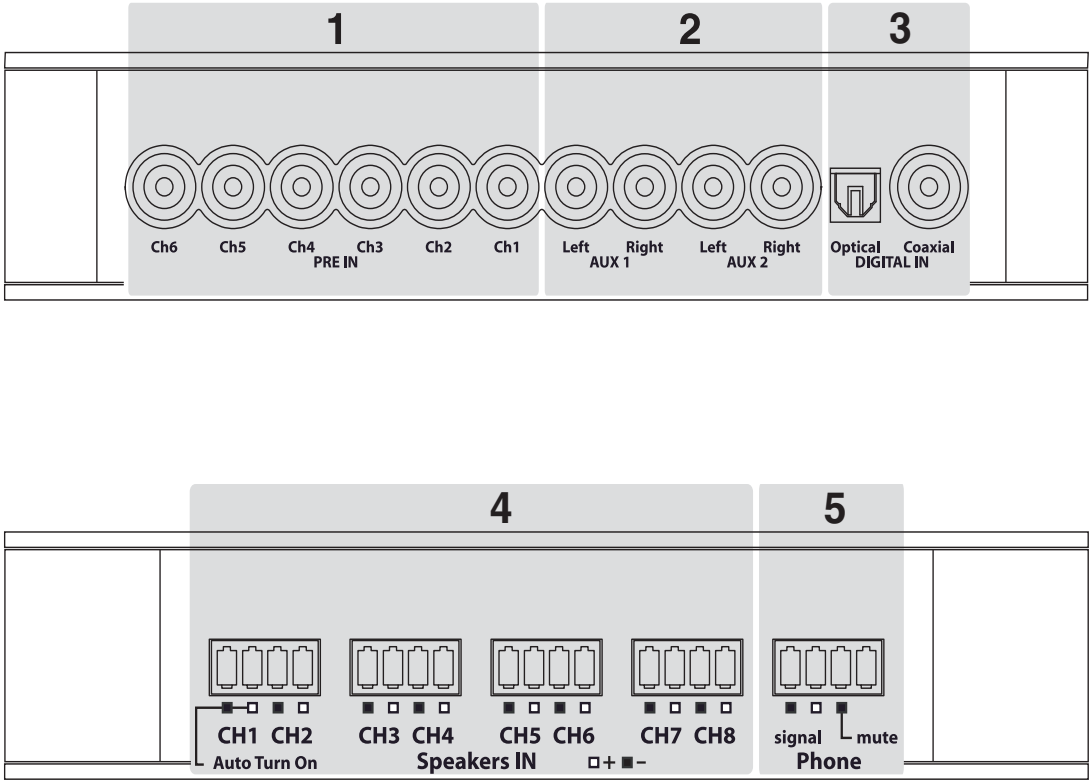
Mounting dimensions



How to secure the product



INPUT / OUTPUT CONNECTION PANELS - DESCRIPTION



■ – negative pole (ground
□ + positive pole

INPUT SIGNALS

1 • MASTER PRE IN (low-level inputs)
Ch1 - Ch2 - Ch3 - Ch4 - Ch5 - Ch6
Connect here the RCA cables coming from the main analog signal source.
If these inputs are used, the MASTER SPEAKER IN inputs can not be used.

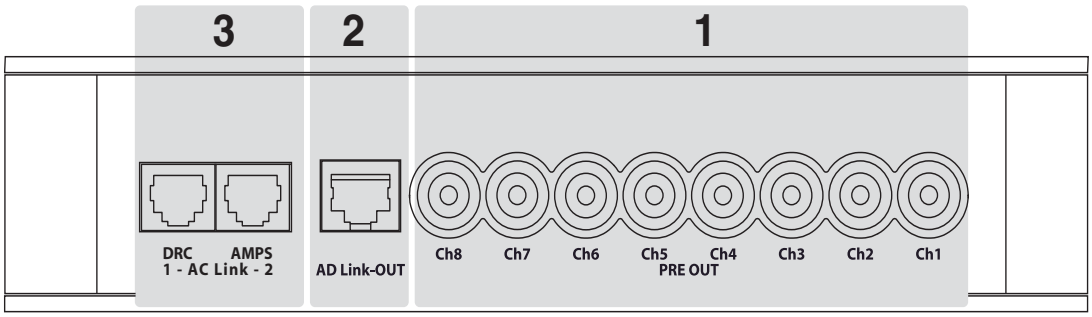
2 • AUXILIARY PRE IN (low-level inputs)
AUX1 - AUX2
Connect here the RCA cables coming from additional analog signal sources.

3 • DIGITAL IN (digital inputs)
Optical - Coaxial (S/PDIF standard)
Connect here the specific cables coming from signal sources with digital output.

4 • MASTER SPEAKER IN (hi-level input)
Ch1 - Ch2 - Ch3 - Ch4 - Ch5 - Ch6 - Ch7 - Ch8
Connect here the specific cables coming from the power output of the main signal source.
If these inputs are used, the MASTER PRE IN inputs can not be used.

5 • HANDSFREE IN (high-level input)
Phone: Signal (+/-) , Mute.
Connect here the specific cables coming from the used handsfree kit.

INPUT / OUTPUT CONNECTION PANELS - DESCRIPTION

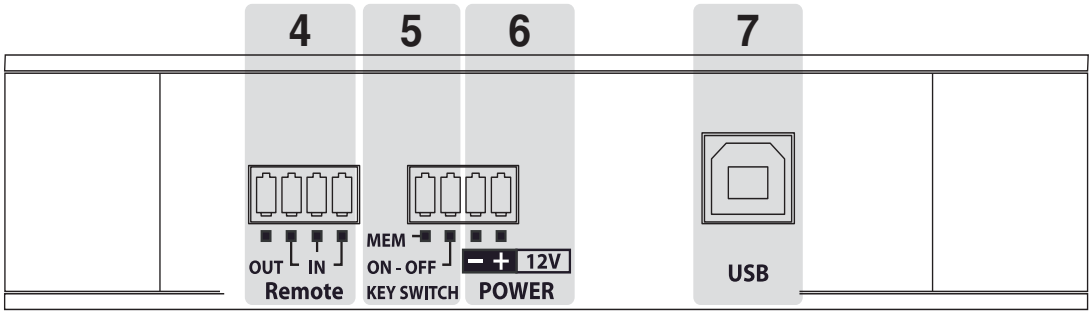


OUTPUT SIGNALS

1 • PRE OUT (low-level analog signal)
Ch1 - Ch2 - Ch3 - Ch4 - Ch5 - Ch6 - Ch7 - Ch8
Connect here the RCA cables going to the system amplifiers.

2 • AD Link - OUT (digital signal)
S/PDIF standard digital signal (Ch1÷Ch8) to connect amplifiers provided with appropriate AD Link input.

3 • AC Link 1 - 2 (REMOTE CONTROLS)
DRC: Connection plug for the remote control panel of the processor functions and the devices connected to the AMPS bus.
AMPS: Connection bus to control the amplifiers provided with AC Link connection.



REMOTE CONTROLS INPUTS / OUTPUTS

4 • REMOTE IN-OUT
IN: for the processor remote turn-on through one or multiple signal sources, featuring Rem Out control.
OUT: output for the remote turn-on of the other devices/amplifiers connected to the processor.

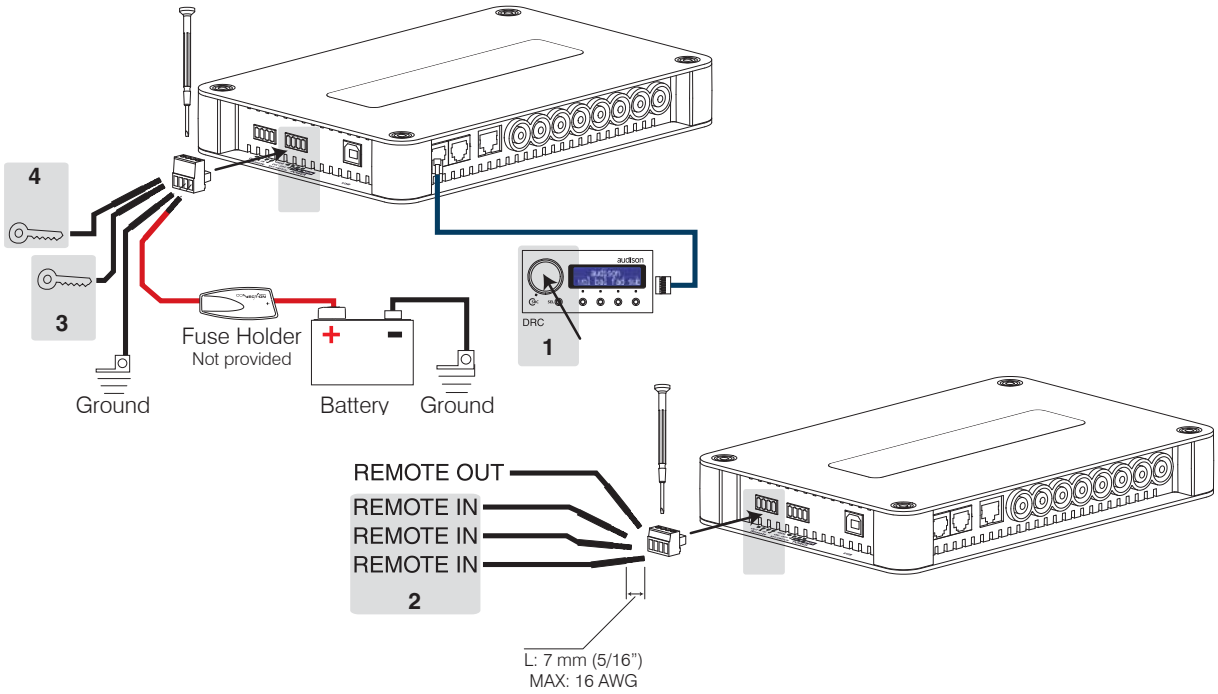
5 • KEY SWITCH
MEM: it stores the processor status at shutdown (optional)
ON - OFF: it turns the processor on/off when the car ignition key is turned on/off (optional).

6 • POWER (power supply connection)
- 12V +
Positive and negative connection terminal for car 12 V power supply.
WARNING: make sure the connection polarity is as indicated on the terminals. A mis-connection may result in damage to the processor.

7 • USB
USB (B) connection plug, to connect the processor to a PC and manage its functions through the Bit One software.

CONNECTIONS

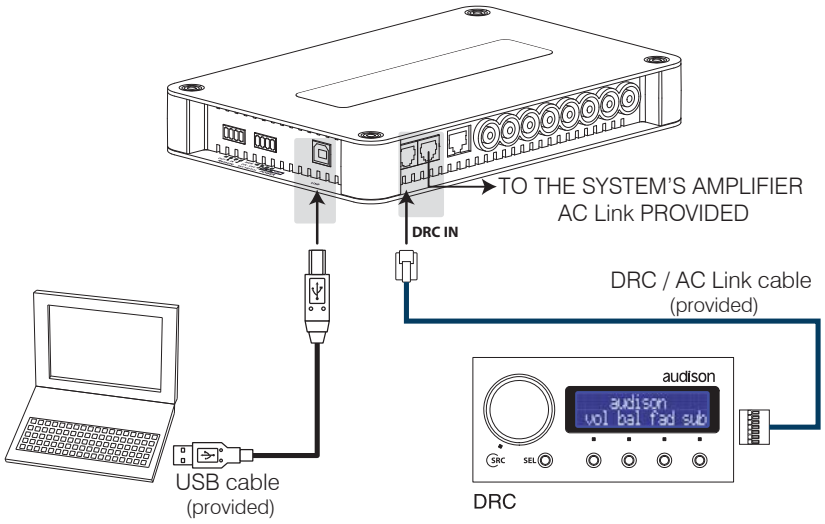
POWER SUPPLY AND REMOTE TURN-ON



HOW TO TURN THE BIT ONE ON / OFF ONCE INSTALLED

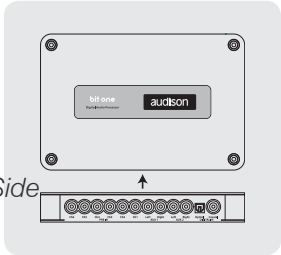
1. Push the DRC main control switch (to turn on). Keep the DRC main control knob pressed (to shut down). In this case no other connections (Remote In / Key Switch) are required.
2. Connecting one of the Remote In plugs (the KEY SWITCH connection is not required).
3. Connecting KEY SWITCH 1. Every time you turn on / off the car ignition key, the Bit One will turn on / off. If this control is used, KEY SWITCH 2 can not be used.
4. Connecting KEY SWITCH 2. Every time you turn on / off the car ignition key, the Bit One will recall how it was shut down; if the processor was shut down from the DRC unit (optional), you can turn it on with the appropriate DRC control. If the processor was shut down with the KEY SWITCH, you can turn it on directly with the KEY SWITCH. If this control is used, the KEY SWITCH 1 can not be used.

