

CARVIN *XDRIVE*

EQ230 / EQ430 Operation Manual



The EQ230 and EQ430 with *X-Drive*[™] processing are two and four channel precision 30-band graphic equalizers designed to elevate the performance of any system. The XD Network[™] software with USB connectivity offers total control with the processing flexibility required for both installation and live use. The EQ230 and EQ430 are next generation tools for critical sound processing between the mixer and power amp.

The EQ *X-Drive* series can improve the sound of main speakers, monitor systems or multi-zone applications with exacting EQ adjustments, but also with reduced feedback, driver protection and time correction of speaker placement. Each channel includes 30 bands of 1/3 octave constant-Q filters, 4th order High-Pass and Low-Pass filters, Gain, Limiter with Threshold and Delays up to 120mS for distance alignments. System Presets allow storage and recall of your preferred settings to get the most out of each element in your system.

A high contrast 2x24 graphic display allows programming from the front panel. For remote settings, use the intuitive USB interface (see carvin.com/XD). Onboard memory capacity has enough storage to contain up to sixteen complete system EQ configurations, or store unlimited configurations on your PC or MAC. Premium 24-bit A/D and D/A converters offer low noise and full 20-20kHz bandwidth with extremely low latency processing. The EQ *X-Drive* series provide multi-channel EQ's with an easy to use interface, high order AD/DA converters and first-rate components in a space and weight saving 1U package, making them a valuable addition to any rack.

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2. SAFETY

IMPORTANT! FOR YOUR PROTECTION, PLEASE READ THE FOLLOWING:

CAUTION: RISK OF ELECTRIC SHOCK, DO NOT OPEN.

WATER AND MOISTURE: Electronic equipment should not be used near water (near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The electronic equipment should be connected to a power supply only of the type described in the operating instructions or as marked on the electronic equipment.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization means of an electronic equipment is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles and the point where they exit from the electronic equipment.

SERVICING: The user should not attempt to service the electronic equipment beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel. If your unit is equipped with a fuse receptacle, replace only with the same type fuse. Refer to replacement text on the unit for correct fuse type.

This equipment has been tested and found to comply with international safety standards.

Warranty Information:

LIMITED WARRANTY

Your Carvin processor is guaranteed against failure for 1 YEAR unless otherwise stated. Carvin will service and supply all parts at no charge to the customer providing the unit is under warranty. Shipping costs are the responsibility of the customer. CARVIN DOES NOT PAY FOR PARTS OR SERVICING OTHER THAN OUR OWN. A COPY OF THE ORIGINAL INVOICE IS REQUIRED TO VERIFY YOUR WARRANTY. Carvin assumes no responsibility for horn drivers or speakers damaged by this unit. This warranty does not cover, and no liability is assumed, for damage due to: natural disasters, accidents, abuse, loss of parts, lack of reasonable care, incorrect use, or failure to follow instructions. This warranty is in lieu of all other warranties, expressed or implied. No representative or person is authorized to represent or assume for Carvin any liability in connection with the sale or servicing of Carvin products. CARVIN SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

SERVICE:

In the USA go to www.carvinservice.com

Outside the USA, contact your dealer or go to <http://www.carvinworld.com> for your nearest service center.

Include a written description of the problem with serial number and date of purchase.

MAINTAINING YOUR EQUIPMENT

Avoid spilling liquids or allowing any other foreign matter inside the unit. The panels of your unit can be wiped from time to time with a dry or slightly damp cloth in order to remove dust and bring back the new look. As with all pro gear, avoid prolonged use in caustic environments such as dust or salt air. When used in such an environment, be sure the unit is adequately protected by a cover.

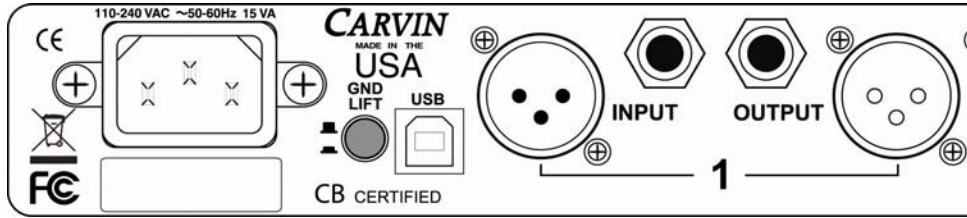
Please record the unit's serial number, invoice number and invoice date (purchase date).

