



Avaya Solution & Interoperability Test Lab

Application Notes for Extron DMP 128 Plus C V with Avaya IP Office Server Edition - Issue 1.0

Abstract

These Application Notes describe the configuration steps required to integrate Extron DMP 128 Plus C V with Avaya IP Office Server Edition. The Extron DMP 128 Plus C V is a digital matrix processor suitable for conferencing applications. Configuration is performed via the Extron DSP Configurator, which provides a GUI for easy visualization of all the signal paths within a single window and the ability to adjust all input levels, DSP processing parameters, mixing points, and output levels. VoIP configuration is performed via a dedicated webpage, simplifying the setup and management for IT personnel. Extron DMP 128 Plus C V registers to Avaya IP Office Server Edition as a SIP endpoint. These Application Notes also apply to the Extron DMP 128 Plus C V AT (although not explicitly tested), which only differs in that it provides DANTE support.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the configuration steps required to integrate Extron DMP 128 Plus C V with Avaya IP Office Server Edition. The Extron DMP 128 Plus C V is a digital matrix processor suitable for conferencing applications. Configuration is performed via the Extron DSP Configurator, which provides a GUI for easy visualization of all the signal paths within a single window and the ability to adjust all input levels, DSP processing parameters, mixing points, and output levels. Extron DMP 128 Plus C V registers to Avaya IP Office Server Edition as a SIP endpoint. These Application Notes also apply to the Extron DMP 128 Plus C V AT (although not explicitly tested), which only differs in that it provides DANTE support. Throughout these Application Notes, the Extron DMP 128 Plus C V will also be referred to as simply DMP 128 Plus.

2. General Test Approach and Test Results

The interoperability compliance test included feature and serviceability testing. The feature testing focused on establishing calls between DMP 128 Plus and Avaya SIP/H.323 desk phones and exercising basic telephony features, such as hold, mute, and conference. Additional telephony features, such as call forward, follow me, and call pickup were also verified using Avaya IP Office Shortcodes.

The serviceability testing focused on verifying that DMP 128 Plus returned to service after re-connecting the Ethernet cable or rebooting DMP 128 Plus.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in this DevConnect Application Note included the enablement of supported encryption capabilities in the Avaya products. Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products.

Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with these Application Notes, the interface between Avaya systems and Extron DMP 128 Plus C V did not include use of any specific encryption features as requested by Extron.

2.1. Interoperability Compliance Testing

Interoperability compliance testing covered the following features and functionality:

- SIP registration of DMP 128 Plus with Avaya IP Office Server Edition and Avaya IP Office 500 V2 Expansion.
- Calls between DMP 128 Plus and Avaya SIP/H.323 deskphones with Direct IP Media (Shuffling) enabled and disabled. Direct IP Media was supported between DMP 128 Plus and Avaya SIP deskphones with SRTP disabled at the IP Office system level.
- Calls between DMP 128 Plus and the PSTN.
- UDP transport protocol.
- Support of G.711 and G.729 codecs.
- Proper recognition of DTMF tones.
- Basic telephony features, including hold, mute, redial, multiple calls, conference, and long duration calls.
- Extended telephony features using Avaya IP Office Shortcodes for Call Forward, Follow Me, Call Unpark, and Call Pickup.
- Proper system recovery after a restart of DMP 128 Plus and loss of IP connectivity.

2.2. Test Results

All test cases passed with the following observations noted:

- During the compliance test, the Phone Dialer tool, available through the Extron DSP Configurator, was used for placing and answering calls. The Phone Dialer is designed for basic test purposes only. Typically, customers would use the Extron CCI Pro 700 TouchLink Pro Conference Room Control Interface, or one of Extron's many other customizable touchpanel devices, which provides a more robust experience and audio tone feedback for each call.
- DMP 128 Plus does not support call transfer.
- DMP 128 Plus supported conferencing by configuring the DSP to automatically mix audio from all active call appearances.
- Only one codec should be configured on DMP 128 Plus for compatibility with IP Office.
- TLS/SRTP is not fully supported between DMP 128 Plus and IP Office at this time. UDP transport over a clear line was used for the audio calls.

2.3. Support

For technical support on the Extron DMP 128 Plus C V, contact the S3 Support Hotline via phone or website.

- **Phone:** +1 (800) 633-9876
- **Web:** <https://www.extron.com/company/contactform.aspx?action=techsupport>

3. Reference Configuration

Figure 1 illustrates a sample configuration consisting of Extron DMP 128 Plus C V with Avaya IP Office Server Edition and Avaya IP Office 500 V2 (Expansion System). The DMP 128 Plus registered with Avaya IP Office Server Edition via SIP. Avaya 96x1 Series H.323 Deskphones, Avaya J129 SIP Deskphones, and an Avaya 1120E and 1220 SIP Deskphones were used for placing and receiving calls.

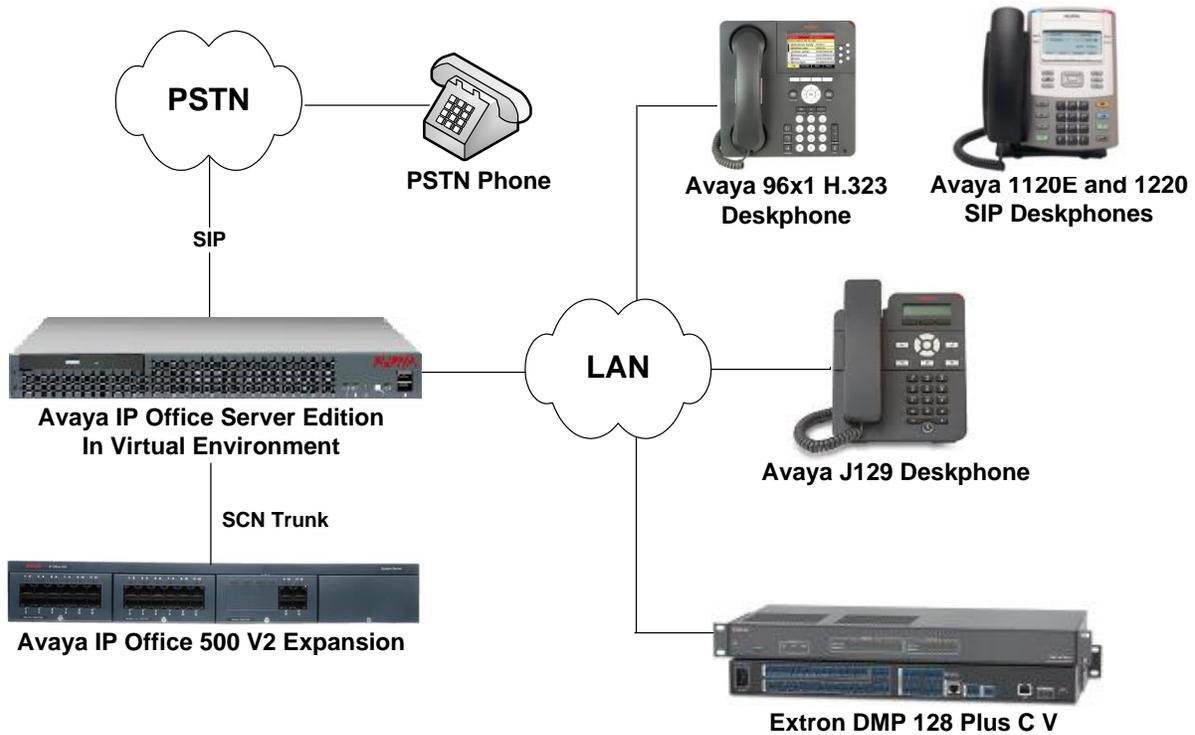


Figure 1: Extron DMP 128 Plus C V with Avaya IP Office Server Edition

4. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

| Equipment/Software | Release/Version |
|---|----------------------|
| Avaya IP Office Server Edition | 10.1.0.0.0 Build 237 |
| Avaya IP Office 500 V2 (Expansion System) | 10.1.0.0.0 Build 237 |
| Avaya 96x1 Series IP Deskphone (H.323) | 6.6401 |
| Avaya J129 SIP Deskphone | 1.1.0.0.15 |
| Avaya 1120E Series SIP Deskphone | 04.04.26.0 |
| Avaya 1220 Series SIP Deskphone | 04.04.26.0 |
| Extron DMP 128 Plus C V | V1.01.0009-b001 |
| Extron DSP Configurator | 2.18.0.10 |

Note: Compliance Testing is applicable when the tested solution is deployed with a standalone IP Office 500 V2 and also when deployed with IP Office Server Edition in all configurations.