PERSONAL COMPUTER and DIGITAL REMOTE CONTROL (DRC)



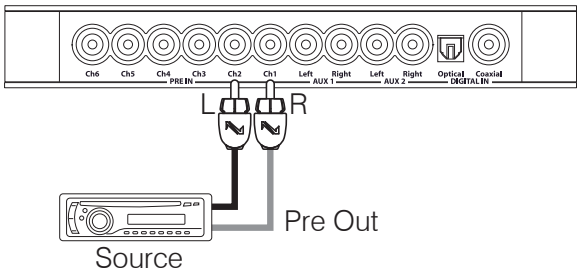
CONNECTIONS:

LOW-LEVEL AND DIGITAL INPUT SIGNALS

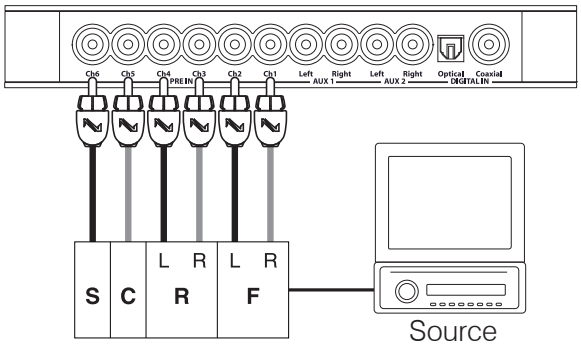


BIT ONE
Bottom Side

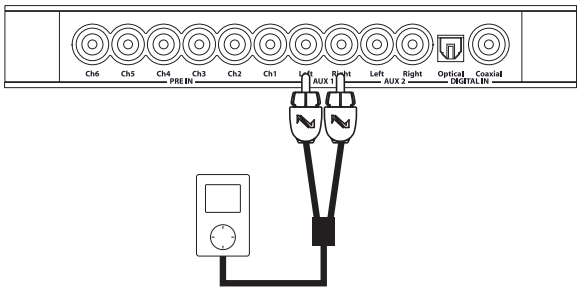
PRE IN - STEREO



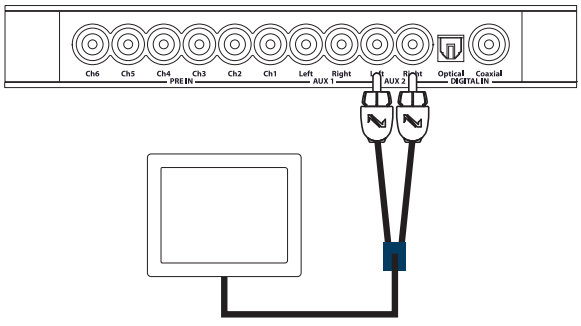
PRE IN - AUDIO CAR THEATRE



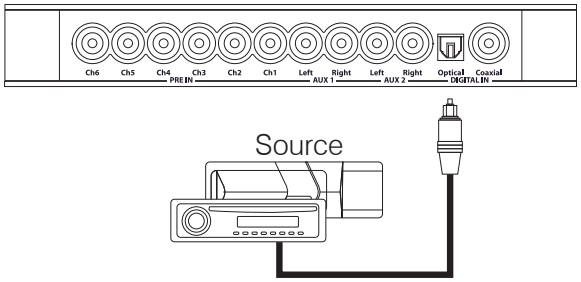
PRE IN - AUX 1



PRE IN - AUX 2

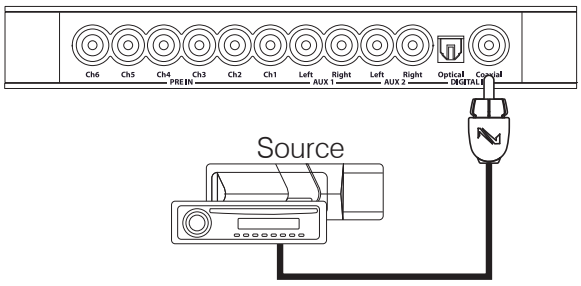


DIGITAL OPTICAL



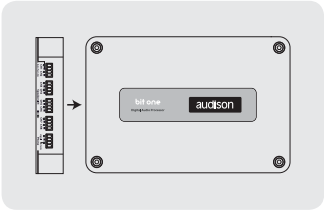
Warning: the digital input accepts up to 192 kHz / 24 bit stereo PCM signals. So it can't reproduce DOLBY DIGITAL multi-channel signals coming from audio/video sources (such as for instance the audio of a movie in a DVD).

DIGITAL COAXIAL



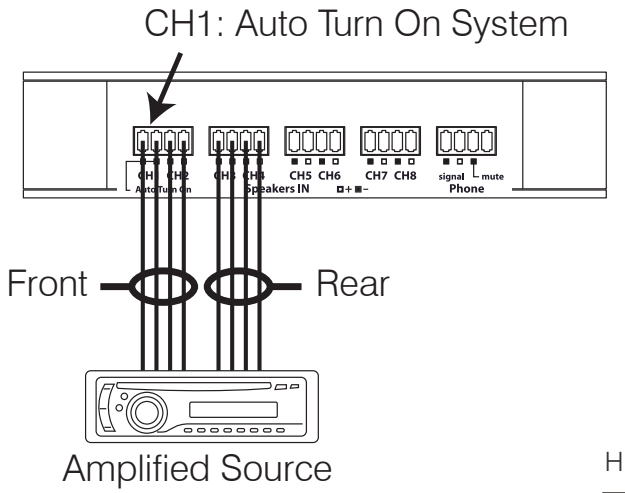
CONNECTIONS:

HIGH-LEVEL INPUT SIGNALS

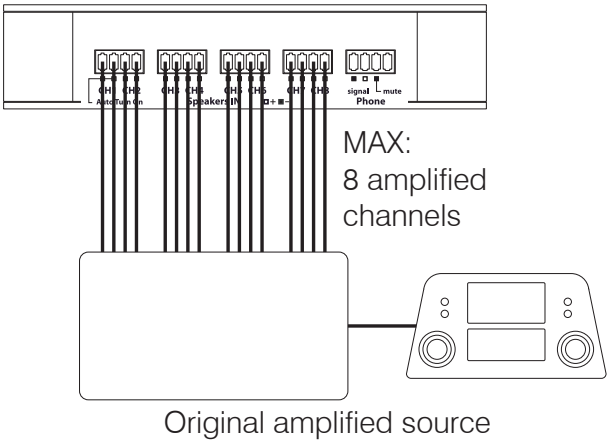


BIT ONE
Left Side

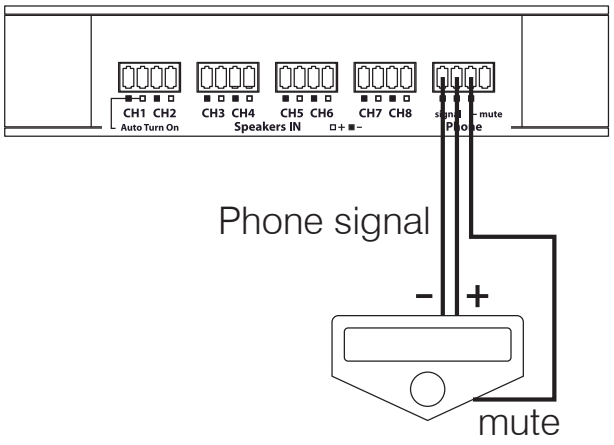
HIGH LEVEL STEREO FRONT + REAR



HIGH LEVEL MULTICHANNEL



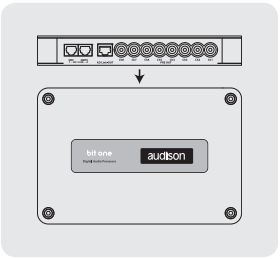
HANDSFREE TELEPHONE KIT CONNECTION



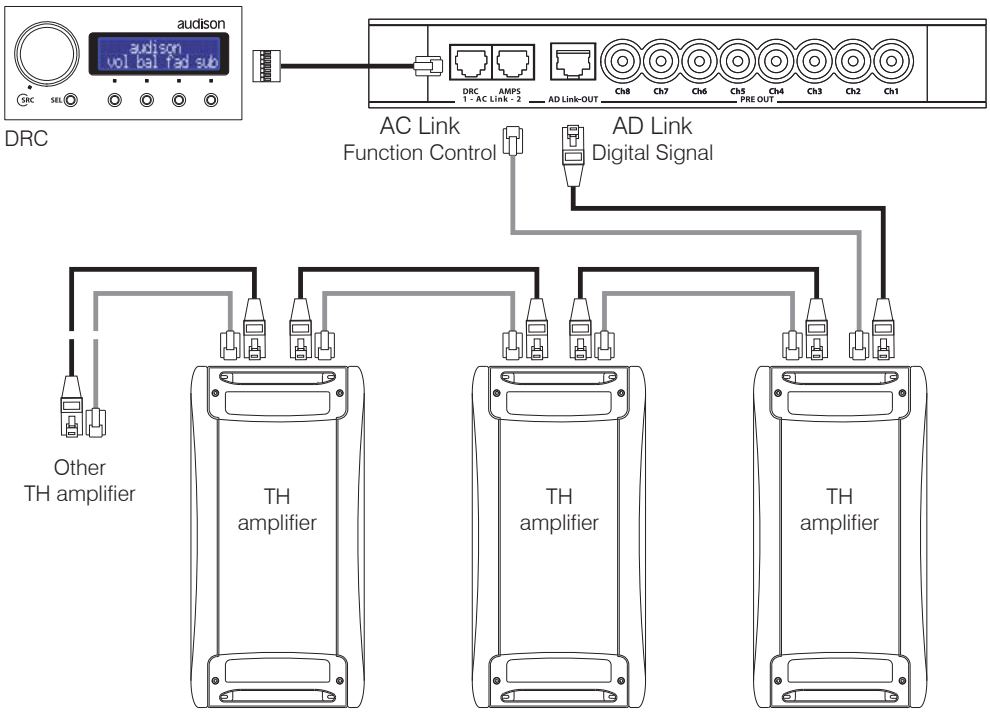
CONNECTIONS:

OUTPUT SIGNALS

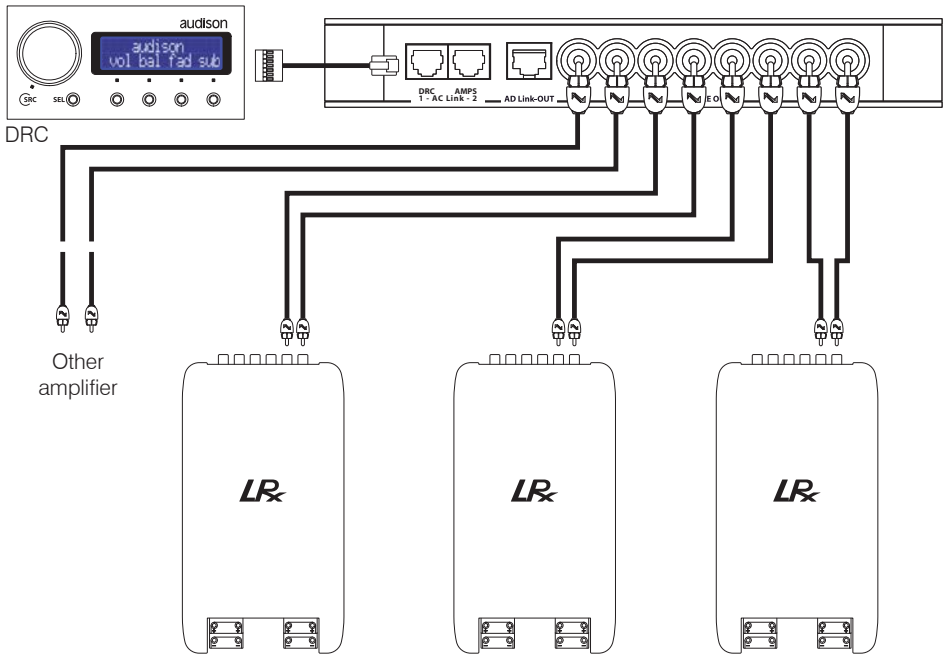
BIT ONE
Top Side



OUTPUT TO A TH AMPLIFIERS SYSTEM (AD LINK + AC LINK)



OUTPUT TO A NON-TH AMPLIFIERS SYSTEM (PRE)



BIT ONE SOFTWARE AND DRIVERS - QUICK INSTALLATION GUIDE

1. Insert the “Bit One Setup CD” CD-ROM into the PC CD-player you want to use.

2. Install the Bit One control software launching the file “setup.exe” that is in the supplied CD.

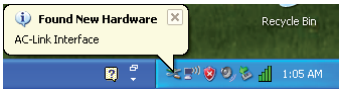
3. Follow and complete the installation procedure.

