

Rev. 1.0.0
Item no. OM-IPD

IPD SERIES

Touring and Installation Amplifiers



Important safety instructions

Before using your IPD Series, be sure to carefully read the applicable items of this Operation Manual and the Safety 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. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with a cart, stand, 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 tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as 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. **WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
16. 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.
17. Do not connect the unit's output to any other voltage source, such as battery, mains source, or power supply, regardless of whether the unit is turned on or off.
18. Do not remove the top (or bottom) cover. Removal of the cover will expose hazardous voltages. There are no user serviceable parts inside and removal may void the warranty.
19. An experienced user shall always supervise this professional audio equipment, especially if inexperienced adults or minors are using the equipment.



Standards



This equipment conforms to the requirements of the EMC Directive 2004/108/EC and the requirements of the Low Voltage Directive 2006/95/EC.
Standards applied: EMC Emission EN55103-1, E3
EMC Immunity EN55103-2, E3, with S/N below 1% at normal operation level.
Electrical Safety EN60065, Class I



This equipment is tested and listed according to the U.S. safety standard ANSI/UL 60065 and Canadian safety standard CSA C22.2 NO. 60065. UL made the tests and they are a Nationally Recognized Testing Laboratory (NRTL).

Warnings

Explanation of warning symbols





The lightning bolt triangle is used to alert the user to the presence of un-insulated "dangerous voltages" within the unit's chassis that may be of sufficient magnitude to constitute a risk of electric shock to humans.





The exclamation point triangle is used to alert the user to presence of important operating and service instructions in the literature accompanying the product.


Warnings


-  To reduce risk of fire or electric shock, do not expose this apparatus to rain or moisture.
Français: Pour réduire les risques d'incendie ou de choc électrique, n'exposez pas l'appareil à la pluie ou à l'humidité.

-  Do not expose this system/apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
Français: N'exposez pas ce système/appareil au ruissellement ni aux éclaboussures et assurez-vous qu'aucun objet contenant du liquide tel qu'un vase n'est placé sur l'appareil.

-  This apparatus must be connected to a mains socket outlet with a protective earthing connection.
Français: Cet appareil doit être raccordé à une prise secteur avec terre de protection.

-  The mains plug is used as a disconnect device and shall remain readily operable.
Français: La fiche d'alimentation sert de dispositif de déconnexion et doit rester constamment accessible.

-  To prevent electric shock do not remove top or bottom covers. No user serviceable parts inside. Refer servicing to qualified service personnel.
Français: Pour prévenir un choc électrique, ne retirez pas les capots du dessus et du dessous. Aucune pièce n'est réparable par l'utilisateur à l'intérieur. Confiez toute réparation à un personnel de maintenance qualifié.

-  To completely disconnect this equipment from the AC mains, disconnect the power supply cord plug from the ac receptacle. The mains plug of the power supply cord shall remain readily operable.
Français: Pour totalement isoler l'équipement de l'alimentation secteur, débranchez le cordon d'alimentation de son embase. La fiche secteur du cordon d'alimentation doit rester accessible.

Radio interference

A sample of this product has been tested and complies with the limits for the European Electro Magnetic Compatibility (EMC) directive. It also has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference from electrical equipment. This product uses radio frequency energy and, if not used or installed in accordance with these operating instructions, may cause interference to other equipment, such as radio receivers. However, there is no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception (determined by turning the equipment on and off), the user may be able to correct the interference by one or more of the following measures:

- Check if the affected unit complies with the EMC limits for immunity, (CE-labeled). If not, address the problem with the manufacturer or supplier. All electrical products sold in the EC must be approved for immunity against electromagnetic fields, high voltage flashes, and radio interference.
- Consult the dealer or an experienced radio/TV technician for help.
- Reorient or relocate the antenna.
- Increase the separation between the equipment and receiver.

For customers in Canada

This Class B digital apparatus complies with Canadian ICES-003.
Français: Cet appareil numérique de la classe B est conforme à la norme NMB003 du Canada.

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1. Introduction

1.1. Welcome

Thank you for choosing a Lab.gruppen IPD Intelligent Power Drive professional audio amplifier. This manual provides a comprehensive guide to the features and functionality of IPD 1200 and IPD 2400 amplifiers. Please read through this manual in its entirety to become fully acquainted with installation, connections, networking features, DSP configuration options and protection circuitry.

To facilitate timely installation and use, the printed Quick Start Guide (included with the amplifier) contains the basic information needed to safely install and connect the amplifier and place it in service. However, we highly recommend reading through this manual in its entirety, beginning with Overview and continuing through the specific details of network and DSP preset configuration. As you become thoroughly familiar with all aspects of operation, you may learn of features or options that will affect your choices on amplifier modes or loudspeaker system configuration.

The extraordinary flexibility of Lab.gruppen IPD Series power amplifiers makes them adaptable to a wide range of portable and permanent installation applications. IPD Series amplifiers are an ideal choice for touring bands and corporate AV presentation systems, where high power density and quick reconfiguration for multiple system applications are of paramount importance. At the same time, the IPD Series amplifiers are a cost-effective choice for permanent installations in houses of worship, clubs, theatres and performing arts centres.

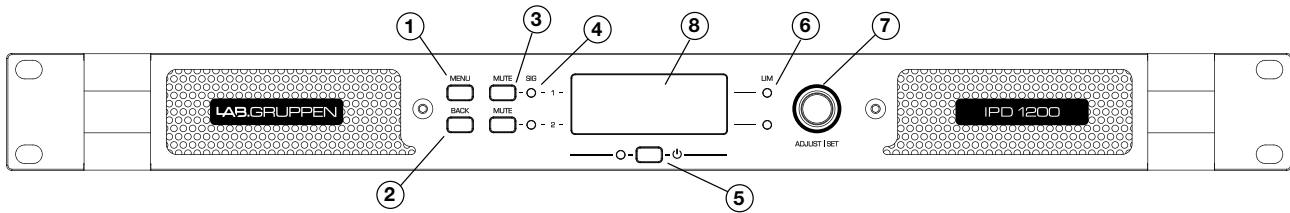
Although competitively priced, IPD Series amplifiers draw on the foundational engineering that has made Lab.gruppen the benchmark of quality for premier touring concert systems worldwide: exceptional sonic performance, rugged construction, proven reliability, and protection features that anticipate every unwelcome possibility.

This manual was created for the IPD Series IPD 1200 and IPD 2400 amplifier models. All references to “IPD Series” in this manual apply to both models.