5. Configure Avaya IP Office Server Edition

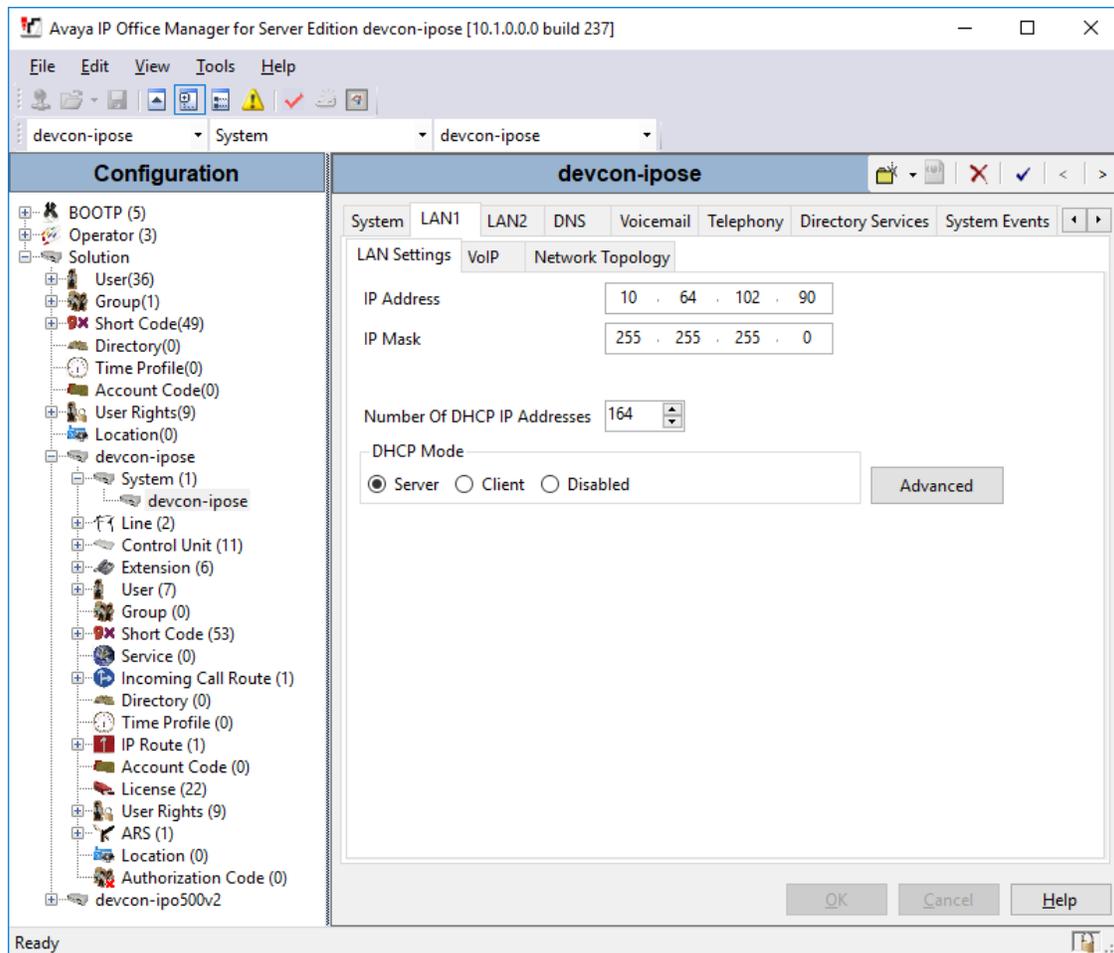
This section provides the procedures for configuring Avaya IP Office Edition. The procedures include the following areas:

- Obtain LAN IP address
- Administer SIP registrar
- Administer SIP extension for DMP 128 Plus C V
- Administer SIP user for DMP 128 Plus C V

Note: This section covers the configuration of Avaya IP Office Server Edition, but the configuration of Avaya IP Office 500 V2 would be similar.

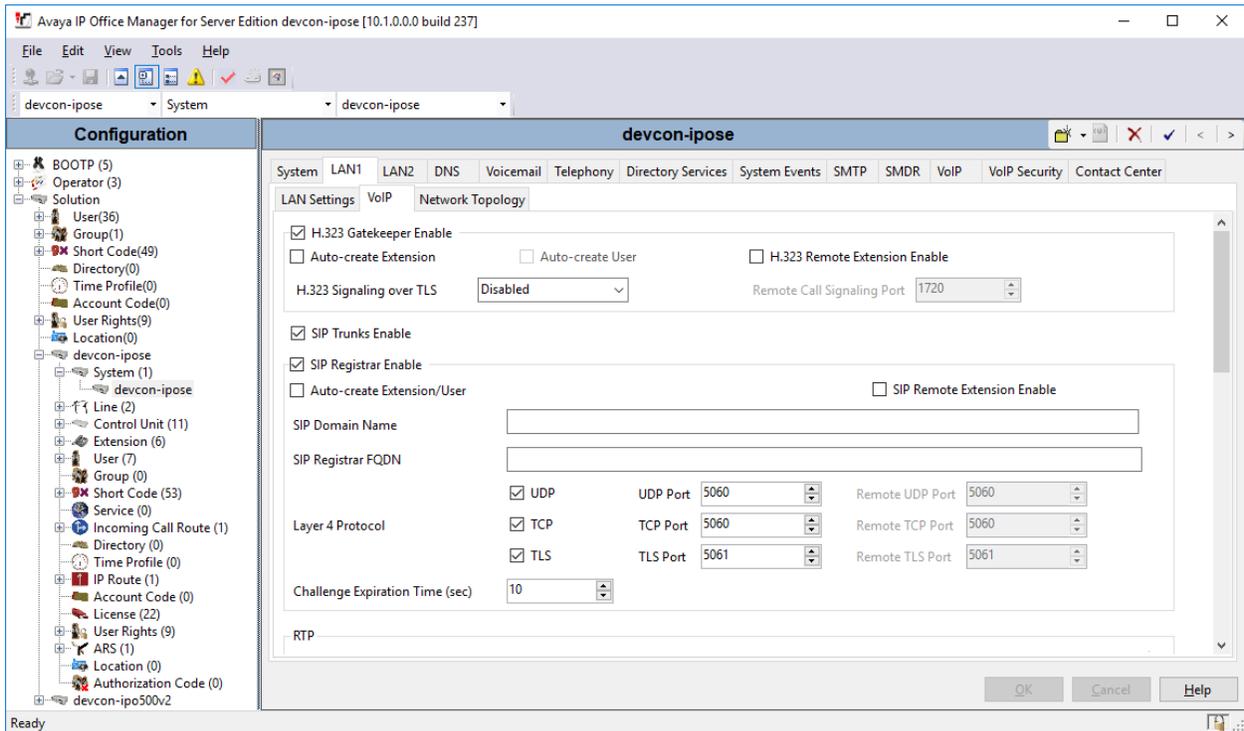
5.1. Obtain LAN IP Address

From the configuration tree in the left pane, select **System** to display the **System** screen for the IP Office Server Edition in the right pane. Select the **LAN1** tab, followed by the **LAN Settings** sub-tab in the right pane. Make a note of the **IP Address**, which will be used later to configure DMP 128 Plus.



