APPLICATION NOTES

QSYS PLUG-IN FOR MEZZO V.1.5

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This document is intended to assist the user in deploying the QSYS Plug-in for Mezzo v.1.5. The plug-in is designed to control, gain, mute, and configuration for the Mezzo input, matrix, and output sections. The Plug-in also monitors Global Alarms, Channel Alarms, Input Signal Presence, Input Signal Clip Output Channel Headroom and Network Settings.

Requirements

There are a few requirements to run the Plug-in and control Mezzo:

- Powersoft Mezzo Amplifier, Model: 322 A, 322 AD, 324 A, 324 AD, 602 A, 602 AD, 604 A, 604 AD, with v.1.1.0.22 or later firmware.
- QSYS Core with QSYS Designer v.8.0 or later software and firmware.
- Powersoft Armonía Plus Software v.1.4 or later.

Preparation

In preparation for the use of the plug-in, the user needs to set, or discover the IP address on the amplifier. Mezzo by default is set to receive an IP address from a DHCP server. If there is no DHCP server on the network, the Mezzo will default to an address within the IP subnet: 169.254.X.Y, where X and Y are variable and unique to each unit.

Following are the steps to connect to the Mezzo and read it is IP address:

1. Connect the Mezzo and the PC to the same network.
2. If there is no DHCP server available, set the PC Network Interface Card (NIC) to an address within the subnet 169.254.X.Y, otherwise, skip to the next step.
3. Open Armonía Plus software and hit “Match”, then “Discovery.” The Mezzo should appear under the list of amplifiers discovered on the network. By hovering the mouse over an amplifier its current IP address will be displayed.

Following are the steps to set the Mezzo IP address:

1. Click on and drag the Mezzo from the Discovery column into the Workspace.
2. Click on “Config” and select the Mezzo to be configured in the Workspace.
3. Under “Select Mode” choose “DHCP” if a DHCP Server is present on the network and the Mezzo is due to have a dynamic address, or “Static” to assign a static IP address to the Mezzo. The IP address must be a member of the subnet the QSYS core is operating within.
4. Click “Apply” and close Armonía Plus.

Important Note:
It is important to close Armonía Plus to insure accurate communication between the Mezzo and the QSYS Plug-in.

Installation

The plug-in will come as a ".qplug" Lua Source Code file. Following are the steps to install the plug-in for use with QSYS to control Mezzo.

1. Once the plug-in is downloaded, deposit the file *Powersoft Mezzo v.1.5.qplug* into the PC's folder: C:\Users*UserNameHere*\Documents\QSC\Q-Sys Designer\Plugins.
2. Close QSYS Designer and re-open it.
3. The plug-in will appear in the "Plugins" tab (Figure 1) under Powersoft. Click on it and drag it into your design.

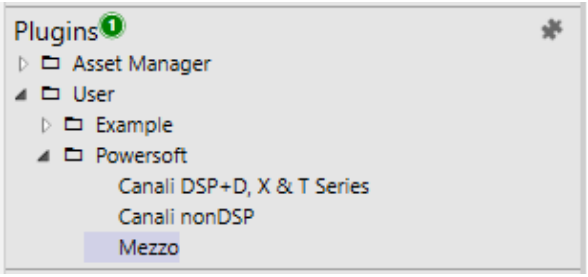

Figure 1 – Screenshot of Plugins section of QSYS Designer.

Getting Started

Following are the steps to get started with the plug-in:

1. Select the "Powersoft Mezzo Series QSYS Control Module v.1.5" plug-in in the design.
2. Choose the model to control in the QSYS Properties pane (Figure 2).
3. Expand and connect any control pins you wish to incorporate into the design (Figure 3).
4. Enter a local UDP Port between 1024 and 49151. If controlling multiple Mezzo, each instance of the plug-in must have a different local UDP Port (Figure 4).
5. Enter the IP Address of the Mezzo you wish to control into the text field (Figure 5).
   Important Note:
   Please know that once the IP Address has been entered, the user is controlling the Mezzo at that IP address. Any further action is writing to the unit.
6. Click on the *Link* button to begin the initial amp settings read process and to begin the polling/connection scheme (Figure 5).