1.2. Features

- High power density with up to 2400 W in 1 U
- Two models: 2 × 600 W or 2 × 1200 W (at 4 ohms)
- Low mains current draw with proven IDEEA® technology
- AES3 and analog inputs with redundant failover
- Link outputs for analog and AES3
- Ethernet network connection
- Fast network setup with auto-discovery and ID of amplifiers
- Networked control via IntelliDrive Controller™ software with touchscreen-friendly GUI
- Wireless control via iPad (requires connection of WiFi router)
- Four-channel input mixer
- Integrated DSP includes:
 - 40 real-time, multi-slope parametric equalizers
 - Adjustable high-pass and low-pass filters
 - Input delay (up to 2 s)
 - Output delay (up to 2 s)
 - Crossover with multiple filter types
 - 100 user-definable presets
- Backlit display with navigation buttons and encoder for front panel setup
- Horizontal VU meters on display in operating mode
- Front-panel mute buttons
- Software configurable limiters (SCVPL)
- Binding post and Neutrik speakON connectors
- Outputs may be connected through either one (NL-4) or both speakONs
- Universal power supply: 100 - 240 V at 50 or 60 Hz
- Three year warranty

2. Front panel

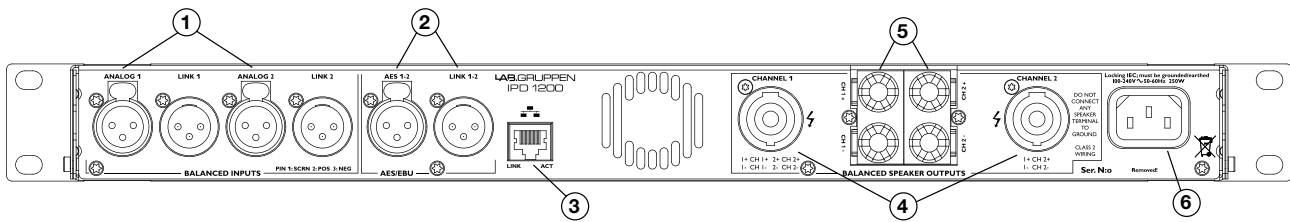


The following indicators and controls are available on the front panel:

- 1 MENU** - Selects MENU mode and confirms a given preset name.
- 2 BACK** - Moves backward through menu layers in MENU mode.
- 3 MUTE** - Mutes corresponding channel as indicated.
- 4 SIG** - Illuminates green when signal is present. Illuminates red when signal is clipping (pre input mixer).
- 5 POWER** - LED indicates STANDBY (red); off when amplifier is ON.
- 6 LIM (limit)** - Illuminates when the amplifier limits the signal. Limiting is engaged when the channel:
 - Reaches the selected voltage limit
 - Rail voltage sags below the selected threshold (both LEDs flash rapidly for 1.5 sec)
 - Maximum current output reached
 - Mains voltage cannot maintain full rail voltage
- 7 ADJUST/SET (Rotary Encoder)** - Rotation moves through the menu and adjusts the currently selected parameter when in setup mode. Pressing down on the knob selects a given parameter or advances further into the menu. In operating mode, rotation of the ADJUST/SET encoder adjusts output gain (outputs ganged).
- 8 BACKLIT DISPLAY** - In operating mode, the display shows the following values and status indicators:
 - Level - Horizontal VU meters for each channel
 - Device name and Preset name

In setup mode, the display shows the currently selected menu locations and parameters. For more information on DSP setup procedures, please refer to Section 10: IntelliDrive Controller Set-up and DSP Configuration.

3. Rear panel

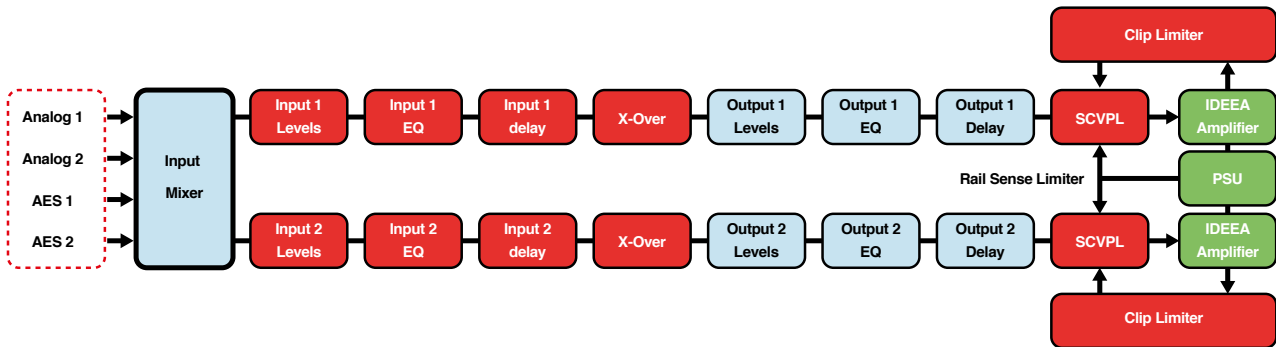


The following indicators and controls are available on the rear panel:

- 1 ANALOG INPUTS and LINK** - XLR-F input connectors provided for each channel, with XLR-M link output connectors.
- 2 AES3 INPUT and LINK** - AES3 digital inputs are on an XLR-F connector with a link output on an XLR-M connector.
- 3 NETWORK (Ethernet)** - An RJ45 jack is supplied for connection to an Ethernet network for external control and monitoring, either by a direct wired connection or via an external WiFi router to an iPad or tablet. LEDs below the connector indicate valid network connection (LINK) and network activity (ACT). When several IPDs are connected to a network, a switch with a built-in DHCP server should be used.
- 4 speakON OUTPUT CONNECTORS** - Both channel outputs are available on a four-pole connector at the left; either channel 1 or both channels 1 and 2 may be connected. Only channel 2 is available on the connector to the right.
- 5 BINDING POST CONNECTORS** - Connectors for channel 1 and channel 2.
- 6 AC LINE INPUT** - A locking IEC receptacle accepts the AC line input at 50 Hz or 60 Hz, 100 V - 240 V. Use an IEC cable with the proper connector for country of use.

4. Signal flow block diagram

The below diagram shows the signal flow from inputs to outputs:



5. Amplifier installation

5.1. Unpacking and visual check

Every Lab.gruppen amplifier is carefully tested and inspected before leaving the factory and should arrive in perfect condition. If any damage is discovered, please notify the shipping carrier immediately. Save the packing materials for the carrier's inspection and for any future shipping.

5.2. Rack installation

IPD 1200 - Depth is 272 mm (10.7") rack ear to back panel. Weight is approximately 4.6 kg (10.1 lbs). Rear support brackets are included and use is recommended in all applications.

IPD 2400 - Depth is 360 mm (14.2") rack ear to back panel. Weight is approximately 6.2 kg (13.7 lbs). Rear support brackets are included and use is recommended in all applications.


5.3. Cooling requirements

Please ensure that there is sufficient space in the front and the rear of each amplifier to allow for a free flow of air. No doors or covers should be mounted either in the front or rear of the amplifiers. Amplifiers may be stacked directly on top of each other with no spacing, though some spacing may enable more convenient installation of rear cabling. Refer to the Thermal Dissipation charts in Section 15.2 for thermal dissipation values when installing large numbers of amplifiers in enclosed spaces.

6. Amplifier connections

6.1. AC line input / operating voltage

All IPD Series amplifiers have a universal power supply that operates on mains from 100 - 240 V at 50 or 60 Hz. The IEC receptacle on the rear panel accepts the supplied IEC cord which terminates in a connector plug appropriate for the country of sale. When AC power is connected, the amplifier goes into standby (red indication on standby LED). The amplifier may be turned on by pressing the front power button or remotely using the IntelliDrive Controller software.

 Signal ground is floating via a resistor to chassis, and therefore grounding is automatic. For safety reasons, never disconnect the earth (ground) pin on the AC power cord. Use balanced input connections to avoid hum and interference.

6.2. Audio inputs

Analog inputs - Analog inputs are available on two standard XLR-F latching connectors. The inputs are electronically balanced. The impedance is 20 kohms, and the inputs can accept a maximum input level of +26 dBu. Polarity is as follows:

Pin 1 = screen (shield), **pin 2** = positive (+), **pin 3** = negative (-).

Analog links - Two latching XLR-M connectors are fitted adjacent to the analog input connectors and are paralleled to the respective input connectors; they provide an unprocessed analog loop-through signal to feed additional IPD Series units or other equipment.

AES3 inputs - A latching XLR-F connector accepts an AES3 digital audio signal. Input impedance is 110 ohms. Ensure that 110 ohm digital audio cables are used; standard XLR microphone cables are rarely suitable for reliable digital audio transmission.