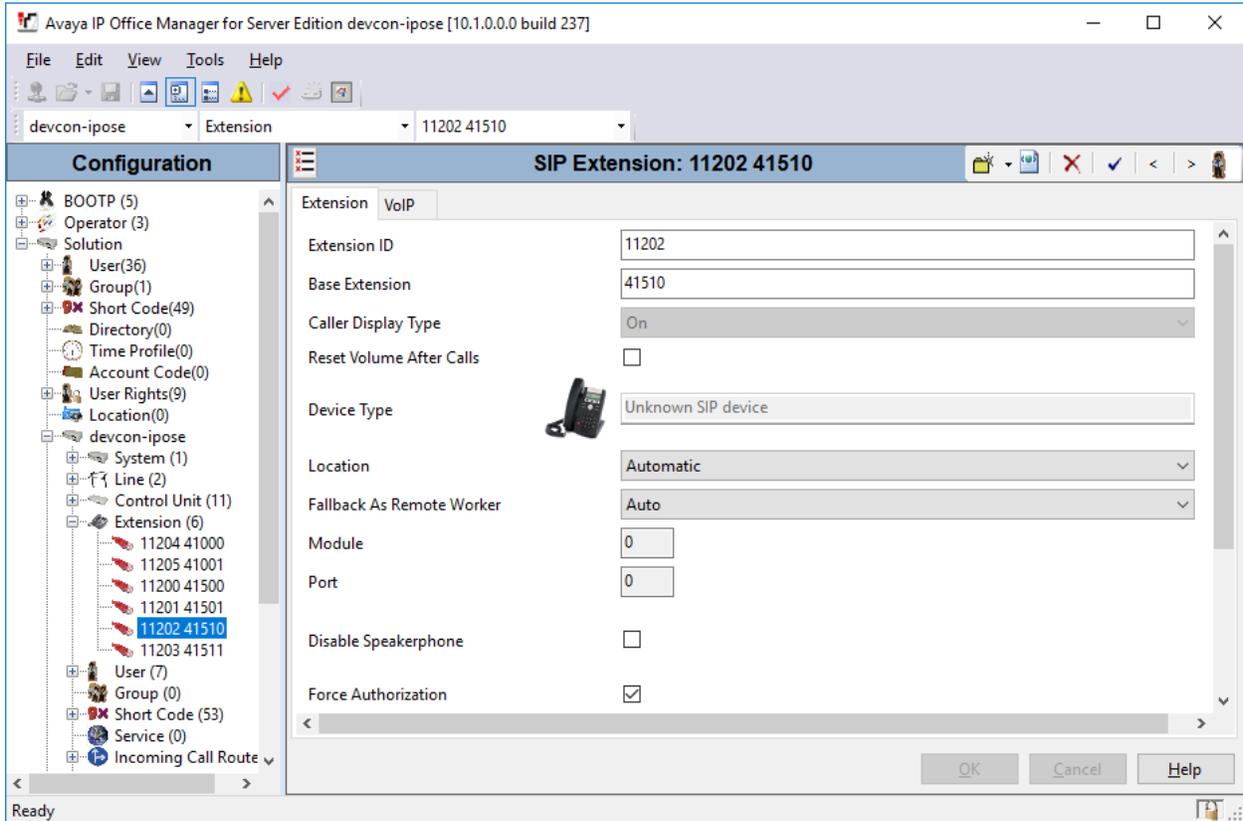
5.2. Administer SIP Registrar

Select the **VoIP** sub-tab. Ensure that **SIP Registrar Enable** is checked and enter a valid **Domain Name**. In the compliance testing, the **Domain Name** field was left blank so the LAN IP address was used. For the **Layer 4 Protocol**, enable **UDP** to use it as the transport between DMP 128 Plus and IP Office.

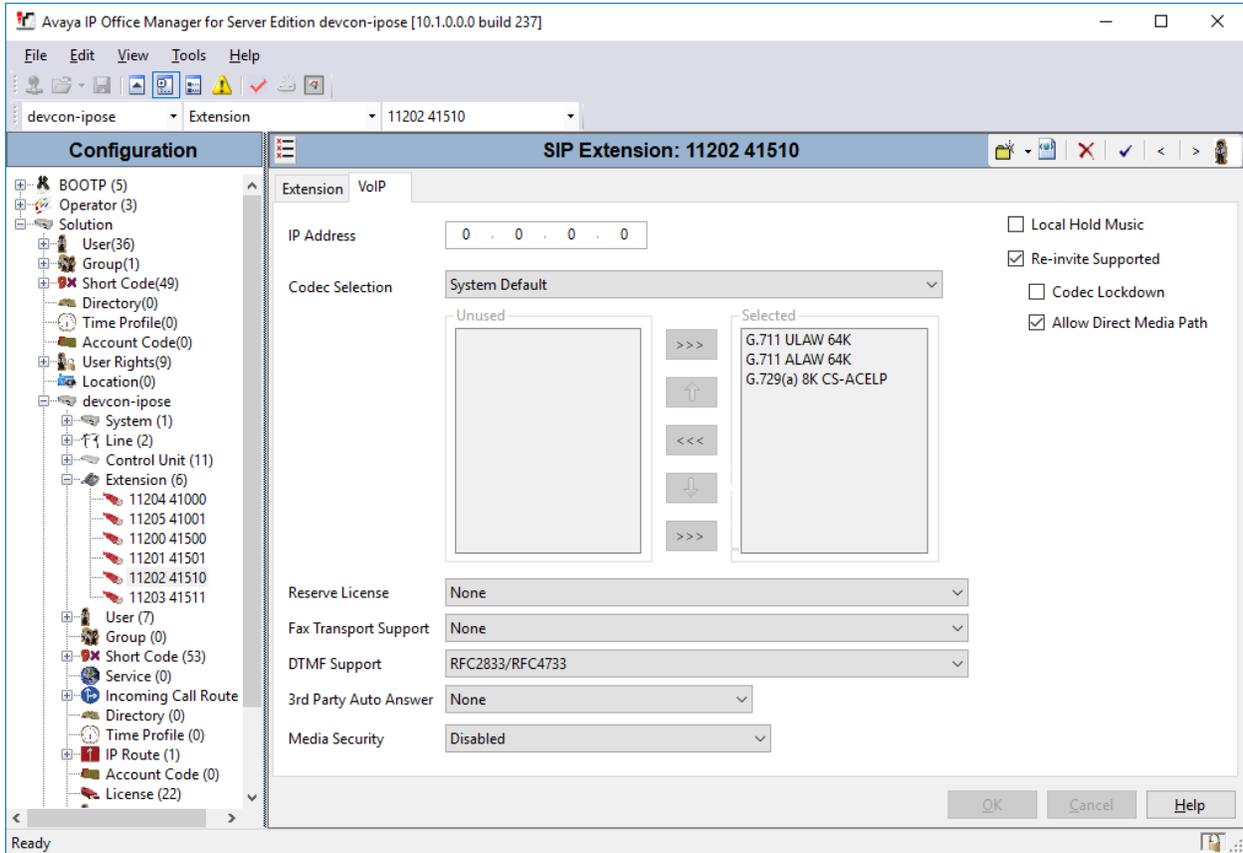


5.3. Administer SIP Extension for Extron DMP 128 Plus C V

From the configuration tree in the left pane, right-click on **Extension** and select **New** → **SIP Extension** from the pop-up list to add a new SIP extension. Enter the desired extension for the **Base Extension** field as shown below. In this example, DMP 128 Plus was assigned extension **41510**. This is the extension that DMP 128 Plus used to register with IP Office Server Edition.

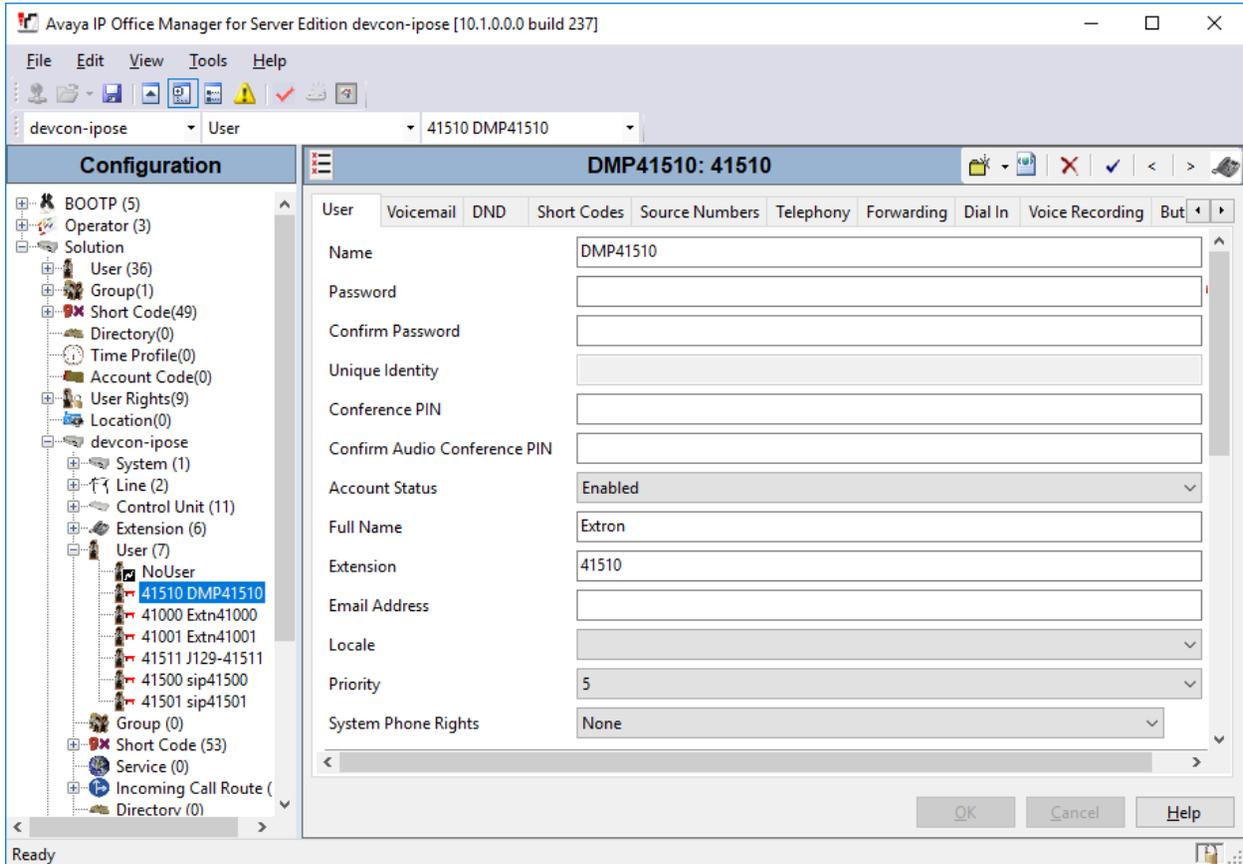


Select the **VoIP** tab and retain the default values in the all fields. During the compliance test, DMP 128 Plus was tested using G.711 and G.729 codecs. Enable **Allow Direct Media Path** so that audio/RTP flows directly between two SIP endpoints without using media resources in Avaya IP Office when SRTP was disabled at the IP Office system level. Set the **Media Security** field to *Disabled*.