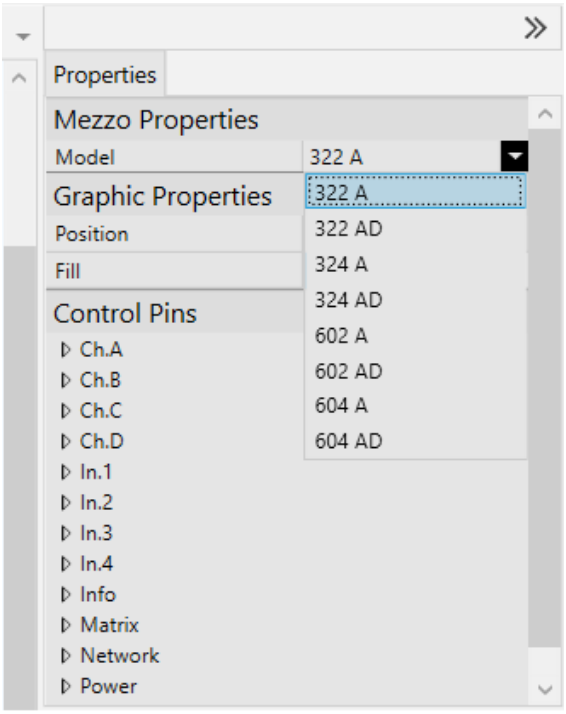

Figure 2 – Screenshot of QSYS Designer's Properties Pane.

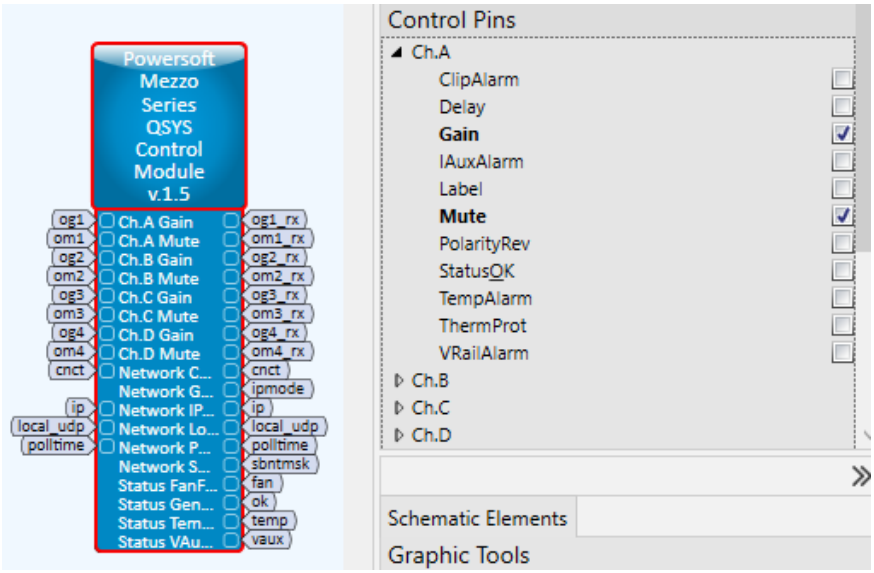

Figure 3 – Screenshot of Control Pins of the Plug-in QSYS Designer.

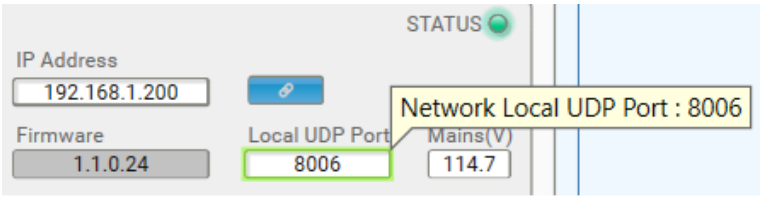

Figure 4 – Screenshot of Local UDP Port text field.

Figure 5 – Screenshot of IP Address text field and Link button.

Features

Following are a list of the plug-in features:

- In the top left corner of the plug-in's Main page the *Model* of the Mezzo amplifier is listed. Initially, the Model is selected in the Properties Pane by the user. It is updated when the user clicks the *Link* button and the plug-in begins reading from the amplifier.