Note: AES3 is a stereo digital format, and therefore both inputs are fed via a single connector. Selection of the analog or digital inputs is made via the front panel display or IntelliDrive Controller software.

AES3 link - A latching XLR-M connector is fitted adjacent to the AES3 input connector. This is an active link which sends an unprocessed AES3 loop-thru to feed additional IPD units. The design requires no termination load when the unit is the last connected.

6.3. Loudspeaker connections

Two types of power output connections are available on IPD Series amplifiers: Neutrik speakON and binding post. Outputs for the two connector types are internally connected in parallel. Loudspeakers may be connected to both connectors at the same time; however, this is generally not recommended as total impedance may be too low.

Binding posts - Power outputs for loudspeaker connection are available on two fully enclosed binding posts. Observe signal polarity as indicated.

speakON connectors - Outputs for both channel 1 and channel 2 are available on a four-pole speakON connector to the left. The two-pole speakON to the right connects to output 2 only. See diagram for output connection and polarity.

Note: When connecting wiring to loudspeaker terminals, the installation shall be made by a knowledgeable technician or ready-made leads or cables shall be used.



No bridge mode - The IPD Series employs an inherently bridged Class D output topology; therefore, an alternate bridge mode output connection should NOT be used, even when only one loudspeaker (such as a subwoofer) will be connected. Under no circumstances should the IPD amplifier connection be bridged, as this may cause undesired operating performance.

6.4. Network connection and configuration (optional)

Connect the host computer for IntelliDrive Controller software to one or more IPD Series amplifiers as shown in the following diagrams (See figures 1 and 2 following). No manual configuration of the network is required. IntelliDrive Controller automatically detects all IPD Series amplifiers on the network.

Note: Direct connection from the computer to an IPD Series amplifier may require a crossed cable or an MDI/X-capable network interface card. However, most newer laptop computers will work with a standard network cable and the built-in interface card.

Wireless control using a WiFi-equipped computer or an iPad may be enabled by connecting the IPD Series amplifier(s) to a WiFi-enabled router. (See figure 3 following)

Important Note: Should the network connection be interrupted between the host computer (or iPad) and any amplifiers, the amplifiers will continue to function with no interruption of audio. However, no adjustments of levels or parameters will be possible using IntelliDrive Controller until the network connection is restored.

Figure 1

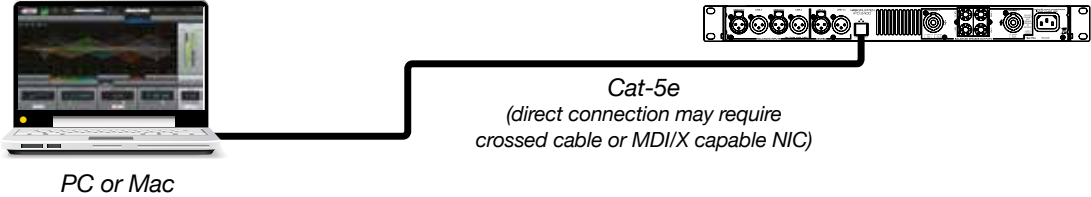


Figure 2

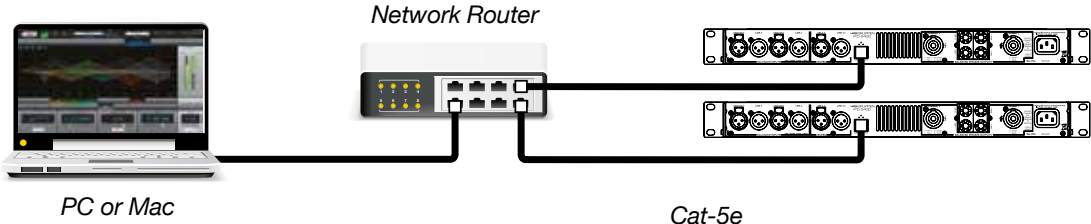
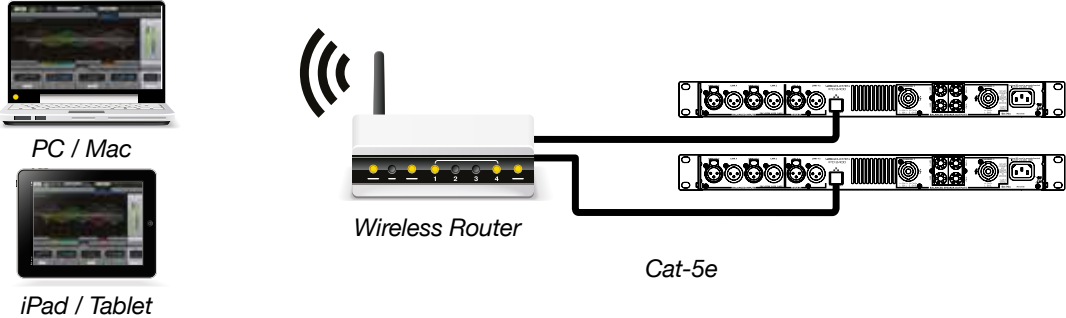


Figure 3



6.5. Network configuration

Direct connection of one IPD to a host computer

An IPD unit may be connected directly to a computer using a straight cable. Because no DHCP server is present, the IPD unit will assign itself an address in the ZeroConfig range. When the IPD unit has a self-assigned IP address, it will continue searching for a DHCP server; if the unit is later connected to a network and a DHCP server is detected, it will take its IP address from it.

If the user assigns a fixed IP address by entering it manually (see Section 9.4.b.iii), this address will have the highest priority, and DHCP will not be used.

Connecting multiple IPD units to a network

Connection of multiple IPD units on a network requires use of a network router which also functions as a DHCP server. (Nearly all new routers offer this function). The router will automatically assign an IP address to each IPD unit on the network, unless an IP address has been assigned manually.

Note: An IPD unit will continuously broadcast its presence on the network, irrespective of its current IP address. Therefore, even if the current IP address is invalid on the network, the broadcast will continue. As a consequence, units that have a changed IP address may appear as duplicates in Global View, but will not connect. Re-starting IntelliDrive Controller normally will make the duplicate unit disappear.

7. IPD Controller software installation and network configuration

7.1. Downloading the installation folder

The installation files for IPD Controller may be downloaded free of charge from the Support section of the Lab.gruppen web site: http://labgruppen.com/support/software_firmware/

Click on the appropriate link and follow the on-screen instructions. Note the destination location of the downloaded installation folder in case you need to find it when the download is completed.

7.2. Windows software installation

System requirements: Operating system: Windows XP or later
 Available hard disk: 70 MB
 Available RAM: 256 MB

To install IntelliDrive Controller:

1. Locate the compressed (zipped) downloaded folder
2. Click/tap on "Extract all files"
3. Open the uncompressed folder

4. Locate and open the PDF file “Installation Instructions and Release Notes”. This document will contain any important updated information regarding the latest version of IntelliDrive Controller and basic information on software installation.
5. Double click/tap on the Windows Installer file appropriate for your operating system type (32-bit or 64-bit). If you are not sure which operating system type you have, you will find it listed on the System Properties page (Control Panel > System and Security > System).
6. Follow the prompts given by the Installation Wizard.

Important Note: In order for IntelliDrive Controller to function, it must be given permission to pass through the Windows Firewall (or third-party firewall if Windows Firewall is replaced). During installation, you will be prompted to allow access. Be certain that access is allowed to any networks to which amplifiers may be connected. By default, access may be allowed only to private networks; click the “Public Networks” if amplifiers may be connected to this network.

