MC1250
OPERATING INSTRUCTIONS

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TECHNICAL SPECIFICATION

Main Specifications - MC series Amplifiers

Parameter (Units)	MC1250	MC750
Output Power (per channel) (Watts)		
8 ohms	850	625
4 ohms	1550	1075
2 ohms	2200	1325
Output Power (bridged) (Watts)		
8 ohms	3100	2150
4 ohms	4400	2650
THD+N:(%) (4 ohms)		
@1kHz(@1dB below max output power) <	0.008	0.007
@20Hz to 20kHz(@3dB below max output power) <	0.03	0.03
Gain Options (dB)	33	31
Sensitivity Options (for maximum power) (dBu)	6	6
Sensitivity Options (for maximum power) (Volts)	1.5	1.5
Frequency Response - 20Hz to 20kHz (dB)	+0 / -0.5	+0 / -0.5
Power Consumption: Nominal @ 240v (4 ohms)(amps)	3.2	2.3
Power Consumption: Nominal @ 120v (4 ohms)(amps)	6.4	4.6
Dimensions: (mm)		
Amplifier: H x W x D	130x480x460	88x480x410
Boxed (shipping UK): H x W x D	230 x 580 x 560	
Boxed (shipping - all except UK): H x W x D	250 x 610 x 600 **	
Weight: (Kgs)		
Amplifier:	30	18.54
Boxed:(shipping)	32	20.64
Additional Specifications		
Input Impedance - Active balanced (k ohms)	20	20
Input CMRR (dB)	>60	>60
Hum & Noise (dB below max output)	-106	-106
Damping Factor: @1kHz into 8 ohms	>400	>400
Signal Limiters - (set to prevent excessive clipping)	Yes	Yes
Protection: Short circuit / DC output / Temperature	Yes	Yes
Mains in-rush control.	Yes	Yes
Output Power (watts) into 8 ohms		
Sine wave @ 1kHz	575	375
Continuous music with Crest Factor of 2.8 (9dB)	850	575
Continuous music with Crest Factor of 4.8 (14dB)	850	625
Continuous music with Crest Factor of 7.8 (18dB)	850	650
Output Power (watts) into 4 ohms		
Sine wave @ 1kHz	1300	800
Continuous music with Crest Factor of 2.8 (9dB)	1450	975
Continuous music with Crest Factor of 4.8 (14dB)	1550	1075
Continuous music with Crest Factor of 7.8 (18dB)	1650	1175
Output Power (watts) into 2 ohms		
Sine wave @ 1kHz	1500	1300
Continuous music with Crest Factor of 2.8 (9dB)	1675	1300
Continuous music with Crest Factor of 4.8 (14dB)	2200	1325
Continuous music with Crest Factor of 7.8 (18dB)	2500	1450

** Single MC1250 orders check packing size with MC2 Audio

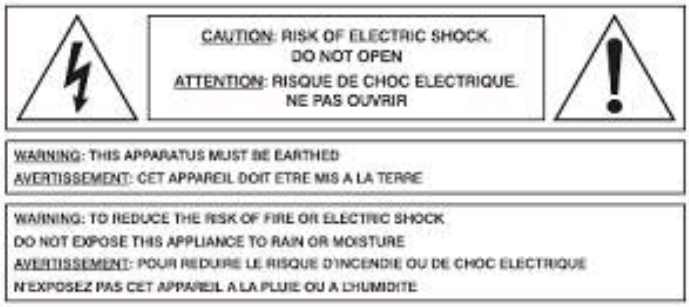
Product compliance to EC Directives

This product conforms to the relevant Directives, Regulations and Standards for electronic and associated apparatus. The equipment is CE marked both on the apparatus and the packaging. A product "Declaration of Conformity" statement, and information regarding auxiliary apparatus and specifications required to meet Conformity is available on request from our Customer Service Department on:

+44 (0) 1404 44633

This amplifier will only operate to its very high specification if it is installed and operated as described in this manual.