- The Power button is used to manually put the Mezzo into Power-On, or Standby Mode. Automatically, the Mezzo will power on when AC power is applied to it and stays on until audio drops below -60dBFS in the input section for more than (25) minutes. It will then go into Standby Mode automatically. When audio signal is applied, the Mezzo will power on and pass audio within (2) seconds.

Important Note:
If the application requires it, the integrator can disable AutoStandby for the Mezzo in Armonía Plus Software on the Tools/Options tab.

- The momentary *Blink* button will engage the (10) second LED Blink sequence. The Blink function can help to verify communication and identify the Mezzo.

- The *Name* text field is for the Nickname that will live on the amplifier. This text field is limited to (16) characters.

- The text entry field *IP Address* is available for the user to enter the IP Address of the Mezzo due to be controlled:
    - The IP address must be a 32-bit numeric IPv4 address written as (4) numbers separated by periods.
    - If the IP address is invalid a warning will appear on the *Status* LED for a few seconds.

- The text entry field *Local UDP Port* is available for the user to enter the local UDP port the Core will use to receive messages from that Mezzo:
    - The acceptable range is from 1024 to 49151
    - The plug-in transmits to the Mezzo on UDP Port 8002. This is set statically within the Application Programming Interface (API). The local UDP port is used to distinguish the plug-in from other instances that are running within the QSYS design when receiving solicited messages from Mezzo.
    - When controlling multiple Mezzo amps with multiple instances of the plug-in, each instance must have a unique Local UDP port number.

- The read only field *Mains(V)* will display the Mains AC voltage applied to the Mezzo. This control will read "Standby" when the Mezzo is in Standby Mode. The Mezzo API ceases to transmit the *Mains(V)* control when in Standby Mode.

- The *Link* button behaves according to toggle logic. Once a valid IP address is entered and the *Link* button is pressed, the plug-in reads all settings and information from the Mezzo and begins the polling and simulated UDP connection sequence.

- The *Status LED* is a virtual LED can indicate several conditions in the Mezzo.
    - A general status of "OK" and **green** LED color is to be expected when the amplifier is running normally.
    - There are fault warnings accompanied by a **red** LED color for the following conditions: Invalid IP Address, Connection Fault, Temperature Fault, Fan Fault, and Main Voltage Fault. If the user witnesses a **red** LED color they can hover over the LED and a flag will indicate which alarm has been triggered.

- *Serial Number* is a read-only field showing data read from Mezzo. Listed is the hardware serial number on the Mezzo. It is read each time the user clicks the *Link* button.

- *Firmware* is a read-only field showing data read from Mezzo. Listed is the firmware version that lives on the amplifier. It is read each time the user clicks the *Link* button.

- The Input section is made up of the following controls (Figure 6):
    - *Input Label* – This label lives only within the QSYS environment and is not associated with a parameter in the Mezzo API.
    - *Backup Strategy* – This control determines whether the fail-over source selection for an input is automatic ("Auto") based on signal presence or forced ("Force") based on a user selection.
    - *Source Priority n* – This input source slot is the n^{th} priority of the fail-over source selection scheme if the Backup Strategy is in "Auto" mode for that input channel.
    - *Source Priority Force Button* – These blue buttons adjacent to each input source slot appear when the user selects "Force" for the Backup Strategy. These controls force that input slot to play as the input's priority source when selected.
    - *Signal Presence n* – This indicator will show if the source in the input slot is sounding when the Input Channel is in "Auto" Mode. This indicator can be deployed to show the user which of the Input Source Priority Slots has taken the priority. The indicator turns from **green** to yellow when signal is present in the Input Source Priority Slot.
    - *Signal Clip n* – Whether the Input Channel is in "Auto", or "Force" Mode, if the signal in the Input *Source Priority* Slot clips, a **red** indicator will apear over the *Signal Presence*, or *Source Priority Force Button*.
    - *Input Gain* – The gain for the input channel. The range is from -60dBFS to 0dBFS.
    - *Mute* – The Mute control for the input channel. The icon change is feedback from the Mezzo confirming that the input is muted.