7. Following installation of IntelliDrive Controller, you will be prompted to also install Microsoft C++ Redistributable Setup. This program is necessary for operation of IntelliDrive Controller. Follow the on-screen prompts to install. This only has to be installed on the computer one time; this can be disregarded on any subsequent installations or updates of IntelliDrive Controller.

7.3. Mac software installation

To install IntelliDrive Controller:

1. Locate the compressed (zipped) downloaded folder
2. Click/tap on “Extract all files”
3. Open the uncompressed folder
4. Locate and open the PDF file “Installation Instructions and Release Notes.” This document will contain any important updated information regarding the latest version of IntelliDrive Controller and basic information on software installation.
5. Double click/tap on the “IntelliDrive Controller MAC” Zip folder.
6. Follow the prompts given by the Installation Wizard.

7.4. iPad App download and installation

Download the IntelliDrive Controller iPad App from the App Store. Search for “Lab.gruppen” or “IntelliDrive”. The app is free. The user interface layout is the same as on the Windows version, and most key operator functions are available. Operation parallels that of the Windows interface, except with variations and enhancements available through iPad touchscreen conventions. For example, EQ bandwidth may be adjusted using two-finger spread and pinch operations.

Note: Use of the IntelliDrive Controller iPad App requires connection of a WiFi-enabled router in the network. (See Section 6.4)

8. Operation with default preset

An IPD Series amplifier may be operated “out of the box” as a standard stereo amplifier. For this application, there is no need to connect the network, download the software, or program a preset in the DSP. Default parameters are as follows:

Input mixer:	Analog 1 and AES 1 routed to channel 1 Analog 2 and AES 2 routed to channel 2
Mode:	Stereo
Input levels:	0 dB
Input EQ:	Flat
Output EQ:	Flat
Delay:	Off
Crossover:	Off
Output mute:	On (muted)

In this mode, the unit will function as a “flat” stereo amplifier. The outputs may be muted and unmuted with the front panel buttons. The encoder knob functions as an output gain control, with level adjustable from -47.75 dB to + 12 dB.

9. IntelliDrive controller overview

9.1. Introduction

IntelliDrive Controller offers fast, intuitive and comprehensive access to the many DSP features offered by IPD Series amplifiers. Although it is possible to program presets and alter existing presets using the front panel controls (See Section 14), most users will find the process is easier and more accurate using IntelliDrive Controller. In most cases, the front panel controls are best reserved for changing presets or making minor level adjustments in circumstances where a control computer is not available or when network problems are encountered.

Note: This manual assumes the user is familiar with the basic principles of loudspeaker system DSP configuration, including multi-way loudspeaker system alignment, room tuning, and delay setting. If you are not familiar with these procedures, we recommend you consult a reference book or online source presenting a comprehensive treatment of the topic.

9.2. Global (System) View

The Global, or System, View presents a graphical representation of all amplifiers connected to the network, identified by IP address or user defined name. The Global View gives an at-a-glance overview of amplifier groups and amplifier status, including Mute status and output level meters.

The following features and functions are accessible in the Global View:

1. Global Control Panel
 - a. Global INFO - Shows the total number of amplifiers connected on the network, current number muted and current number off.
 - b. Power ON/OFF - Control and status indication for all connected IPD units.
 - c. MUTE - Mutes both channels of all amplifiers in the group.
 - d. Expand/collapse group button - Toggles between expanded view (display all amplifier panels) and collapsed view (group panel only).
2. Global View Menus. (See Section 9.3 following)
3. Group Control Panels - The Group Control Panel provides the following information and functions:
 - a. DELETE GROUP - Deletes the group. Pop-up window requires confirmation.
 - b. GROUP NAME - Name entered by user when new Group set up. Name can be changed in SET UP mode. (See Section 10.1.)
 - c. GROUP INFO - Shows the total number of amplifiers in the group, current number muted and current number off.
 - d. MUTE - Mutes both channels of all amplifiers in the group.
 - e. SET UP - Brings up the Configure Group window. (See Section 10.1)
 - f. Expand/collapse group button - Toggles between expanded view (display all amplifier panels) and collapsed view (Group panel only).
4. Amplifier Control Panels - The Amplifier Control Panel provides the following information and functions:
 - a. MUTE - Mutes both channels of the amplifier.
 - b. Amplifier Name - Default name is the model of the amplifier. Custom names may be set in the Amplifier Header window. The units in Global View are positioned based in alpha-numeric order. The unit named with the lowest first number or letter will be placed at the top left, the second lowest number at top right, continuing downward.
 - c. Network Status - ONLINE or OFFLINE. Amplifiers will show as online when AC power and network are connected, even if the amplifier is in standby mode.
 - d. Amplifier IP address - This is for identification and is not user configurable in this view.
 - e. Amplifier Mode - Displays current mode, either Stereo or 2-Way.
 - f. Output Meters - Displays amplifier output level.
 - g. MIXER Button - Selects amplifier and opens Amplifier Header and Input Mixer Views. If the mixer button displays "No Sync", the amplifier is online but has not synchronized with the controller.
 - h. Amplifier "PING" - Clicking anywhere on the Amplifier Control Panel will blink all LEDs (green) and the display on the associated amplifier for ten seconds.

9.3. Global (System) Menus

The following operations can be accessed using the Menu selections:

1. File - Select Quit to exit IntelliDrive Controller.
2. Tools -
 - a. Set Software Password - Sets password for access to IntelliDrive Controller. **Important Note:** Make careful note of the password as you will be prompted to enter it when starting IntelliDrive Controller. If password control is not required, users are advised not to set a password.
 - b. New Group - Brings up the New Group name window. (See Section 10.1)
 - c. Enter Demo Mode - Enables use of the software in offline demo mode. Toggles with Leave Demo Mode.
 - d. Enable Update - Places all amplifiers on the network in Firmware Update mode. (See Section 10)
 - e. Firmware Update All units - Updates Firmware on all units connected to the network. (See Section 10)
3. Help - Displays About information: Application version and build

9.4. Mixer (Unit) View

The Mixer (Unit) View displays information about, and accesses control parameters for, the selected amplifier. At the top of the view are a menu bar and a graphical Amplifier Header which remain in view regardless of the operating window tab selected.

1. Menus - Select Quit to exit IntelliDrive Controller.
 - a. File
 - i. Accesses Open and Save functions for preset files stored on the computer and saving custom presets to the computer. (See Section 10.8.)
 - ii. Load Factory File - Loads Factory Presets from the Factory folder.
 - iii. Restore Presets - Opens file directory and enables restoration of presets in the device memory. This function restores all presets that have been backed up using Backup Presets.
 - iv. Backup Presets - Saves all presets in the device memory to the selected file location.
 - v. Quit - Exits IntelliDrive Controller.
 - b. Hardware
 - i. Enter Password - Enter the password for the device, if a password was set for the device. Password may be required to unlock specific functions. Default password is: Password
 - ii. Configure > Change Password - Allows entry of new password. Old password must be entered if set previously. **Note:** Change Password is a global function and will affect all amplifiers on the network.
 - iii. Configure > Network Settings - Enables manual configuration of network address for the device. (Normally these are set automatically by DHCP.)
 - iv. Configure > Power On Preset - Selects Preset stored in device that will be loaded after the unit goes out of standby mode.
 - v. Configure > Access Rights > Locked Rights - Allows system administrator with password control to restrict access to functions by end user. Check boxes select those functions where access is allowed by user, after the unit is locked. **Note:** Locked Rights is a global function and will affect all amplifiers on the network.
 - vi. Configure > Auto Power Down - Activates and sets the time delay before device will go into standby mode when no signal is present at the input. A value of 0 disables Auto Power Down. Threshold for "no signal" is -48 dBu.
 - vii. Configure > Display - Sets device front-panel display for ON, DIM, or OFF. Please note that even if set

to ON, the screen saver will always be activated.