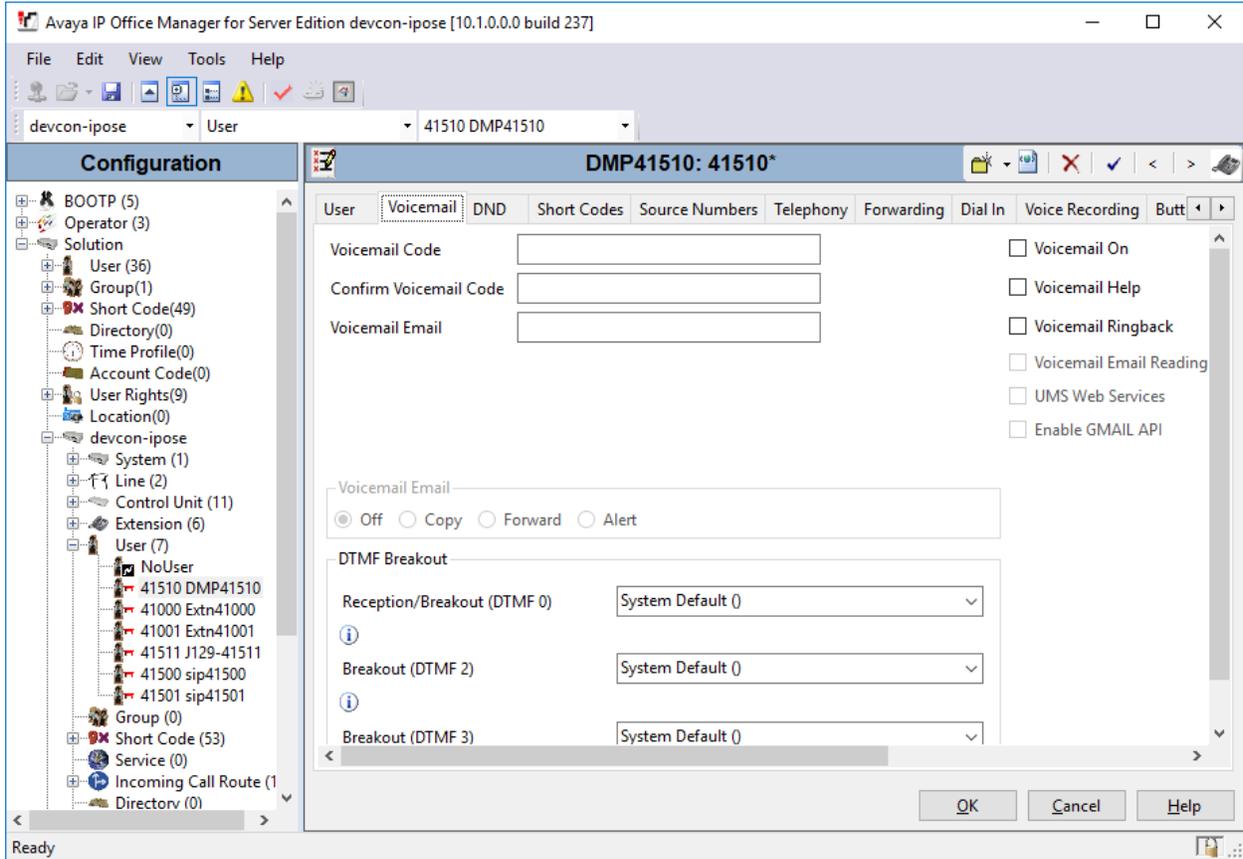


5.4. Administer SIP User for Extron DMP 128 Plus C V

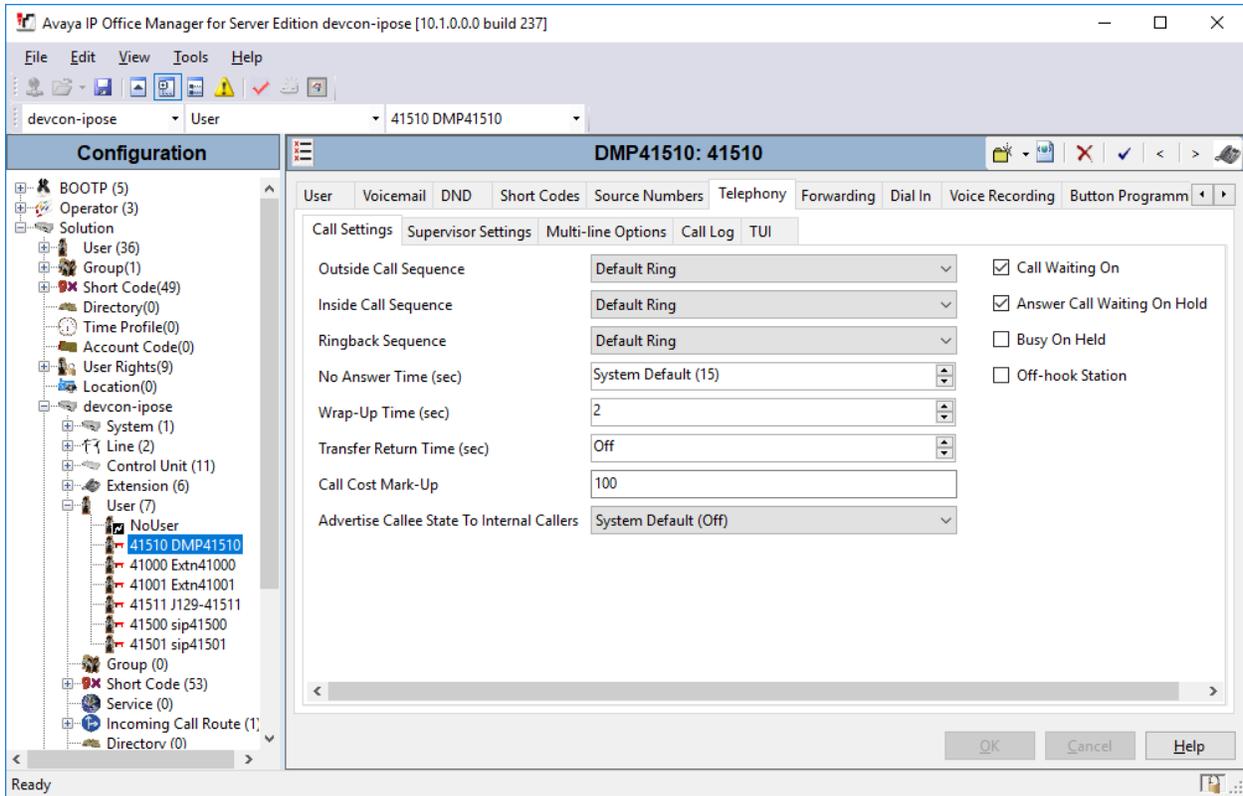
From the configuration tree in the left pane, right-click on **User** and select **New** from the pop-up list. Enter desired values for the **Name** and **Full Name** fields. For the **Extension** field, enter the SIP extension created above.



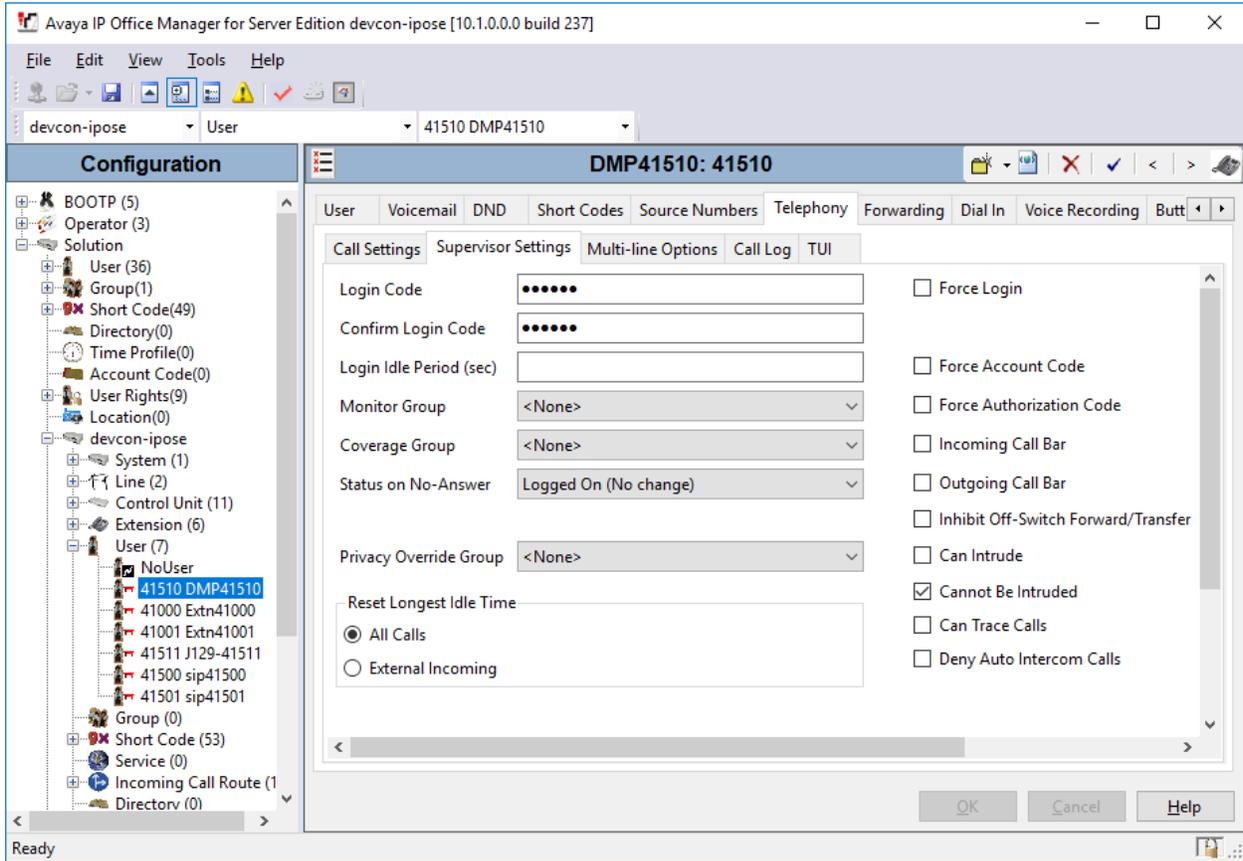
Select the **Voicemail** tab and disable **Voicemail On** as shown below.