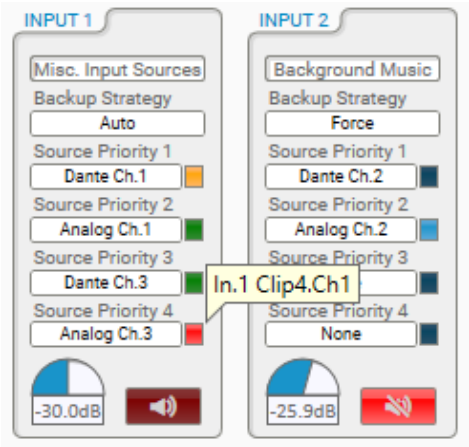

Figure 6 – Screenshot Input Section.

- The Matrix section is made up of the following controls (Figure 7):
  - *Output Select Buttons* – Pushing one of these (4) buttons will display the mix of matrix input channels and mute orientation with respect to the matrix output channel which is selected. The choices are matrix output A, B, C & D. Upon start-up ***A*** output select button is engaged. These buttons work according to interlock logic. Only (1) button can be active at a time.
  - *Matrix Reset Button* – This momentary button resets the visible mutes to off and assigns the gain of the corresponding input to output cross-point to 0dBFS. This action simultaneously assigns the gain of the other (3) cross-points to -60dBFS. This action is only applied to the matrix cross-points associated with the matrix output which is currently selected and in view.
  - *Input Label* – Above each matrix gain and mute control is the input label. This label lives only within the QSYS environment and is not associated with a parameter in the Mezzo API.
  - *Matrix Gain* – Each matrix cross-point has a gain associated with it. Only (4) gain knobs are shown at a time. That which is shown is the mix of the (4) matrix inputs to the selected matrix output.
  - *Matrix Mute* – Each matrix cross-point has a mute associated with it. The icon change is feedback from the device that the cross-point is muted. That which is shown is the configuration of the mutes for the (4) matrix cross-points indicated by the active Output Select button.

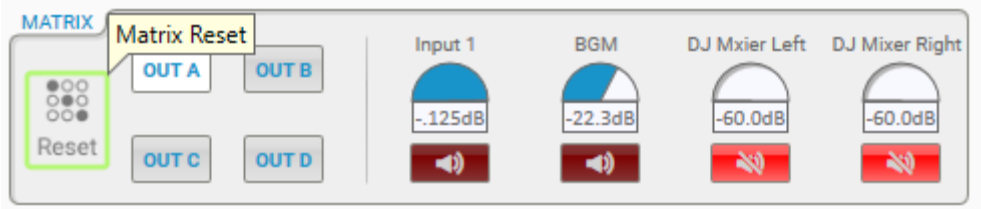

Figure 7 – Screenshot of Matrix Section.

- The Output Section controls the *User EQ* section of the amplifier (found in Armonía +) and is made up of the following controls (Figure 8):
    - The *Channel Status LED* – This virtual LED can indicate several conditions in the Mezzo for the output channel.
        - A general status of "OK" and **green** LED color is to be expected when the amplifier channel is running normally.
        - There are fault warnings accompanied by a **red** color for the following channel conditions: Temperature Fault, Thermal Limiting Fault, Clip Signal Fault, Voltage Rail Fault, and Current Rail Fault.

    - *The Output Label* – This label lives entirely within the QSYS environment and is not associated with a parameter in the Mezzo API.
    - *Headroom* – A useful control which demonstrates the available dynamic range the user has on that output channel. The range depicted is from greater than (>) 24dB to -12dB: The blue LEDs Indicate 6dB steps of reduction in the headroom available below the limiter threshold for that channel.
        - The first yellow LED indicates a gain reduction of 0 to 6dB due to limiting.
        - The second yellow LED indicates that the output is experiencing a gain reduction of 6 to 12dB.
        - The red LED indicates a gain reduction of more than 12dB.