- viii. Lock Unit - Locks the device. Only allowed functions (see above) may be performed while unit is locked. Unit must be unlocked via the Enter Password menu command.
 - ix. Firmware update - Forces new firmware to the unit even though unit already is carrying an operable Firmware version
- c. Help > About
- i. Name - Shows name of the internal DSP board
 - ii. Serial Number - Shows the serial number of the internal DSP board
 - iii. Connected by - Displays the network address through which the unit is connected
 - iv. MAC Address - Shows the MAC address of the unit
 - v. Firmware Version - Shows the Firmware version of the unit. (OK) indicates that Firmware matches the Software version in use. (Update Available) indicates you should update the Firmware for the unit to work correctly with the software in use.
 - vi. Interface Version - Shows the version the DSP connection interface. (OK) means it is up to date.
- Application Information:
- vii. Application version - Shows the version number of the IntelliDrive Controller Software.
 - viii. Build - Shows the build number of the IntelliDrive Controller Software.

2. Amplifier Header

- a. Overview - The Amplifier Header provides a graphical user interface which accesses amplifier status information and controls for ON/OFF and for muting the amplifier channels; naming the amplifier; and creating, storing and recalling presets.
- b. Global button - Click/tap to go back to the Global View for controlling and monitoring all amplifiers on the network.
- c. Power button - Click/tap to turn amplifier on or off (toggle function).
- d. Output mute buttons - Click/tap to engage or cancel output mute.
- e. Amplifier name - Default name is the model name of the amplifier, e.g. IPD 2400. To enter a custom name, click/tap on default name and enter new name using the keyboard. New name also will appear on the amplifier front panel display in operating mode and will determine alphanumeric ordering of the device in Global View.
- f. Network status - Displays current status, either ONLINE or OFFLINE.
- g. Amplifier network IP address - This normally is assigned by DHCP but may be assigned manually in the top Menu: Hardware > Configure > Network Settings.
- h. Temp - Displays amplifier temperature as a percentage of thermal muting threshold. **Note:** Idle temperatures of 30% to 60% are normal; caution should be exercised when TEMP display exceeds 70%.
- i. Preset selection - Drop down menu selects DSP preset. Default name is Empty Preset, numbered 2 to 100. Default name is replaced by custom name when entered. Preset 1 is named Factory Default. It is locked for editing and contains the Factory Default setting.
- j. Current preset - Displays currently selected preset. The default name may be changed to a custom name by clicking/tapping in the window and entering the new name using the keyboard.
- k. Preset Store and Recall buttons - Presets may be stored on the device, in the host computer, or both. (See Section 10.8)
 - i. To Recall a preset from the Device, select the preset from the drop-down menu and click/tap on Recall above ON DEVICE.
 - ii. Recall a preset from the computer, click/tap RECALL above ON COMPUTER. Select the desired preset from the folder or menu and click/tap Open.
 - iii. To Store a preset on the device, click/tap on STORE above ON DEVICE.
 - iv. To Store the current DEVICE preset on the computer, click/tap on STORE above ON COMPUTER. Navigate to the desired storage folder (if necessary) and click/tap SAVE.
- l. Configuration window tabs - These seven tabs select windows for configuration of DSP functions.

These tabs are:

- i. To Recall a preset from the Device, select the preset from the drop-down menu and click/tap on operation. (See Section 10.3)
- ii. Levels - Presents facilities for setting input and output levels, setting limiters, and allows an option for linking channels to duplicate settings. (See Section 10.4)
- iii. Input EQ (1 & 2) - Presents facilities for setting parameters for the 10-band parametric input EQ. (See Section 10.5)
- iv. X-Over (Crossover) - Presents facilities for setting high- and low-pass filters for precise signal division. (See Section 10.7)
- v. Output EQ (1 & 2) - Presents facilities for setting parameters for the 10-band output parametric EQ.
Note: In Two-Way Mode, the Output EQ will show the settings of the Crossover filters. (See Section 10.6)

10. IntelliDrive Controller Set-up and DSP Configuration

10.1. Setting up and modifying amplifier groups

Amplifiers on the network may be set up in groups to allow easier monitoring of status and simultaneous configuration grouped amplifiers.

Note: There is no group master control panel. When a group is formed, any change in any amplifier's Mixer control panel will affect all amplifiers in the group, with resulting changes in functions and parameters determined by the specific group configuration.

Creating a new group - From Global View, at top right corner click/tap New Group button. Enter a name for the group and click/tap Okay. The new group will appear in Global View.

Setting up and modifying an existing group - In Global View, click/tap the SET-UP button for the group. This opens the Configure Group window.

1. Select desired Group Status
 - a. When Group is Enabled, any changes will affect units in the Group as determined by Group Type. When Disabled, any changes affect only the individual amplifier unit selected.
2. Select Group Type
 - a. Carbon Copy - Parameters changed on any amplifier in the Group will apply to all other amplifiers in the Group by default. If exceptions are desired, click on Exceptions. In the Select Exceptions window, Active Links will be displayed. Use the drop-down tabs to add or remove parameters to be linked within the Group.
 - b. Advanced Configuration - Click on Setup Links. Active Links in the Group will be displayed. No parameters will be linked by default. Use the drop-down tabs to select any parameters to be linked within the Group. Drop-down tab functions are (top to bottom):
 - i. Amplifier/DSP functions
 - ii. Function dependent: filter number if PEQ or All selected; input number if Mixer selected
 - iii. Inputs and outputs
 - iv. Function dependent: parameters if filter selected; On and Gain if Mixer selected

3. Description - Enter description of Group. This text is for reference only and does not affect operation in any way.
4. Members - Click on Select to add or remove units from the Group. Amplifier units may be assigned to more than one group.

10.2. Device (Amplifier) Set-Up

To set up an amplifier for Operating Mode, Linked Devices and AES > Analog Failover, click/tap on the Mixer button for the amplifier as shown in Global View. The Input Mixer tab is shown as the default view.

1. Operating Mode - Select stereo mode if the amplifier will be driving two or more full range speakers with full bandwidth signal. Select 2-Way if the amplifier will be driving separate low- and high-frequency loudspeaker systems, either inside a bi-amplified cabinet or a separate subwoofer and full-range cabinet.
2. Linked Device - Select any Linked Device from the drop-down menu. This opens the Mixer window for the selected device (any amplifier on the network) without returning to the Global window.
3. AES > Analog Failover - Turn ON if both AES3 and analog inputs will be connected, and you wish analog inputs to become active automatically if AES3 inputs fail. Set mix balance using faders in the mix window, and turn all mutes off (unmuted).

10.3. Input mixing

The Input Mixer tab allows any combination of the four input signals (analog 1 and 2, AES3 1 and 2) to be mixed and routed to the amplifier input channels. In Stereo Mode, the default will mix Analog 1 and AES3 1 inputs to amplifier input channel 1 at 0 dB; and Analog 2 and AES3 2 inputs to amplifier input 2 at 0 dB. In 2-way Mode, the default will route Analog 1 and AES3 1 to Input 1. Control operation is as follows:

1. Channel label strip - Enter channel names using the keyboard.
2. Input mixer fader - Sets the level for the associated input. Alternatively, the level may be set using keyboard entry of the desired level in the window below the fader. This fader sets the level going into the DSP section.
3. Input mixer level meters - Meters show input levels and include peak-hold indication.

