DGX Series - *Quick Start Guide*

DGX Series Open Architecture / Drag & Drop DSP - *Quick Start Guide*

1. What's in the Box
- The DGX Series processor model hardware device purchased
- This hard copy of the Quick Start Guide
- USB drive with Software, Help File, Quick Start Guide, Spec Sheets
- IEC socket detachable power cable
- Detachable 3.5mm Phoenix/Euro type terminal block connectors

2. What you need to provide
- A Windows PC – 1GHz or higher processor
- Windows 8, 7, Vista, or XP
- 500 MB of free storage space
- 16 Bit or higher colours
- 4GB or more RAM
- Network (Ethernet) interface
- Ethernet cable (Cat5 or 6)

3. Getting Help
- The included LaxConsole software - the Windows software that configures & controls the DGX processor - includes a Help File. That help file provides a detailed User Manual (software and hardware) as well as this Quick Start Guide.

  If you have questions beyond those guidance resources please contact,

- Technical Support at support@lax-pro.com   Web Site:
- Tel: 020-3928 0051.
- Fax: 020-3928 0051.

Important Safety Information

1. READ THESE INSTRUCTIONS
All the safety and operating instructions should be read before the product is operated.

2. KEEP THESE INSTRUCTIONS
The safety and operating instructions should be retained for future reference.

3. HEED ALL WARNINGS
All warnings on the product and in the operating instructions should be adhered to.

4. FOLLOW ALL INSTRUCTIONS
All operating and use of instructions should be followed.

5. DO NOT USE THIS APPARATUS NEAR WATER
Do not use the product near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.

6. CLEAN ONLY WITH DRY CLOTH
Unplug the unit from the wall outlet before cleaning

7. DO NOT BLOCK ANY VENTILATION OPENINGS
Slots and openings in the cabinet back or bottom are provided for ventilation, to ensure reliable operation of the limit and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or similar surface. This product should never be placed near or over a radiator or heat source. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

8. DO NOT INSTALL NEAR ANY HEAT SOURCES
This Product should be situated away from heat sources such as radiators, stoves, or other products (including amplifiers) that produces 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 prongs are 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 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 TO AVOID INJURY FROM TIP-OVER.
Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious injury to someone, and serious damage to the appliance. A unit and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.
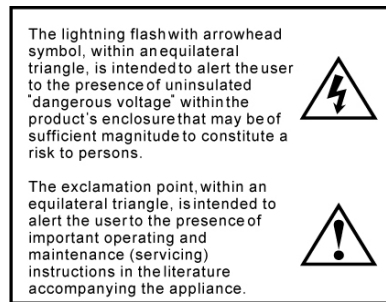
13. UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.
For added protection for this unit during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the unit due to lightning and power line surges.

14. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL. SERVICING IS REQUIRED WHEN THE APPARATUS HAS BEEN DAMAGED IN ANYWAY, SUCH AS WHEN 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. WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

16. APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER - SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

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 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.

4. Introduction and Description:

- ***Thank you***

Hello from everyone here at Lax Audio Design and thank you for purchasing our

DGX Series digital processor.

Since DGX is setup and controlled by a host computer via Ethernet it is important that we get you connected and up and running as quickly and easily as possible. Thus the first portion of this Quick Start Guide is dedicated to getting the DGX processor and the LaxConsole software

connected and operating with ease. Once the DGX processor and the LaxConsole software is connected and operational we believe you will find working with the software and processor to be straight forward as outlined in the balance of this Quick Start Guide. If you have any suggestions for making this quick start guide better in that or any regard please bring them to my attention at support@lax-pro.com   and we will make those changes.

- **8 ; L Series Digital Processor**

Designed in Lax and built on the audio performance reputation of our 40 Bit, Floating Point DSP Engine and High Performance 24 Bit Converters – DGX brings a new level of audio performance, ease of use, and value to the world of open architecture-drag & drop audio processing for fixed audio installations.

DGX Series processors are available in four I/O model configurations - 8x8, 16x8 and16x16 with Mic/Line input selection per input, 48v phantom power and premium grade mic pre-amps. DGX-Series N and model versions provide Dante enabled Network I/O (N)Networkcombo model versions for added I/O and application flexibility.

From a large palette of audio DSP modules, create your personal DSP system design to accommodate each unique project requirement using the LaxConsole drag & drop software. Control DGX via Ethernet using the included LaxConsole software GUI, from any PC using our PC control designer, with the logic input/relay output ports, using our optional Wall Panel Series - Mini and Touch model wall controls, using your own Android device via our free Control /Touch software, using your iOS, OSX, or Android device via the browser control in our optional Centro SM1 site manager, or with any third party controller.

Optional WallPanel Series – Mini Model Programmable Wall Controls – See www.lax-pro.com

5. Hardware:

1. **Power Status LED** (New front panel version only)
2. **Network Status LED** (Data Status LED on older front panel version)
- When the processor has an Ethernet cable / network cable connected the Network status LED on the front of the processor will light - once the processor initializes. If there is no Ethernet / network cable attached it remains off.
  Note: When the Network status LED is on it does not mean that you have established a Network Connection – only that an Ethernet or network cable is connected to the processor. Proper Network Connection and Operation is indicated/displayed only in the software's "Network View" page (see the Network View & Connection section of this guide).
- When the processor and software are connected and communicating the Network status (Data status) light will flash.
3. **Input/Output Signal Indicators**
   Each Input and Output channel has a dual colour LED signal indicator. Green for signal present at -40 dBu and Red at +17 dBu at the advent of analog clipping.

REAR PANEL   Rear panel of DGX 1616 (top) and 1616-ND (bottom) models shown above

1. **Power On/Off Switch**
2. **Fuse Compartment**
   Should you need to replace the fuse use a T2 5A-250v fuse. Ensure power to the device is disconnected when replacing the fuse.

3. **Power Input Connector**

Insert the IEC plug connector end of the supplied cable into the rear panel of the Uno. Connect the AC end of the cord into an AC power source of the correct voltage and frequency (100-240 VAC, 50/60 Hz).

4. **Ethernet Connector**

DGX utilizes a TCP protocol for communication with the host PC running the LaxConsole software. The port is a standard RJ45 (Ethernet) jack.

5. **IP Reset Button.**

See the IP Reset / Reset Processor Network Settings section in this guide.

6. **Logic Control Input/Output Port**

Utilizing twisted pair wire with an attached terminal block, you can use external signals to control parameters such as triggering presets within LaxConsole or control external devices like an electric screen for example.

7. **Analog Line Outputs**

Euro/Phoenix style terminal block output connections utilizing 3.5mm terminal block connectors (included). Use balanced, shielded audio cabling. DGX has eight (8) or sixteen (16) outputs depending on the model.

8. **Analog Mic/Line Inputs**

Euro/Phoenix style terminal block input connections utilizing 3.5mm terminal block connectors (included). Use balanced, shielded audio cabling. DGX has eight (8) or sixteen (16) switchable Mic/Line inputs w 48v phantom power depending on the model.

9. **Network Audio I/O** (16x16 I/O audio channels on one RJ45 connector – one RJ45 for redundancy.)

DGX -Series N, model versions Include two RJ45 Dante enabled network audio connectors
(not to be confused with the Ethernet connector).   As shown on the 1616-Nmodel version on page 4 above.

6. Install the @U Console Software:

The USB drive included with each processor includes a full copy of the DGX's LaxConsole software (including Microsoft's .net framework component) or you can download the Windows 8, 7, Vista, XP compatible LaxConsole software from our web site and install on your computer (www.lax-pro.com). Determine which has the most recent software version and use that one.

- *When installing our LaxConsole software via our web site and where your PC software does not include Microsoft's .net framework component - your PC will use the internet to secure a copy and continue the installation. If you have no internet connection you will need to use the included Lax USB drive for your software installation as it also provides the Microsoft .net frame work component. Or contact Lax tech support.*

Note: The Microsoft installation program/process remembers what location you installed from - the first time you load the LaxConsole software into your computer. This can cause issues if you try and load a new software Version (update) from a different location than the location originally used to load the LaxConsole software into your computer (USB, Internet Download, etc).