IMPORTANT SAFETY INSTRUCTIONS



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

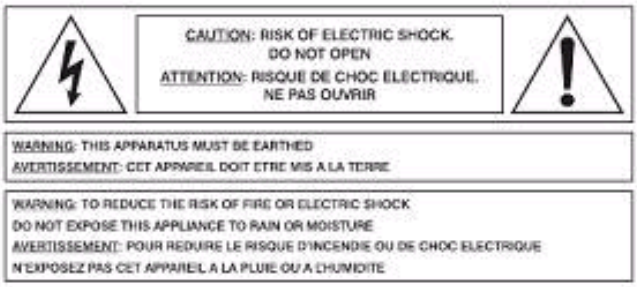
The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: Apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

WARNING: To prevent injury, this apparatus must be securely attached to the rack in accordance with the installation instructions.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings, install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources, such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
9. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the pint where they exit from the apparatus.
10. The mains circuit breaker shall remain readily accessible.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from a tip over.
13. Disconnect this apparatus during lightning storms or when unused for a long period of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as if the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
16. To completely disconnect this equipment from the AC mains, disconnect the power cord from the mains circuit breaker.
17. Where the amplifier is mounted in a rack and permanently connected to the mains, then the rack should be installed with a readily accessible connector or an ALL POLE circuit breaker with 3mm breaking distances.
18. This unit is fitted with a 3-wire power cord. For safety reasons, THE EARTH LEAD SHOULD NOT BE DISCONNECTED IN ANY CIRCUMSTANCE.
19. The cooling fans suck cool air in through the front and blow hot air out at the rear of the unit through the ventilating grills. The front and rear of the amplifier should have free exposure to the air (i.e. in a rack leave the front and rear doors off), with 2cm air gap at the sides and top. IF AIR IS NOT ALLOWED TO ESCAPE FROM THE REAR, OVER-HEATING WILL OCCUR. Take care when mounting other equipment in the same rack.

INSTRUCTIONS DE SÉCURITÉ IMPORTANTES



Le symbole représentant un éclair fléché dans un triangle équilatéral a pour but d'alerter l'utilisateur de la présence d'une « tension dangereuse » non isolée à l'intérieur du boîtier, pouvant être d'une force suffisante pour constituer un risque d'électrocution.

Le point d'exclamation dans un triangle équilatéral a pour but d'alerter l'utilisateur de la présence d'instructions importantes concernant le fonctionnement et la maintenance, dans la documentation qui accompagne l'appareil.

ATTENTION: Appareils de construction de CLASSE I doit être raccordé au réseau électrique via une prise de courant reliée à la terre.

ATTENTION: Pour éviter toute blessure, cet appareil doit être solidement fixé à la torture, conformément aux instructions d'installation.

1. Lisez ces instructions.
2. Gardez ces instructions.
3. Faites attention à tous les avertissements.
4. Suivez toutes les instructions.
5. N'utilisez pas cet appareil près de l'eau.
6. Faites le ménage seulement avec un tissu sec.
7. Ne bloquez pas d'ouvertures de ventilation, installez conformément aux instructions du fabricant.
8. N'installez près d'aucunes sources de chaleur, comme les radiateurs, les registres de chaleur, les cuisinières ou d'autre appareil (en incluant des amplificateurs) qui produisent la chaleur.
9. Protégez la corde de pouvoir d'être marché sur ou pincé particulièrement aux prises de courant, les réceptacles d'avantage et la pinte où ils sortent de l'appareil.
10. Le disjoncteur de conduite principale restera sans hésiter accessible.
11. Utilisez seulement des attachements/accessoires spécifiés par le fabricant.
12. Utilisez seulement avec le chariot, le trépied, la parenthèse ou la table spécifiée par le fabricant, ou vendu avec l'appareil. Quand un chariot est utilisé, utilisez la prudence en déplaçant la combinaison de chariot/appareil pour éviter la blessure d'un bout.
13. Débranchez cet appareil pendant les tempêtes de foudre ou quand neuf pendant un long terme de temps.