10.4. Level, limiter and channel link setting

The Levels tab sets the input and output levels, limiter functions, channel link and phase (polarity) reverse.

1. To set Input or Output levels, click/tap on faders and drag to desired level. Alternately, use keyboard to enter level values in the window below the fader on the keyboard. Input and Output levels are displayed on the associated meters; a peak-hold line shows above the instantaneous levels.
2. Limiter - The IPD is equipped with a built in limiter calculator that allows the user to enter the desired output power at a given impedance. It is also possible to adjust the limiter by clicking/tapping the Limiter fader and dragging it to the desired threshold position, or by entering the desired Vpk or dBu value:
 - a. V peak - Sets the peak voltage at the output to where limiter should take effect.
 - b. Ohm - Enter the Nominal impedance of the loudspeaker for accurate display of Output Power (Watt). Default value is 4 ohms. A 2 ohm setting will result in lower allowed maximum power according to the

capability of the amplifier. This setting avoids current clip, ensuring best possible sound when reaching the clipping threshold. **Note:** There is no auto-detection of the loudspeaker impedance; therefore, the user must set the proper impedance for an accurate reading of values on the other parameters. However, the function of the limiter is not affected by the nominal impedance entered.

- c. Watt - Sets the maximum output power before limiter action takes effect.
- d. dBu - Sets the maximum output in dBu before limiter action takes effect.
3. Limiter meter display - The display shows gain reduction with a peak hold line. **Note:** When limiting is active, the peak hold line on the output meters changes to yellow to indicate peak limiting is in effect.
4. EQ DLY button - Click/tap to bring up the Input EQ tab for the input(s).
5. LINK button - Click/tap to link the two Input (Stereo mode only) or Output channels. When Link is active, all settings in Channel 1 are automatically copied to Channel 2.
6. PHASE button - Toggles between PHASE NORMAL and PHASE REVERSE to reverse the phase (polarity) of the output signal.

10.5. Input EQ and delay setting

1. Equalizer setting - Click/tap on the Input EQ 1 or Input EQ 2 tabs to bring up the parametric equalizer and delay setting windows. Equalizer setting may be accomplished using any of three modes:
 - a. Curve “handles” - Click/tap on any of the ten colored filter “handles.” Drag the handle by left clicking the mouse to create the desired equalization curve. For PC and MAC users, right click and move the mouse right and left to adjust the Q/Bandwidth. On iPad this is done by pinching around the “handle” with two fingers. **Note:** Default filter type is Bell.
 - b. Slider setting - Click/tap the Edit button under the number of the EQ band to be modified. Use the Sliders to set the frequency, Q/Bandwidth, and Gain.
 - c. Keyboard entry - Click/tap the parameter window and enter the desired value.
2. Filter type - Use the drop down menu to select the desired filter type: Bell, Notch, Low Shelf, High Shelf, Band Pass, High Pass or Low Pass.
3. Filter tools - The following filter tools are available on the left side of the EQ display:
 - a. Full screen - Expands EQ window to full screen.
 - b. Camera - Saves image of the EQ screen as a PNG file.
 - c. Micro-adjustment mode - Enables very fine adjustment of curve parameters when using the “drag handles” mode of setting. Parameter values are displayed.
 - d. Text tool - Displays the parameter values for all inserted filters.
4. Output Level metering for both outputs is displayed to monitor the effects of inserting the filters.
5. Delay - Use the slider to set the channel input delay, or use keyboard entry to enter the desired delay value in the window. **Note:** Both input and output delays are provided for each channel. In stereo mode, the Input and Output settings are redundant. In 2-way mode, the Input delay may be used for longer delays for aligning remote delay loudspeaker systems with the main front system while the output delay may be used for aligning drivers within the loudspeaker cabinet or array.

10.6. Output EQ and delay setting

1. Stereo mode - In stereo mode, the Output EQ and Delay allow insertion of additional filters and additional delay. Features and operation are identical to Input EQ and Delay in Section 10.5.
2. Two-way mode - In two-way mode, the Output EQ window shows the crossover filters created in the X-Over tab (See Section 10.7 following). Parametric output filters may be inserted as well for loudspeaker correction.

10.7. Crossover configuration

Click/tap the X-Over tab to bring up the Crossover window. The following functions are available for each output:

1. High Pass Filter type: Use the drop-down menu to select from the available filter types. Abbreviations are L-R (Linkwitz-Riley), But (Butterworth), and Bes (Bessel).
2. Low Pass Filter type: Same as above.
3. Corner frequency setting: Set the filter corner frequency by using the slider, keyboard entry of the frequency in the display window, or dragging the “handles” on the display graph.

Output Level metering for both outputs is displayed to monitor the effects of inserting the filters.

10.8. Preset store and recall

Presets may be stored to the device and the host computer, and recalled from either the device or the host computer.

1. Device Store - Once a preset has been created, it may be stored to the device. It is recommended to first give the preset a name by entering it into the current preset name window. Click/tap on the STORE ON DEVICE button.
2. Device Recall - Select the desired preset from the drop-down list in the Preset Selection window. Click/tap the RECALL ON DEVICE button.
3. Computer Store - Click/tap the STORE ON COMPUTER button. Store the preset file in the desired location. (Default is to Documents folder.) It is recommended that the preset first be given a name by entering it into the current preset name window and clicking Enter/Return. Then Click/Tap on the STORE ON COMPUTER button.
4. Computer Recall - Click/tap the RECALL ON COMPUTER button. Select the desired preset from the list of available preset files and click/tap Open.

Caution - Recalling a preset while the amplifier is online can cause drastic and potentially damaging changes in output level if output mutes are not engaged and faders are at zero attenuation. It is recommended that all presets be stored with output mutes engaged.

11. Updating amplifier firmware

There are three ways to update firmware on IPD units; each method serves different purpose.

1. Global View/Tools/"Firmware Update All units".

This updater allows simultaneous update of all IPDs connected to the network and has built in mechanisms that scan the version number of the units so that only those units with old firmware are updated. It also verifies the process, repeats updating if some should fail, and summarizes the process once completed. This process takes a couple of minutes but is the safest way to update the IPD units.

2. Global View/Tools/"Enable Update".

This updater displays a symbol in Global view which makes it easy to see if any unit is not up to date. A symbol appearing on the Amplifier Control Panel is gray if firmware is up to date and orange if firmware is not up to date. If not up to date (orange) you can click the symbol to start the update. "Enable Update" also works as a recovery tool. If the firmware update somehow gets interrupted, e.g. through power loss in the middle of updating, the unit can end up in fault state. The Enable Update tool can, in most circumstances, reach the faulty unit and re-update the Firmware, bringing it back to normal.

3. From within the Mixer (Unit) View, click hardware/firmware update.

This update is for a single unit only and will force new firmware to the unit regardless of what firmware the IPD currently has. Using this tool, all presets are asked to be backed up and are automatically restored back to the unit once updated.

Important: A firmware update will erase all presets on the device. Before initiating a firmware update, be sure all device presets have been backed up using Backup Presets in the Hardware menu. After firmware update has been completed, restore presets using Restore Presets in the Hardware menu.

12. Operation with iPad App

The iPad App version of IntelliDrive Controller duplicates nearly all of the functions of the Windows version. Also, appearance of the user interface closely resembles that of the Windows version. However, because of significant differences in the basic operating system, some differences apply, particularly regarding use of menu commands.

Note: Only one device running IntelliDrive Controller is allowed to access the network at any given time. If you wish to use an iPad as the controller, you must first close the application on any Windows or Mac computer.