Solution: Simply un-install the old LaxConsole software version in Control Panel before you update your software version each time. You won't have any update issues and you won't have to remember what location you loaded the software from previously or what the source was - USB, Internet, etc.

- *Make sure the LaxConsole Software version is the latest version (see "About" menu in LaxConsole to view version) vs. version on the web site. Make sure the processors*

Firmware version is compatible with the software (view device firmware version in Network View). See firmware upgrade info on Page 11- #14.

- If you have a personal Firewall setup on your computer, a Firewall popup window might be displayed during the software installation to ask whether users want to "Block" or "Allow"

  LaxConsole from accessing the network. Select "Allow" to continue installation.

- Once installed and working – close the LaxConsole software for now until you are instructed to open it again.

7. **Initial Device Connectivity:**

The DGX series of digital processors run on a network based infrastructure and are set up

and controlled by a host computer via Ethernet using the LaxConsole software.
A network connection can be made between your computer and DGX **(A)** Via a DHCP enabled Router, Server, or Router/Server/Switch combination as recommended and shown below or **(B)** A Non-DHCP enabled Direct connection or Indirectly via an Ethernet switch.

The primary difference between these two connection methods is the automatic IP address assignment that DHCP provides in **(A)**.
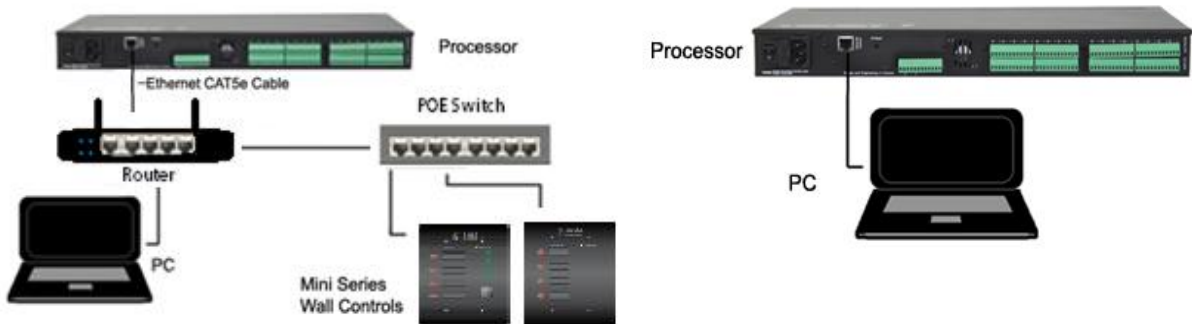
(A) DHCP Enabled Router, Server, or Router/Server/Switch Combo Connection

The DGX processor device boots up with DHCP enabled by default so with DHCP

enabled routers and servers DGX will automatically obtain an IP address upon power up and connection. This may take a minute or two as the devices look for DHCP to obtain their IP address.
Available DHCP is the recommended connection method. Where our ControlPanel Series wall controls will be used to control the processor we recommend the use of a low cost router along with a POE switch. This combo will provide **DHCP** as well as power to the wall controls over their Ethernet cable by way of the switches **POE** feature (Power Over Ethernet).
Note: Linksys routers/NetGear switches have tested well (D-Link routers have not).

(B) Non-DHCP Enabled Direct or Indirect Connection

When the processor is connected directly to a computer or indirectly via a switch or hub and DHCP is not available to assign IP addresses - the connection process is not automatic.

(1) A Single Processor or Device in the Network Only - No DHCP Available

Once no DHCP is detected - a single direct or indirectly connected processor device will either try to connect using the IP address last assigned and stored in the device or attempt to revert to is default IP address of 169.254.128.128. Under some conditions the processor might refuse to relinquish its stored IP address or revert to its default IP address and thus refuse to connect. **To simplify and speed this non-DHCP enabled**

connection we recommend - that before you power up your device you should **Reset** the processor to its **Default IP Address** using the **IP Reset Button** on the rear of the processor. Resetting the processor to its default IP address of 169.254.128.128 will have you connecting directly quickly and without problems when no DHCP is available. Please see - **IP Reset Push Button / Reset Processor Network Settings** instructions below.

Note: Your PC should be set to "Obtain IP Address Automatically" (default setting).

Note: For direct connection a standard Ethernet cable should work with most computers.

IP Reset Push Button / Reset Processor Network Settings (DHCP not available)

Follow these instructions prior to powering up the processor and opening the LaxConsole software.

(a) At the rear of the processor you will see a small round recessed push button labeled **"IP Reset"**- just to the right of the Ethernet connector (looking from the back). You are able to push this reset push button inward using the point of a pen or a small pointed object.

(b) Press the IP Reset push button inward and while holding it pushed in power up the processor device.

(c) Wait 5 seconds after power up and then release the IP Reset push button.

(d) Wait for the processor to power up completely (this will take a minute or so as it initializes and sets its default IP address). When complete the Network LED (Data LED on older models) will light and remain on.

(e) You can verify your network connection on **Page 8 - #10.**

Note: Some DGX processors were manufactured with a different IP Reset switch that was hidden behind a removable cover on the rear of the processor. If yours is like that – Remove the small black cover on the rear of the processor near the Ethernet connector (remove 2 small screws). Looking from the back of the processor you will see a small black Reset Switch to the right of the Ethernet connector. Press this Reset Switch forward lightly with your finger and while holding it pressed forward power up the processor. Wait 5 seconds after power up and then release the Reset Switch. The balance of the process is as above.

Note: Although not as reliable, each connected device also has a software IP reset function. In **Network View**, right click the device and select **Remote Reset**.

(2) Multiple Processor Devices Connected to the Network – No DHCP Available
Where you will be connecting multiple processors in your network and DHCP is not available, the user will have to manually assign unique IP addresses to each processor device. See – **Manual Assignment of IP Addresses on Page 9 &10 - #12 & 13.**

8. **Processor Device Connected and Powered Up:**

With your processor (and devices) connected as a network or directly to your computer, power on all devices.

(a) On power up the processors power status LED and LCD display will light (just the LCD display on the older models).

(b) If the processor has an Ethernet cable / network cable connected the Network LED (Data LED on older models) on the front of the processor will light - once the processor initializes. If there is no Ethernet / network cable attached it will remain off.

Note: This does not mean that you have established a Network Connection – only that an

Ethernet or network cable is connected to the processor. Proper Network Connection and Operation is indicated/displayed only in the software's Network View page – see **Network View & Connection** below.

(c) Upon being powered up the processor will search for a DHCP enabled router or server to obtain an IP address. If it locates DHCP it will connect quickly. If you are using a non-DHCP direct or indirect connection you will have followed the instructions on **Page 6&7** to connect to a single processor or multiple processors – where DHCP is not available.

(d) When the processor and software are connected and commands are being sent to the device the blue Network status LED (Data LED on older models) will flash.

9. Launch @U Console Software: (Getting Connected)

Upon opening the LaxConsole software you will be shown the **"@U Console Startup"** window. It provides 3 possible selections – **New Design Project, Open Design Project**, and **Start "Network View"** (Network View will also be available to you as a separate button located at the top right of the main Project Design window once you are working on a DSP project).
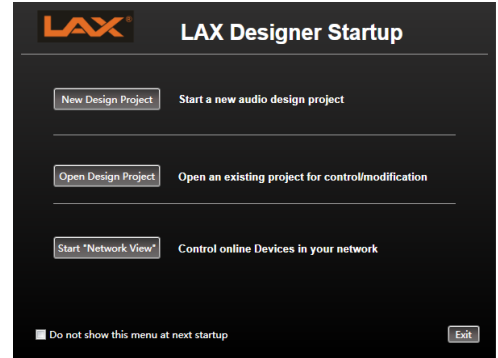
10. Network View and Connection:

(a) Click **Start "Network View"** from the LaxConsole Startup window shown above.
The Network View displays all processors and control devices connected to the network plus information such as the processor device model, a green, yellow or red network connection indicator, the IP address, and the devices Firmware version (as shown below).