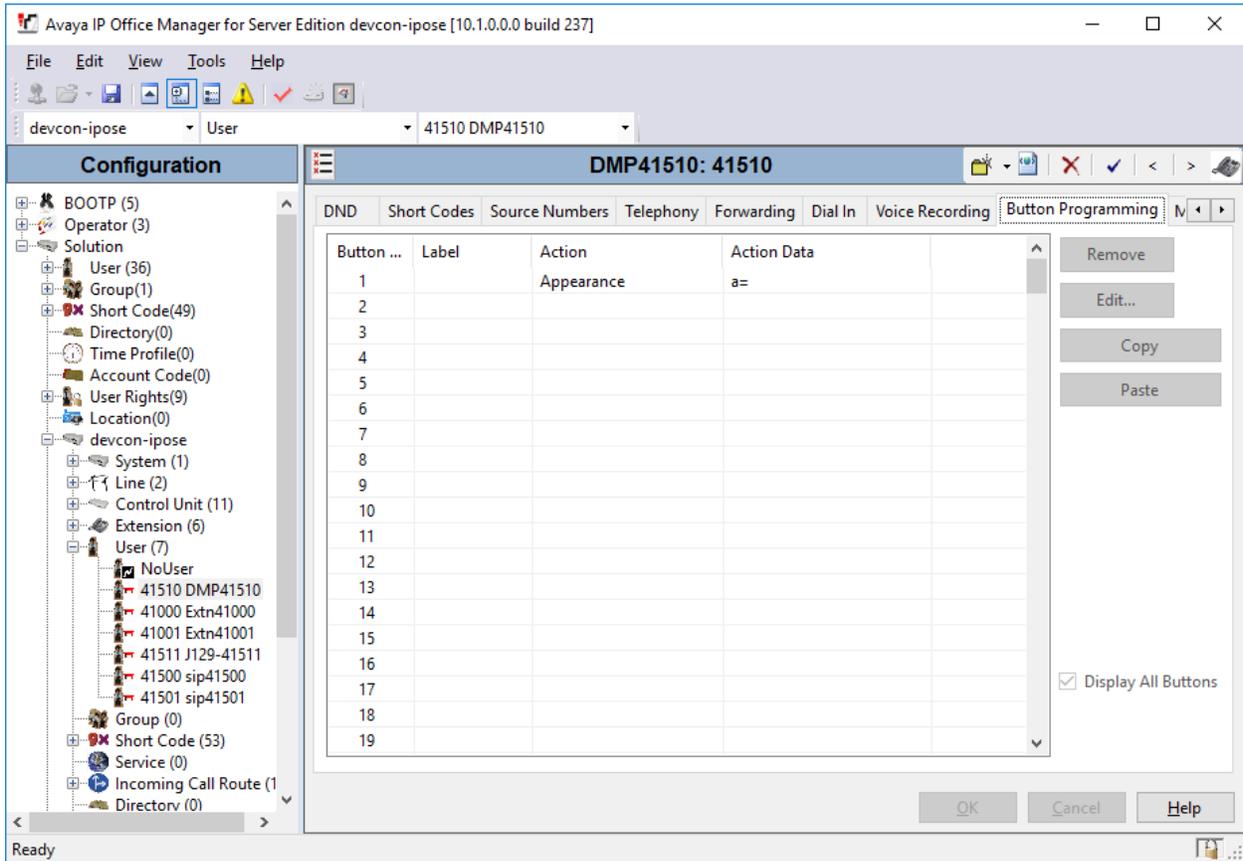
Select the **Telephony** tab followed by the **Call Settings** sub-tab. Note the settings below for the user. Enable **Call Waiting On** so that multiple calls could be delivered from IP Office to DMP 128 Plus; otherwise, only one call would be delivered to DMP 128 Plus and any subsequent calls would result in IP Office responding with a busy signal.



Select the **Supervisor Settings** sub-tab and enter a desired **Login Code**. The **Login Code** is the password that was used by DMP 128 Plus to register with IP Office.



Note that in the **Button Programming** tab, only one call appearance was configured for DMP 128 Plus even though DMP 128 was configured to handle up to four calls. Configuring multiple call appearances for a 3rd party SIP phone is not required on IP Office; however, call waiting should be enabled, as shown above, so that multiple calls could be delivered to DMP 128. When all of the call appearances configured on DMP 128 Plus are in-use, the next incoming call would get busy treatment.



6. Configure Extron DMP 128 Plus C V

This section provides the procedures for configuring DMP 128 Plus. The procedures fall into the following areas:

- Launch Web Interface
- Administer Network Settings
- Administer SIP Settings
- Configure the DSP

6.1. Launch Web Interface

DMP 128 Plus was configured via the web interface by using the URL “https://ip-address/www.voip.html” in an Internet browser window, where “ip-address” is the DMP 128 Plus IP address. The web page displayed in the following section is displayed.

6.2. Administer Network Settings

To configure IP network settings, navigate to **Network** → **Interface** and configure the **LAN 1** settings. For the compliance test, a static IP address, *192.168.100.230*, was assigned to DMP 128 Plus as shown below. Alternatively, DHCP may be used. Click **Apply**.

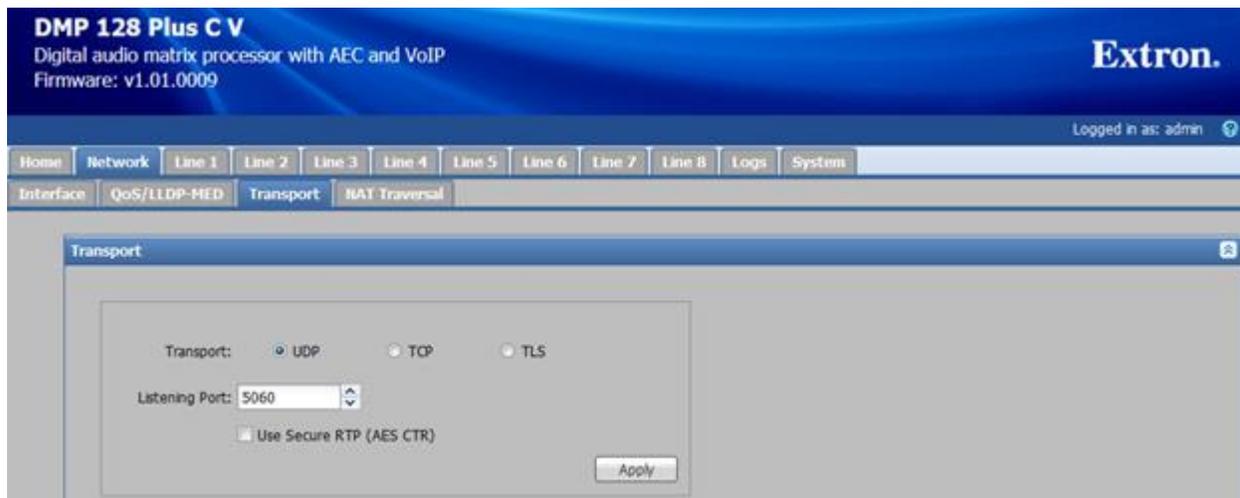
The screenshot displays the web interface for the Extron DMP 128 Plus C V. The header includes the device name, model, and firmware version (v1.01.0009), along with the Extron logo and a login status of 'admin'. The navigation menu shows 'Network' as the active section, with sub-tabs for 'Interface', 'QoS/LLDP-MED', 'Transport', and 'NAT Traversal'. The 'Interface' tab is selected, and the 'VoIP Interface' is set to 'LAN 1'. The DNS settings are optional, with 'DNS 1' set to '192.168.1.1'. The 'LAN 1' configuration panel shows 'IP Address' set to 'Static' with a value of '192.168.100.230', 'Subnet Mask' set to '255.255.255.0', and 'Default Gateway' set to '192.168.100.1'. An 'Apply' button is located at the bottom right of the interface.