13. Third party control

Lab.gruppen IPD Series of amplifiers can be controlled directly using any Telnet client software using the same TCP/IP network connection used for IntelliDrive Controller. (IntelliDrive Controller software need not be active or even installed on the host computer to enable third-party software control.) However, only limited control functions are available via third-party clients.

The available functions are:

- Levels/Gain
- Mute
- Standby
- Preset recal
- Locate (Ping)

For detailed information about third party control, please read “IPD Series Third Party Control Instructions” manual, to be found on the Lab.gruppen website.

14. Operation using front panel controls

14.1. Introduction

All individual amplifier control and status functions available through IntelliDrive Controller are also available using the amplifier’s own front-panel controls. It is also possible to create and save presets on the device using the front panel controls. However, because this process is much more time consuming and less precise, in most cases users will prefer using IntelliDrive Controller to create presets. The front panel control are best reserved to basic functions such as on/off, local mute, and preset recall.

14.2. Overview of procedures

All operations using the front panel controls follow the same basic procedure, using the same controls.

MENU button - The Menu button opens menu functions and steps forward through available functions and options in the currently selected main menu section.

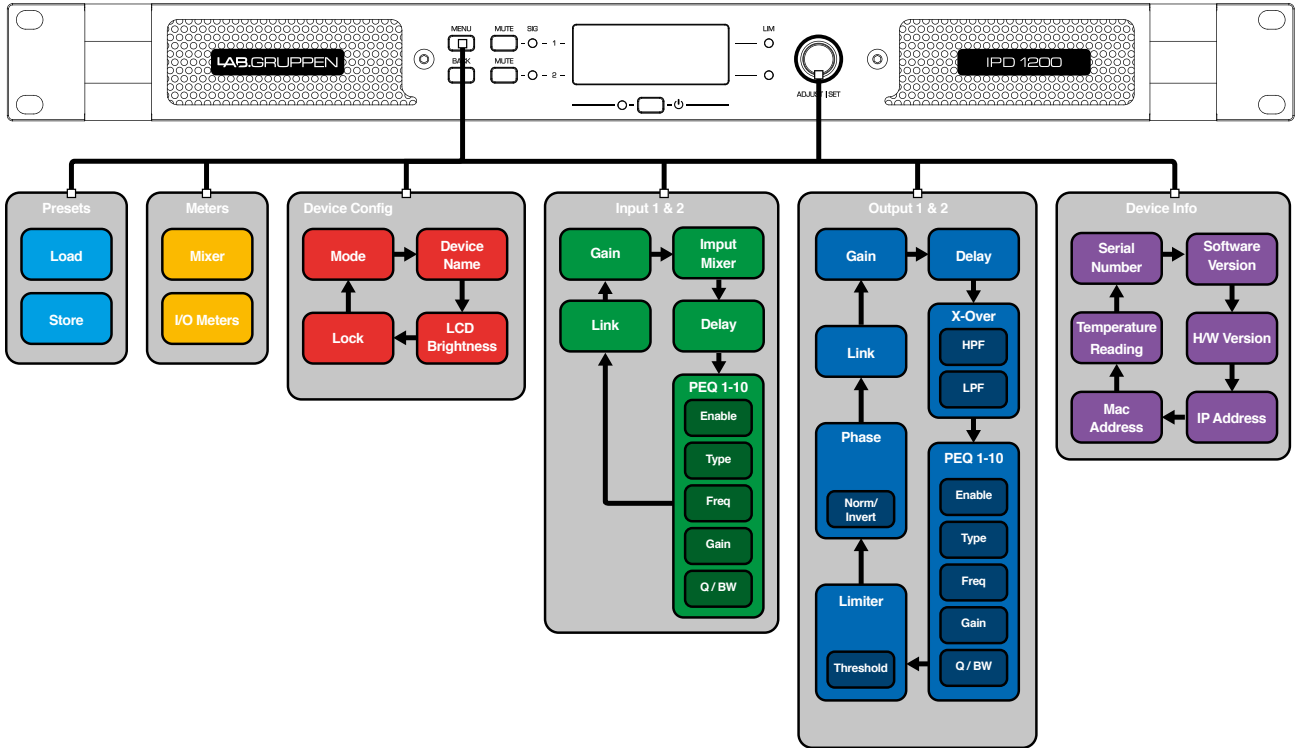
BACK button - The BACK button steps back through the currently selected main menu functions.

ENCODER knob/push button - The encoder knob scrolls through all options or parameter settings available in the currently selected menu or sub-menu item. For example, the encoder may be used to scroll through available presets, adjust EQ parameters, set delay times, or scroll through configuration menu items. When a desired value, option or parameter is down, push down momentarily on the knob to enter into device memory as part of the preset.

For a detailed menu tree, please refer to Section 15.1.

15. Appendices

15.1. Front-panel menu tree



15.2. Thermal dissipation charts

Model - IPD 1200

IPD 1200										
Level	Load	Rated power		Mains voltage	Line current	Watt *1)			Thermal Dissipation	
						In	Out	Dissipated	BTU/hr	kCal/hr
Standby w. remote Power Off.				VAC	IAC *2)					
				230	0.07	6.50	0	7	22	6
				120	0.01	6.05	0	6	21	5
Power on, Idling				230	0.21	25.80	0	26	88	22
				120	0.36	26.50	0	27	90	23
				100	0.39	24.90	0	25	85	21
Pink Pseudo Noise (1/8)	16 Ω / Ch.	150	x 2	230.0	0.5	68	38	30	103	26
				120.0	1.0	71	38	34	116	29
				100.0	1.1	71	38	34	116	29
	8 Ω / Ch.	300	x 2	230.0	0.9	119	75	44	152	38
				120.0	1.6	122	75	47	159	40
				100.0	1.8	122	75	47	159	40
	4 Ω / Ch.	600	x 2	230.0	1.8	226	150	76	260	65
				120.0	3.0	234	150	84	288	73
				100.0	3.4	229	150	79	269	68
	2 Ω / Ch.	500	x 2	230.0	1.7	217	125	92	313	79
				120.0	2.8	211	125	86	294	74
				100.0	3.4	222	125	97	331	83
<p>*1) The amplifier's PSU operates as a non-resistive load, so the calculation "Volts x Amps = Watts" would not be correct. Instead, measured and specified here is what is known as the "Active Power" in the amplifier providing useful, real-world values of power consumption and heat dissipation.</p> <p>*2) Current draw figures measured at 230 V. as well as 120 V. The efficiency is similar, but not identical for the two scenarios. The efficiency for 100 V mains is very similar to that of 120 V.</p>										

15.2. Thermal dissipation charts

Model - IPD 2400

IPD 2400										
Level	Load	Rated power		Mains voltage	Line current	Watt *1)			Thermal Dissipation	
						In	Out	Dissipated	BTU/hr	kCal/hr
Standby w. remote Power Off.				VAC						
				230	0.088	7.10	0	7	24	6
				120	0.0981	6.45	0	6	22	6
Power on, Idling				230	0.229	28.20	0	28	96	24
				120	0.383	29.20	0	29	100	25
				100	0.44	27.40	0	27	94	24
Pink Pseudo Noise (1/8)	16 Ω / Ch.	300	x 2	230.0	1.1	127	75	52	178	45
				120.0	1.7	127	75	52	177	45
				100.0	1.8	114	75	39	134	34
	8 Ω / Ch.	600	x 2	230.0	1.9	218	150	68	233	59
				120.0	3.0	229	150	79	270	68
				100.0	3.8	239	150	89	303	76
	4 Ω / Ch.	1200	x 2	230.0	3.3	431	300	131	448	113
				120.0	5.3	455	300	155	530	133
				100.0	6.1	451	300	151	514	129
	2 Ω / Ch.	800	x 2	230.0	2.3	279	150	129	439	111
				120.0	3.4	260	150	110	376	95
				100.0	4.1	258	150	108	368	93

*1) The amplifier's PSU operates as a non-resistive load, so the calculation "Volts x Amps = Watts" would not be correct. Instead, measured and specified here is what is known as the "Active Power" in the amplifier providing useful, real-world values of power consumption and heat dissipation.

