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How to install and operate the **X-D50** digital 5-channel amplifier

Welcome!

This owners manual is written in easy english and uses a lot of drawings to simply the installation and use of the above amplifiers.

Your X-program amplifiers must be installed correctly in order to work well. This manual will show you how to install the amplifier like a pro. Please read the entire manual before beginning the installation.Install the amplifier yourself if you feel confident with our instructions and if you have the proper tools. However if you feel unsure, turn over the installation job to someone better suited to it.

Warranty Service

This amplifier is covered by warranty, depending on the conditions in the country where it is sold. If the amplifier is returned for service, please include the original dated receipt with the product.

Technical Assistance

For technical assistance ask the shop where the product was sold or the distributor in your very country. Information can also be found on our WEB-site www.xprogram.com

We follow a policy of continuous advancement in development. For this reason all or part of specifications & designs may be changed without prior notice.

DECLARATION OF CONFORMITY

X-program amplifiers for vehicles are manufactured in accordance with the EU directive EEC 95/54 (72/245/EEC) and are marked with the approval number. They are also marked in accordance with the WEEE-directive 2002/96/EC.

The products are also produced in accordance with the EU RoHS directive 2002/95/EC.

Contents

Approval of electromagnetic compatability according to the EEC Directive 72/245/EEC and 2006/96/EC

E 13 Approval No: 03 6367 CE

This product must be returned to the separate collection system for electronic products. Do not dispose this product together with general household waste.

X-program is designed, engineered and distributed by:

DLS Svenska AB
P.O. Box 13029 - SE-40251 Göteborg - Sweden
Tel: +46 31 840060 - Fax: +46 31 844021
E-mail: info@dls.se
www.xprogram.com
X-program products are produced in Taiwan

This model include

- Digital class D technique
- High efficiency
- Low profile design
- RCA line inputs
- Parallel input switch
- High level input with Auto start
- Phase shift control on mono channel
- Powerful cable terminals
- Built-in active crossovers

Installation

Before you begin installation

Before you begin you need to read the manual, to have some tools, cables and other material available. There is one such list of material on the following page.

Amplifier location

Important
Allow air circulation around the amplifier.

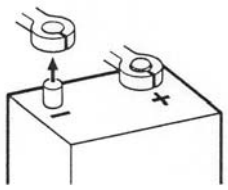
The X-program series of amplifiers have a compact design that allows great flexibility in mounting. You can mount it under a seat or in the trunk.
When you select a location, do remember that the amplifier generates a lot of heat.

Choose a location where air can circulate freely around the amplifier. Do not cover the amplifier with carpets or hide behind trim panels.
Do not mount the amplifier in an inverted or upside down position.

Check all locations and placements carefully before making any cuts, drilling any holes or making any connections.

Disconnect Battery

Before starting the installation, always disconnect the negative terminal of the battery.



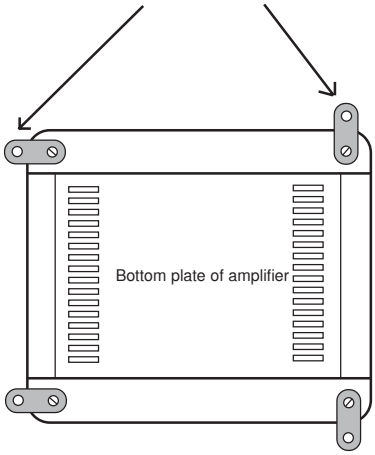
X-logo on amplifier cooling flange

The X-logo on the amplifier top is attached with two 1 mm hex. screws. The logo can be removed and twisted 90 or 180 degrees, and then screwed back in wanted position. The logo can be mounted in four different ways to match your installation.

Mounting

Fasten the amplifier to the surface using the four separate brackets coming with the amplifier. The brackets are attached to the amplifier with screws and can be directed in two ways, see figure:

Mount the flanges this way, or this way.