Serial No.: _____

Invoice No.: _____

Invoice Date: _____

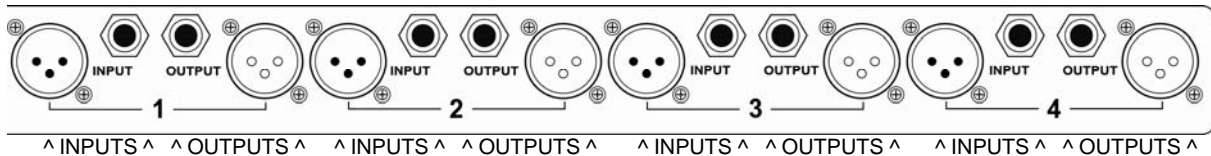
3. Rear Panel:



AC Power receptacle: A standard IEC that will accept 90-250 VAC, 50-60Hz.

Ground Lift switch: Lifts the signal grounds to solve ground loop issues in complex setups.

USB type B jack: For connection to a computer using Carvin's XD™EQ software with a full screen graphic interface and for firmware updating.

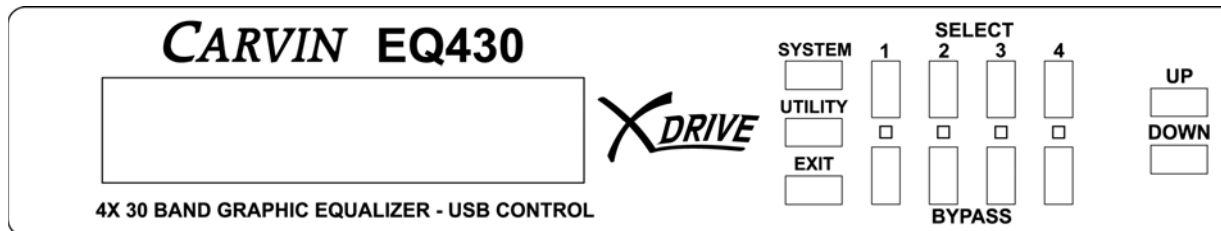


INPUTS 1 - 4, (XLR or 1/4"): Connect to audio sources.

OUTPUTS 1 - 4 (XLR or 1/4"): Connect to audio inputs.

If using 1/4" jacks there will be a 6dB loss. This can be adjusted with the INPUT or OUTPUT Gain. When using the Balanced XLR jacks the signal has unity gain, 0dB in equals 0dB out.

4. Front Panel:



SYSTEM, UTILITY, and EXIT

Enter to SYSTEM or UTILITY menus. Escape from the menus with EXIT.

SELECT buttons (1-4)

Press once to adjust that channel's graphic EQ settings and adjust with the UP/DOWN buttons and 30 frequency band selectors.

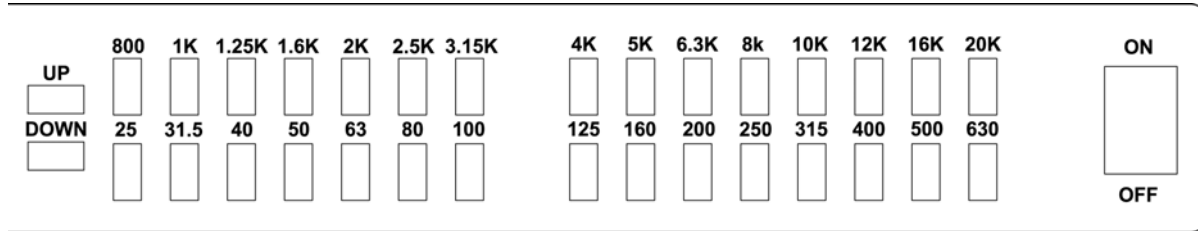
Pressing the same SELECT button again will cycle through access to settings for Gain, Limiter, Delay, HPF and LPF. Adjust settings with the UP/DOWN buttons. Press EXIT at any time to return to the Graphic EQ or cycle back with SELECT.