6.3. Administer SIP Settings

To configure SIP settings, select the **Network** tab followed by the **Transport** sub-tab. click **Configuration** and then select the **SIP** tab. Configure the following fields:

- **Transport** Specify the *UDP* transport protocol.
- **Listening Port** Specify port 5060.
- **Use Secure RTP (AES CTR)** Disable SRTP.

Click **Apply**.



Navigate to **Line 1** tab to configure the SIP registration settings. Configure the following fields:

- **User Name** Specify the SIP extension configured on IP Office.
- **Authentication User Name** Specify a user name.
- **Authentication Password** Specify the SIP password used to register with IP Office. This field must match the **Login Code** Configured for the SIP user on IP Office.
- **Display Name** Provide a display name.
- **Primary Proxy Name/IP** Specify the IP Office IP address (*10.64.102.90*).
- **Primary Proxy Port** Specify SIP port *5060*.

Click **Apply** to submit the changes and then click the **Register** button to register DMP 128 Plus with IP Office after all the configuration is in place.

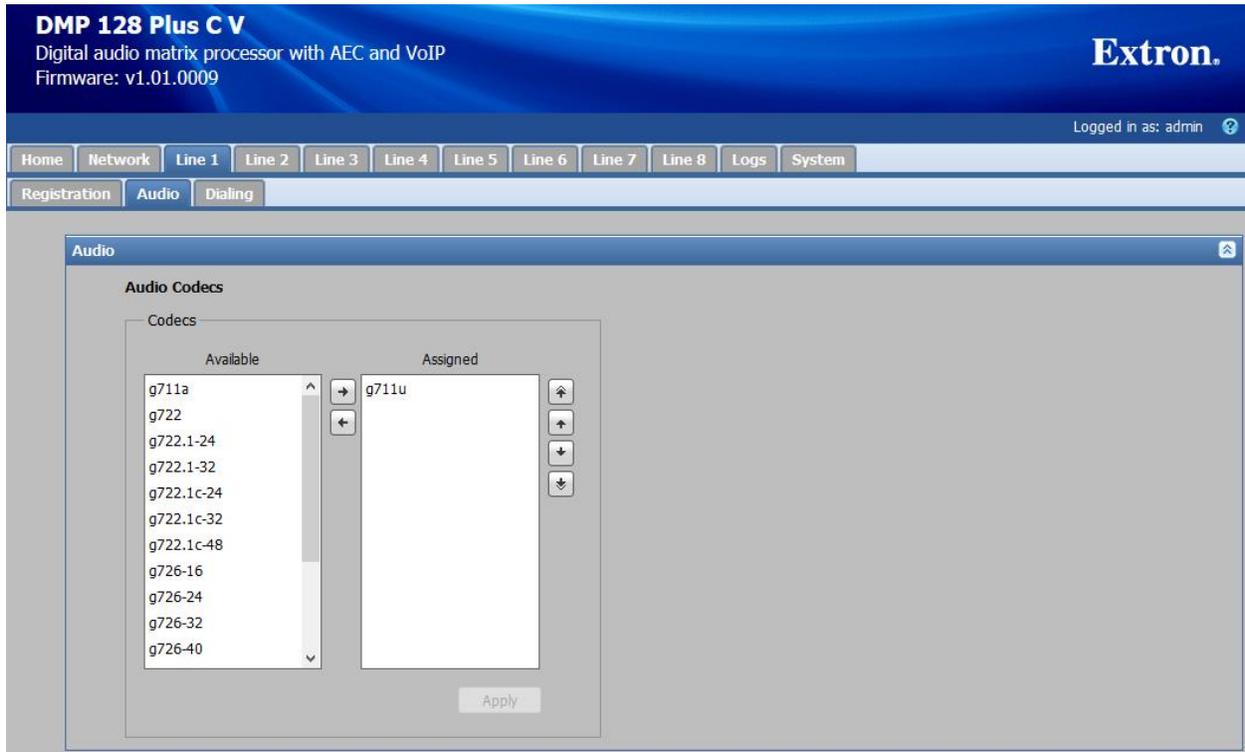
The screenshot shows the web interface for the Extron DMP 128 Plus C V. The page title is "DMP 128 Plus C V" with the subtitle "Digital audio matrix processor with AEC and VoIP" and "Firmware: v1.01.0009". The user is logged in as "admin". The navigation menu includes "Home", "Network", "Line 1", "Line 2", "Line 3", "Line 4", "Line 5", "Line 6", "Line 7", "Line 8", "Logs", and "System". The "Registration" tab is selected, and the "Advanced" section is expanded. The registration form contains the following fields:

- * User Name: 41510
- Authentication User Name: 41510
- Authentication Password: ****
- Display Name: DMP128
- * Primary Proxy Name/IP: 10.64.102.90
- Primary Proxy Port: 5060

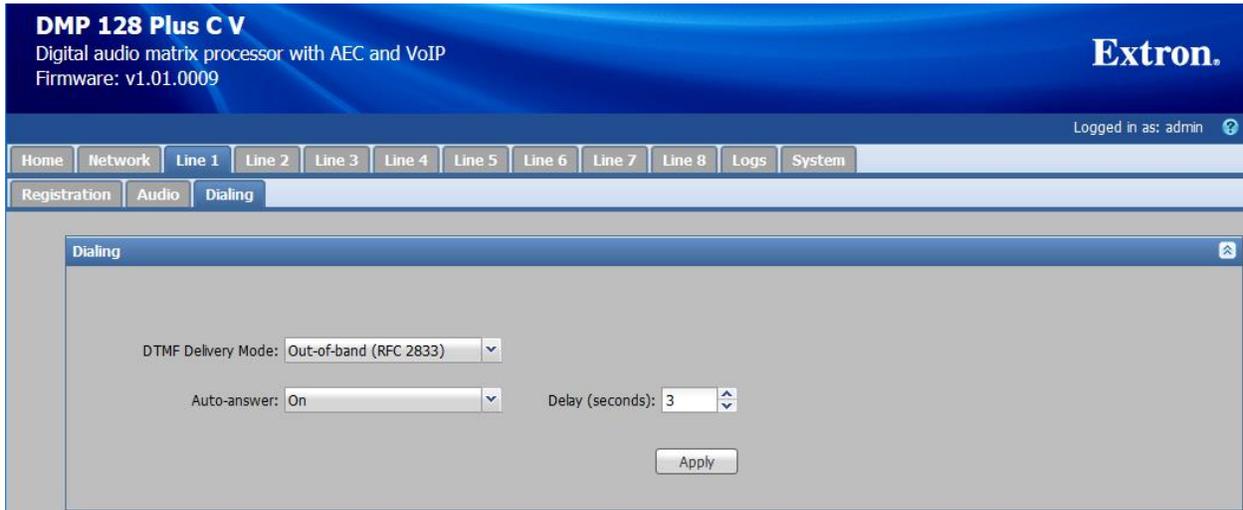
* Denotes Required Field

Buttons: Register, Unregister, Status: Not Registered

In the **Audio** sub-tab, specify the desired codec, G.711 and G.729, but not both. Refer to the note on codec negotiation in **Section 2.2**. Click **Apply**.



In the **Dialing** sub-tab, accept the default settings shown below.



6.4. Configure the DSP

Although the DSP configuration is outside the scope of these Application Notes, the following information is provided for informational purposes only.