Tools and material needed

Tools:

- Flat and Phillips screwdrivers
- Wire cutter
- Wire stripper
- Electric drill with drills
- Crimping tool
- Digital multimeter or test lamp
- Wire brush, scraper or a piece of an abrasive sheet to remove paint for a good ground connection
- Grease to protect the ground connection from oxidation

Material:

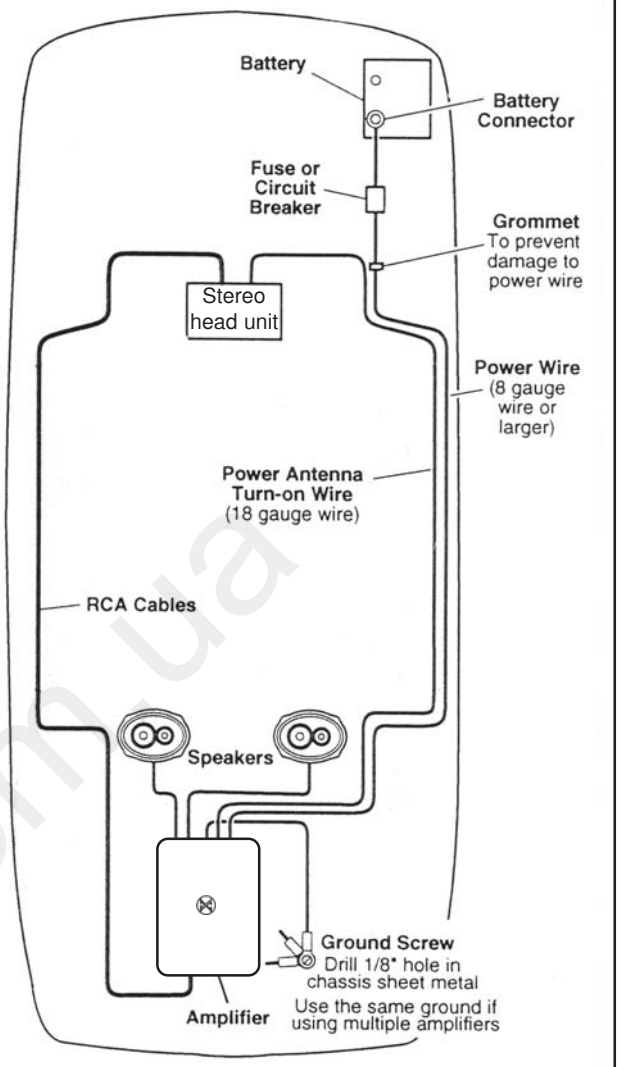
- Speaker wire: minimum 12 AWG = 4 mm² for subwoofers 13 – 16 AWG = 1,5-2,5 mm² for other speakers
- Sheet metal screws for mounting the amplifier to the amplifier board and the amplifier board to the car + some extra for fuse holder, amplifier ground etc.
- Electrical insulation tape
- ½ inch thick plywood or particle board for the amplifier to be mounted upon.

Amplifier installation kit:

If available,buy an amplifier installation kit. It contains normally all you need. This is what you have to buy if you buy the items separately

- 20- 25 feet = 6- 7.5 meter power cable, minimum AWG 5 = 16 mm² or heavier
- 1 pc of fuseholder to install close to the car battery + fuse 50 Ampere.
- 20 feet of AWG 15 = 1,5 mm² wire for remote turn on / off cable from radio.
- RCA-cable for input from radio.
  - 20 feet or 5 meter for trunk installations
  -12 feet or 2 – 3 meter for under seat installations.
- Four to eight splicers to connect speaker cables to high level input cable, if high level input is used.
- Wire ties
- Insulating grommet or insulating tube

Routing wires



Professional Tip:

If amplifier installation kits are available with different size of power cable, chose the most heavy power cable to improve sound quality and to allow more amplifiers to be installed now or later.

The amplifier power terminals accept AWG 4 cables directly, so If possible buy AWG 4 = 21 mm² cable for best performance.

Both the positive wire and the ground wire must have the same size. To avoid cable fire, be sure not to oversize the main fuse value for the power wires.

THE DC-FEED

Maximum main fuse values for different cable sizes.