BYPASS buttons (1-4) and LEDs

Defeats only the Graphic EQ for the channel. Gain, Limiter, HPF and LPF remain active. The LEDs above each button indicate the EQ is bypassed for the channel.

UP, DOWN: Adjust parameter values or navigate system menus.

4. Front Panel:



FREQUENCY BAND SELECTORS (numbered 25 through 20K)

Selects which frequency band to be adjusted in Hertz (Hz). Adjust with **UP/DOWN**.

4.A. SYSTEM MENU:

Press the **SYSTEM** button to open the SYSTEM menu and to select parameter. Use **UP/DOWN** buttons to move through the menu pages or adjust parameters. Press **EXIT** to return to the Channel screens.

Page 1 - > COPY CHANNEL: (Press **SYSTEM**) ~

To quickly copy the settings to another Channel, use COPY CHANNEL.
 ~ Press **SYSTEM** for COPY CHANNEL mode (-or **UP** for pg.2, or **EXIT**).
 Select the channel to copy **from** with **UP/DOWN**, then press **SYSTEM**.
 Select a channel location (**Paste into: #**) with **UP/DOWN**.
 Press **SYSTEM** again to paste, or **EXIT** to end.

< - Page 2 - > SAVE SYSTEM: (Press **SYSTEM** then **UP**) ~

SAVE SYSTEM will save a complete setup into a memory location, including all Input/Output settings. You can save multiple systems and recall (load) them later.
 ~ Press **SYSTEM** to SAVE SYSTEM (-or **UP** for pg.3, **DOWN** for pg.1, or **EXIT**).
 Select a memory location **Save at slot: "#"** with **UP/DOWN**, then press **SYSTEM** to save.

< - Page 3 - > LOAD SYSTEM: (Press **SYSTEM** then **UP** [2 times]) ~

LOAD SYSTEM will recall a complete setup from a memory location, including all Input and Output settings.
 ~ Press **SYSTEM** to load a system (-or **UP** for pg.4, **DOWN** for pg.2, or **EXIT**).
 Select the **Sys. to load: "#"** with **UP/DOWN**, then press **SYSTEM**.

< - Page 4 RESET CHANNELS TO FLAT: (Press **SYSTEM** then **UP** [3 times]) ~

This will set the parameters for ALL Channels to the "0" or Flat setting, all HPF/LPF's will be set wide open at 20Hz to 20kHz, and all Limiters to +20dB(off).
 ~ Press **SYSTEM** to begin (-or **UP** for pg.4, **DOWN** for pg.2, or **EXIT**).
 "Are you sure?" Press **UP** to continue and reset to flat, or press **EXIT** to cancel.

SYSTEM DATA RESET:

If corrupt data is loaded into the system, reset the system to clear the corrupt data. Channel values will be reset to "0".

Channels and Systems saved in memory will not be affected.

~ First, turn the unit OFF.

Hold down the **SYSTEM** and **EXIT** buttons and then turn the unit back **ON**.

Hold the buttons in until the channel screen is displayed.

4.B. UTILITY MENU:

Press the **UTILITY** button to open the UTILITY menu and to select function.
Use **UP/DOWN** buttons to move through the menu pages or adjust parameters.
Press **EXIT** to return to the Channel screens.

Page 1 - > **DELAY UNITS** (Press **UTILITY**) ~

~ Press **UTILITY** again to change the setting.
Use **Up/Down** to display delay times in **Seconds, Feet, or Meters**.
Press **UTILITY** again to save changes.
Press **UP** for Page 2 or **EXIT** to return to the Channel screens.

< - Page 2 - > **DELAY MEMORY** (Press **UTILITY** then **UP**) ~

This screen displays how much memory is remaining for use.
The EQ230/EQ430 starts with a total of 120mS of delay memory. As you assign more delay to channels, the remaining available memory time decreases.
~ Press **UP** for Page 3, **DOWN** for Page 1, or **EXIT** to return to the Channel screens.