(b) In **Network View** as shown at right - you should now see your processor device model connected to the network router block and the **Network Connection Indicator** to the left of the processor device model should be **Green/On** (meaning it is connected and operational).

(c) Note the **Firmware** version of the device.
Any device firmware / software incompatibility will be indicated in **Network View** with a red or yellow warning symbol. Red - firmware upgrade required/not functional or Yellow - firmware upgrade recommended/but functioning.

(d) If your processor and software have Not connected properly you will see a Yellow or Red connection indicator to the left of the processor device model indicating a connection or operational problem.
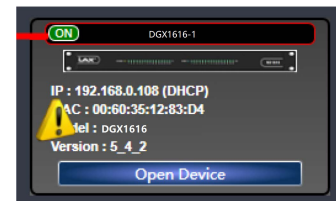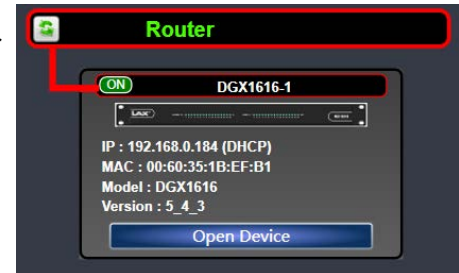
Network Connection Indicators

Green (On) - Connected and operational.
Yellow - Connected/Online but Not operational.
Red (Off) - The processor is offline – not connected – no communication between the LaxConsole software and the processor. Check cables and connections.
Note: This could also be a temporary Offline interruption if the processor is busy performing a firmware upgrade or the processor is re-booting.

11. Connection Problems?

Yellow Network Connection Indicator
While in **Network View** if there is a **Yellow** network connection indicator next to the processor device model the device is connected/online - **but Not Ready / Not Operational.**

(a) The three most common reasons for this Yellow connection indicator is the result of **(1)** A non-DHCP connection where multiple processors are in use and each device needs a unique IP address manually assigned to it **(2)** Where a non-DHCP direct or indirectly connected - single processor device is not reverting to its default IP address and/or is holding onto its previous address and **(3)** Software/Firmware incompatibility.

(b) **Solutions** – **(1)** See instructions **Page 9&10** - **#12&13** below – Manual Assignment of IP Addresses **(2)** See **Page 7** to reset the processor to its Default IP address and **(3)** Check device firmware version in Network View & perform a processor Firmware Upgrade – as described on **Page 11 - #14**.

(c) Those connection solutions resolve 99% of any Yellow indicator connection issues but to assist further, when the indicator is Yellow you can hover your cursor over the device and there is a pop-up Tooltip message to tell you the kind of issues it has detected.

(d) A few message and solution examples,
    Message: Device not ready.
      Solution: Wait a minute or two till the device is ready and it should then connect and the indicator turn Green if successful.
      Solution: If the indicator remains Yellow, close the LaxConsole software and then re-open. Or Reset the processor.
    Message: Device Schematic Not ready.
      Solution: The processor has already been loaded with a DSP design. Give the connection process a minute to connect and if it does not connect close the LaxConsole software, open it again, select Start Network View and you should now see that the processor is connected and operational - as indicated by the Green network connection indicator to the left of the processor device model.
      Solution: If not connected – reset the processor – see IP Reset Button/Reset Processor on **Page 7**.
    Message: DSP Processing Error.
      Solution: This could be a bad DSP Design schematic. You may need to reload the DSP schematic and restart and/or restart device to reset its DSP chip.
    Message: Error in Firmware Upgrade.
      Solution: It will print out an error code when you hover your cursor over the device in Network View (Do Firmware Upgrade again).

12. Manual Assignment of IP Addresses to Multiple Devices - DHCP Not Available:

Unique, manually assigned/static IP addresses are required for each processor device. Computer set to "Obtain IP Address Automatically". **We will set your computers static IP address after setting each processor or device.**

To manually assign IP addresses,

(a) Connect processor device number one directly to your PC. Reset its IP as described on **Page 7** (IP Reset) and establish a connection.

(b) In **Network View** as shown below left - right click the processor device and select **"Device Setup".**
In the **Network Properties** window as shown at the far right - select the **"Change Network Configuration"** button in order to disable **DHCP** and to insert IP addresses manually.
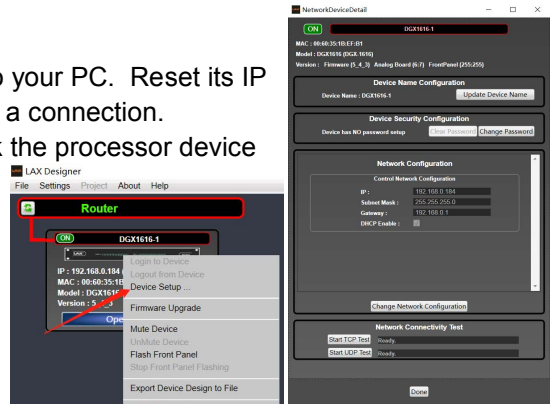
(c) With the **DHCP** button **disabled**, assign the **unique IP Address of 192.168.1.X** – where X is a unique number between 0 & 255 – to the first device and subsequent unique IP addresses to the remaining devices in the network.

(d) When finished – Select **"Apply"** to save changes and then **"Done"** to exit.

(e) Complete steps 1 thru 4 for each subsequent processor or device so each is assigned its own unique IP address (example-might be 192.168.1.**180/181/182** etc).

(f) Your devices will appear Offline in Network View until you are able to assign a static IP address to your PC - as described in #13 below.

13. **A Static IP Address for your Computer - Multiple Devices – No DHCP Available:**
    In this section, we will be navigating through Microsoft Windows to determine your home networking information as it applies to manually assigning a unique static IP addresses to your computer.

(a) The first step is to open the **'Start Menu'** and select **Control Panel**.

(b) Click **View Network Status** and **Tasks** under the Network and Internet header as shown at the right.
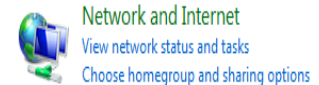
(c) Click on **Change adapter settings** on the left most tab.

(d) Left-Click on **Local Area Connection** and click the **Properties** button. Select **Internet Protocol Version 4 (TCP/IPv4**) then click **Properties** to access the manual IP settings.
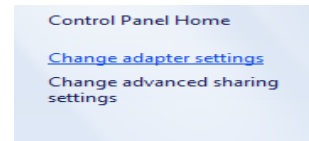
(e) Set up your IP address to be **192.168.1.X** where the X can be any value from 0 – 255 – but unique from the other devices that you already manually assigned unique IP addresses to.

(f) Use the following settings for your PC's unique static address: **IP Address: 192.168.1.X**
(Example – IP might be 192.168.1.185 based on my   **Subnet Mask: 255.255.255.0**
unique device addresses above)   **Gateway: 192.168.1.1**
  DNS Servers: 192.168.1.1

(g) If you set up your devices as per step 12 & 13 on Page 9 & 10 above, you will now see them appear online and connected in **Network View** in the LaxConsole software.

14. Firmware Upgrade to Processor Device:

Once you have the processor device and the LaxConsole software connected and operational and before you start work on a DSP design project - make sure your processor has the latest firmware installed .

Note: It is imperative that power is not disrupted during the firmware update process.