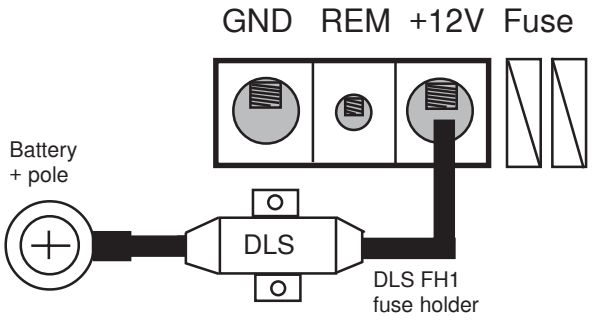
6 mm² (9 AWG)	**:25 A**	10 mm² (7AWG)	**:40 A**
16 mm² (5AWG)	**:60 A**	21 mm² (4AWG)	**:100 A**
33 mm² (2AWG)	**:150 A**	42 mm² (1AWG)	**:200 A**

Wiring

Power and Outputs

Power terminal (+12V)

Connect the fuse holder as close to the vehicle battery + as possible, using AWG 4 = 21 mm^2 power cable. Use a ring crimp terminal cable to connect to battery +. Apply silicon grease to the fuse to prevent corrosion. The AWG4 cable can use an 80 Amp fuse, if the cable is smaller, the fuse value must be lower (see table on previous page).

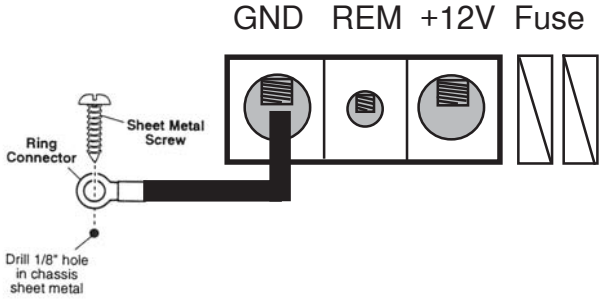


A cable up to AWG 4 fits directly in the amplifier + 12 V terminal, tighten with the hex screw.

Be sure to use a rubber grommet or a plastic insulating tube where the cable passes the firewall or other places where it can be easily jammed.
Use wire ties to secure to existing cables in the engine compartment.

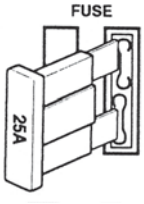
Ground Terminal (GND)

Connect to a good chassis ground. The ground connection should be clean, unpainted metal to provide a good electrical connection. Use a wire brush, a scraper or a piece of an abrasive sheet to clean the metal. Use a lock washer or two to secure contact. Protect with silicon grease or by paint applied afterwards.



Fuses

Use only 30 ampere ATC blade type fuses when replacing a blown fuse.

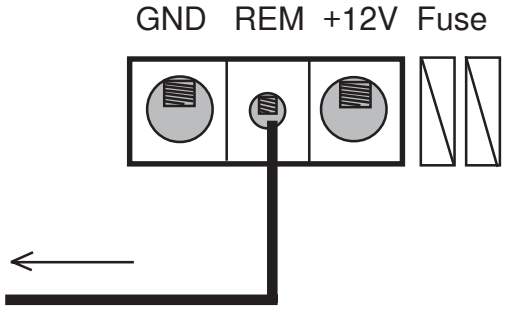


Remote terminal (REM)

For RCA cable signal input:
Connect the radio power antenna lead = remote turn on/off from the car stereo to the amplifier remote connection. This turns on the amplifier whenever the car stereo is turned on.
You can either use the built in remote cable in the RCA cable itself or use a separate cable.

Sometimes a small disturbance may enter the amplifier coming from the remote voltage , through the built in remote wire and into the RCA cable. Thus we recommend to use a separate remote wire and run the RCA lead separate from remote wire, power cables and speaker cables.
You can insert the cable directly into the amplifier terminal. If there is no remote voltage available from the stereo, you must connect to the ignition key through the radio or any accessories fuse.

For High Level input:
We recommend you to connect the remote wire as described above. The amplifier will produce soft on / soft off operation this way.
In the case that there is no remote voltage available from the car stereo or you want to simplify the installation, the amplifier can be turned on/ turned off by the high level input voltage. This is done automatically when the head unit is turned on. There is a small disadvantage that this function gives soft turn on operation but some pop sound when switching off.