4. Leave the CD-ROM inside the drive.

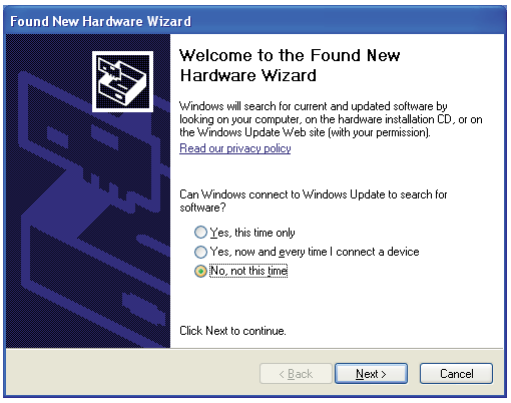
5. Turn the Bit One on.

6. Connect the USB cable coming from its appropriate plug on the Bit One to a USB plug available on the PC.

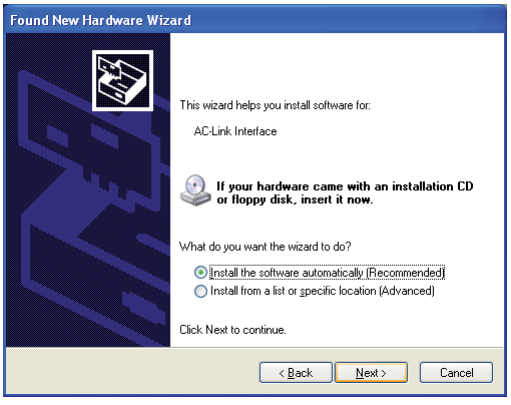
7. The PC will recognise the Bit One interface and will ask you to install the driver:



8. Select “No, not this time” and click on “Next”:

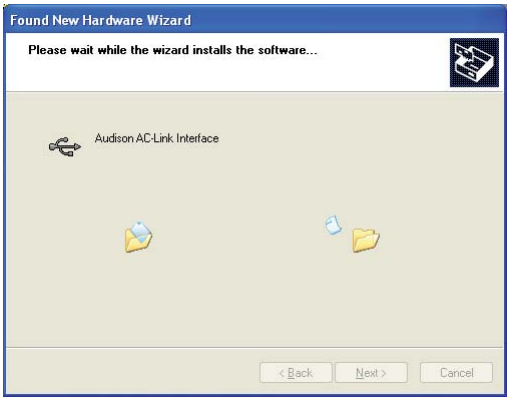


9. Check if the Bit One Setup CD is inside the CD-ROM drive. If it is, select “Install software automatically” then click on “Next”:

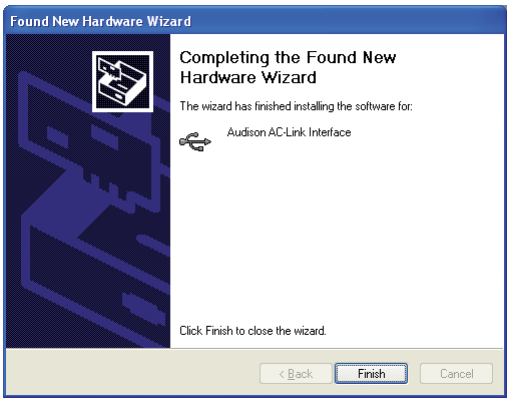


10. In Windows XP and superior operating systems, the following window regarding the driver certification warning will show up. Click on “Continue Anyway”:

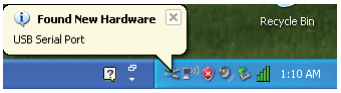
11. The system will install the ACLink interface drivers:



12. If the procedure was successfully completed, the system will notify you that the driver installation has been completed. Click on “Finish”:

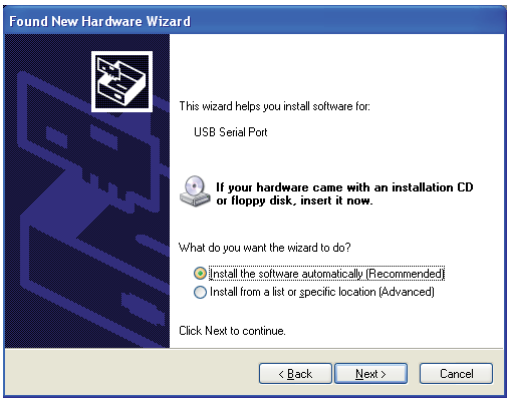


13. The system will now recognise the virtual serial port connected to the Bit One and will ask you to install the driver:



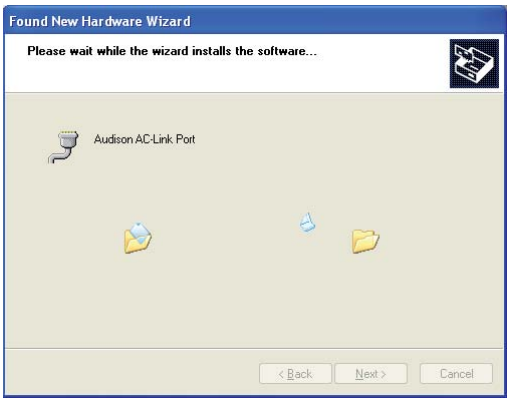
14. Select “No, not this time” and click on “Next”:

15. Check if the Bit One Setup CD is inside the CD-ROM drive. If it is, select “Install software automatically” then click on “Next”:

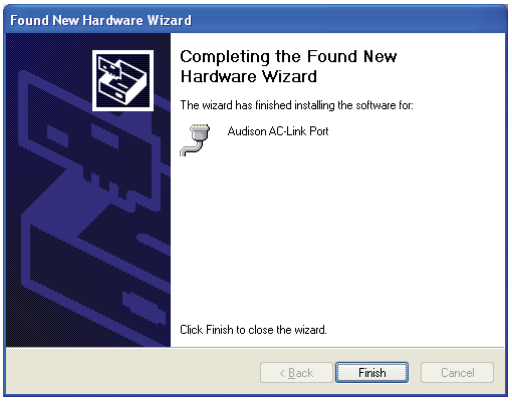


16. In the Windows XP and superior operating systems, the following window regarding the driver certification warning will show up. Click on “Continue Anyway”:

17. The system will install the ACLink drivers:



18. If the procedure was successfully completed, the system will notify you that the driver installation has been completed. Click on “Finish”:



19. The installation of the Bit One software and driver is now completed.

Trouble-shooting section

If any error message shows while installing the software or the drivers, check if the user account logged onto the PC owns the administrative privileges.

If the PC shows an error message regarding the connection with the Bit One (for example: “Bit One device not found”), check the following points:

- If the DRC display shows the message “audison: vol bal fad sub”:
  the fault could be either in the PC, for instance due to a wrong installation of the software / drivers, or in the PC operating system or in the hardware, so in this last case the problem can’t be identified and addressed in this Manual.
- If the DRC display shows the message “PC control - DRC is disabled”:
  in this case the PC initializes the AC-Link bus correctly, but the fault is in the Bit One.
  Terminate the program on the PC, shut the Bit One down and turn it on again, then try to reconnect.

HOW TO CONNECT THE BIT ONE TO THE PC

To adjust the Bit One functions the software is required. The processor needs to be connected to the PC and turned on. After installing the software, start it by clicking on the icon shown on your desktop.

The first screenshot showing up is the start up page where you need to choose between:

- OFFLINE mode (Bit One not connected) ;
- TARGET mode (Bit One connected).

To select the start mode select the corresponding entry on the drop down menu, then press ENTER or double click on the Bit One image.

OFFLINE MODE

In this case even if the Bit One processor is connected to the PC, it does not interact with the software.

The OFFLINE mode can be used to work on the software without connecting the Bit One to the PC, to get familiar with the processor multiple functions. For more information on the specific functions, see the following pages on this Manual.

The software is pre-set to start with a 3-way + stereo Sub active multi-amplified system.

To set a new “virtual” system, and so to change the inputs and select the outputs, you need to select the function I/O Configuration Wizard in the “Config” window of the software main menu. (See point n. 4 of the TARGET mode below).

Here is how the Bit One software appears when it is started up in OFFLINE mode.

FIRST START-UP IN TARGET MODE OF THE BIT ONE SOFTWARE

1. The software performs a scan of the PC port looking for the Bit One; this operation won't repeat again, unless the installation settings of the PC hardware change; this screenshot will show also if you select the TARGET mode with the Bit One shut down.

2. Once the processor has been detected by the system, the software will store the connection previously selected and won't perform that search on the next turn-on's. (even if on each turn-on a different USB port is selected).

POSSIBLE ERROR MESSAGE

3. Bit One NOT found

For some reason the processor is not recognised as connected to the PC.

Press CANCEL to start up the OFFLINE mode.

TARGET MODE

In this case the Bit One processor has to be connected to the PC and turned on, otherwise the software won't even show the TARGET entry as selectable on the start up window.

At this point you need to have in mind the system you want to realize beforehand, since from this moment if you want to change any of the settings you will have to go through the guided procedure all over again.

More specifically the guided procedure will ask for:

- Which main inputs you want to use (high or low level). Once you select your choice, auxiliary low level or digital sources can anyway be added. The guided procedure changes according to the selected choice.
- Which auxiliary inputs will be used (ex. : AUX1 or DIGITAL IN or PHONE etc.).
- Which kind of signals will be allocated to the different inputs (ex. : Front Left or Center or Subwoofer etc.).
- Which speakers you are using for your system (ex. : 3-way Front or stereo Sub or 2-way Rear etc.).
- If the system features passive crossovers managing speaker groups (ex. : 3-way system with active mid-low).
- If the system features any speaker connected through the AC Link.

The procedure starts automatically.

4. Guided procedure to set the desired car audio system.

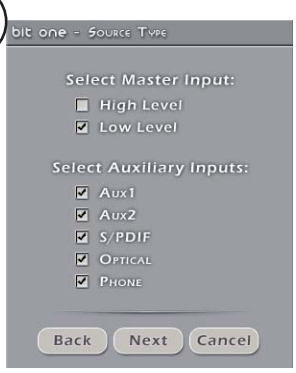
Press NEXT to go on with the setting.
Press CANCEL to exit the program.

5. Inputs selection

- Select the main inputs (MASTER) type (Low Level or High Level) used. To change this setting afterwards, you will have to go through this guided procedure all over again;
- Among the available auxiliary inputs (AUX1 - AUX2 - S/P DIF - OPTICAL – PHONE) pick those that wil be used. You can change this setting afterwards by selecting "Config / External Source" on the software main menu.

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.

5



MASTER LOW-LEVEL INPUTS SELECTION

6. How to set up low-level inputs

An identifying name corresponding to the signal coming from the source can be assigned to any of the processor input channels (Ch1÷Ch6). The available names are: Front Left, Front Right, Rear Left, Rear Right, Center, Subwoofer. The Bit One will use these names to assign the corresponding signal to the respective output.

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.

6

7. Calibrazione dei livelli degli ingressi MASTER

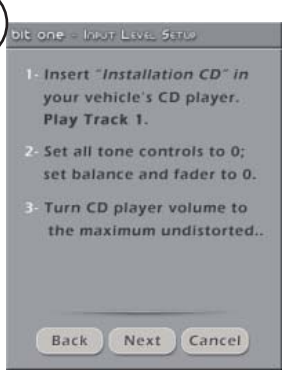
Seguire le indicazioni riportate:

- Inserite il disco fornito in dotazione, denominato "Installation CD", nel lettore CD della vostra sorgente;
- Eseguite la traccia 1 (premere Play);
- Impostate tutti i controlli di tono a zero (0);
- Impostate il balance e il fader al centro (0);
- Regolate il volume della sorgente al massimo indistorto.

Premere BACK per tornare al passo precedente.
Premere NEXT per proseguire nella configurazione.
Premere CANCEL per uscire dal programma.

Remark: calibration is absolutely required to adapt the Bit One inputs sensitivity to the signal coming from the source.

7



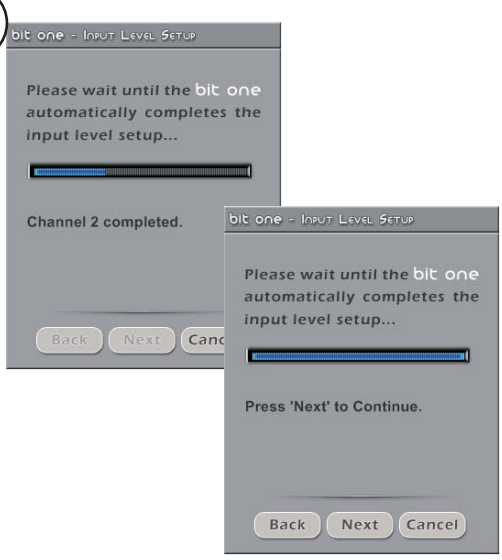
8. Automatic calibration

Through a real-time progress bar and specific messages the software shows how the procedure is being executed.