    - *Gain* – The gain for the output. It ranges from -60dBu to +15dBu.
    - *Polarity Invert* – A toggle button which will invert the polarity of the output channel.
    - Mute – The Mute button for the output channel. The icon change is a result of feedback from the Mezzo confirming that the output channel is muted.
    - Delay – The amount of delay applied to the output channel. The output delay range is from 0.0ms to 100.0ms with refinement to 1/100ms.

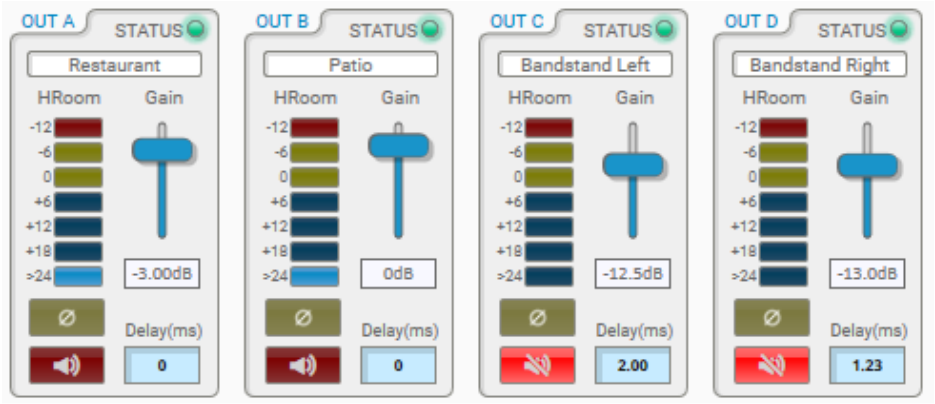

Figure 8 – Screenshot of Output Section.