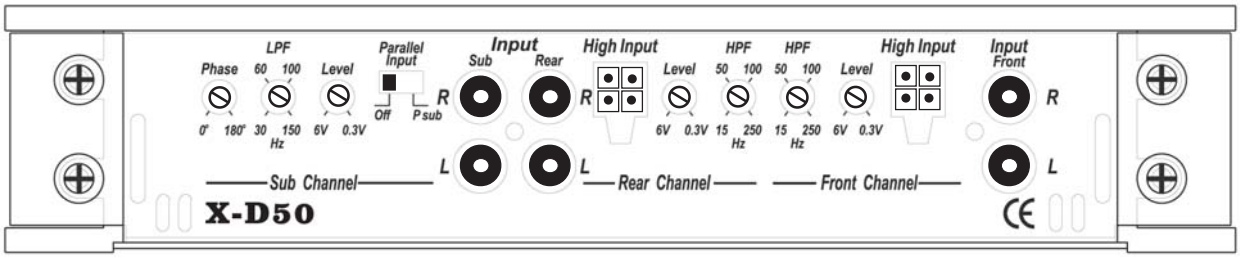


Power Light / Protect light

The power light (green) comes on when the amplifier is turned on.

The protect light (red) comes on when the amplifier shuts down from overheating, or a short circuit (speaker failure)

Input and controls

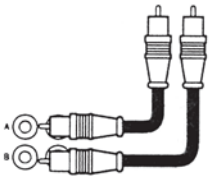


Low level Input Wiring

Inputs may be low level from the RCA output of the car stereo or high level from the car stereo speaker output. Low level = RCA is to prefer for the best sound quality.

Important
Use either the low level or high level input, do not use both at same time.

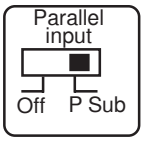
Low level input
Use a pair of shielded stereo audio cables with RCA type jack. Most trunk-mount amplifiers need a 20 feet RCA cable (appr 5 – 6 meters). Most under the seat installations require 12 feet (2 – 3 meters) RCA cables. Avoid placing the RCA cable close to speaker cables, power cables and remote control cable. Connect to input socket R/L.



X-D50 have three inputs, Front R/L, Rear R/L and one for the mono sub channel.
Depending on your chosen configuration you can use either three separate RCA cables, or two RCA cables using the **Parallel input** switch to connect rear and sub inputs in parallel.

Parallel input on X-D50

If you don't have dual line cables to rear and sub input you can use a single line cable. Connect to the rear stereo input sockets and set the Parallel input swich to position "P-sub" and the signal is fed to the Sub input socket automatically.



High Level Input wiring

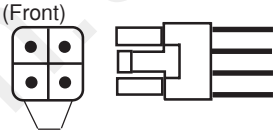
Connect left and right speaker wires coming from the car stereo to the high level input as shown. You must connect both plus and minus as the inputs are balanced, connecting plus only gives lower level and bad sound quality. By changing the polarity of plus and minus, you can change the phase.

X-D50

On X-D50 the high level signal is fed internally to channel SUB when using high level input.

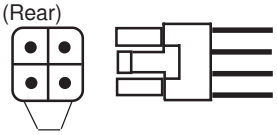
High level input socket

High Input (Front)



Hi level input plug on amp for CH L/R.

High Input (Rear)



Hi level input plug on amp for CH L/R.

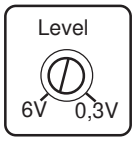
Automatic turn on when using high level input.
The amplifier turns on automatically when using high level input, you dont need to connect a separate remote wire from your head unit.

For a soft turn ON /OFF operation we recommend you to use a remote wire, if this is available.

Features / crossovers

Input Level control

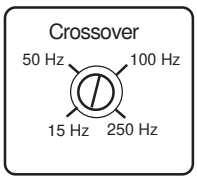
The input level control, 6V – 0,3 V, matches the output of your radio to the input of the amplifier. After installation is complete, make sure the input of the amplifier is turned down all the way (counter-clockwise at 6V).



Play a CD, make sure all bass or treble settings or equalizer are flat, and turn the volume of the radio up until you just start to hear distortion. Turn the volume control down just a bit. On the amplifier increase the input level control (clockwise or to the right) until you just start to hear distortion, then back the level control just a bit. Now your radio and amplifier levels are matched.

High Pass filter on rear / front channels

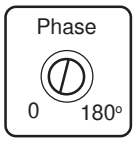
The high pass filter blocks very low frequencies from reaching the speakers. It is mostly used at say 60 Hz to protect small speakers (like 6 inch and smaller) from deep bass.