14. Renvoyez tout l'entretien au personnel de service qualifié. L'entretien est exigé quand l'appareil a été nui de toute façon, comme si la corde de pouvoir provision ou la prise de courant sont nuis, le liquide a été déversé ou les objets sont tombés dans l'appareil, l'appareil a été exposé pour pleuvoir ou l'humidité, n'opère pas normalement, ou a été baissé.
15. N'exposez pas cet équipement au fait de tomber goutte à goutte ou au fait d'éclabousser et garantissez qu'aucun objet rempli des liquides, comme les vases, n'est placé sur l'équipement.
16. Pour complètement débrancher cet équipement de la conduite principale de courant alternatif, débranchez la corde de pouvoir du disjoncteur de conduite principale.
17. Où l'amplificateur est monté dans un égouttoir et en permanence raccordé à la conduite principale, alors l'égouttoir devrait être installé avec un connecteur sans hésiter accessible ou TOUT le disjoncteur de PÔLE avec 3 millimètres cassant des distances.
18. Cette unité est correspondue avec une corde de pouvoir de 3 fils. Pour les raisons de sécurité, l'AVANCE DE TERRE NE DEVRAIT ÊTRE DÉBRANCHÉE DANS AUCUNE CIRCONSTANCE.
19. Les ventilateurs engloutissent l'air frais par le front et soufflent l'air chaud à l'arrière de l'unité par les grils aérants. Le front et l'arrière de l'amplificateur devraient avoir l'exposition libre à l'air (c'est-à-dire dans un égouttoir omettent les portes de devant et arrière), avec le trou aérien de 2 centimètres aux côtés et au haut. Si on NE PERMET PAS QUE D'AIR S'ÉCHAPPE DE L'ARRIÈRE, LE FAIT DE SURCHAUFFER SE PRODUIRA. Faites attention en montant d'autre équipement dans le même égouttoir.

INTRODUCTION

Your MC1250 digitally controlled power amplifier represents the latest technology in control circuitry coupled to a no compromise, high quality class AB power amplifier. There is no dynamic switching of the audio or power rails (a very common method of achieving extra power at the expense of audio quality) thus ensuring optimum sonic performance.

The digital control monitors the operating parameters and adjusts the amplifier to suit the conditions. Fan speed and supply rails are varied as required to keep the amplifier within its temperature limits. The levels are adjusted by specially selected, high performance, digitally controlled attenuators. Signal limiters are included, the attack and release times of which can be adjusted internally by the bit switches on the control PCB (printed circuit board).

The amplifiers include full DC and short circuit protection which automatically re-connects when the fault is cleared.

INSTALLATION: ELECTRICAL

The amplifier has been manufactured to comply with your local power supply requirements, but before connecting the unit to the supply, ensure that the voltage (printed on the rear panel) is correct. The equipment should be installed professionally using a connector of the correct rating - consult your dealer if you are not sure.

SAFETY WARNING

This unit is fitted with a 3 wire power cord. For safety reasons, THE EARTH LEAD SHOULD NOT BE DISCONNECTED IN ANY CIRCUMSTANCE. If ground loops are encountered consult the section on input connections later in this manual.

TO PREVENT THE LIKELIHOOD OF SHOCK OR FIRE HAZARD, DO NOT EXPOSE THE UNIT TO RAIN OR MOISTURE.

TO AVOID ELECTRICAL SHOCK DO NOT REMOVE COVERS. REFER ALL SERVICING TO QUALIFIED PERSONNEL.

INSTALLATION: MECHANICAL

To ensure that this equipment performs to specification, it should be mounted in a suitable rack or enclosure as described below. Like all high power amplifiers, it should be kept away from other equipment which is sensitive to magnetic fields. Also, this amplifier may suffer a substantial reduction in performance if it is subjected to, or mounted close to equipment which radiates high R.F. fields.
When mounting the amplifier in a rack or enclosure, ensure that :-

1. The rear of the unit is adequately supported. The brackets which are supplied fit standard 19 inch (483mm) rack mounting systems. THE FRONT PANEL IS NOT CAPABLE OF SUPPORTING THE UNIT ON ITS OWN.

2. THERE IS ADEQUATE VENTILATION. The cooling fans suck cool air in through the front air filter and blow hot air out at the rear of the unit through the ventilating grills. IF THIS AIR IS NOT ALLOWED TO ESCAPE OVERHEATING WILL OCCUR. Take care when mounting other equipment in the same rack. The air filter must be kept clean and free from dust. It is easily removed by pulling it through the front. Dust can usually be shaken out, or if necessary, the filter can be washed.