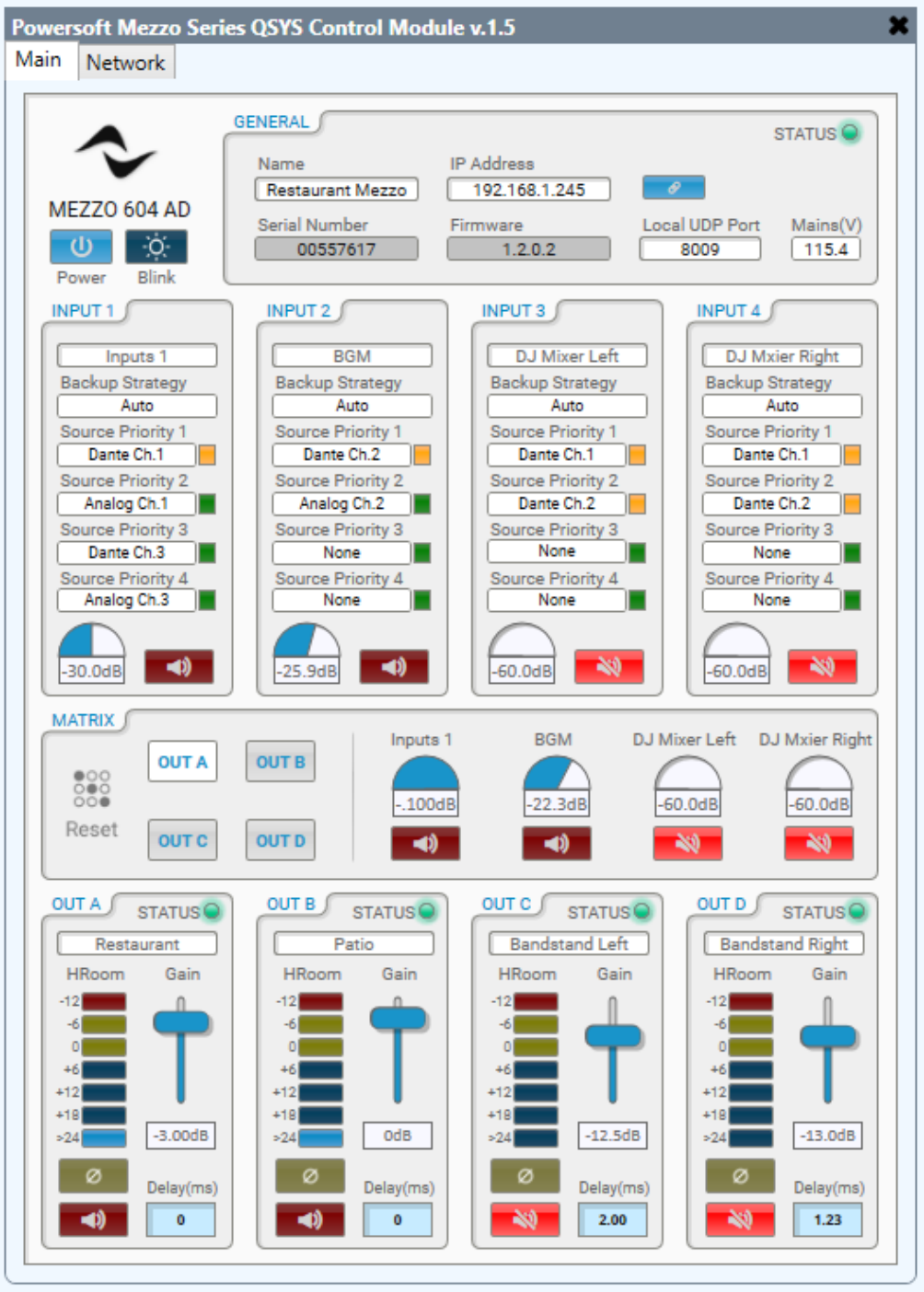

Figure 9 – Screenshot of Plug-in Main Page.

- The Network page has many identical controls to the Main page. These controls include: *Power, Blink, Nickname, IP Address, Link, Serial Number, Firmware, Local UDP Port, Mains(V),* and the *Status LED.*
- The Network page also has read-only text fields for the Mezzo network settings, such as: *Subnet Mask, IP Mode* (DHCP, or Static) and the *Gateway* address.
- The final field on the Network Page is for a user designated *Poll Time*. The QSYS plug-in is polling for the Mezzo amplifier's headroom, channel status and general status 1x for every poll period. The choices for the poll period range from (1) to (5) seconds.

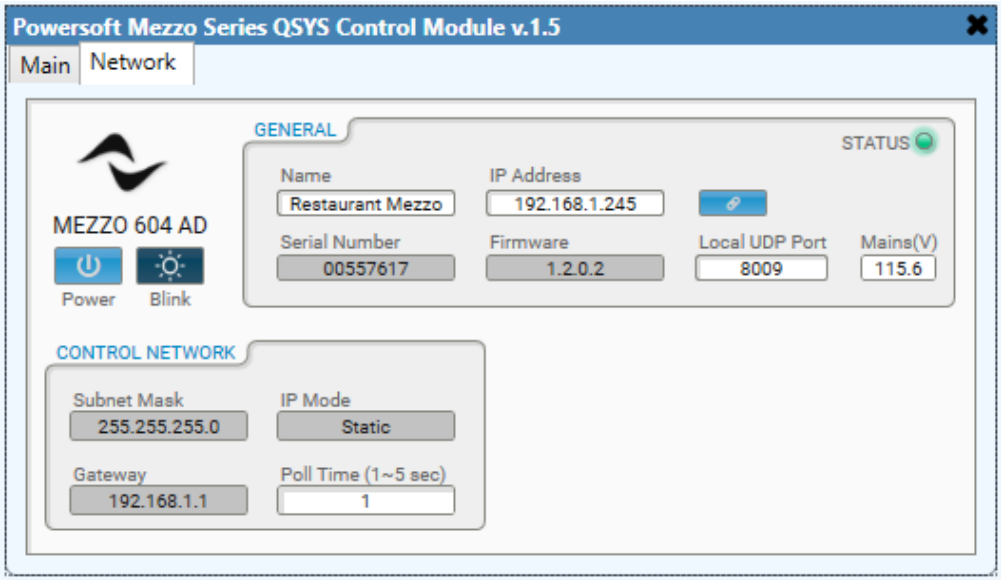

Figure 10 – Screenshot of Plug-in Network Page.

Final Comments

- It is important to close Armonía Plus to insure accurate communication between the Mezzo and the QSYS Plug-in.

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