Set the filter to 15 Hz position if you want to run the amplifier in full range mode (almost).
The filter can not be switched off.

Phase control on mono sub channel

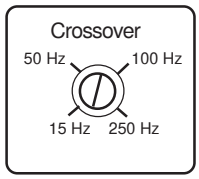
The phase control can be set continuously from 0 - 180 degrees.
This function is used together with subwoofers. This is very useful when you want to adjust the bass sound for best front stage image. Start at 0 and turn the control slowly clockwise until you experience that the bass sound is coming from the front. If you don't get the result you want, also try to phase reverse the subwoofer connections and make a new adjustment.



Low Pass filter on mono sub channel

The low pass filter is mostly used for subwoofers. It will allow low frequencies only and blocks higher frequencies. A typical setting is 50 – 70 Hz.

The filter can not be switched off.

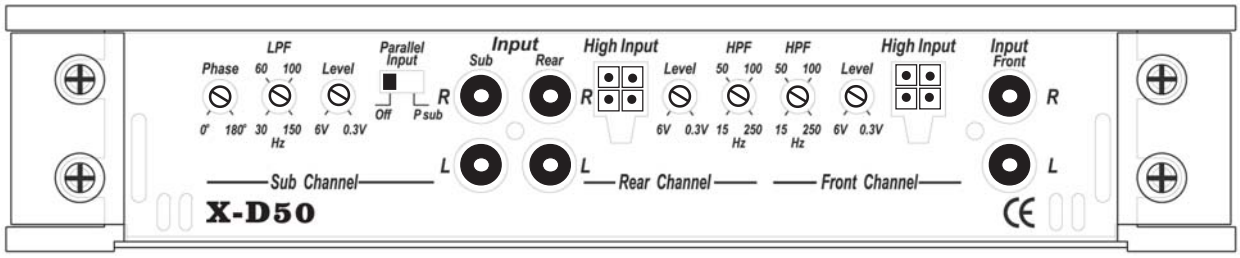


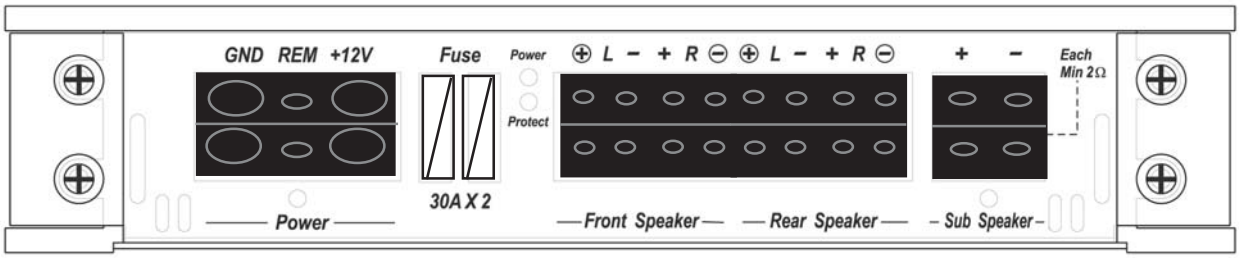
Crossovers and other features

The **X-D50** is a 5-channel amplifier for use with a front and rear system and a subwoofer.
The amplifier has the following filters / features:

Stereo sections (front & rear channel pairs):
❒ High pass filter adjustable from 15 to 250 Hz.
❒ Level control adjustable from 0,3 to 6 Volt.

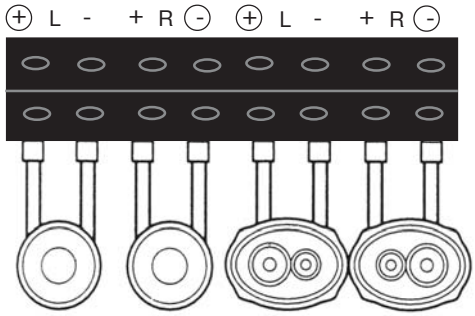
Mono section:
❒ Lowpass filter adjustable between 30 and 150 Hz.
❒ Subsonic / highpass filter fixed to 25 Hz.
❒ Phase control adjustable from 0 to 180 degrees.