- **In Network View** – Right click the device and select "**Firmware Upgrade**" from the menu and follow the instructions as shown below.
- As indicated during the firmware upgrade procedure – a firmware upgrade will erase all saved data on the device. Do a firmware upgrade first or re-transfer/save a saved project design file to the processor device after the processor firmware upgrade is complete.
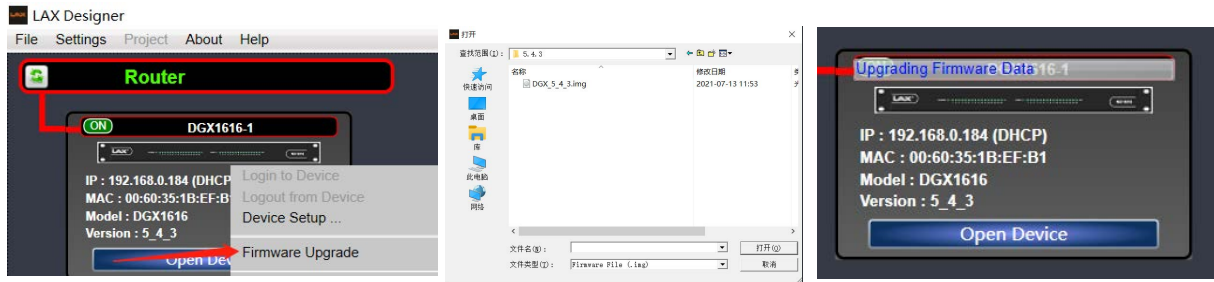
15. @U Console Software - Project View/Design Mode:

You are able to work with the LaxConsole software without being connected to the network and processor but for the purpose of this guide example we are establishing a network connection first before beginning to work on a New Design Project.

In the following example the processor is connected and operational.

New Design Project

If you are still in the **Network View** window (or in the Project View window) – Go to **"File"** at the top left and select **"New Project"** in order to begin a new DSP design project - as shown at right.
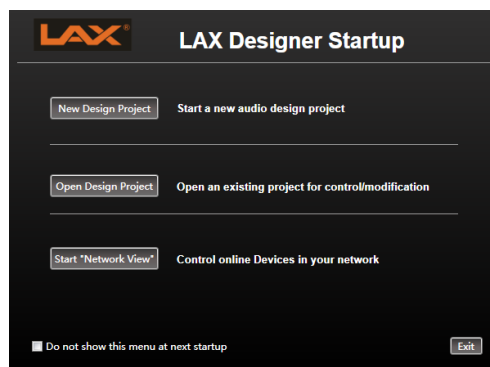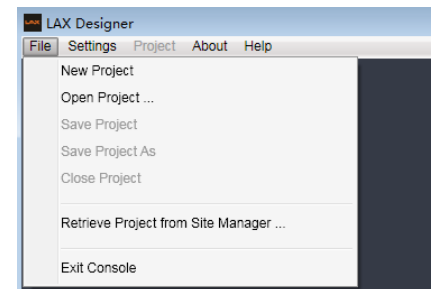
If you have just opened the software - from the **@U Console Startup** window you can select **"New Design Project"** in order to begin a new DSP design project.
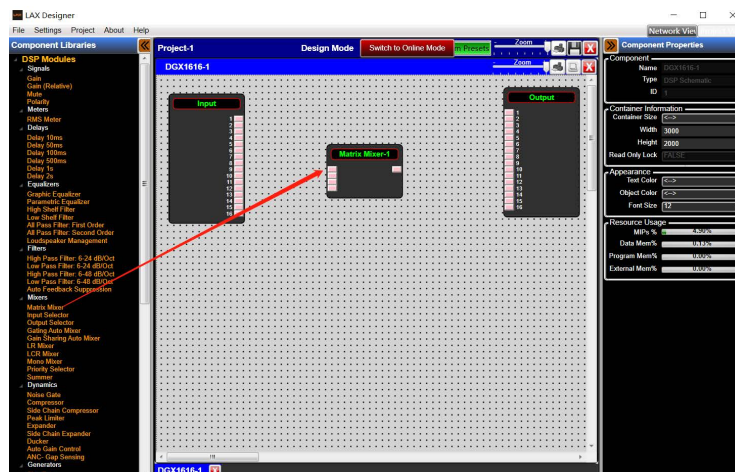
Processor Module – DSP Schematic Design Page

(a) Double-Click on the red DGX 1616 processor module shown above to open it and to access its DSP schematic design layout page – defined by a grey dotted work area (not white).

(b) The DSP schematic design page has 'Input', 'Output' and 'Logic' DSP modules already inserted and shown by default.

(c) Notice that once you've opened up the DGX DSP module to display the DSP schematic design page that under the **Component Libraries** at the left – the list of **System Components** has been replaced by **DSP Modules**. DSP modules that can be dragged and dropped into the DSP schematic design page to create your DSP design schematic.

16. @U Console Software - Creating Your DSP Design Schematic:

For this design example, we will create a very simplistic speaker crossover DSP schematic.

(a) Enlarge the opened, grey dotted DSP Schematic design page, move the Input and Output DSP modules to the left and right and the two logic modules out of the way (since we will not be using them this time) to create a larger DSP schematic work area – as shown below.

(b) As shown below - under **DSP Modules** on the left - drag and drop a **Matrix Mixer** onto the schematic design work area. (Click on the grey dotted DSP schematic design page to open the Components Library and the list of DSP modules if it is temporarily hidden).

information (source & destination labels) and more can be adjusted & labeled in this menu.

Processor Module

DGX is an open architecture DSP and you use the LaxConsole drag and drop software to create your own specific DSP design layout for each project application.

(a) From **System Components** in the **Component Libraries** on the left of the Project View/Design Mode work area – click and drag the **8；L 16‰** processor module we will use for our design example and drop it onto the **Project View/Design Mode** work area as shown below.
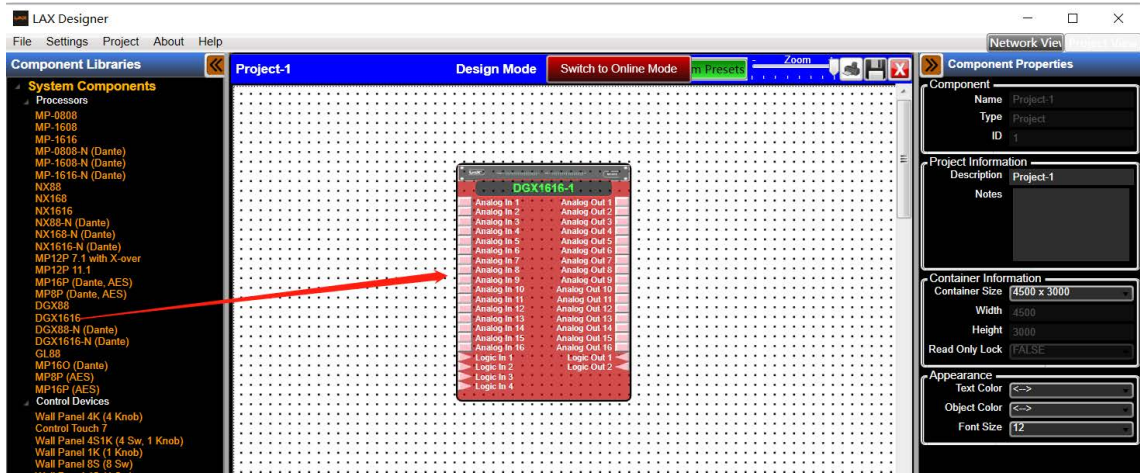
(b) You will notice that the red DGX1616 processor module placed in the project view work area is a light see through red color.

Processor Module / Project View

(a) With the red DGX 1616 DSP module placed in the Project View work area we can create the overall project view of the application design by dragging audio source and other audio components into the work area and wiring/connecting them to the processor module to then represent the other physical audio components that are connected to the physical DGX processor. As shown below on Page 14.