Once the procedure is completed, the window will show the message "Press Next to Continue".

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.

8

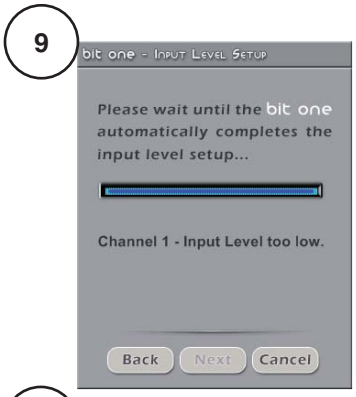


POSSIBLE ERROR MESSAGE

9. “Input level too low“

Should the procedure get interrupted during the calibration with the above message showing up, check if the signal or its level is present on the indicated corresponding channel.

Press CANCEL to log out the program.
Press BACK to go back to the inputs set-up.



10. How to select the speakers available in the system

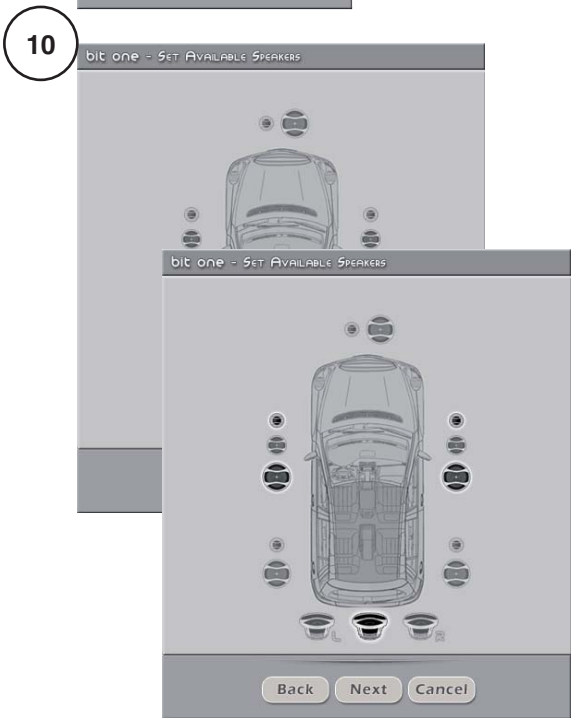
Speakers can be selected just by clicking on it.

If the left tweeter, left midrange or left woofer are selected, the software provides the ability to automatically activate also the right tweeter, right midrange or right woofer.

Once the software has been started up, this choice will affect the dedicated crossover type. Ex.: if on the rear system only the woofers were activated, the software will show exclusively a low-pass or band-pass filter as available.

If you want to use a coaxial system as rear channel, both tweeter and woofer need to be selected and after that (see point n. 11) you need to enter that a passive crossover connecting one to the other is present in the system, so the software will show a high-pass filter as available.

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.



Here is how the system speakers selection is shown by the Bit One software

From this point on follows a simulation of a system made up of:

- 3-way Front/ - 2-way Rear / - 2-way centerl / - mono Sub.

The Bit One features 8 output channels. To multi-amplify each single speaker of the system 13 output channels would be required. In that case the software would automatically signal the limit.

11. How to select passive crossovers for speaker groups

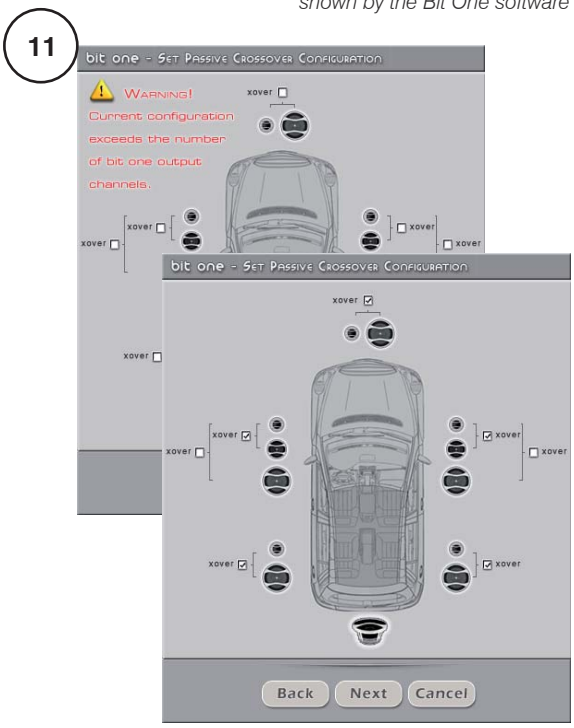
While carrying out the configuration of your system, you can also set the presence of passive crossovers managing speaker functional groups in complex systems

Ex.: The 3-way Front can be managed as:

- multi-amplified (6 output channels would be required);
- passive mid-high speakers + separately amplified woofer (4 output channels would be required);
- 3-way passive (2 output channels would be required).

While performing the set-up, the software will automatically notify the return within the 8 output channel limit, the warning message will then disappear and the NEXT button will appear.

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.



12. Processor outputs (Ch1÷Ch8) allocation

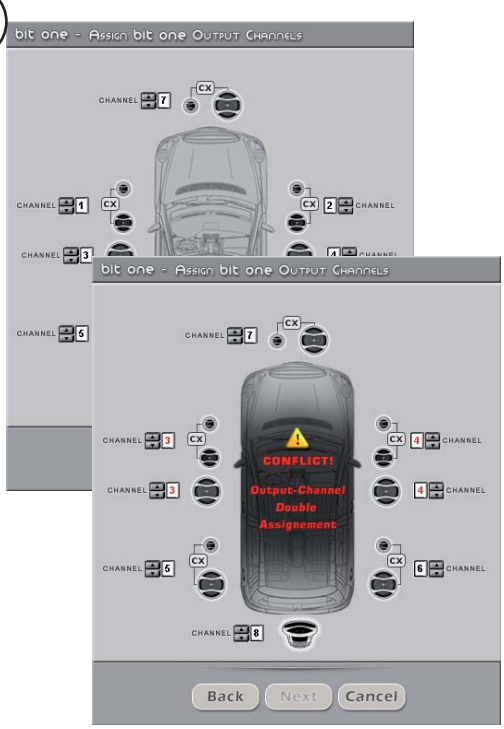
The Bit One features 8 output channels. On this specific step of the procedure, any signal can be assigned to each output channel.

Ex.: the 1 and 2 outputs could be assigned to the rear channels just because with this setting the cables going to the relative amplifier would not need to be lengthened.

Due to a matter of convenience, if the output 1 is assigned to the left woofers, the software will automatically assign the output 2 to the right woofers. If during the procedure the output 1 is assigned also to the left mid-high speakers, the software will show a warning message. Change the allocation of one of the two numbers marked in red and the software will automatically select the first available channel.

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.

12



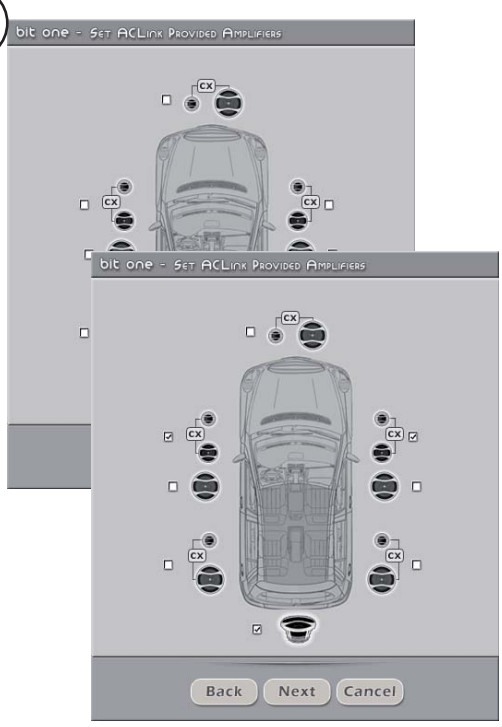
13. Selecting amplifiers connected through the AD Link / AC Link connection system

If the system features amplifiers provided with the AD Link digital input and you want to connect them with the system, you have to select them on this screenshot of the set-up procedure.

This means that the Bit One will manage the corresponding outputs through the AD Link-OUT plug, managing the other outpust through the RCA-Pre OUT plugs.

Remark: keep in mind that you have to assign the corresponding Amp ID to the specific amplifier. The Bit One will then automatically recognise the identified amplifier.

13



14. System configuration successfully completed

Stop playing the Test track and remove the provided CD-ROM, called “Installation CD”, from the CD player of your source.

14

Go to page 22.

MASTER HIGH LEVEL INPUTS SELECTION

15. How to set up high-level inputs

You can assign to any of the processor input channels (Ch1÷Ch8) the identifying name corresponding to the signal coming from the source.

The available names are:

- Front Left Full / Tweeter / Midrange / Woofer;
- Front Right Full / Tweeter / Midrange / Woofer;
- Rear Left Full / Tweeter / Woofer;
- Rear Right Full / Tweeter / Woofer;
- Center Full / Tweeter / Woofer;
- Subwoofer.

The Bit One will use these names to:

- Reconstruct a full range signal coming from an OEM source with a dedicated multi-channel amplifier;
- Assign the corresponding signal to the respective output.

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.

15

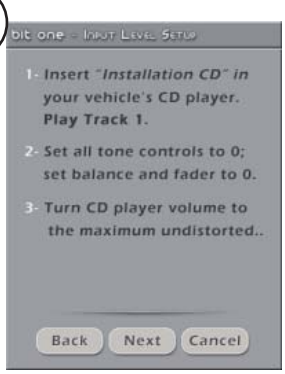
16. How to calibrate the MASTER input levels

Follow the instructions listed below:

- Insert into the CD player of your source the “Installation CD” provided;
- Play track 1 (press Play);
- Set all tone controls to zero (0);
- Set balance and fader to center (0);
- Adjust the head unit volume to the maximum undistorted output level.

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.

16



Remark: is absolutely required to adapt the Bit One inputs sensitivity to the signal coming from the source.

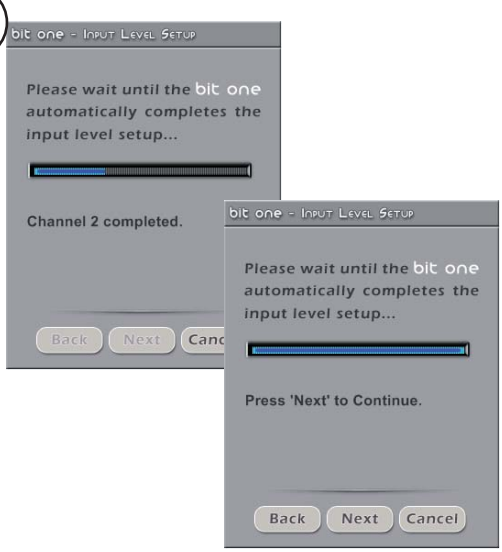
17. Automatic calibration

Through a real-time progress bar and specific messages the software shows how the procedure is being executed.

Once the procedure is completed, the window will show the message “Press Next to Continue”.

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.

17



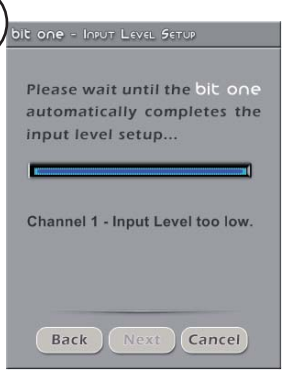
POSSIBLE ERROR MESSAGE

18. Input level too low

Should the procedure get interrupted during the calibration with the above message showing up, check if the signal or its level is present on the indicated corresponding channel.

Press CANCEL to log out the program.
Press BACK to go back to the inputs set-up.

18



19. OEM source de-equalization

Optional operation.

While setting up the high-level inputs you can take advantage of this function to use OEM sources, even if they were equalized to best adapt to the acoustics of the vehicle they are dedicated to.

The de-equalization process performs an analysis of the electrical frequency response coming from the different channels of the OEM source, automatically applying an equalization contrary to the original one, thus generating a linear signal, much more suitable to drive high-quality audio systems.

Regardless of the input channels used, the de-equalization will be performed for each functional group.