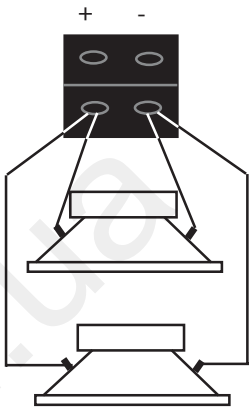
Speaker wiring X-D50

1. Two or four fullrange speakers to the front and rear speaker channels



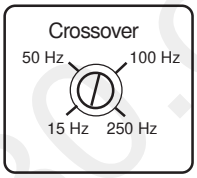
- Front Speaker - - Rear Speaker -

2. One or two subwoofers to mono sub channel, Each speaker min 4 ohm.



Filter settings Front & rear channels

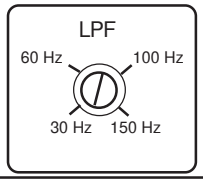
The high pass filter blocks very low frequencies from reaching the speakers. It is mostly used at say 60 Hz to protect small speakers (like 6 inch and smaller) from deep bass.



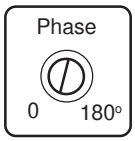
Set the filter to 15 Hz position if you want to run the amplifier in full range mode (almost).
The filter can not be switched off.

Filter settings Sub channel

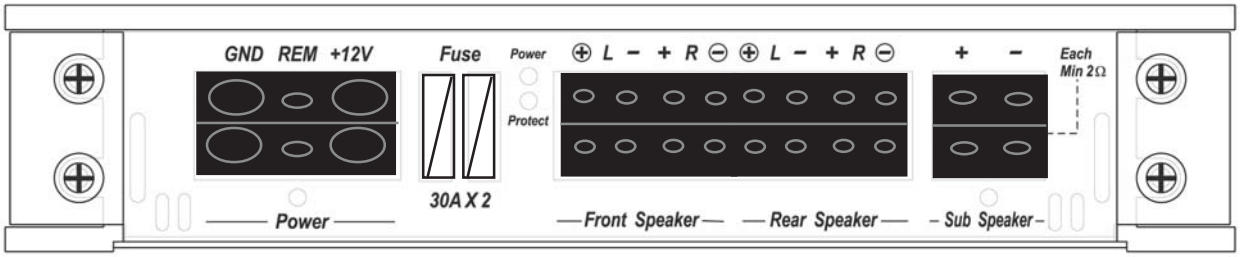
The **low pass filter** is used for subwoofers. It will allow low frequencies only and blocks higher frequencies.
A typical setting is **50 – 70** Hz.



The **phase control** can be set continuously from 0 - 180 degrees.
This function is used together with subwoofers. This is very useful when you want to adjust the bass sound for best front stage image. Start at 0 and turn the control slowly clockwise until you experience that the bass sound is coming from the front. If you don't get the result you want, also try to phase reverse the subwoofer connections and make a new adjustment.

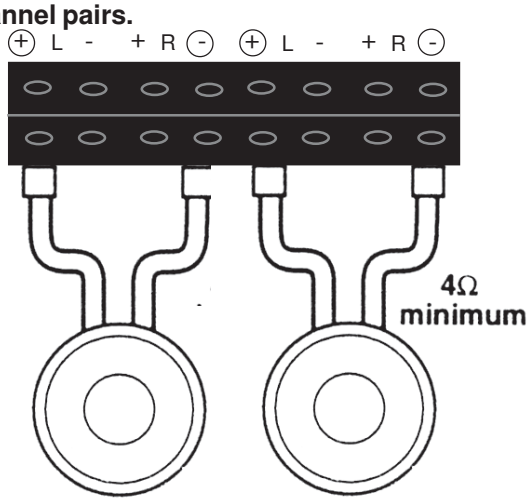


For power wiring, see page 4
For High or low level input wiring, see page 5



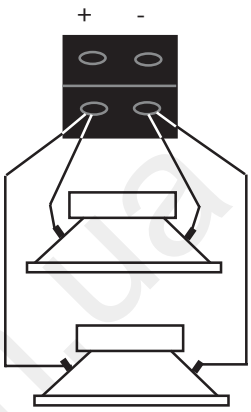
Speaker wiring in bridge mode X-D50

1. Two fullrange speakers to X-D50, connected in bridge mode to front & rear channel pairs.



Front speakers connected in bridge mode

2. One or two subwoofers to mono sub channel, Each speaker min 4 ohm.

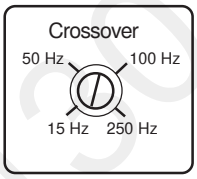


Filter settings Front channels

Filter settings Rear channels

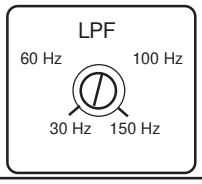
The high pass filter blocks very low frequencies from reaching the speakers. It is mostly used at say 60 Hz to protect small speakers (like 6 inch and smaller) from deep bass.