CONNECTIONS

INPUTS

The inputs are made via 2 separate 3 pin XLR connectors wired in parallel. Either socket can be used as the input, the other one can be used to link to other amplifiers ('daisy chain') or to the other input for mono signals. They are electronically balanced and should be connected via a high grade twin core screened cable, as follows:-

PIN1 - Screen (see note)
PIN2 - Hot (signal +)
PIN3 - Cold (signal -)

The amplifier is designed to operate with fully balanced equipment and ground loops. Loss of performance may be experienced if connected to unbalanced sources. If using unbalanced sources is unavoidable however, the following wiring should be used. The cable should still be twin core plus screen.

PIN1 - Screen - connected to the chassis of the unbalanced equipment - or left disconnected at the unbalanced end.
PIN2 - Signal Hot
PIN3 - Signal Cold

The input requires a peak level of +6 dBm for full output.

NOTE: This amplifier is wired to the latest industry recommendations. PIN1 is connected directly to the chassis/mains earth. If ground loops (mains hum) are encountered remove the screen connection from the other end of the cable and leave it open circuit. If problems persist, consult your dealer/supplier. DO NOT TAMPER WITH OR ALTER ANY GROUND (EARTH) CONNECTIONS INSIDE THE AMPLIFIER.

BRIDGED OPERATION

In Bridged mode input A is fed to both channels. Channel B will be out of phase with channel A.

OUTPUTS

The speaker outputs are via 4mm shrouded binding posts. They can be used with 4mm plugs or plain wires, which can be inserted in the sides of the terminals. Two sets per channel are provided - either or both can be used.

Terminations are as follows :-	Hot	Red
	Cold	Black

NOTE: 1. Although the "cold" output terminals are nominally at 0V., they should **not** be joined together, otherwise cross-talk may be introduced.

2. The currents involved are very high, especially when using 2 ohm loads. The speaker cables should be capable of carrying the currents, otherwise the losses will cause the cables to get hot and audio power will be reduced. The minimum rating for an MC1250 should be 18 amps for 4 ohm and 25 amps for 2 ohm loads.

BRIDGED (MONO) OPERATION

Connect as follows: HOT - Channel A Hot
COLD - Channel B Hot

Leave both **cold** connections open circuit, they are internally joined.

NOTE: The load impedances change when operating in the Bridged mode (see Load/Power section below).

LOAD/POWER SWITCH 2 ohm /4 ohm

In the 4 ohm position the amplifier supply voltages are set up for loads of 4 ohms and above. Lower impedance loads can be connected but the internal current limit circuit could cause clipping and, unless the signal is very dynamic, the internal temperature rise will automatically reduce the supply voltages and set the amplifier to the 2 ohm position.

In the 2 ohm position, the supply voltages are reduced and the level (overload) indicators and limiters are re-referenced accordingly.

When operating in bridged mode, the minimum impedances are doubled - i.e. for 4 ohm loads use the 2 ohm position and for 8 ohm loads use the 4 ohm position. The minimum load in bridged mode is 4 ohms.

OPERATION

SWITCHING ON

When the amplifier is switched on, the outputs will be muted and the controller will check for any faults. It then goes through a 'power up' routine and finally connects the speakers to the output stages and fades up the signal to the level at which the amplifier was previously set.

PANEL CONTROLS AND INDICATORS

Level controls

These are continuous rotary encoders which provide fine adjustment (3 turns from min. to max.). When adjusted, the level indicators change to level control position indicators and thus the height of the LED column shows the level position. After a second or so the LED column changes back to monitor the signal level. This function can be changed internally via the programming switches on the control PCB. (See Internal Configuration section.)

Mute Switches

These are self explanatory and require one push to mute the signal and one to un-mute (toggle action). The LEDs indicate their status and when 'un-muting' the signal is ramped (faded) up.

Link Switch

This is also a toggle action switch and the LED above indicates its status. When **ON**, the two level controls are linked together and either control will adjust both channels to the same level. The controls track very accurately and operate as stereo attenuators. The limiters are also linked. When **OFF**, the level controls and limiters operate separately.