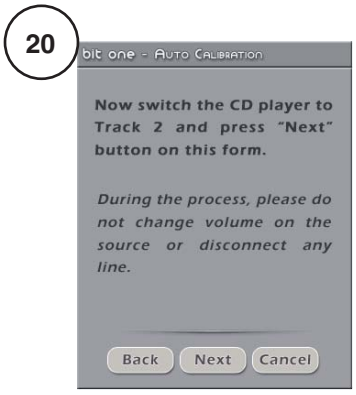
Ex. : even though you are using Front Left Full and Front Right Full as inputs, the software will perform the de-equalization also on the Rear, Center and Subwoofer as the processor will have to use the signals identified as Front to possibly also manage the outputs Rear, Center and Subwoofer.

Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press SKIP to skip the de-equalization procedure.

20. Running the de-equalization procedure

If you decide to run the procedure, follow the instructions listed below:

- Insert the provided "Installation CD" into the CD player of your source;
- Play track 2 (press Play);
- Set all tone controls to zero (0);
- Set balance and fader to center (0);
- Don't change the volume level previously set through the inputs level automatic calibration;

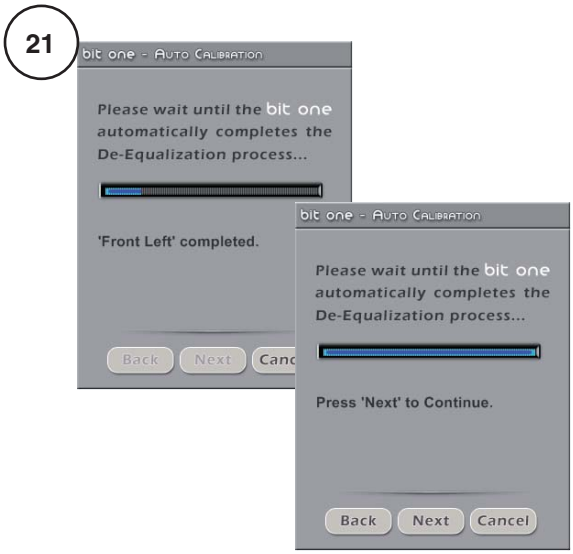


Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.

21. De-equalization

Through a real-time progress bar and specific messages the software shows how the procedure is being executed.

Once the procedure is completed, the window will show the message "Press Next to Continue".



Press BACK to go back to the previous step.
Press NEXT to go ahead with the set-up procedure.
Press CANCEL to exit the program.

22. How to select the speakers of your system

...

From this point on the procedure is same as the one of the low-level inputs section.
See page 17, point n. 10.

SOFTWARE START UP

Processor inizialization

The software transfers to the processor main memory the settings selected during the guided procedure.

Once this operation is completed, a message confirming the update has been done is displayed.

Press OK.

BIT ONE SOFTWARE

The processor has been properly set and is ready for use.

STANDARD / EXPERT MODE

The software is preset for two operational modes: Standard and Expert. For both of these modes all the features are anyway available, however when set in Standard mode some shortcuts and links are available as well, thus easing its use. To move from a mode to the other click on: CONFIG / WORKING MODE / STANDARD OR EXPERT.

In this Manual you will find detailed information about the features, regardless of the STANDARD mode restrictions.

Any possible relevantly different feature will anyway be addressed in this Manual.

WARNING

Resist to the temptation of modifying in one second all the parameters available and manageable by the Bit One.

Take your time to get familiar with the possibilities this software offers you.

The adjustments you can perform through the Bit One have an immediate effect on the signal and, if not carried out with the proper attention, may result in damage to your system's speakers.

Keep in mind you should work keeping the general volume on a level that should not be dangerous to the system.

FEATURES - DSP Settings

Description of the Bit One features the software can manage can be found on the following pages.

1. CHANNEL MAP

This window displays the identification names given to the Bit One output eight channels.

This window is active, you can click on it to manage each channel that, once selected, will show as highlighted.

If you keep the button CTRL pressed and click on another channel, this other channel will be selected and highlighted as well.

The software though will allow you to work on one single channel and will display the word EDIT in red next to the channel you can act on.

This way you can see on the graphics the response of all of the highlighted channels.

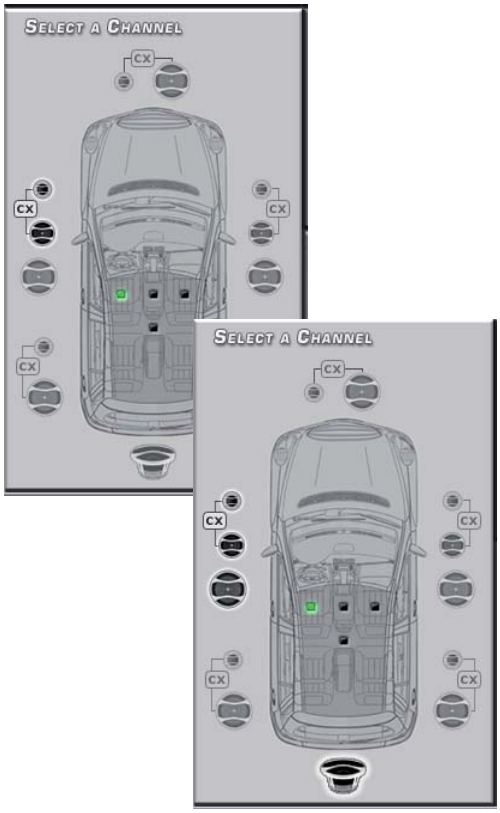
To act on another channel keeping your selection, click on the right hand of the desired channel, where the EDIT column is.

Multiple selection is only allowed for functional groups, except for the Subwoofer that can be selected with any group.
Ex.: Front Left Mid-Hi with Front Left Woofer with Subwoofer, but not with Rear Left Full or Center Full. If you want to check the Rear+Subwoofer system electrical response you have to de-select the Front system.

This window also lets you set on MUTE each channel by clicking on the word MUTE on the left hand of the desired channel. If MUTE is on, the word gets highlighted in green.

You can also visually select a channel by clicking on the dedicated window: Select a Channel.

2. SELECT A CHANNEL



This window is active. You can click on the speaker or the speaker system to manage each single channel that, once selected, will show as highlighted.

If you keep the button CTRL pressed and click on another channel, this other channel will be selected and highlighted as well.

LISTENING POINT VISUAL INDICATOR

This window includes this function as well.

The indication acts only and exclusively as reference for the digital delay automated calculation.

If delays are set according to the “driver” ‘s position and then you want to optimize the system also for the “passenger” position, you need to set again the distances through the specific menu, as the system doesn’t update them automatically.

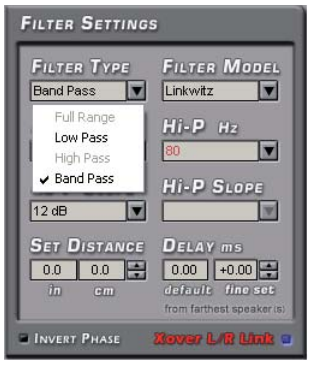
If used together with the memories it is useful to realize different setups according to the different listening points.

3. FILTER SETTINGS

The Bit One manages eight crossovers, one for each output channel. Each filter allows adjustment of all of the parameters. If the entry Xover L/R Link is active, the modifications applied to one of the channels (right or left) will automatically be applied also to the other.

The following parameters to adjust the response can be selected through the different displayed drop-down menus:

- Filter Type
  - Full Range
  - Low Pass
  - High Pass
  - Band Pass



In STANDARD mode:

According to the speaker system selected during the set up, the filter type suitable for the used speaker will be available.

Ex.: For the Front Woofer only Low Pass or Band Pass will be available. For the Front Mid-Hi only High Pass and Band Pass will be available, etc.

STANDARD MODE

	Full Range	Low Pass	High Pass	Band Pass
Tweeter			x	x
Midrange				x
Woofer		x		x
Mid-Hi			x	x
Subwoofer		x		x
Full	x	x	x	x

In EXPERT mode:

Any speaker system selected has any filter type available.

Remark: in this case pay the due attention to the filter adjustment. Speakers have mechanical limits that must not be exceeded and could lead to damage to the components.

EXPERT MODE

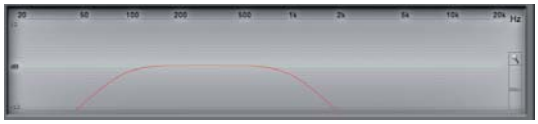
	Full Range	Low Pass	High Pass	Band Pass
Tweeter	x	x	x	x
Midrange	x	x	x	x
Woofer	x	x	x	x
Mid-Hi	x	x	x	x
Subwoofer	x	x	x	x
Full	x	x	x	x

- Filter Model
  - Linkwitz (default)
  - Butterworth

When starting up the software, the Bit One offers Linkwitz standard filter model. If you change it into Butterworth, the change will be applied only to the channel you are working with.

Ex.: If you are adjusting the Front Woofer, the change will only affect this channel (right and left, if linked). If you selected Band Pass as filter type, this model will be applied to both the hi-pass and the low-pass.

80 - 1000 Hz 12 dB/oct Linkwitz Band Pass Filter



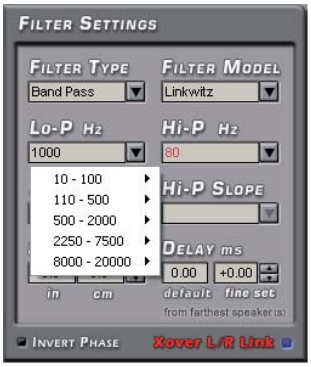
80 - 1000 Hz 12 dB/oct Butterworth Band Pass Filter

Cut-off frequencies

- Hi-P (in Hz) 10 ÷ 20000
- Lo-P (in Hz) 10 ÷ 20000

You can select the cut-off frequency by:

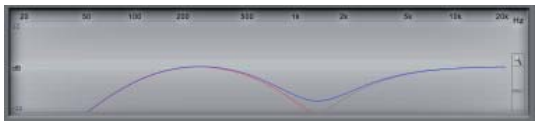
- clicking on the corresponding drop-down menu, selecting the frequency range and the value;
- clicking on the corresponding drop-down menu, selecting the frequency range and then moving from value to value with the arrows controls (up / down) on the PC keyboard;
- clicking on the corresponding drop-down menu and then moving from value to value with the use of a mouse featuring a rotating finger wheel.



In STANDARD mode the crossing frequency among speakers of the same front is bound.
It is however free if among different fronts.
Ex.: If you change the Front Woofer low pass cut-off frequency, also the Front Mid-Hi hi-pass cut-off frequency will automatically change.If you change the Subwoofer low-pass cut-off frequency, instead, the Front Woofer hi-pass cut-off frequency won't change.

STANDARD mode 1000 Hz crossover frequency

In EXPERT mode the crossing frequency among speakers of the same front is free, meaning that open cuts can be created.



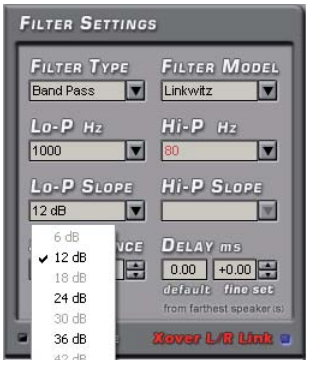
EXPERT mode crossover frequency:
-Low Pass 750 Hz - High Pass 2500 Hz

Filter slope

- Hi-P Slope (in dB/oct)
  12/24/36/48 (in Linkwitz)
  6/12/18/24/30/36/42/48 (in Butterworth)
- Lo-P Slope (in dB/oct)
  12/24/36/48 (in Linkwitz)
  6/12/18/24/30/36/42/48 (in Butterworth)

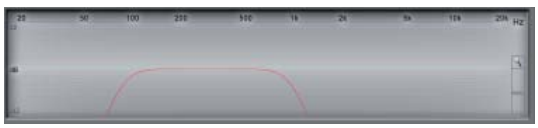
When starting up the software, the Bit One offers Linkwitz with 12 dB/oct slope as default slope. By changing the slope, the change will be applied only to the channel you are working on.

Ex.: If you are adjusting the Front Woofer, the change will affect only that channel (right and left, if linked). If you selected Band Pass as filter type, the slope will be applied to both hi-pass and low-pass.

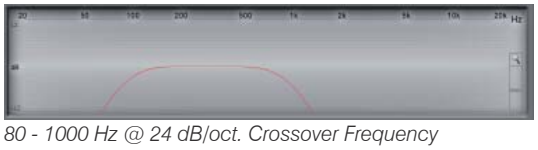


Nota: in Linkwitz mode slopes with a value not multiple of 12 dB are not available as they are not compatible with the alignment type.