Set the filter to 15 Hz position if you want to run the amplifier in full range mode (almost).
The filter can not be switched off.

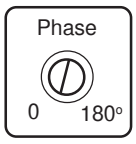


Filter settings Sub channel

The **low pass filter** is used for subwoofers. It will allow low frequencies only and blocks higher frequencies.
A typical setting is **50 – 70** Hz.



The **phase control** can be set continuously from 0 - 180 degrees.
This function is used together with subwoofers. This is very useful when you want to adjust the bass sound for best front stage image. Start at 0 and turn the control slowly clockwise until you experience that the bass sound is coming from the front. If you don't get the result you want, also try to phase reverse the subwoofer connections and make a new adjustment.



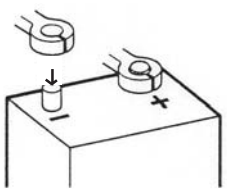
For power wiring, see page 4
For High or low level input wiring, see page 5

Testing

Before you finish the installation, you should do the following tests to make sure the wiring is correct and everything is operating properly.

Reconnect Battery

When wiring is complete, reconnect the battery negative terminal.



Test power wiring

1. Turn on the head unit but do not turn up the volume. The amplifier power light should come on. If not, check the remote and +12 volt wires. Also check the ground connection.
2. Turn up the head units volume slightly. All speakers should operate. if not, check wiring connections at amplifier and speakers.

Test speaker connections

Make sure the speakers are connected right. Use the balance control on the head unit to make sure right channel is on right speaker etc. If speakers don´t play at all, one or both speaker wires may be disconnected.

Troubleshooting

If problems occour during the installation, or later, this guide might help you to find out whats´s wrong.

THE AMPLIFIER IS DEAD:

1. Check power lead, ground and remote connections at the amplifier using a multi meter.
2. Check the battery terminal connections.
3. Check the power lead fuse or circuit breaker. If fuse damage continues, inspect the power lead for short circuits.
4. Check the amplifier protection fuses. Are these broken change to new ones with the same value. If short circuiting continues, contact your local DLS dealer. A fault may exist in the amplifier.
5. To start the amplifier requires a remote voltage of 9-15 volt. Check the voltage with a multi meter.

AMPLIFIER PROTECTION FUSE BLOWS AT LOW VOLUME :

1. One or more speaker cables are shorted. Make an insulation test with a multi meter. The cables must not have a connection to earth.

THE AMPLIFIER TURNS OFF AFTER 10 - 30 MINUTES.

The amplifier is overheating due to inadequate ventilation. Check mounting position is free from obstruction.

Do this:

1. Move the amplifier to a place with better ventilation.
2. Install one or two fans to cool down the heatsink.
3. Overheating can also be caused by an impedance load below the level permitted.

NO OUTPUT FROM ONE OR MORE SPEAKERS:

Check the following:

1. Balance control position.
2. Fader control position.
3. Speaker cable connections to both amplifier and drivers.
4. Signal lead plugs and cables.
5. Change left and right signal lead plugs in the amplifier to see if the problem moves to a different speaker, the lead has a fault.
If the problem remains, the speaker or amplifier are at fault.

Professional Tip:

NOISE PROBLEMS

WHINING NOISE VARYING WITH ENGINE REVOLUTIONS:

Do this:

1. Rewire the power supply (12 V) to source unit direct from battery.
2. Rewire ground wire from source unit to clean position on chassis.
3. Check all power connections to ensure that they are clean and tight.
4. Check quality of system ground connection.
5. Install a Power Cap capacitor. This can be helpful against most noise problems.