(b) As shown below, we have added source and playback audio components. We are able to label the DGX processor and audio components as well as connecting cable types and ID's by clicking them and using the **Component Properties** menu at the right. If you click the white work area to open the Project Information section in the Component Properties menu you can type a project description (project name) and project notes into that section of the menu. If you select Project in the top menu and select Export Bill of Materials to File you can create/print a bill of materials listing the DGX components along with the cable types and other information on this Project View page.
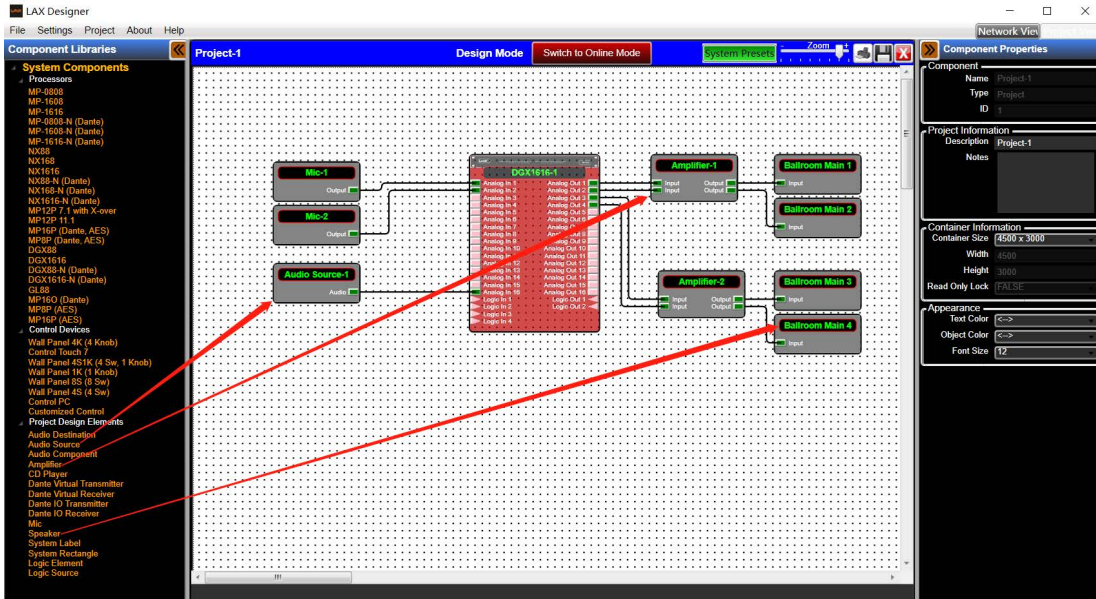
Map Physical Device

(a) Next, with the DGX 1616 processor module for this application placed in the software's **Project View/Design Mode** work area as above (and when the processor device is connected to the LaxConsole software) we need to **Map** or connect the DGX's software processor module in the work area with the actual physical DGX processor device that is connected to the PC via the network connection. **To Map the physical processor device**,
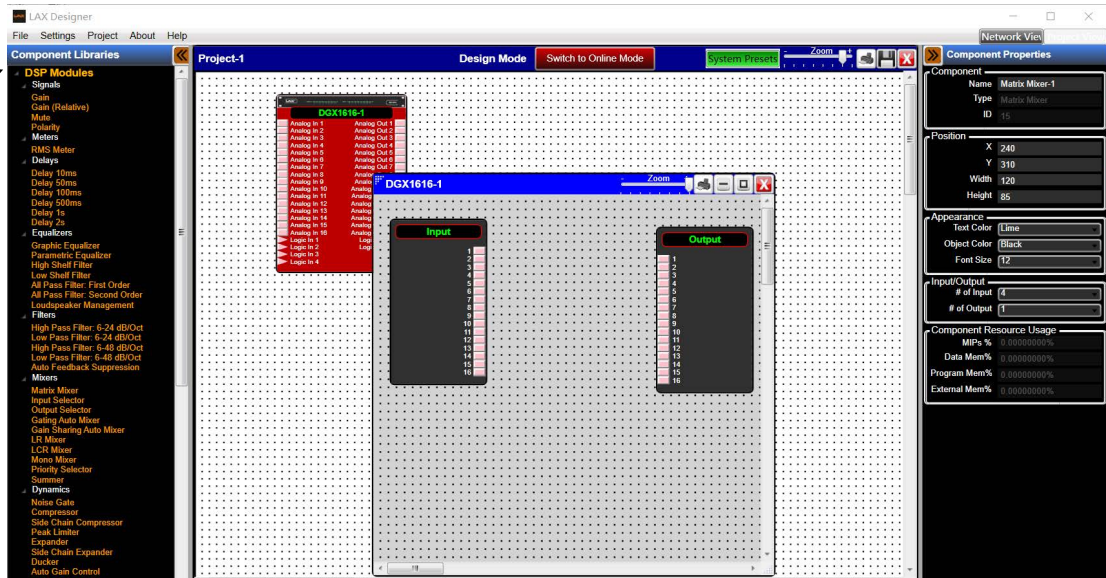
(b) Right click the DGX processor module in the Project View/Design Mode work area; Select **"Map Physical Device"** and then select the processor device model you are working with from the drop down list – as shown at right.

(c) As shown below on Pg 15, once mapped you will notice that the software processor module in the Project View/Design Mode work area has turned from light see through red to a solid red – indicating successful Mapping (connected to physical device).
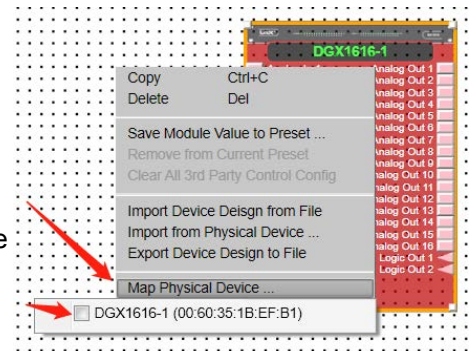
(This Mapping procedure can be done later if you have no physical processor to connect to at this time. Simply continue with your DSP design work, save as you go, and Map the software processor to the physical processor when one is connected and when you want to be able to transfer/save your DSP design work into the physical processor device)
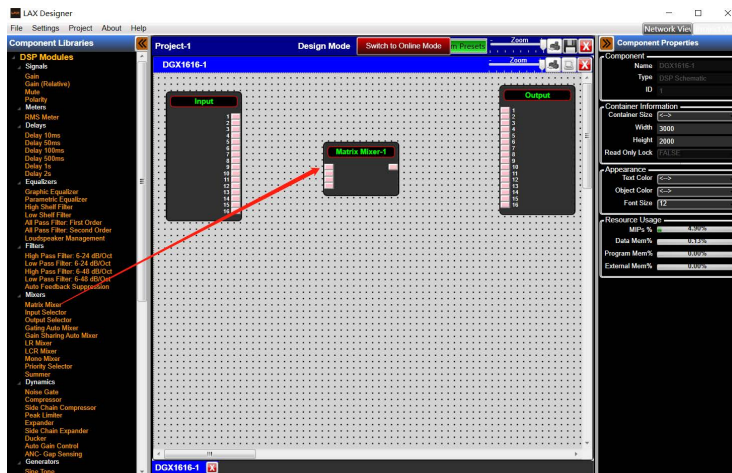
Processor Module – DSP Schematic Design Page

(a) Double-Click on the red DGX 1616 processor module shown above to open it and to access its DSP schematic design layout page – defined by a grey dotted work area (not white).

(b) The DSP schematic design page has 'Input', 'Output' and 'Logic' DSP modules already inserted and shown by default.

(c) Notice that once you've opened up the DGX DSP module to display the DSP schematic design page that under the **Component Libraries** at the left – the list of **System Components** has been replaced by **DSP Modules**. DSP modules that can be dragged and dropped into the DSP schematic design page to create your DSP design schematic.

16. @UI Console Software - Creating Your DSP Design Schematic:

For this design example, we will create a very simplistic speaker crossover DSP schematic.

(a) Enlarge the opened, grey dotted DSP Schematic design page, move the Input and Output DSP modules to the left and right and the two logic modules out of the way (since we will not be using them this time) to create a larger DSP schematic work area – as shown below.

(b) As shown below - under **DSP Modules** on the left - drag and drop a **Matrix Mixer** onto the schematic design work area. (Click on the grey dotted DSP schematic design page to open the Components Library and the list of DSP modules if it is temporarily hidden).

(c) The Matrix Mixer as dropped/placed in the schematic design area arrives as a 1x1 I/O Matrix Mixer**. As shown above**, I have already re-sized the Matirx Input from 1 to 4 inputs for our design example.