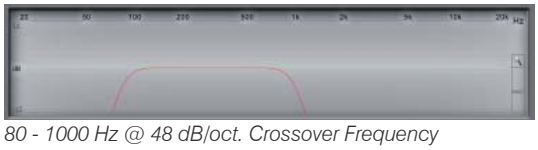
80 - 1000 Hz @ 12 dB/oct. Crossover Frequency



80 - 1000 Hz @ 36 dB/oct. Crossover Frequency



80 - 1000 Hz @ 24 dB/oct. Crossover Frequency



80 - 1000 Hz @ 48 dB/oct. Crossover Frequency

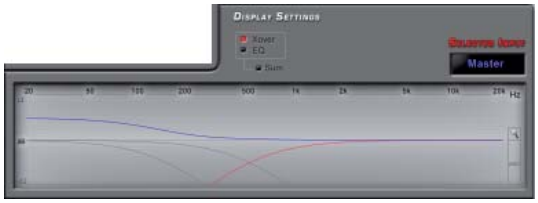
4/5. DISPLAY AND SETTINGS

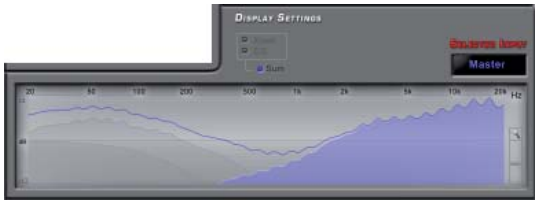
You can view the electrical response of the output channel you are acting on through the display (4). If multiple channels are selected, the display will show the electrical response of all the channels, showing the “active” channel highlighted in red and the other channels selected in gray.

The displays shows frequencies from 20 to 20000 Hz in a +24 a -24 dB range. The default resolution is set to ±12 dB, but on the right hand a zoom control can be found, to change the resolution.

After changing the resolution, to go back to the default one you have to double click within the zoom bar area.

The Display Settings (5) offers the possibility to view:
- the electrical response under crossover filtering action (Xover) displayed as a red line;
- the electrical response under equalization (EQ) displayed as a green area;
- the resultant of the sum between the filtered electrical response and the equalized one (Sum) displayed as a blue area. In this case the red line and the green area are hidden;
- the system total electrical response when multiple channels are selected, displayed as a blue line.





During the tuning phase, the display shows in real time the changes applied to the electrical signal.

Pay attention to not confuse what you see on the display with what is reproduced by the speakers.

The Bit One works on the signal that has to be sent to the amplifiers.

We suggest that while performing the tuning, you also work with a good real-time spectrum analyzer that will give you the acoustic resultant of the whole system.

Display of a High Pass filter

Display of a Band Pass filter

Display of a Low Pass filter

Display of a Mid-Hi + Woofer + Sub system

6. SELECTED INPUT

Once the set up procedure has been completed, the Bit One is regularly working and you can adjust the system using the sources selected during the first set up phase.

The window “Select Input “ will show the active source.

Since while connecting the device with the PC the DRC is disabled, the source can be changed by clicking on the Ext. Source EQ card on the top and selecting the desired source on the left hand.

7. EXT. SOURCE EQ

This specific card manages everything is related to the external sources.

On the top the actual plugs of the selected sources will lit up.

Should you have not activated an external source during the set up phase, you can modify this step of the set up without going back to the main set up.

Select Config/External Source on the top main menu and select the desired source or de-select the source you're not using. As a consequence the source name will appear or disappear respectively from the list at the bottom on the left of the screen.

This card displays:
- type and description of the MASTER inputs used;
- which alternative sources are active;
- the system general volume;
- input sensitivity adjustment for the AUX 1 / AUX 2 / PHONE sources;
- a 30-band graphic equalizer for the AUX 1 / AUX 2 / PHONE sources;
- the graphic display showing the equalization applied to the selected input signal;
- the EQ Off feature, allowing to disactivate the equalizer to check the effect without losing the settings;
- the Flat feature, settino all the cursors back to 0 dB position;
- the Select All feature, providing the ability to move all the cursore at the same time, once the desired equalization curve has been set;
- one "select" button for each equalizable band, providing the ability to move all the selected cursors all together.

Example of equalization dedicated to the PHONE input

8. SET DISTANCE AND DELAY

The Bit One provides the ability to set a digital time delay for each channel of the system.

The time delay allows to virtually move the speakers emission point it is applied to, so that their time distance compared to the emission point is the same. This way the listener will virtually be at the center in respect to the speakers.

How to perform time delays:

- scegliete il punto d'ascolto da ottimizzare.
Ex.: driver or passenger;
- place in the pre-set listening position, at ear level, a steady point as reference. Ex: the tip of a the pole of a microphone;
- measure the exact distance between the reference point and the speakers. Ex.: microphone / left woofer = 90 cm, microphone / left Mid-Hi's = 105 cm, etc. ;
- enter into the Set Distance (8) box of the Filter Settings function of the corresponding speaker the distance in relation to each measured speaker;
- repeat these operations for each system channel.

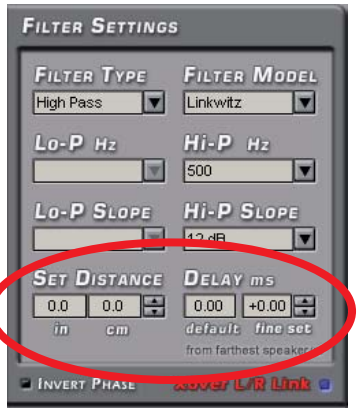
The Bit One will automatically calcolate in milliseconds the time delay to apply to each system channel.

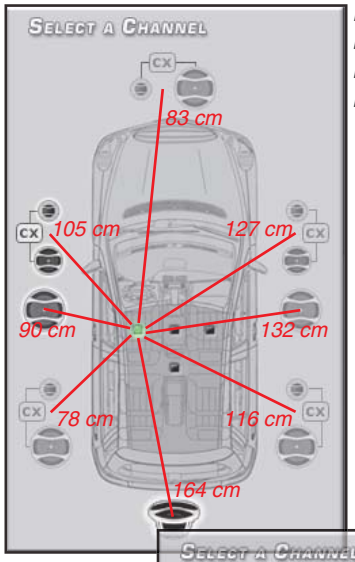
The calculation is made taking into consideration the furthest speaker. Ex.: if the furthest speaker is the Subwoofer (164 cm) the processor will add to the other speakers as much delay as to virtually move their distance up to 164 cm. So we recommend you first enter all the distances into the system before checking the listening acoustic effect and do not amaze if no delay will be applied to the Subwoofer.

Warning: the digital delay does not rectify possible errors during the acoustic phase of the system it is applied to. Therefore, enter the distances only after performing the system proper adjustment and its consequent "phase tuning".

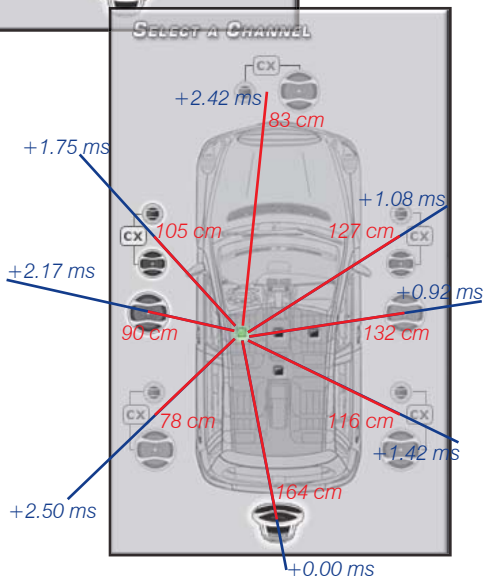
Warning: if, once you have set the distances comparing to the "driver" listening point you click on the "passenger" listening point, the Bit One won't re-calculate the delays compared to the new reference point because the buttons available in the SELECT A CHANNEL diagram are merely descriptive and their only purpose is to remind you that you have set the delays for that listening point!

Once the distances have been properly set you can perform a final tuning, adding milliseconds to or removing them from the delay the Bit One calculated, through the FINE SET box of the DELAY function.

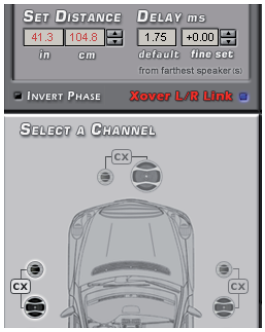


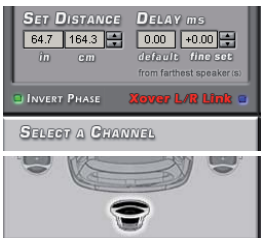


Real distances measured in relation to the listening point



Virtual distances generated from the introduction of time delays



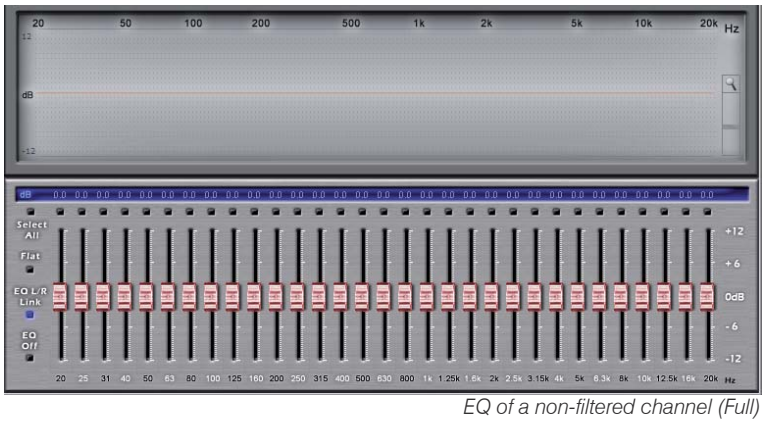


9. GRAPHIC EQUALIZER

The Bit One software features a graphic equalizer provided with 31-bands, ± 12 dB for each system channel. in compliance with the ISO, frequencies are equally spaced at 1/3 oct. from 20 to 20k Hz.

Adjusting the equalizer depends on the chosen functioning mode.

In STANDARD mode the equalizer works on functional groups, so there will be:
- one equalizer for the Front;
- one equalizer for the Rear;
- one equalizer for the Center;
- one equalizer for the Subwoofer.

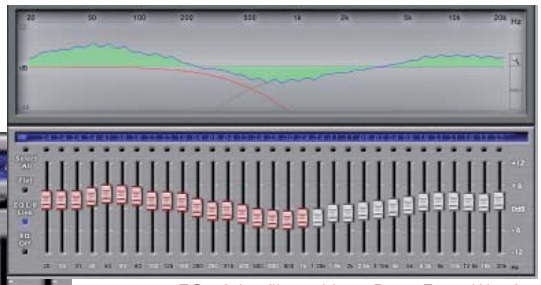


EQ of a non-filtered channel (Full)

In EXPERT mode the equalizer works on each single channel.

Ex.: if examining the system so far described there would be:
- one equalizer for the Front Mid-Hi;
- one equalizer for the Front Woofer;
- one equalizer for the Rear;
- one equalizer for the Center;
- one equalizer for the Subwoofer.

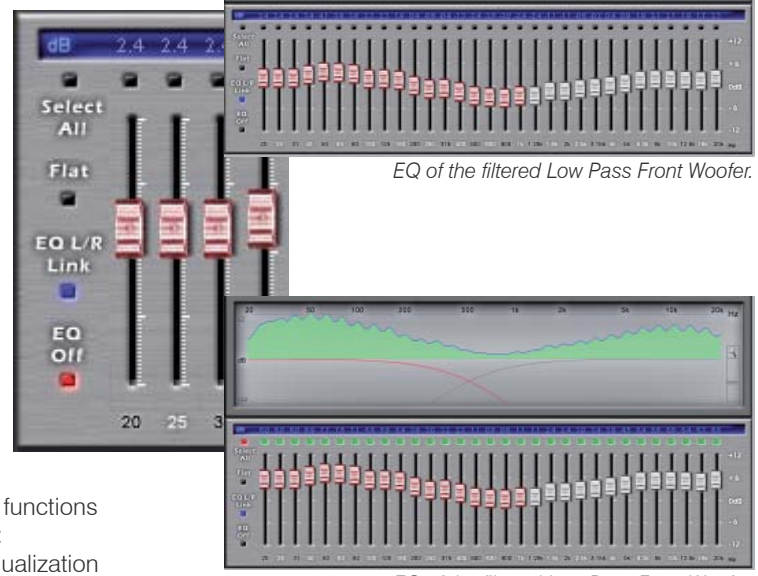
If the system had been a three-way + Sub entirely multi-amplified, there would have been:
- one equalizer for the Front Tweeter;
- one equalizer for the Front Midrange;
- one equalizer for the Front Woofer;
- one equalizer for the Subwoofer.



EQ of the filtered Low Pass Front Woofer.

If the system had been a two-way Front + two-way Rear entirely multi-amplified, there would have been:
- one equalizer for the Front Tweeter;
- one equalizer for the Front Woofer;
- one equalizer for the Rear Tweeter;
- one equalizer for the Rear Woofer.

etc.