CONSTANT WHINING NOISE:

Do this:

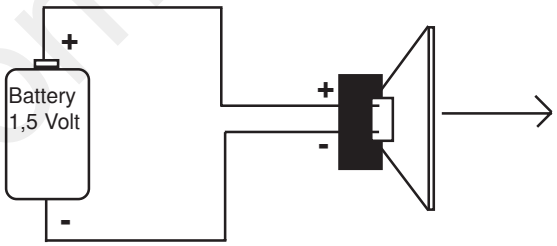
1. Ensure that all equipment has a common ground point.
2. Check quality of earth strap connection from battery negative terminal to chassis.
3. Disconnect signal cables from amplifier to see if noise disappears. If so the leads are picking up noise. Test this by laying a new cable over the seats and reconnecting to the amplifier. If the noise does not return, re-route original cable away from source of interference.
   If noise remains regardless of cable position, try to use so called Quasi-balanced signal cables. DLS PRO-cables are Quasibalanced.

Professional Tip:

SPEAKER POLARITY CHECK.

All speakers in a car audio system should be connected in phase (the same polarity). All speaker cones must move in the same direction. Out of phase speakers will cause a lack of bass, and a poor stereo soundstage.

Checking polarity:
Hold the - connection of the speaker wire to the - terminal of a 1,5 Volt flashlight battery. Tap the + wire on to the + terminal of the battery, and observe the movement of the cone. The cone should move outwards when the wire touches the battery, and inwards when the battery is removed. If it is the other way around, the speaker has been connected backwards and it must be removed and connected correctly.
If your system also has a subwoofer connected through a passive 6 or 12 dB crossover, try to connect this with various polarity and judge what sounds best. The phase shift in passive crossovers sometimes makes it necessary to change polarity.



NOTE! Tweeters can not be tested this way, double check the connections instead.

Professional Tip:

Installing in trunk
When installing the amplifier in the trunk, run the power wires along the same path as the other vehicle wiring. Many cars have insulated channels for wiring. you will have to remove the door sill trim and the carpet.

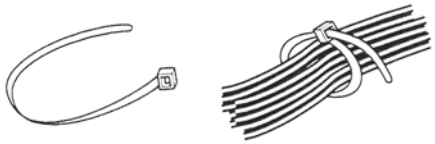
Professional Tip:

Crimp connections
Purchase crimp connectors and crimping tool. Connectors are color coded.

1. Strip 1/4 inch (6 mm) of insulation from the wire.
2. Insert into connector
3. Crimp tightly

Professional Tip:

Securing wires
Use wire ties to bundle together when possible. (But never bundle speaker wires or signal cables together with power wires.



Professional Tip:

Speaker and power wires
Do not run speaker and power wires next to each other. Power wires can generate a ”siren” sound in the speakers. Run speaker and power wires on opposite sides of the car.

Specifications

X-program	X-D50
Number of channels	5
Power output, 4 ohm (0,1% THD)	4 x 80 W
Power output, 2 ohm (0,2% THD)	4 x 130 W
Power output, 4 ohm bridged	2 x 225 W
Power out mono sub ch. 4 ohm	1 x 270 W
Power out mono sub ch. 2 ohm	1 x 310 W
Signal to noise ratio, A-weighted	>100 dB
Damping factor	>100
Frequency response	10 Hz - 35 kHz
Input impedance, low level	33 kohm
Input impedance, high level	1 kohm
High level input with auto start	Yes
Input sensitivity	0,3 - 6V
Variable phase shift control	0-180 degrees (mono sub channel)
Filter high pass front/rear channels	15 - 250 Hz / 12 dB slope
Filter low pass, mono sub channel	30 - 150 Hz / 18 dB slope
Subsonic filter, all channels	Fixed 25 Hz / 18 dB slope
Power consumption, idle	2 A
Max current draw	60 A
Fuse	2 x 30 A
Dimensions HxWxD(mm)	50 x 399 x 250
Dimensions (inch)	2 x 15,7 x 10
Weight	4,7 kg / 10,4 lbs

All above output power ratings at 13,8 VDC

DECLARATION OF CONFORMITY

X-program amplifiers for vehicles are manufactured in accordance with the EU directive EEC 95/54 (72/245/EEC) and are marked with the approval number. They are also marked in accordance with the WEEE-directive 2002/96/EC.
The products are also produced in accordance with the EU RoHS directive 2002/95/EC.

We follow a policy of continuous advancement in development.
For this reason all or part of specifications & designs may be changed without prior notice.

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