Level Indicators

These are peak reading meters which show the signal headroom before clipping. The 0dB LED is set at approximately 1/2dB below clipping. They are referenced to the supply voltages and automatically adjust when the supply changes.

When the level controls are adjusted, the level indicators change function and show the level control position. They return to their normal function after the level has been set.

Limiters

The MC1250 incorporates digitally controlled signal limiters. They attenuate the signal via the same switch array as the level controls and introduce virtually no distortion. The 'attack' time, 'release' time, threshold level and operating mode can be set internally via the programming switches on the control PCB. (See Internal Configuration section.) When the level controls are 'linked' the limiters are also linked and when the level controls are separate the limiters are separate.

The amplifiers leave the factory with the limiters setup in the **OVER CLIP PROTECTION** mode. The threshold is set just below the clipping point, with fast attack and release times. This is the most sonically transparent configuration. Transients are allowed to go into clipping for a few milliseconds, but if large amounts of overdrive are applied, the limiter will attenuate the signal back to the clipping point. Low frequency signals will be clipped as normal because of the fast release time. Changing the release time to slow will prevent low frequencies from being clipped but will change the mid and high frequency dynamics.

The threshold can be adjusted in 1dB steps up to 3dBs below the clipping point. The limiter then behaves like a conventional limiter. Transients will be allowed to go above the threshold level but the average peak level will be kept to the threshold point.

The release time can be set to infinity, which changes the limiter to function as an AUTOMATIC GAIN CONTROL. In this mode, if the signal goes above the threshold level, the gain of the amplifier will be reduced. This reduction will remain until the level controls are manually turned back up, or until the amplifier is switched off.

NOTE: All levels are referenced to the clipping point of the amplifier and not an actual output voltage or power level. If the mains power drops or increases then the limit threshold will also change, thus maintaining maximum output level.

Temperature Control

If the heat sinks get excessively hot, the controller will automatically reduce the supply voltages to the power devices. This is totally inaudible and does not affect the levels but merely reduces the amplifier headroom by about 1.5dBs. (The heat generated by the heat sinks is reduced by 30%.) If the temperature still continues to rise the controller will disconnect the outputs. Just before this 'shutdown' point, the temperature LED will start flashing and will stay on permanently whilst the amplifier is 'shutdown'.

The operation of the temperature LED can be changed (see Sw1, internal configuration switches below) in the alternative position and the LED will come on as soon as the first headroom reduction point is reached. In certain applications it is important for the user to know this. All other functions remain the same.

Normal dynamic signals will not cause the amplifier to overheat unless the air filter is clogged or the ventilation is inadequate. (See installation section.)

Fault Indicators

If the outputs are shorted or if DC is present, the control circuit will disengage the outputs and the fault LED will illuminate. The controller will keep monitoring the amplifier and will reconnect the outputs and fade up the signal when the fault is cleared.

The controller also monitors all supply voltages and the mains transformer temperature. Any fault with these will cause the amplifier to shut down and both fault LEDs will show.

2 ohm & Bridged LEDs

These indicate the position of the switches on the rear panel. The 2 ohm LED will also illuminate if the controller senses a low impedance load (excessive temperature rise).

INTERNAL CONFIGURATION SWITCHES

These can only be accessed by removing the top panel. **THIS SHOULD ONLY BE CARRIED OUT BY QUALIFIED PERSONNEL.**

The control PCB is located on the side of the unit behind the front panel. The switches are an 8 switch DIL package at the rear of the PCB. For full description of the switches consult the Service manual.

The standard configuration is for all switches to be **ON**, except Sw2 and Sw6, which are normally **OFF**.

Sw 1 Temp LED operation - ON = standard position, OFF = alternative position (See temperature control section above.)

Sw 2 (Normally OFF) This selects the auto reconnect mode. If switched OFF then when a fault has been detected the amplifier will not reconnect the outputs even when the fault is cleared. This is a safety requirement in certain applications.

Sw 3 (Normally ON) When OFF the LED columns will always show the signal level and will not change to show the level control position when the level controls are adjusted.

Sw 4 & 5 These select the threshold level as follows:-

Sw4	Sw5	
ON	ON	Just below clipping point.
ON	OFF	1dB below clipping point.
OFF	ON	2dB below clipping point.
OFF	OFF	3dB below clipping point.