< - Page 3 - > **SECURITY LOCKOUT** (Press **UTILITY** then **UP** [2 times]) ~

~ Press **UTILITY** to change the setting.
Select **ON** to prevent any changes to the EQ230/EQ430 settings.
Select **OFF** to allow changes to the EQ230/EQ430 settings.
Press **UTILITY** to enter the password.
Input the 4-digit password using the **SELECT (1-4)** buttons.
*Note: The factory set default password is **1122**.
Press **UP** for Page 4, **DOWN** for Page 3, or **EXIT** to return to the Channel screens.

< - Page 4 - > **CHANGE PASSWORD** (Press **UTILITY** then **UP** [3 times]) ~

To change the 4-DIGIT PASSWORD, you must first enter the old password.
~ Press **UTILITY** to change the setting.
Press **SELECT (1-4)** buttons to first enter the old password.
*Note: The factory set default password is **1122**.
Then enter the new password using **SELECT (1-4)** buttons.
Press **UP** for Page 5, **DOWN** for Page 3, or **EXIT** to return to the Channel screens.

< - Page 5 - > **Unit ID – USB** (Press **UTILITY** then **UP** [4 times]) ~

More than one EQ230/EQ430 can be controlled through USB ports from a single computer. When doing this, set the UNIT ID for each EQ230/EQ430 to a different number. The limit is 16 units.
~ Press **UTILITY** to change the setting.
Press **UP/DOWN** to set the UNIT ID from 1-16. The maximum cable length for a USB connection (without an active extension) is 16.4ft (5M).
Press **UTILITY** again to save changes.
Press **UP** for Page 6, **DOWN** for Page 4, or **EXIT** to return to the Channel screens.

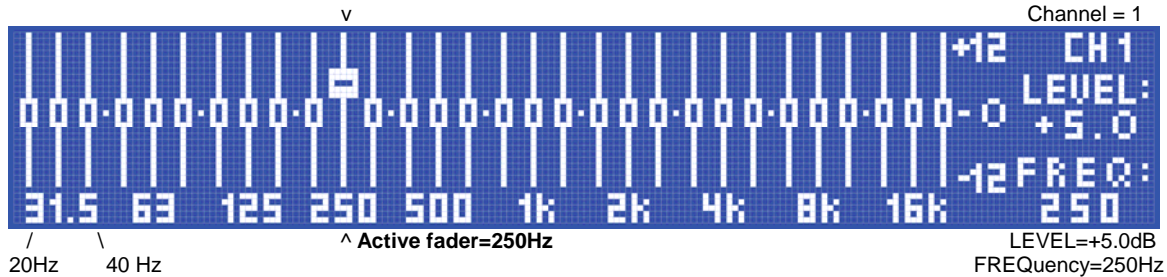
< - Page 6: **Firmware Version** (Press **UTILITY** then **UP** [5 times])

Displays firmware version. If desired, download updates from a computer through the USB port using the Carvin XD™ EQ software. (**DOWN** for Page 5 or **EXIT**)

4.C. CHANNEL SETTINGS:

Press a channel **SELECT** button (1,2,3, or 4) to access the channel settings.

CHANNEL SCREEN PAGE 1: GRAPHIC EQ



Press one of the 30 Frequency buttons **25** to **20k**.

Use the **UP/DOWN** buttons to adjust the level.

On the display, the active “fader” for the frequency will move with your adjustments. The active frequency, **FREQ** (in Hz) and it’s **LEVEL** (in dB) will be displayed at the right side of the screen.

To adjust a different channel, press it’s **SELECT** button 1-4. (displays at top right) When you change from one channel to another the changes are saved in memory.

Continue pressing the same channel’s **SELECT** button to cycle through the channel’s other setting screens and parameter selections. Press **EXIT** at any time to return to the Graphic EQ screen.