(d) To **Re-Size** the Matrix Mixer I/O (or any module), click it so it is highlighted in Orange (if not already highlighted) and see the **Input/Output** section of the Component Properties menu on the right. As indicated with the Blue dropdown selection above on Pg 15 & below, I have chosen to re-size the output side of the Matrix Mixer to 4 outputs – creating a 4x4 Matrix Mixer (as shown below).

(e) **Next**, from DSP Modules on the left, drag and drop a **High Pass Filter** (6-24 db/Oct); a **Low Pass Filter** (6-24 db/Oct); and a **Peak Limiter** onto the grey dotted, schematic design area and re-size each as we did with the Matrix Mixer – as 2x2 Filters and a 4x4 Peak Limiter.

(f) Once completed, **Minimize** the **Component Libraries** menu on the left using the orange double arrow symbol so we can create a larger work area to better continue our DSP design work (positioning, wire DSP modules, label Source/Destination connections, open and configure DSP modules, etc) – as shown below.
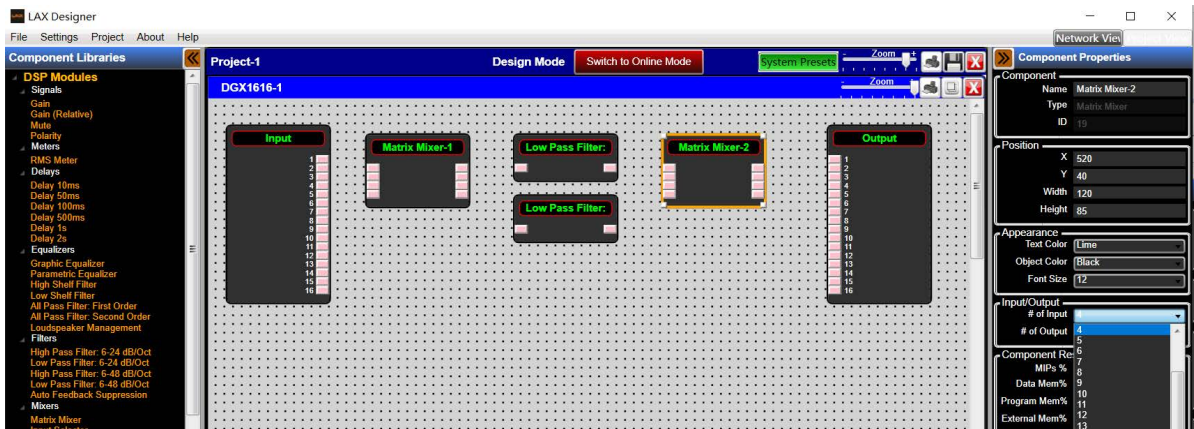

(g) **Next**, as shown below left – point, click, and drag from one DSP module I/O connection node to another. Release when the destination node is reached and it turns red to create a "wire" connection between the two modules I/O. Alternatively, you can highlight a box around multiple nodes (capture them) to make more than one connection at a time.

(h) As shown below right - connect the first 4 connections from the **Input** module to the **Matrix Mixer**. You can name the source and destination labels of each DSP modules inputs/outputs by pointing at and clicking on a "wire" and typing in the label name under the appropriate Source or Destination Label in the Link Information section of the **Component Properties** menu on the right hand side of the work area page (that is why it remains open).

Alternatively, you can copy and paste modules by highlighting the desired modules and pressing **ctrl+c** to copy and then **ctrl+v** to paste or selecting copy/paste from the right-click menu.
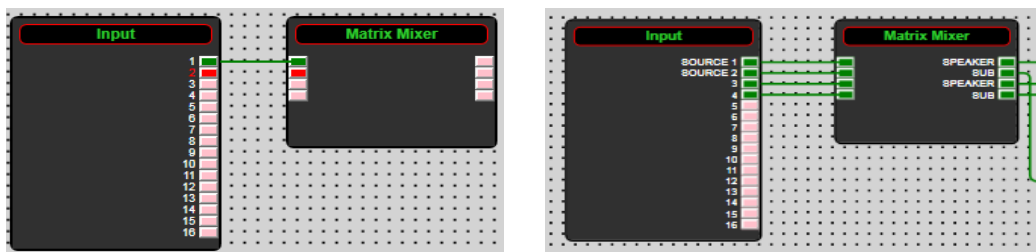
(i) As shown below, wire/connect the balance of your DSP modules - Matrix outputs 1 & 3 to the High Pass Filter; Matrix outputs 2 & 4 to the Low Pass Filter; Filter outputs to the Peak Limiter; Peak limiter to the Output module (point and right click to delete a wire connection). Label each DSP modules source and destination I/O as you desire.

(j) By clicking a DSP module you can re-label it in the Component Properties menu (we re-labeled the Analog Input module to House Mixer). **This completes the DSP design example**.
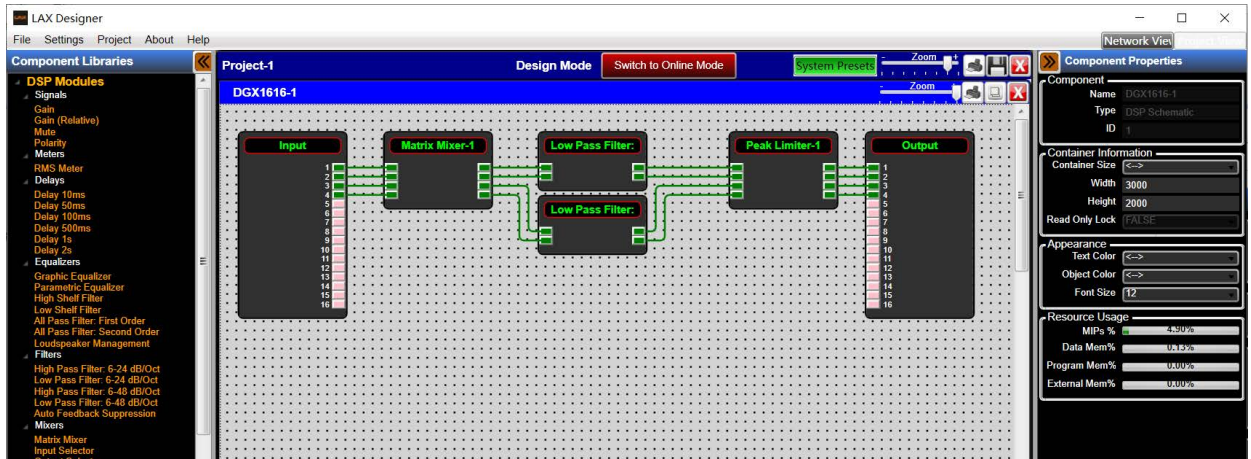

- New to LaxConsole **v5.2.1** – We support printing of Project System Overview and Device Schematic Design to JPEG files for documentation purposes. See the **Print Project to JPEG File** printer symbol button to the right of the Zoom slider at the top right.