Sw6 & Sw7 operate together and determine the operating mode and release time of the limiter as follows:-

Sw6	Sw7	Function
OFF	OFF	Release time = slow
OFF	ON	Release time = fast
ON	OFF	Automatic gain control mode. (Once the level has been reduced it will remain at that level until changed manually).
ON	ON	Limiter disabled.

Sw 8 (Normally ON) This sets the attack time of the limiter. ON = Fast OFF = Slow

FAULTS/FUSES

There are internal secondary (low voltage) fuses on all the internal supply rails. If one of them blows the amplifier will indicate a fault on both channels and the unit will power down. If the controller (5 volt) supply fails then all LEDs will go out and the unit will shut down.

The unit must be disconnected from the mains supply and the fuses replaced before switching the unit back on. They should be replaced with the same type fuses only.

THIS SHOULD BE CARRIED OUT BY QUALIFIED PERSONS ONLY.

REMOTE CONTROL OPTION

The MC1250 is internally wired for remote control, which is easily achieved by installing the appropriate interface/drive board during the manufacturing process, without any change to the amplifier's performance.

Description

The system is designed to replicate via Windows all the controls that are available on the front panel of the amplifier (except power-on/off). This means that the volume can be turned up and down, the channels can be linked/un-linked and muted/un-muted remotely.

Features

- Up to 256 amplifiers can be 'daisy-chained' together from an RS485 port via an RS232-485 adaptor (available from MC^2 Audio Ltd.).
- Amplifiers can be grouped together and controlled all at the same time within that group.
- The front panel controls on the amplifiers can be 'locked out' so that they can only be controlled from the computer. This allows the system to be set up to the client's requirements and then made secure against manual interference.
- Two levels of security are available on the management control system through the use of passwords, which permit a higher level access for the senior manager through one password and more limited access at a lower level to a number of other 'users'.
- Full Windows software is available on www.download.at/mc2a

Wiring information

The interconnecting cable required is a twisted pair cable for short runs and for long runs (approx. 500m) a screened, low capacitance data cable is required. The connectors are 9-way D-type and the wiring of this connector on the rear panel complies with the standard two wire RS485 configuration as follows:

Signal	Pin No.
A (+)	2 & 8
B (-)	3 & 7
Screen	5

- ✶ All the 'A's should be joined together and all the 'B's joined together.
- ✶ Pins 2 & 8 and 3 & 7 are joined inside the amplifier to ease the 'daisy chain' wiring.
- ✶ The cable screen should be terminated at one place only, i.e. PIN 5 of the computer.

REMOTE CONTROL SET-UP INSTRUCTIONS

To set up the remote control:

Connecting the system to the controlling computer

- The RS485 adaptor is plugged into the back of the computer and the cable (which must be 2-core with a screen) runs from this adaptor to the 9-pin D connector on the back of the first amplifier in the sequence and then on, via 9-pin D connectors, to all other amplifiers in the system, thus creating the daisy chain link from one amplifier to the next.

  NOTE: All amplifiers in the sequence must be connected at all times to enable the selection of any one amplifier for individual remote control.

- There needs to be a D connector at either end of the cable and connected as follows:

  PIN 2 hot (positive)
  PIN 3 cold (-)
  PIN 5 screen

Configuring the PC

1. Launch Amplifier Explorer program (can be downloaded from www.mc2@mc2-audio.co.uk)

2. Click on the 'Tools' menu and select 'Serial link setup'.

   Then: SET OPERATING SYSTEM (e.g. WIN98)
   SET COM PORT NUMBER
   SET PORT ADDRESS (This happens automatically.)

   Set up is now complete.

Each amplifier has its own individual ID (identity) number, which is shown on a small white label under the socket for the 9-way D connector located on the rear panel of each amplifier.

1. Click on the 'Tools' menu again and select 'New amplifier list'.

2. Check (✔) 'Find all responding amplifiers' in the amplifier list box that appears.

3. Click 'START' - Amplifier Explorer will automatically search for all responding amplifiers.

4. Click on 'ICONS' in left panel to select amplifiers found.