CHANNEL SCREEN PAGE 2: [press **SELECT** to access parameters]

Channel number	channel gain level
C h a n n e l : 1	G a i n : + 0 6 . 0
D e l a y m S : 1 2 1	u S : 9 0 5
Delay in large units (mS)	Delay in small units (uS)

GAIN:

To adjust the Gain (volume) of the selected channel use the **UP/DOWN** buttons. The range is +12db at maximum to -68db at minimum, in 0.5dB steps.

DELAY:

The **Delay** time can be adjusted in large and small increments:

mS/uS (milliseconds/microseconds), **Feet/Inches** or **Meters/mm**.

(change units in the **UTILITY** menu).

The total amount of delay available for the EQ230/EQ430 is 120 milliseconds (120ft./36.5M). Each time a delay is added, it deletes it from the total time available for the system. For example, a Stereo system may have up to a maximum of 60mS for each of the 2 channels.

- Channel Settings continued on next page: Limiter, HPF, LPF -

- Channel Settings continued -

CHANNEL SCREEN PAGE 3: [press **SELECT** to access parameters]

Channel selection		Limiter threshold in dB	
C h a n n e l : 1	L i m i t e r : + 2 0 . 0		
H P F : 4 0 H z	L P F : S : 2 0 k H z		
High Pass Filter (Low Cut) Frequency		Low Pass Filter (High Cut) Frequency	

LIMITER:

The Limiter is used to protect amplifiers, speakers and recordings by controlling peaks in the signal output which would otherwise cause distortion and clipping. The Limiter has a threshold level has a range from +20.0dB (**off**) to -20.0dB. Output levels less than the threshold setting will not be affected.

HIGH PASS (HPF) and LOW PASS (LPF) FILTERS:

Use the filters to protect speakers from extreme frequencies beyond the speaker's usable range. These are a 4th order (24dB/oct.) Butterworth filters.

HPF: Set the High Pass Filter frequency (Low Cut). The lowest setting is OFF.

LPF: Set the Low Pass Filter frequency (Hi Cut). The highest setting is OFF.

5. COMPUTER CONTROL / GRAPHIC INTERFACE

The EQ230/EQ430 has a USB port allowing use with Carvin's XD™ EQ software.

5.A. THE CARVIN XD NETWORK™ SOFTWARE

MINIMUM COMPUTER SYSTEM REQUIREMENTS:

Windows: XP or later, MAC: OS 10.5 or later.

SOFTWARE INSTALLATION:

Download the software from: www.carvin.com/XD

To install the EQ230/EQ430 software:

1. Unzip the files to a directory on your Hard Drive. There is 1 file: "Setup.exe"
2. Run the Setup.exe file to install the Carvin XD™ Serial Control software on your computer.
3. The software will be installed to the **c:\Program Files\Carvin XD** directory. It is recommended to not change the install directory.
4. You will be asked if you would like a Desktop shortcut icon created. It is recommended to do this to allow easy access to the program.
5. The XD software is now ready to use by double-clicking the Carvin XD™ Serial Control icon on your desktop. When linking to the EQ230 or EQ430 hardware, the device should be connected via the USB cable and powered on before the software is started.

5.B. SERIAL CONNECTION:

Connecting through USB.