DSP Module Parameters – Open and Adjust

(a) Double clicking any DSP module will open it and display the modules parameter controls.
(b) All but one of the DSP modules are shown opened below.
(c) I have also now minimized the Component Properties menu to provide more work space.
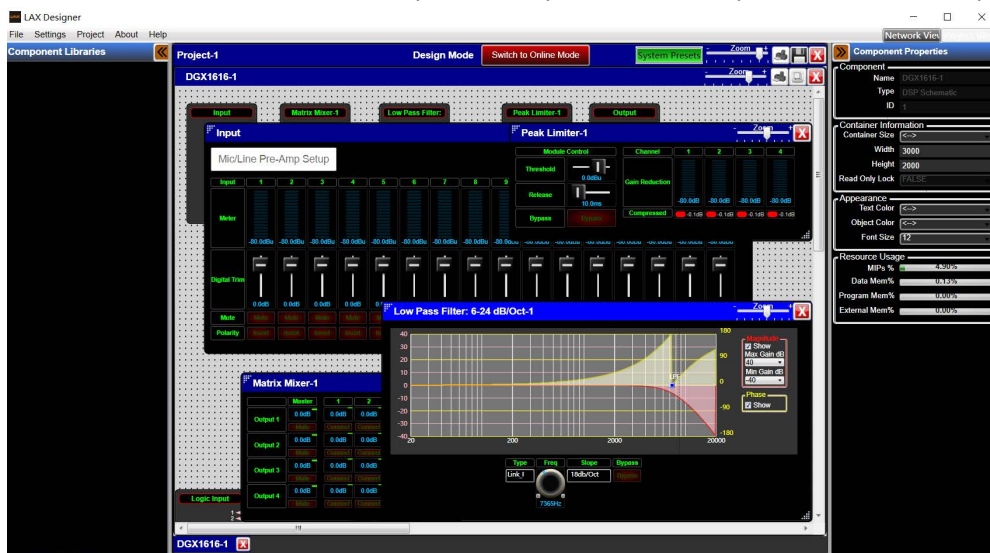
(d) Double clicking on the **Analog Input** DSP module (re-labeled as House Mixer in our example) provides access to the Master Input – Polarity, Mute, Digital Trim, & Meters (below left) as well as the processors **Mic/Line Pre-Amp** controls by way of a secondary Grey select button at the top left of the **Input** DSP module.
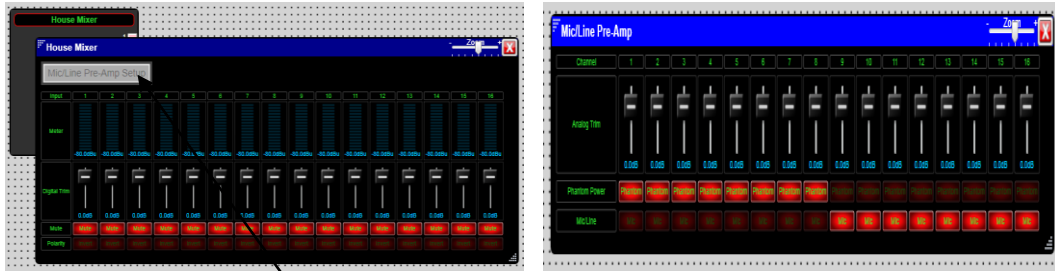

(e) Click the grey **"Mic/Line Pre-Amp Setup"** button in the opened Analog Input module (House Mixer) window above left to display and adjust the processors **Mic/Line Pre-Amp** parameters - Mic/Line selection, Phantom Power and Analog Trim (shown above right).

(f) Make appropriate parameter adjustments as required.

(g) **Nex**t, double-Click on the **Matrix Mixer** to open up the routing matrix. Here input sources are assigned to any or all outputs. Ensure that Input 1 routes to Output 1, Input 2 to Output 2 and so on as shown at right. The **Connect** button ensures that the signal routes to the associated output. Turn the Connect Button OFF when you want to mute the signal going to the conflicting outputs. The Matrix screen shot at the right displays the correct routing assignments for our design example.


• For the sake of this example, we are going to designate Outputs 1 and 3 as speaker channels (high frequencies) and Outputs 2 and 4 as subwoofer channels (low frequencies).

(h) Double click to open the **High Pass Filter** DSP module. Set the **Type** to Butterworth. The **Slope** to 18 dB/Oct and set the cutoff **Frequency** appropriately.

(i) Open the **Low Pass Filter** DSP module. Set the **Type** to Butterworth. The **Slope** to 18 dB/Oct and set the cutoff **Frequency** appropriately.
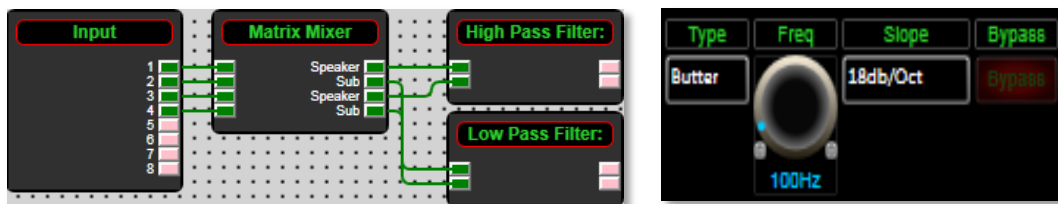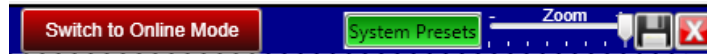

(j) Double-Click the **Peak Limiter** DSP module to open the limiter's DSP parameters. Ensure that the threshold is set to 0dB or less.

- **That completes our design example, DSP module parameter settings**.
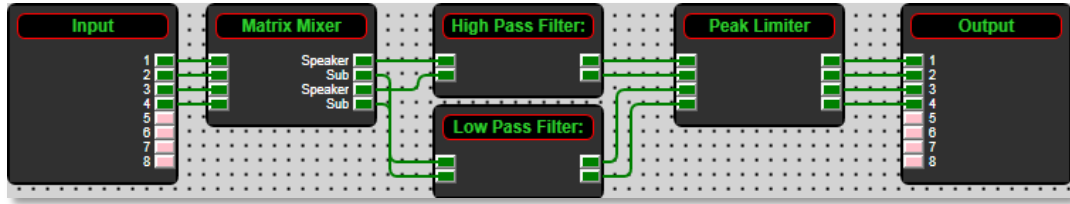

17. Save Project:

(a) Click the **"Save Project" Disc** located to the right of the zoom control in the Project View/Design Mode work area to "Save Project As" or "Save" your DSP design project (each time a DSP adjustment or change is made the Save Project Disc will reappear) **OR** Select **"Save Project As"** under the **File** menu at the top left of the application to name and save your design project or **"Save Project"** to save as you work.

(b) **This saves the DSP design project you are working on to your PC/Computer (not to the physical processor device). See Switch to Online Mode below to accomplish that).**

(c) We recommend that you **Save As** the project file twice. Once to create a **Master File** and a second time to create a **Work File**. Continue working with the Work File (or a file name of choice) and the Master File is protected should you ever need it. At the end of the project – continue running the system with the Work File, rename it to Master Ver 2, or other.

18. Switch to Online Mode: (Transfer/Save DSP design project to the physical processor device)

Once your DSP design project and parameter adjustments are completed (and saved to your PC) you can **Transfer/Save** your work to the connected processor device. **To do this**,

(a) Select the red **"Switch to Online Mode"** button (not visible if a network interface is not detected – you are working Offline) at the top center of the **Project View / Design Mode** work area page – as shown above & below on **Page 20**.

(b) This button selection performs two functions at the same time – it transfers or saves your DSP design project to the connected processor device and that processor is now Online/Live.

(c) Follow **Permission** Instructions menu shown below **carefully**. Once permissions are given a **Preparing Devices. Please Wait…** prompt will appear once the process begins of transferring / saving your DSP design project to the physical processor device.
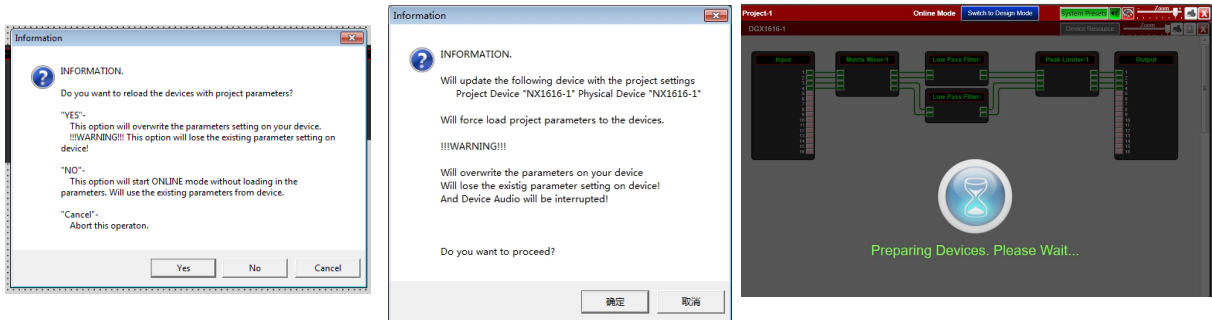
(d) Any problems – check Auto Warning Messages in Network View regarding any Firmware Incompatibility with Software (will not load your design into device if any incompatibility).