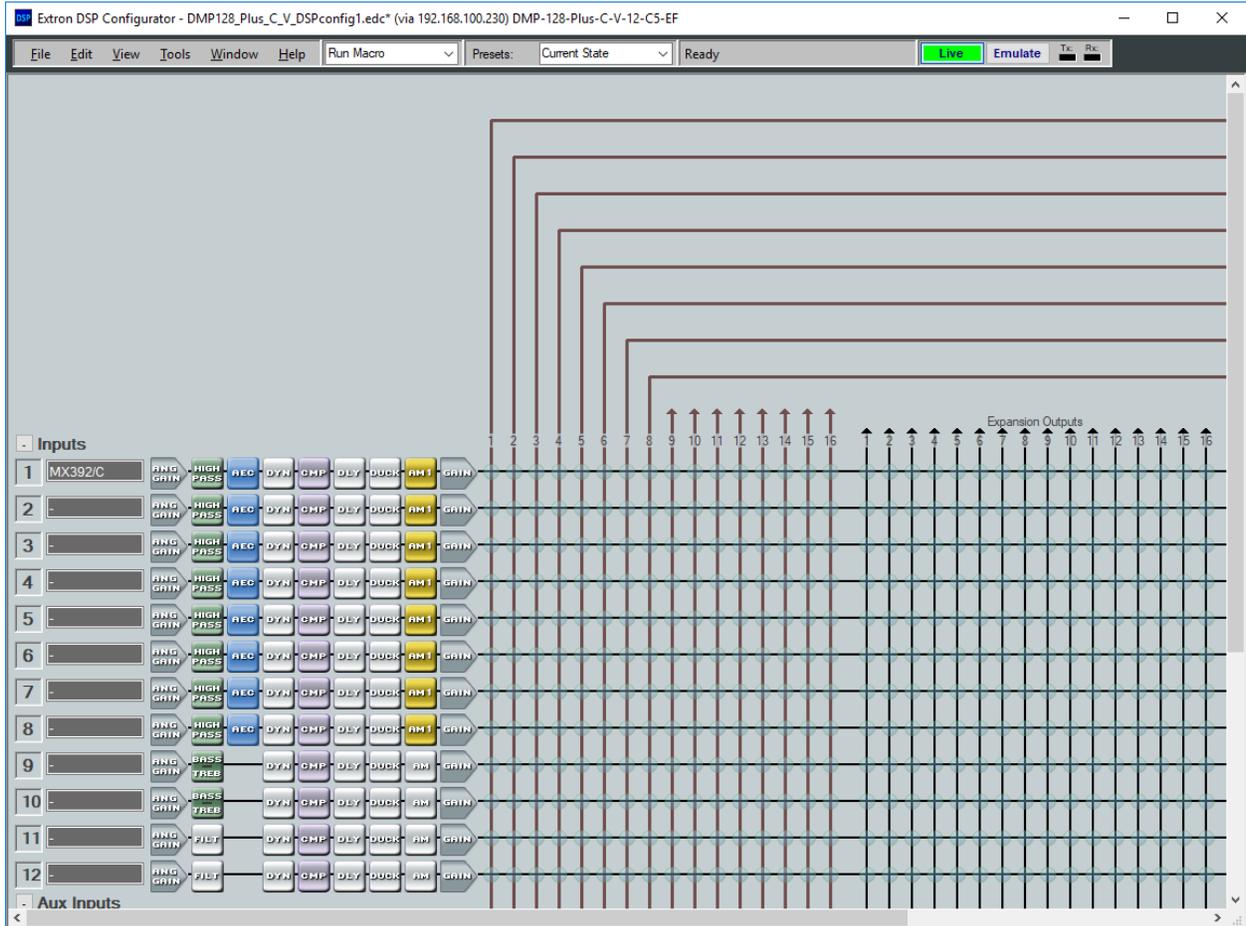
Launch the **DSP Configurator**, select **Connect...** in the drop-down field, and click **OK**.



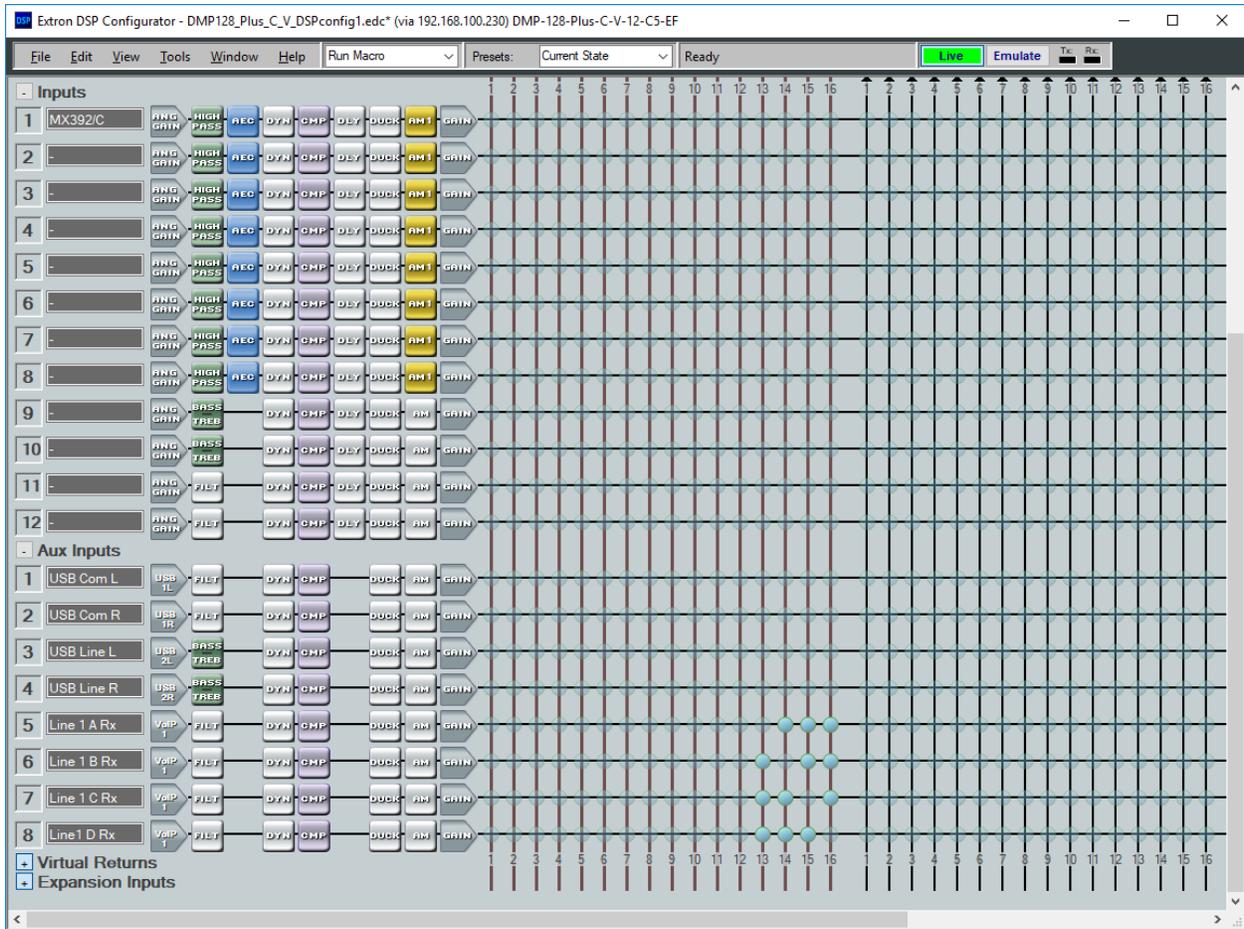
In the **Connect to device...** window shown below, enter the DMP 128 Plus IP address in the **Hostname or IP Address** field and click **OK**.

The image shows a dialog box titled "Connect to device...". At the top, it says "Please select the appropriate communication settings and click OK to continue." Below this, there are four tabs: "TCP/IP", "USB", "RS-232", and "Dante". The "TCP/IP" tab is selected and highlighted with a dotted border. Underneath the tabs is a section titled "Port Configuration" which contains three input fields: "Hostname or IP Address" with the value "192.168.100.230", "Telnet port" with the value "23", and "Password" which is empty. At the bottom right of the "Port Configuration" section is a "Set Defaults" button. At the very bottom of the dialog box are "OK" and "Cancel" buttons. The "OK" button is highlighted with a blue border.

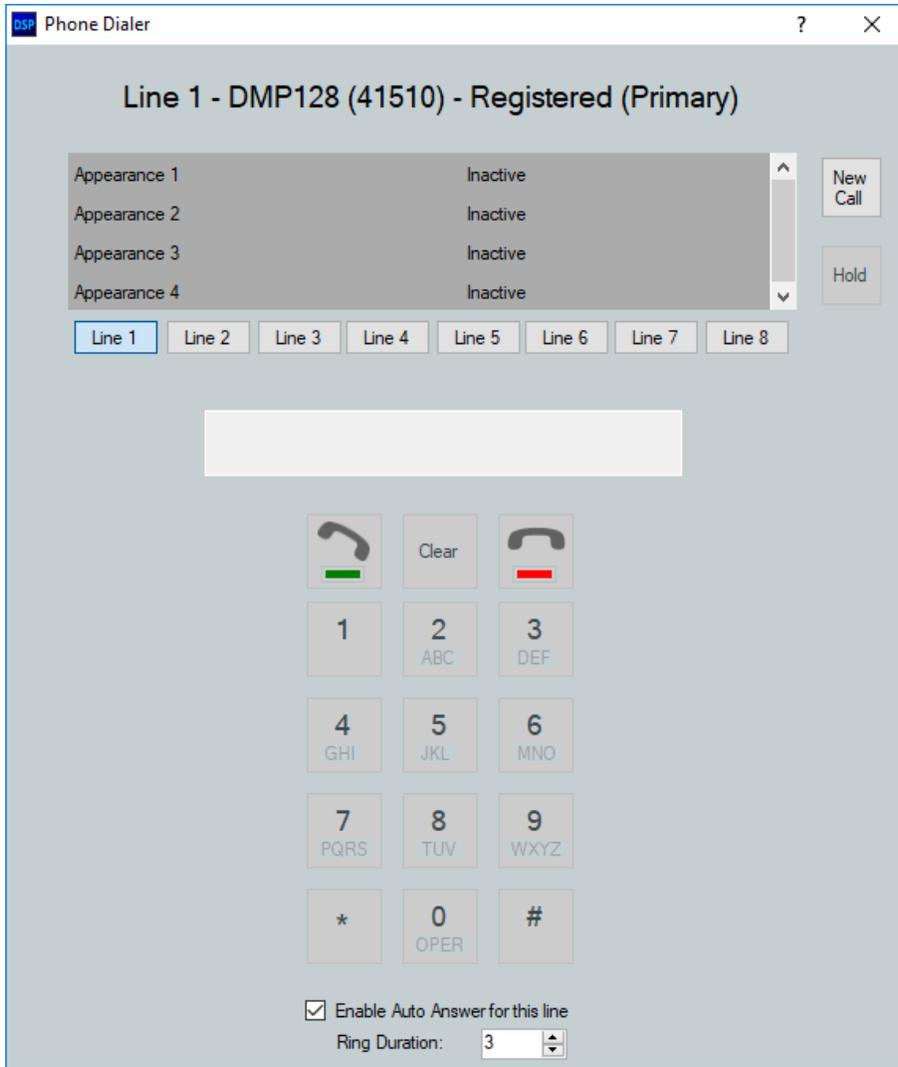
Once connected to DMP 128 Plus, the **DSP Configurator** is displayed as shown below.