Connecting the EQ230 or EQ430 hardware: CONNECT TO DEVICE

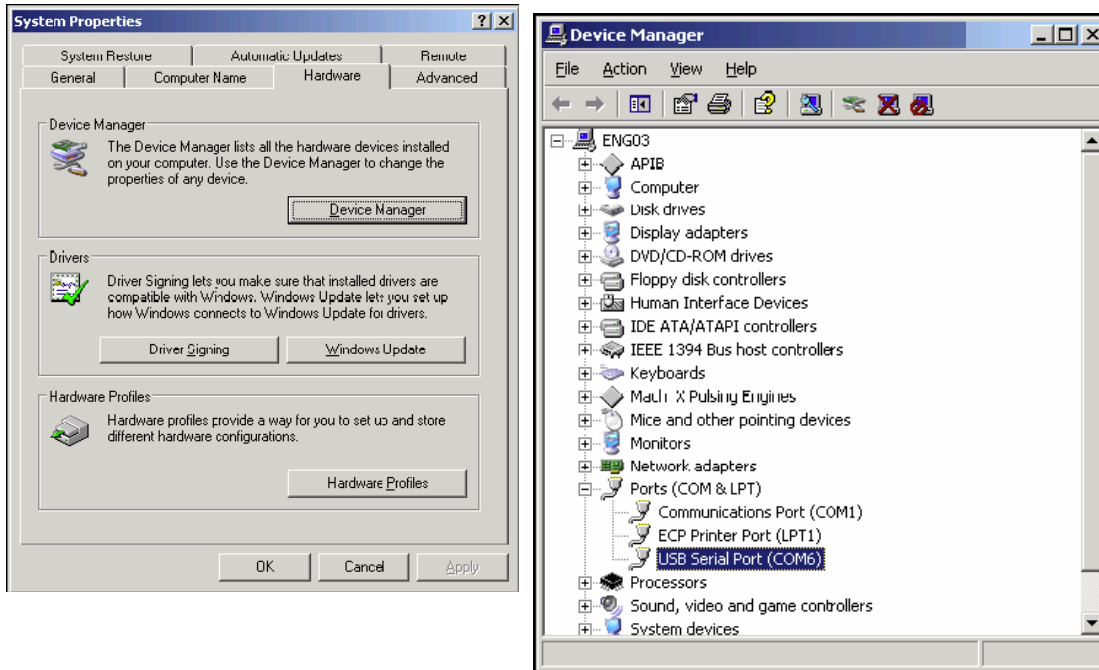
1. You must plug in the USB cable to both the computer and the EQ before you turn on the EQ.
2. Turn on the computer and wait to see the desktop.
3. Turn on the EQ.
4. Run the XD™ Serial Control software on the computer.
5. Click on the "CONNECT TO DEVICE" button at the top middle of the screen.



- continued on next page: selecting the COM port -

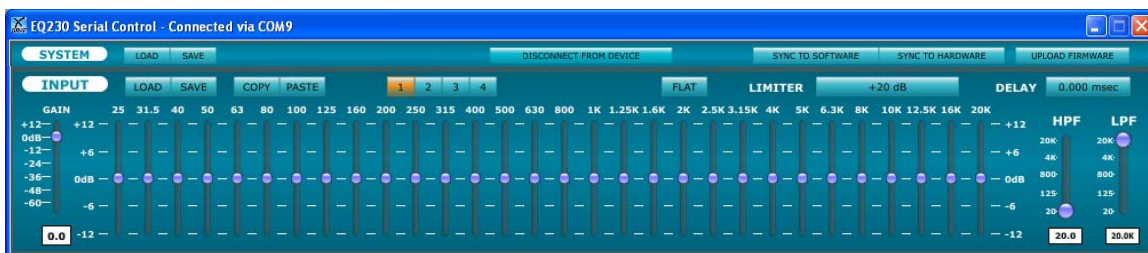
- USB connection procedure continued -

6. Select the COM port for the device. This will usually be higher than COM1. The actual COM PORT can be found by right clicking on the 'MY COMPUTER' icon and selecting 'Properties'. Select the 'HARDWARE' tab and click on 'DeviceManager' button. Finally click the PORTS (COM & LPT) to see which USB Serial Port is assigned.



UPLOAD FIRMWARE (top right of screen)

Future upgrades and improvements can be uploaded from the computer to the EQ230/EQ430 hardware memory.



To perform a EQ230/EQ430 firmware update:

1. Download new firmware to your computer from www.carvin.com/XD.
2. Save the file in a known location on your computer.
3. Click on the "UPLOAD FIRMWARE" button at the top right of the screen.
4. Navigate to the firmware file you saved on your computer and double click.

5.C. CONTROL from the GRAPHIC INTERFACE:



SYSTEM SETTINGS:

LOAD and **SAVE:** (top left of screen)

Complete setups can be configured then saved as a SYSTEM in a file on the computer, and later loaded back in from the computer from the saved files. Be sure to save the files in a known location so they can be retrieved later.