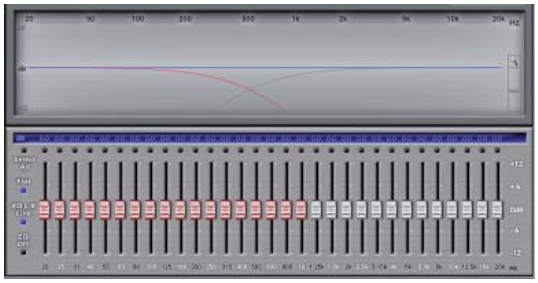


EQ Off, the cursors don't move but the equalization isn't active

EQ of the filtered Low Pass Front Woofer.
Select All on, equalization performed moving the cursors all together

The graphic equalizer features four specific functions helping with and easing the tuning process:
- EQ L/R Link; when active, it applies the equalization curve both to the right and the left channel at the same time;
- EQ Off; when active, it provides the ability to disabile the equalizer to check its effect without losing the settings;
- Flat; if pressed, it brings all the cursors back to 0 dB position;
- Select All; once the equalization curve has been set, it provides the ability to move all the cursors at the same time;
- one "select" button for each equalizable band providing the ability to move all the selected cursors all together.

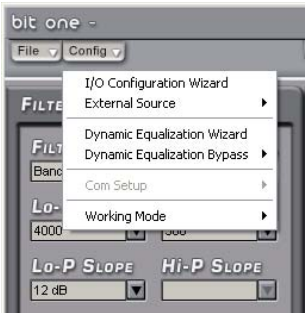
When adjusting a filtered (non-full range) channel, the equalizer highlights in red the cursors that will affect the frequency response of that channel.



Flat pressed, the cursors have been brought to 0 dB.
Equalization has been eliminated

DYNAMIC EQUALIZATION

Select the CONFIG / DYNAMIC EQUALIZATION WIZARD entry from the main menu to access to a unique function the Bit One software features.
Of course the sound of an audio system varies according to its reproduction volume.
At low volume the noise coming from the outside of the car along with the particolarly sound-damping acoustics of the car compartment contribute to limit the system performance (especially in low frequency).



Generally speaking while tuning the system you need to take into consideration that the adjustments performed at low level volume will necessarily change when turning up the volume.

The Dynamic Equalization improves the listening impression by positively affecting the variation of the frequency response when volume varies.

The Wizard will offer a set of screenshots to set the equalization to apply on the general frequency response.

The Bit One will automatically perform a gradual interpolation of the data, following the signal level and so acting according to the system listening volume.

Two operational modes are available:

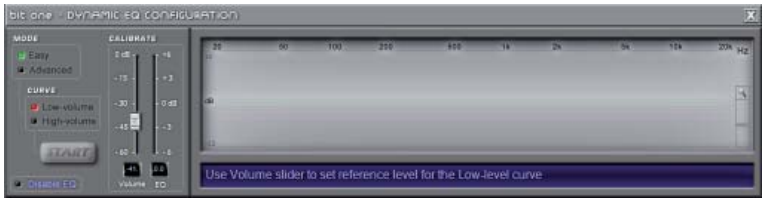
EASY MODE

In this case the equalization curve that will be entered is pre-set.

Select the operational mode by clicking on Easy.

Insert a CD into the head unit and play a reference musical track.

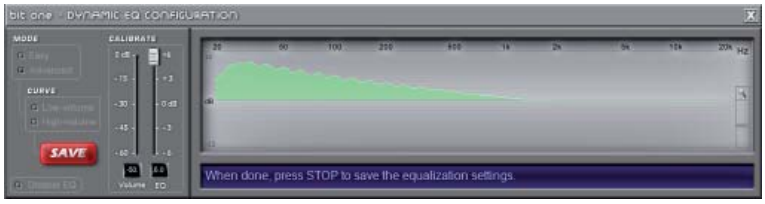
Move the volume cursor by setting the listening reference level to a low volume.



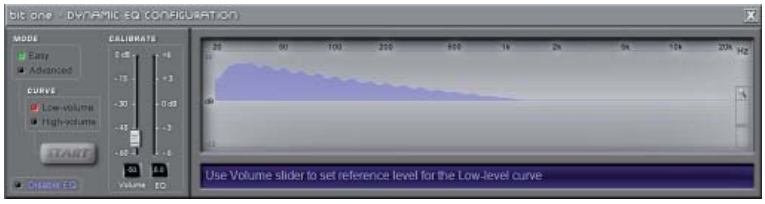
After adjusting the cursor, press the START button.

Move the EQ cursor to tune the equalization of the low volume response until you get the desired sound.

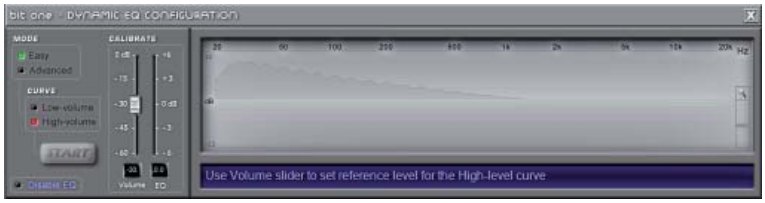
Once you have found the right adjustment press the SAVE button.



Now the reference curve for a low volume listening level has been entered.



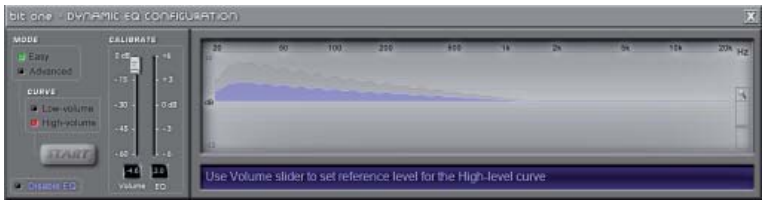
Select the CURVE/Highvolume entry and set the volume cursor adjusting it at a high volume listening reference level.



Once you have adjusted the cursor, press the START button.

Move the EQ cursor to tune the equalization of the high volume response until you get the desired sound. Once you have found the right adjustment press the SAVE button.

Now the reference curve for a high volume listening level has been entered.



Disable EQ

While adjusting the system, you can press the DISABLE EQ button to check in real time the modifications made on the Dynamic Equalization signal.

ADVANCED MODE

In this mode the equalization curve is not steady but it can be selected through a 31-band graphic equalizer.

The steps to adjust it are exactly the same as those described so far, adding to them the possibility of operating with a custom curve.

Just for example on your right you can see the main screenshot showing a “custom” equalization.

The result of the Dynamic Equalization is automatically stored in the main set up.

To exit the Dynamic EQ configuration press (X). During regular reproduction the Dynamic EQ can be disabled by selecting the specific entry from the main menu CONFIG/ DYNAMIC EQUALIZATION BYPASS/ON.

10. OUTPUT LEVEL

The Bit One provides the ability to adjust the output levels for each channel.

Once the system adjustment is completed, you can operate on each channel to “linearize” the system response and adjust it to the listening needs.

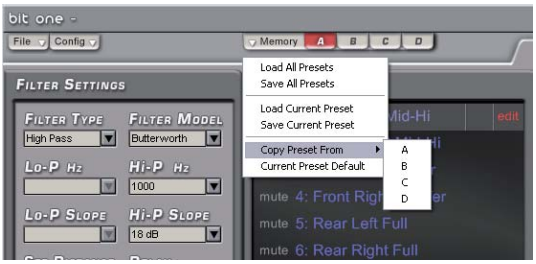
From this window you can:
- change the output levels of each channel (identified by the description you can find at the cursor’s basis) moving the cursors;
- silence each channel through the Mute button you can find at the cursor’s basis;
- modify the general output volume;
- modify the Subwoofer general volume (besides adjusting its output level);
- adjust all the levels at the same time, by pressing the Link button on the left hand of the screen.

Mute enabling

On this window the software also displays a useful Clipping alarm for each channel considering all the adjustments and equalizations entered during the tuning process. The Clipping is referred to the input musical signal. So, should it activate, you will have to either lower the output level of the corresponding channel or the previously set equalization.

Clipping alarm

11. MEMORY



The Bit One manages the system set up working on one memory by default. However it also offers the possibility to store and recall four memories.

Pressing the MEMORY button on the main menu you access to the different functions you can perform on the featured memories.

The following features are available:

- Load All Presets: it loads all the memories (A/B/C/D) from a file previously saved (.prs format);
- Save All Presets: it saves all the memories (A/B/C/D) in a file that can be recalled (.prs format);
- Load Current Preset: it loads a memory previously saved (.prs format) by placing it on the memory you are operating on;
- Save Current Preset: it saves the memory you are operating on in a file that can be recalled (.pro format);
- Copy Preset From: it provides the ability to copy the content of one memory into another memory;
- Current Preset Default: it restores the crossover and equalization default values, that would be proposed at the end of the set up procedure

The following data will be stored into the memories:
- the filter settings for each channel;
- the time delay settings for each channel;
- the equalization settings for each channel.

WARNING:
The following data will not be stored into the memories:
- the selected MASTER inputs;
- the selected output channels;
- the equalizations on the external source input signal (if entered);
- the output levels of each channel;

as these data refer to the Bit One Setup and they are supposed to not change during the tuning process.

12. *FILE* MAIN MENU

Clicking on the corresponding button a drop-down menu opens up listing the following entries:

- Load Setup..: it loads the Bit One entire Setup from a previously saved file (.bit format)
- Save Setup..: it saves the Bit One entire Setup in a file that can be recalled (.bit format)
- FINALIZE to Bit One: it loads all the parameters set during the tuning process (as well as the four memories) into the Bit One microprocessor internal memory.

WARNING: always perform this operation before disconnecting the Bit One from the PC.

- Synchronize: PC to Bit One or Bit One to PC: it synchronizes and transfers the software data from PC to the Bit One or vice versa.

WARNING: this operation is very useful in case the communication between the two devices gets interrupted for some reason.

- Check for Updates: it checks if any update on the software or on the microprocessor firmware is present.

WARNING: internet connection is required to properly perform this operation.

- Update Firmware: it updates the firmware if it has been detected during the Check for Updates process and if its corresponding file (.bin format) was saved in the PC.
- Reset Default Answer: it restores the display of the warning messages that have been possibly disabled while using the software.
- Restore Factory Defaults: it resets the Bit One back to its default settings.
- Restore Factory Defaults: it totally resets the Bit One.

WARNING: by performing this operation all the data previously saved in the Bit One are cancelled!

- Credits: it shows the information about the Bit One software.
- Exit: it exits the program.

When running the FINALIZE to Bit One, the software notifies that the data entered in the Bit One will be overwritten.

The Bit One software can now be shut down and the Bit One can work autonomously.

STARTING UP THE BIT ONE SOFTWARE IN TARGET MODE

Should you need to reconnect the software to any set up processor, you won't need to repeat the steps described in the guided set up procedure.

These operations will be repeated only if you want to set the Bit One processor with a system of inputs/outputs different from those present in the processor memory.

After selecting the Target mode, the software will display the following window notifying about the data transfer from the processor to the PC.