When complete – as shown below,

(a) **Note** that the Design Mode label at the top of the page has changed to **"Online Mode"** and that the red "Switch to Online Mode" button is now Blue and has been re-named **"Switch to Design Mode"**. Thus you are able to quickly switch back and forth between Online Mode and Design Mode.

(b) **Note** that the **Tool Bars** at the top of the **Online Mode** page, the opened DSP schematic and the two opened DSP modules shown are now Red (not blue) indicating that the hardware and software are in **Online Mode.**
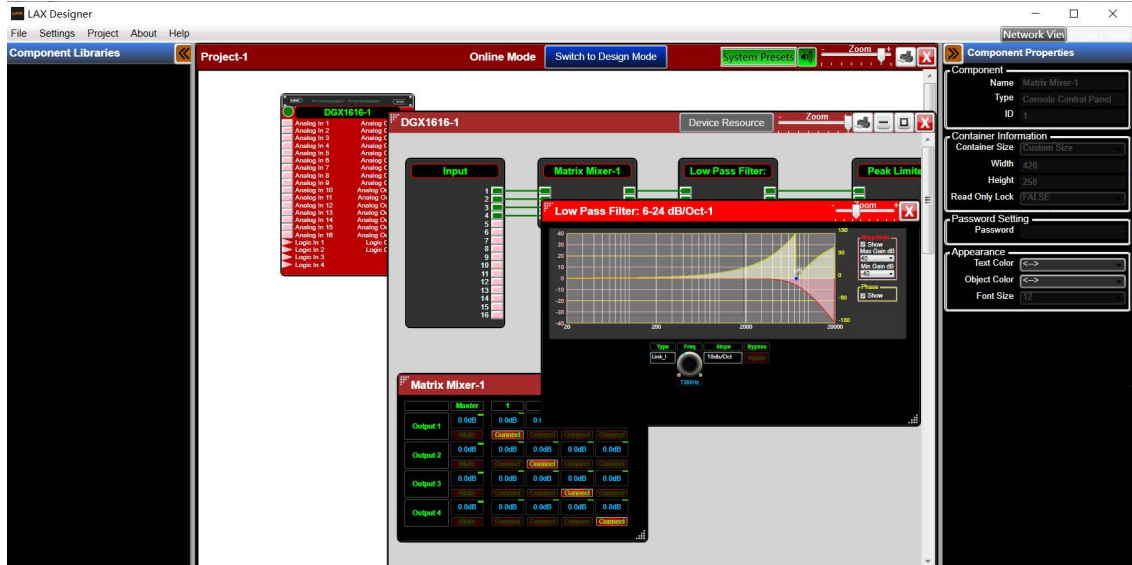
(c) **Note** that when the red processor module is visible as it is above that the processor device model has a green indicator beside it to indicate that the processor device is connected, is in Online Mode and active.

(d) **Note** that you can continue to make adjustments to the DSP modules in **Online Mode**. When you do, upon switching back to **Design Mode** you will be asked **"do you want to copy the Online Device parameter changes back to your project (file) – yes or no".**

So you can make parameter adjustment changes to the DSP modules in **Online Mode**, hear their effect live, and not affect the related DSP design project file as saved on your PC if you select "**No**" from that menu. Or select **Yes** to modify your saved project file and continue working or **Yes** and **Save As** immediately to save the changed processor settings to a new project file – thus protecting the original project file. Then continue working.
Be careful here not to write over a saved project file by mistake.

(e) **Note** the green **"Mute All Devices"** speaker symbol button at the top of the **Online Mode** page to the right of the System Presets button.

19. Working Offline:

Of course you can work on a DSP design project and save it to a file while "**Offline**" - no network interface detected / no processor connected, no Map Physical Device action taken, and without transferring / saving your work to the processor device right away. Then later, connect processor, Map Physical Device, open your saved project, and transfer/save your saved DSP design project file to the connected processor device by selecting the "Switch to Online Mode" button.

20. Open Design Project:

Open Design Project or **Open Project** is where we open or access previously worked on and saved DSP design project files - as compared to creating a New Design Project as we did above.

- From the software **@U Console Startup** window – Select **"Open Design Project"** and select and open the specific DSP design project saved in your PC (.pjxml files).
- Or - From the **Network View** or **Project View** window - Go to **"File"** at the top of the page, select **"Open Project"** and select and open the specific DSP design project saved in your files.
- In both cases the saved DSP design project once opened will appear in your Project View/ Design Mode work area. Double click the red processor module in the work area to view the saved DSP design project schematic. Double click DSP modules to open them and make parameter adjustments as required.
- Save your work as you go and the balance of your work operations are the same as described above in New Design Project.

21. Open Device: (Quick Access to a Programmed Processor Device)

If you are connecting to a processor device that has already been programmed with a DSP design project and you need quick access to the processors DSP to check out its settings or to make new "Live" DSP module parameter adjustments,

(a) Connect to the processor device.
(b) Open the LaxConsole software.
(c) From the **@U Console Startup** window select **Start "Network View"**.
(d) In the Network View window as shown at the right - make sure the network connection indicator to the left of the processor device model is Green/On (connected and operational).
(e) At the bottom of the Network View page see **"Open Device"**.
(f) Select **"Open Device"** to open the DSP design project saved on the connected physical processor device.

(g) Once open - the processors DSP is active (live) now just as it was/is in Online Mode.
(h) Double click DSP modules "if" you need to open and make parameter adjustments to the DSP modules in real time.
Note 1: Any parameter changes you make from **"Open Device"** mode will only be maintained in the processor device itself and can Not be saved to the specific DSP design project file as saved on your PC. Thus no one can accidently alter the original saved project file while working in the **Open Device** operating mode.
Note 2: You must be working with that same, specific DSP design project file as saved on your PC and working in **Project View/Design Mode** and **Online Mode** in order for parameter

changes made to the physical processor device while in **Open Device** mode to be accessible and savable to your PC project file – and there are safety reminders and permissions required in order to accomplish that to protect your original as-saved design project file. On switching to Online Mode from Design Mode, if you answer **No** to permissions the processor is not loaded with the saved project file and thus any changes to the processor settings made in **Open Device** mode are visible. On switching back to **Design Mode** you have two options – save the processor settings back to the project file (Yes) or not (No)]. **So proceed carefully in this regard so as not to over write your original file if that is not the intent.**

Note 3: A continuation from Note 2 above - you are able to **Export** the settings in the physical processor device to a separate design file (.sxml file). Use as a reference file for changes made, as a recovery file, or import that file into LaxConsole as a new project design. To **Export** the processors settings - right click the processor in **Network View** and select **Export Device Design To File**.

22. 8 ; L DSP Remote Control

The DGX processor can be remotely controlled using its LaxConsole software GUI, from any PC using our PC control designer, with the logic input/relay output ports, using the optional WallPanel Series - Mini and Touch model programmable wall controls, using your own Android device via our free Control/Touch software, via your iOS, OSX, or Android device using the browser control feature in our optional Centro SM1 site manager, or any third party controller.   See www.lax-pro.com for spec sheets and information or contact Lax using the contact information provided on the web site or here on Page 1.

23. Additional Operational Guidance

That should get you connected, operational, creating new DSP design projects, opening and working on saved DSP design project files, transferring/saving your DSP design projects to the processor, and working in Online mode and Open Device mode.

- For more detailed operational guidance (regarding Presets and other topics) please see the detailed User Manual that can be viewed in the LaxConsole software "Help File"; information on the USB drive packaged with each processor (this Quick Start Guide can be found in both locations as well);or contact Lax via our web site or this guides contact information on page 1.

Again, from everyone here at Lax Audio Design, thank you for your support.

Kind regards,
support@lax-pro.com