SYNC TO SOFTWARE (top right area of screen)

Click on this button to transfer the computer screen settings to the EQ230/EQ430. All changes made on the computer screen will be sent to the EQ230/EQ430.

SYNC TO HARDWARE (top right area of screen)

Click on this button to display the settings from the EQ230/EQ430 onto the computer screen. All changes made on the computer screen will be sent to the EQ230/EQ430.

INPUT SETTINGS:

Click on **1**, **2**, **3** or **4** to access each channel. You can drag each fader to adjust, or click on the buttons or white areas to enter values from the computer keyboard.

LOAD and **SAVE:**

Load channel settings you have saved to the current channel from a file, or save the current channel settings to your computer in a file.

COPY and **PASTE:** Copy settings from one channel to another.

Select the channel to be copied (1-4) and click COPY.

Then select the channel to receive the copied settings and click PASTE.

FLAT: Sets the current channel's Graphic EQ to flat (0dB for each freq.).

LIMITER: Set the threshold for the Limiter (+20db is OFF, no limiting).

Click on the **LIMITER** button to access the input window for the Threshold setting.

DELAY: Set the delay time for the input and to select time units: S, Ft, M.

Click on the **DELAY** button to access the input windows for Time and Units.

GAIN: Set input level from +12dB (full) to -68dB(off).

EQ faders: Set each frequency to the desired level.

HPF (Low Cut) and **LPF** (High Cut):

Set the minimum and maximum frequency output for the channel.

6. SPECIFICATIONS: CARVIN X-Drive EQ430/EQ230

INPUTS:

Female XLR connectors: 10kOhm, balanced
1/4" connectors: 10kOhm, unbalanced
Maximum Input +18 dBu

OUTPUTS:

Male XLR connectors: 150 Ohms, balanced
1/4" connectors: 150 Ohms, unbalanced
Maximum Output +18 dBu
Dynamic Range 114dB unweighted 20Hz – 20kHz
Frequency Response 20Hz – 20kHz
Distortion (THD) <0.005%, 20Hz – 20kHz @+10dBu

DIGITAL CONTROLS: per channel

30 one-third octave filters, +/-12dB in 0.5dB steps
Center Frequencies: (Hz)
25, 31.5, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800,
1k, 1.25k, 1.6k, 2k, 2.5k, 3.15k, 4k, 5k, 6.3k, 8k, 10k, 12.5k, 16k, 20k
Gain: +12dB to -68dB in 0.5dB steps
High pass and Low pass Filters:24dB/oct. 20Hz-20kHz, 1/9 oct. steps to OFF
Limiter: +20dB(off) to -20dB Threshold
Delay: 0-120mS (max. system delay) in 21uS steps
(0-120ft in 0.28in steps or 0-40 meters in 7mm steps)

USB compatibility: USB 1.1 or higher; Windows: XP or later, MAC: OS 10.5 or later.

System Processing:

Multi DSP 48kHz 24 bit
A/D Converters 114dB 24 bit
D/A Converters 120dB 24 bit

General:

Dimensions 19"W x 1.75"H x 8"D (483mm x 45mm x 204mm)
Weight 4.4 lbs (2 kg)
Power 90-250 VAC, 50/60Hz standard IEC receptacle

7. MENU QUICK REFERENCE CHART:

SYSTEM SETUP

- COPY CHANNEL
COPY FROM:
PASTE INTO:
- SAVE SYSTEM
SAVE AT SLOT:
- LOAD SYSTEM
SYS. TO LOAD:
- RESET CHANNELS TO FLAT
SURE? (UP), or EXIT (end)

UTILITY

- DELAY UNITS: S/F/M
- DELAY MEMORY REMAINING
- SECURITY LOCKOUT: ON/OFF
- CHANGE PASSWORD
- UNIT ID - USB: 1-16
- FIRMWARE VERSION

CHANNEL: 1-4

- 30 BAND GRAPHIC EQUALIZER
- GAIN
DELAY
- LIMITER THRESHOLD
HPF / LPF

BYPASS 1-4:

press to BYPASS GRAPHIC EQ.

input data reset:

Hold SYSTEM and EXIT at power ON.