DRC - Digital Remote Control

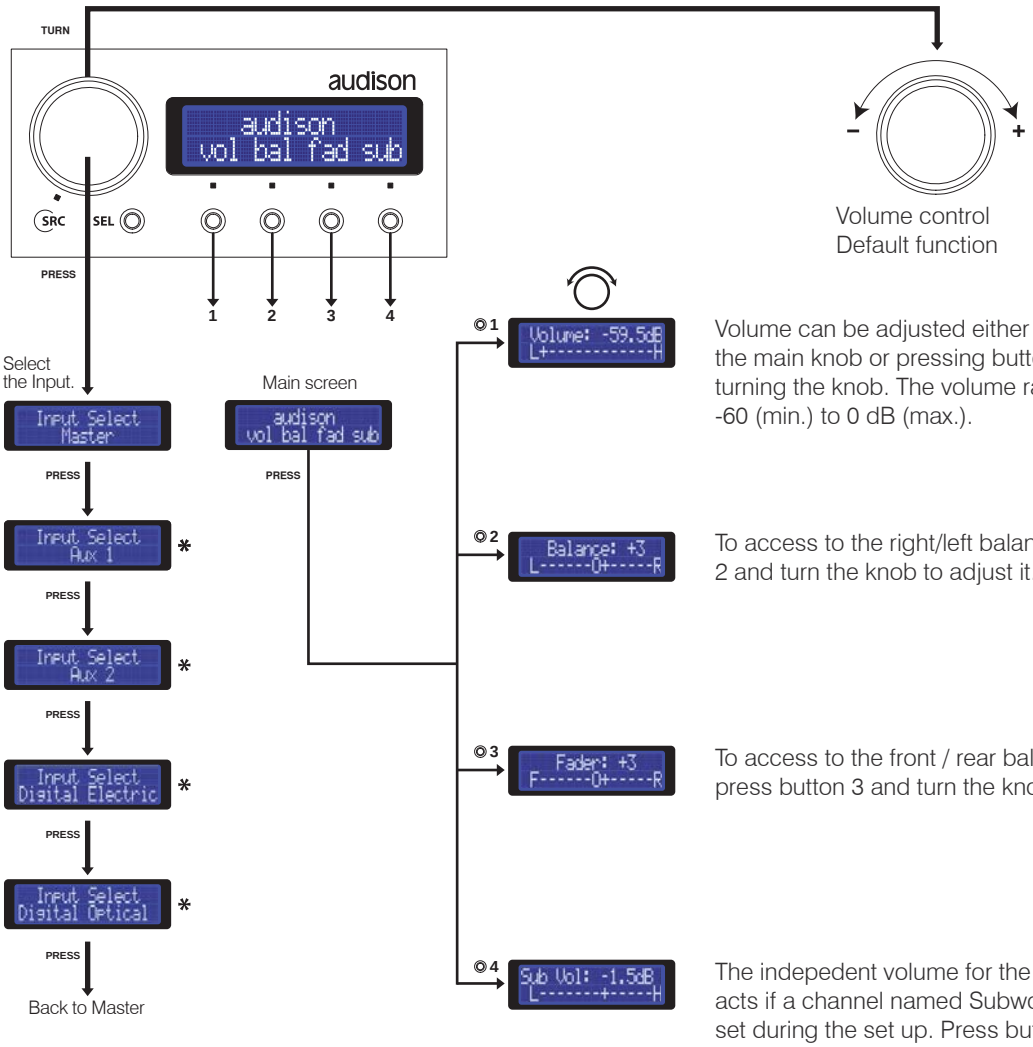
The DRC is the Bit One remote control system. It is a microprocessor digital system; it controls and monitors also the amplifiers equipped with the AC Link bus control, if present.

When the Bit One is set through the PC, the DRC can stay connected but will show on the display the message (PC control - DRC is disabled). Once the set up is completed, its use becomes required.

The features are:

- The Bit One turn on / off;
- Main volume control;
- Subwoofer volume control;
- Right / left balance control;
- Front / rear fader control;
- Set sources selection;
- Memory selection;
- Dynamic EQ activation (if set);
- MASTER source level control activation.

DRC controlled by PC



Volume can be adjusted either by turning the main knob or pressing button 1 and then turning the knob. The volume range goes from -60 (min.) to 0 dB (max.).

To access to the right/left balance push button 2 and turn the knob to adjust it.

To access to the front / rear balance adjustment press button 3 and turn the knob to adjust it.

The indepedent volume for the Subwoofer only acts if a channel named Subwoofer has been set during the set up. Press button 4 and turn the knob for an adjustment from -12 (min) to 0 db (max).

* These options are available only if activated during the set up process.

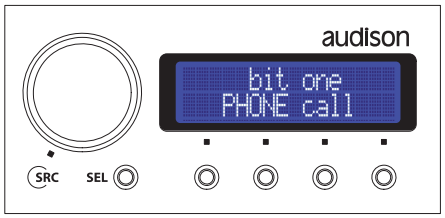
DRC - Digital Remote Control

PHONE CALL

The PHONE input can't be selected as normal source because it activates exclusively when an external handsfree telephone sends the MUTE when receiving a phone call. The DRC display will show the message shown on the right, the Bit One will set the source selected in that moment to muting, reproducing the signal coming from the PHONE input.

During the phone call the volume can be adjusted through the DRC knob.

Please, note that in any case you can pre-set the volume of this "source" and custom an adeguate equalization curve through the software.



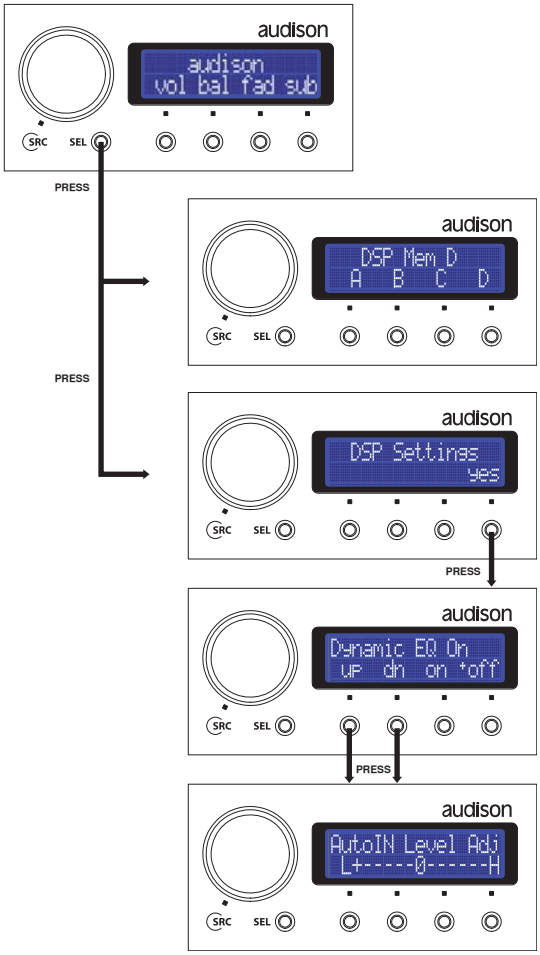
SEL BUTTON FUNCTIONS

By pressing the SEL button you access to:

- DSP Memory: the A/B/C/D set memories can be recalled (through the software) and stored in the processor (Bit One);

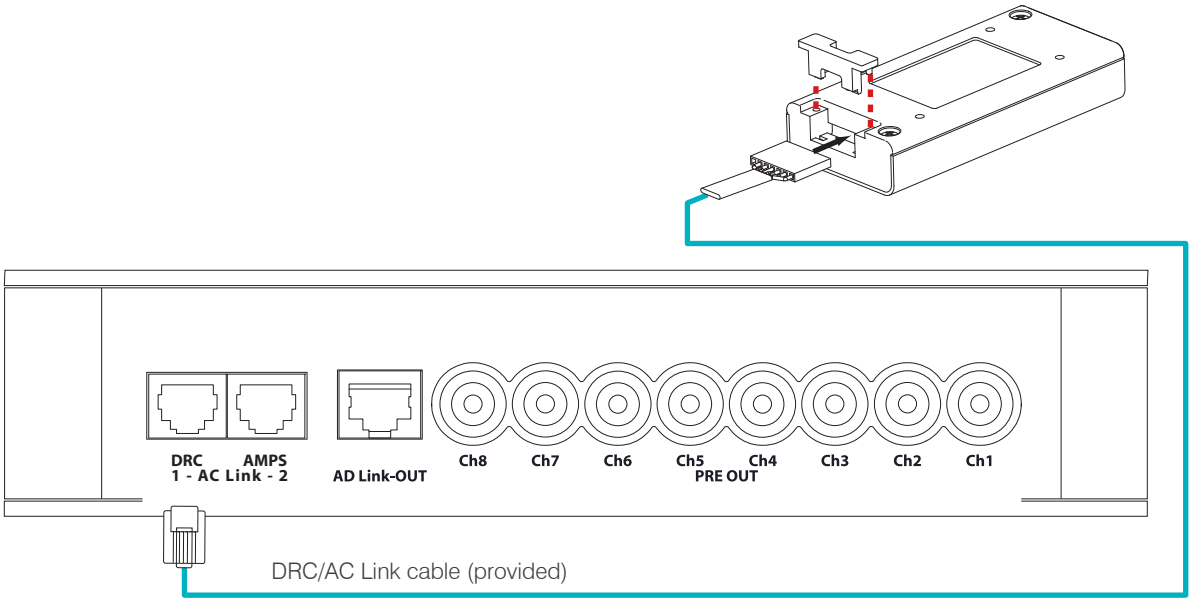
- DSP Settings: through this menu you can enable/ disable the Dynamic EQ as well as the Auto IN Level Adj. Function;

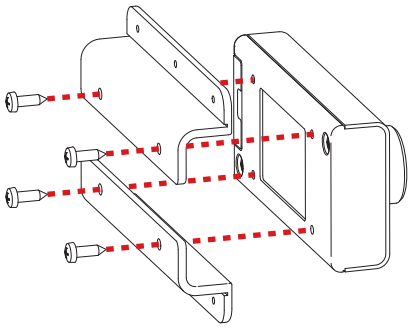
- Auto IN Level Adj: if while listening the MASTER source volume moves and you don't have any indications about its original level, to correctly set it back to the level it was when it was initially tuned, insert the "Installation CD" into the head unit, play track 1 and press the "yes" button on the DRC. Now adjust the MASTER source volume until the cursor (+) is on "0" and not over (to avoid the clipping)..

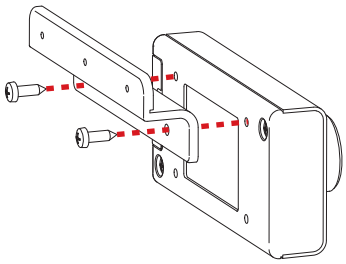


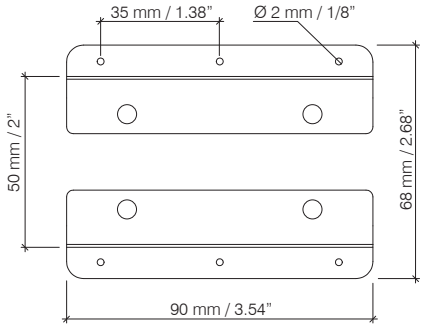
DRC - Digital Remote Control

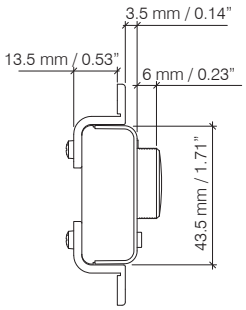
INSTALLATION

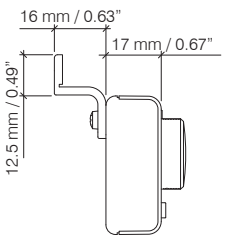












TECHNICAL SPECIFICATIONS

Power supply	
Voltage	11 ÷ 15 VDC
Idling current	0.45 A
Switched off	<0.001 mA
Remote IN voltage	7 ÷ 15 VDC (1.3 mA)
Remote OUT voltage	12 VDC (10 mA)
Signal stage	
Distortion - THD @ 1 kHz, 1 VRMS Output	0.002 %
Bandwidth @ -3 dB	4.5 ÷ 21k Hz
S/N ratio @ A weighted	
Digital Input	112 dB
Master Input	96.5 dB
AUX Input	100 dB
Channel Separation @ 1 kHz	77 dB
Input sensitivity (Pre In)	0.3 ÷ 5 V
Input sensitivity (Speaker In)	1.2 ÷ 20 V
Input impedance (Pre In)	20 kW
Input impedance (Speaker In)	5 kW
Max Output Level (RMS) @ 0.1% THD	4 V
Input stage	
Low level (Pre)	Ch1÷Ch6, AUX1 L/R, AUX2 L/R
High Level (Spk)	Ch1÷Ch8, Phone IN
Digital	Coaxial, Optical (S/PDIF Max 192 kHz/24 bit)
Output stage	
Low level (Pre)	Ch1÷Ch8
Digital	AD Link (Ch1÷Ch8 S/PDIF)
Connection	
From / To Personal Computer	1 x USB / B (2.0)
To Audison Electronics	2 x AC Link control bus
Crossover	N. 8 (one each output channel)
Filter type	Full / High Pass / Low Pass / Band Pass
Filter mode and slope	Linkwitz @ 12 / 24 / 36 / 48 dB
	Butterworth @ 6 / 12 / 18 / 24 / 30 / 36 / 42 / 48 dB
Crossover Frequency	70 steps @ 10 ÷ 20k Hz
Phase control	0° / 180°
Equalizer	
On High Level Inputs (Speaker In)	Automatic De-equalization
On AUX Inputs	N.4 x Graphic: ±12 dB @ 31 Band, ISO 1/3 Oct, 20 ÷ 20k Hz
On Outputs	N.8 x Graphic: ±12 dB @ 31 Band, ISO 1/3 Oct, 20 ÷ 20k Hz
Dynamic Equalization	Self-adjusting System between low and high listening levels
Time Alignment	
Distance	2.8 ÷ 748 cm / 1.1 ÷ 294.5 inches
Delay	0 ÷ 22 ms
Step	0.08 ms, 2.8 cm, 1.1 inch
Size	
B (Base) x L (Lenght) x H (Height) mm/inch	225 x 150 x 32.3 / 8.85” x 5.90” x 1.27”
Weight kg/lb	1.345 / 2.965

Technology for Art of Sound
Manufactured by elettromedia Italy

audison

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