Scrolling down shows that four call appearances were configured for the SIP line and that the audio call appearances were mixed together. This results in all calls being conferenced together automatically.



Calls were originated and answered using the **Phone Dialer** accessible from the **DSP Configurator** menu (i.e., **Tools → Phone Dialer**). Typically, the **Extron CCI Pro 700 TouchLink Pro Conference Room Control Interface** would be used by customers for this purpose, which would provide audio tone feedback for each call.



7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya IP Office Server Edition and Extron DMP 128 Plus C V.

1. Verify that DMP 128 Plus has successfully registered with IP Office Server Edition. In **IP Office System Status**, select the extension of DMP 128 Plus in the left pane and verify that the **Current State** is *Idle* as shown below.

The screenshot displays the Avaya IP Office System Status web interface. The title bar indicates the system is running on a Linux PC (10.1.0.0.0 build 237). The main header shows the Avaya logo and the page title "IP Office System Status". A navigation menu on the left includes System, Alarms (25), Extensions (4), Trunks (2), Active Calls, Resources, Voicemail, IP Networking, and Locations. The "Extensions (4)" menu is expanded, showing extensions 41000, 41001, 41510 (selected), and 41511.

The main content area is titled "Extension Status" and displays the following configuration details for extension 41510:

- Extension Number: 41510
- IP address: 192.168.100.230
- Standard Location: None
- Registrar: Primary
- Telephone Type: Unknown SIP Device
- User-Agent SIP header: EESB 1.03.0011
- Media Stream: RTP
- Layer 4 Protocol: UDP
- Current User Extension Number: 41510
- Current User Name: DMP41510
- Forwarding: Off
- Twinning: Off
- Do Not Disturb: Off
- Message Waiting: Off
- Phone Manager Type: None
- SIP Device Features: UPDATE
- License Reserved: No
- Last Date and Time License Allocated: 2/26/2018 12:34:19 PM
- Packet Loss Fraction: (empty)
- Jitter: (empty)
- Round Trip Delay: (empty)
- Connection Type: (empty)
- Codec: (empty)
- Remote Media Address: (empty)

Below the configuration details is a table showing the current state of the extension:

| Call Ref | Current State | Time in State | Calling Number or Called Number | Direction | Other Party on Call |
|----------|---------------|---------------|---------------------------------|-----------|---------------------|
| | Idle | 00:06:34 | | | |

At the bottom of the interface, there are buttons for Trace, Trace All, Pause, Ping, Call Details, Print..., and Save As... The status bar at the bottom right shows the time as 12:40:54 PM and the system is Online.

- Alternatively, the registration status may be viewed on the DMP 128 Plus web interface in the **Registration** tab or in the **Phone Dialer** shown on the next page.

DMP 128 Plus C V
Digital audio matrix processor with AEC and VoIP
Firmware: v1.01.0009

Extron.

Logged in as: admin

Home Network Line 1 Line 2 Line 3 Line 4 Line 5 Line 6 Line 7 Line 8 Logs System

Registration Audio Dialing

Registration

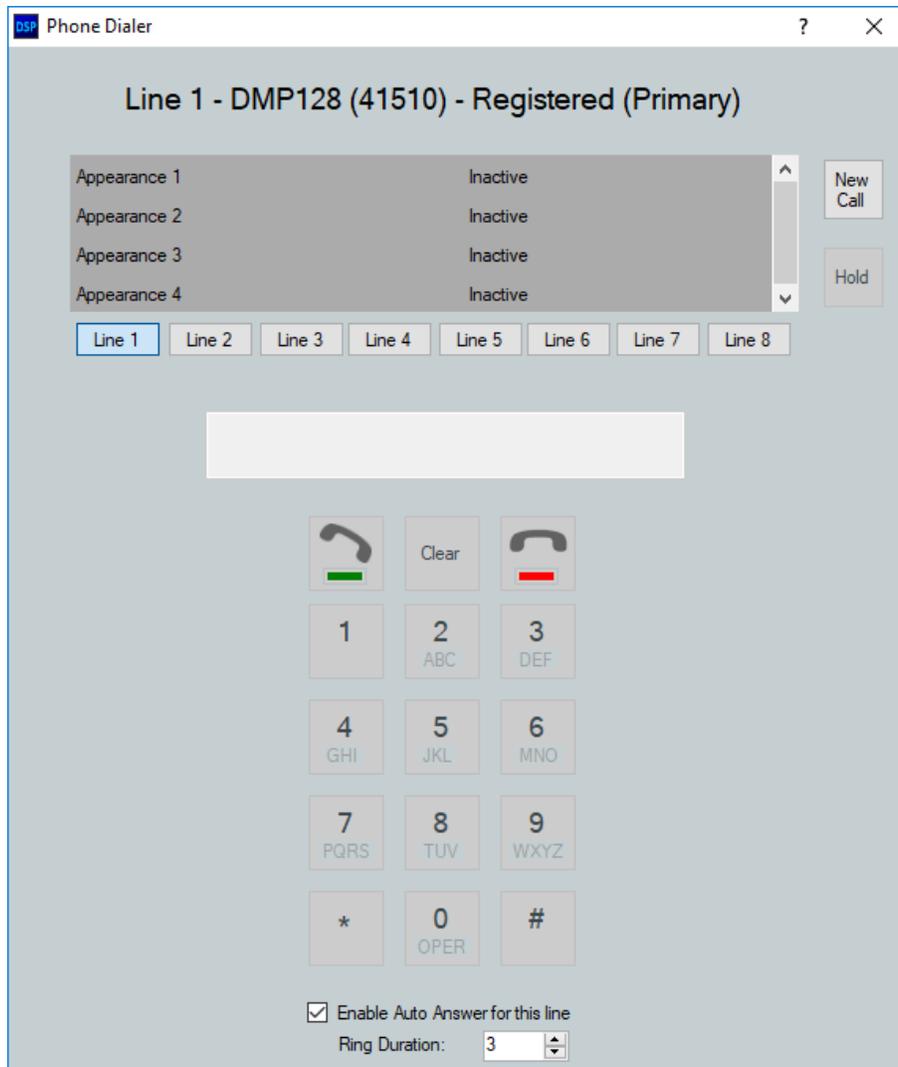
* User Name: 41510
Authentication User Name: 41510
Authentication Password: ****
Display Name: DMP128
* Primary Proxy Name/IP: 10.64.102.90
Primary Proxy Port: 5060

* Denotes Required Field

Apply

Advanced

Register Unregister **Status: Registered - Primary**



3. Verify basic telephony features by establishing calls between DMP 128 Plus and local phones.

8. Conclusion

These Application Notes described the configuration steps required to integrate Extron DMP 128 Plus C V with Avaya IP Office Server Edition. Extron DMP 128 Plus C V was able to establish calls with H.323 stations, SIP stations, and the PSTN. In addition, basic telephony features were verified. All feature and serviceability test cases were completed successfully with observations noted in **Section 2.2**.

9. References

This section references the Avaya and Extron documentation relevant to these Application Notes. The Avaya product documentation is available at <http://support.avaya.com> and the Extron documentation is available at <https://www.extron.com>.

- [1] *Administering Avaya IP Office Platform with Web Manager*, Release 10.0, September 2016.
- [2] *Administering Avaya Aura® Session Manager*, Release 7.0, Issue 2, May 2016.
- [3] *Extron DMP 128 Plus User Guide*, 68-2826-01 Rev.D, 01 18.

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