*2) Current draw figures measured at 230 V. as well as 120 V. The efficiency is similar, but not identical for the two scenarios. The efficiency for 100 V mains is very similar to that of 120 V.

15.3. Technical specifications

Model - IPD 1200

General	
Number of channels (not bridgable)	2
Maximum total output power	1200 W
Output voltage	70 V peak / 50 Vrms / 36.2 dBu
Output current	16 Arms
Max. Output Power (all ch.'s driven)	
2 ohms	500 W
4 ohms	600 W
8 ohms	300 W
16 ohms	150 W
Performance	
THD+N 20 Hz - 20 kHz @ 1 W	<0.1%
THD+N @ 1 kHz, 1 dB below clip	<0.05%
Output noise	-66 dBu
Signal To Noise Ratio	102 dB
Channel separation @ 1 kHz	>80 dB
Frequency response (-3 dB)	2 Hz - 42 kHz
Input impedance	18 kOhm
Common Mode Rejection (CMR)	>50 dB
Output impedance	25 mOhm
Input sensitivity for maximum output voltage	6 dBu
Maximum analog input level	20 dBu
Gain (all DSP controls set to 0 dB)	30.2 dB
Mains power	
Nominal mains voltage	100 - 240 VAC
Operating mains voltage	60 - 265 VAC
Standby consumption	<6.5 W
Mains connector	Locking IEC inlet
Physical	
Dimensions (Rack rail - rear panel)	W: 483 mm (19"), H: 44 mm (1 U), D: 272 mm (10.7")
Dimensions (over all incl. handles & rear support)	W: 483 mm (19"), H: 44 mm (1 U), D: 344 mm (13.5")
Weight	4.6 kg (10.1 lbs)
Finish	Black, anodized aluminium front panel. Black/grey steel chassis
Connectors	
Analog input connectors per channel	3-pin XLR female
Analog input link connectors per channel	3-pin XLR male
AES input connector	3-pin XLR female
AES input link connector	3-pin XLR male
Output connectors per channel	Neutrik speakON / Binding posts, electronically balanced
Network connector	RJ45 (Ethernet)
Buttons	
	Power
	Menu
	Back
	Mute (per channel)
	Power
Encoder	
	Adjust/Set
LED's	
	Signal / Mute (per channel)
	Limit (per channel)
	Power State
Approvals	
	CE, UL (ANSI/UL, CAN/CSA), PSE, RCM, CCC, FCC.

All specifications are subject to change without notice.

15.3. Technical specifications

Model - IPD 2400

General	
Number of channels (not bridgable)	2
Maximum total output power	2400 W
Output voltage	100 V peak / 70 Vrms / 39.2 dBu
Output current	20 Arms
Max. Output Power (all ch.'s driven)	
2 ohms	800 W
4 ohms	1200 W
8 ohms	600 W
16 ohms	300 W
Performance	
THD+N 20 Hz - 20 kHz @ 1 W	<0.1%
THD+N @ 1 kHz, 1 dB below clip	<0.05%
Output noise	-66 dBu
Signal To Noise Ratio	105 dB
Channel separation @ 1 kHz	>80 dB
Frequency response (-3 dB)	2 Hz - 42 kHz
Input impedance	18 kOhm
Common Mode Rejection (CMR)	>50 dB
Output impedance	25 mOhm
Input sensitivity for maximum output voltage	6 dBu
Maximum analog input level	20 dBu
Gain (all DSP controls set to 0 dB)	33.2 dB
Mains power	
Nominal mains voltage	100 - 240 VAC
Operating mains voltage	60 - 265 VAC
Standby consumption	<7.5 W
Mains connector	Locking IEC inlet
Physical	
Dimensions (Rack rail - rear panel)	W: 483 mm (19"), H: 44 mm (1 U), D: 359 mm (14.1")
Dimensions (over all incl. handles & rear support)	W: 483 mm (19"), H: 44 mm (1 U), D: 431 mm (17.0")
Weight	6.2 kg (13.7 lbs)
Finish	Black, anodized aluminium front panel. Black/grey steel chassis
Connectors	
Analog input connectors per channel	3-pin XLR female
Analog input link connectors per channel	3-pin XLR male
AES input connector	3-pin XLR female
AES input link connector	3-pin XLR male
Output connectors per channel	Neutrik speakON / Binding posts, electronically balanced
Network connector	RJ45 (Ethernet)
Buttons	
	Power
	Menu
	Back
	Mute (per channel)
	Power
Encoder	
	Adjust/Set
LED's	
	Signal / Mute (per channel)
	Limit (per channel)
	Power State
Approvals	
	CE, UL (ANSI/UL, CAN/CSA), PSE, RCM, CCC, FCC.

All specifications are subject to change without notice.

16. Warranty

This product is manufactured by Lab.gruppen, and it is warranted to be free from any defects caused by components or factory workmanship, under normal use and service, for a period of three (3) years from date of purchase from an authorized Lab.gruppen dealer.

If the product fails to perform as specified during the warranty period, Lab.gruppen will undertake to repair, or at its option, replace this product at no charge to its owner, provided the unit is returned undamaged, shipping prepaid, to an authorized service facility or to the factory.

This warranty shall be null and void if the product is subjected to: repair work or alteration by a person other than those authorized by us; mechanical damage including shipping accidents; war, civil insurrection, misuse, abuse, operation with incorrect AC voltage, incorrect connections or accessories; operation with faulty associated equipment; or exposure to inclement weather conditions. Damage due to normal wear and tear is not covered by the warranty. Units on which the serial number has been removed or defaced will not be eligible for warranty service.

Lab.gruppen shall not be responsible for any incidental or consequential damages. Lab.gruppen's responsibility is limited to the product itself. Lab.gruppen takes no responsibility for any loss due to cancellation of any events, or rent of replacement equipment or costs due to a third party's or customer's loss of profit, or any other indirect costs or losses however incurred.

Lab.gruppen reserves the right to make changes or improvements in design or manufacturing without assuming any obligation to change or improve products previously manufactured.

This warranty is exclusive, and no other warranty is expressed or implied. This warranty does not affect the customer's statutory rights.

International warranties

Please contact your supplier or distributor for this information, as rights and disclaimers may vary from country to country.

17. Service

International

If your Lab.gruppen product requires repair, contact your Lab.gruppen dealer or distributor. Find your local distributor or sales representative via <http://labgruppen.com/distributors/>. A full listing of service centre is available at http://labgruppen.com/support/find_service_centre/.

Factory service

In the event a Lab.gruppen product requires factory service, you may contact Lab.gruppen's service department for return instructions and a Return Authorization number.

Please note for product return:

1. Use the original packing.
2. Include a copy of the sales receipt, your name, return address, phone and fax number, email address and description of the defect.
3. Mark the Return Authorization number on the outside of the packing.

Ship the product prepaid to:

Lab.gruppen AB Faktorvägen 1
SE-434 37 Kungsbacka
Sweden
Phone: +46 300 56 28 00
Fax: +46 300 56 28 99

service@labgruppen.com www.labgruppen.com

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labgruppen.com