UDP Meter Software Collection

Version 1.7 (Apr 9, 2026)

Overview

The UDP Audio Meter is a Driver/Plug-in + App system that offloads CPU-intensive meter rendering from the DAW host as well as screen real estate to a remote device. For example a tablet or a separate computer.
This architecture enables high-quality real-time metering while minimizing processing load on the audio workstation.

Goals

- Maintain minimal CPU usage on the host DAW system
- Reduce network bandwidth requirements
- Achieve real-time metering with <25 ms maximum latency
- High security (No audio data is ever sent through the network)

System Requirements

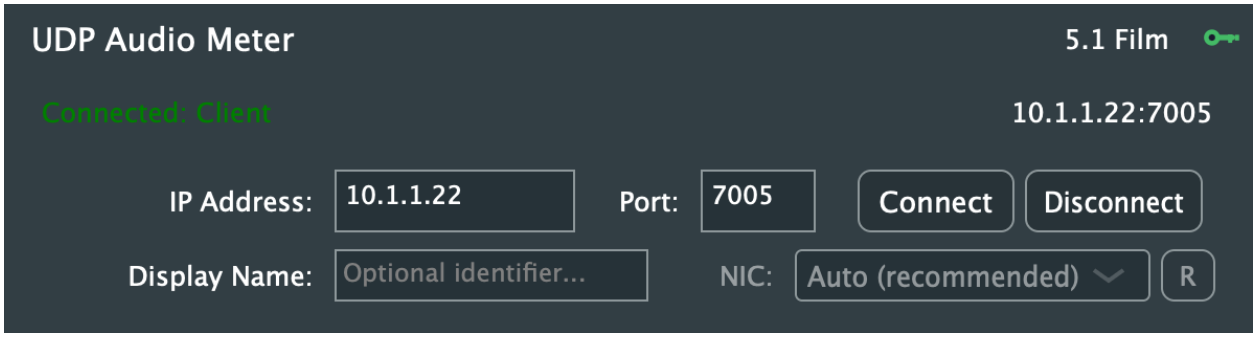
- MacOS 14 (Sonoma) +
- iOS: iOS 16.6 Supported Plugin Formats
- AAX - Pro Tools 12 or later.
- AU - Logic Pro / Garage Band / Reaper / etc...
- VST3 - Cubase / Nuendo
- HAL - Universal

Channel Support

- Stereo
- 5.0 - 5.1
- 7.0 - 7.1
- 7.0.2 - 7.1.2 (Atmos)
- 7.0.4 - 7.1.4 (Atmos)

Networking & Automatic Discovery

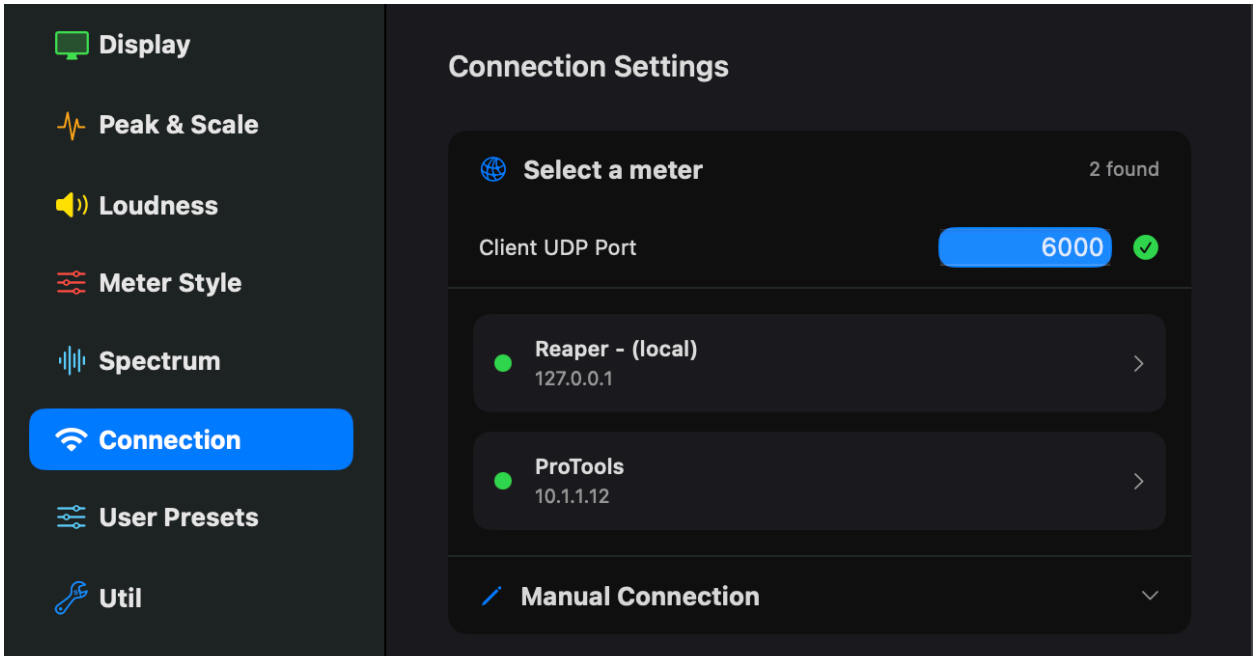
Client discovery is automatic when the plugin host and client machine are on the same network.



Initial discovery takes 4 seconds, after which the client app will automatically connect to the plugin and will store the plugin host ip as default for future connections. If more than one plugin hosts are found in the same network and the default has not been set, you will have to open the client app preferences, connection tab and select the desired plugin server to connect and store as the new default. For multi room facilities, the plugin can have a name identifier. ie: Room A, Mix B, or Edit C, etc...

Only one client can connect to one plugin at a time.

To switch to a different host than the one the client app is already connected to, open the client app preferences, connection tab and select the desired plugin server from the list.



The connection is usually controlled from the client app and not in the plugin, however manual connection override is there for cases where automatic discovery (multicast) is blocked by network policy.

A Plugin instance in the same host computer will automatically show in the Preferences Connection panel and be identified by (local). However this plugin will bind to the multicast port and block the Meter app from discovering other network servers. This is not normally a problem because when a plugin is run in the host system, network discovery is not needed. To bypass this limitation, the meter has to be loaded first, and the Connection panel needs to be open before the local plugin is run, so the multicast port is bound to the meter first.
When leaving the Connection panel, the port is released, so a plugin may bind to the port again and block the meter discovery.
This network limitation doesn't affect the normal meter operation once connected to a host.

Troubleshooting Network issues:

<u>If you're in Preferences > Connection in the meter app and can't see any plugin hosts.</u>

- If you are using a single system for plugin and meter, make sure there's no firewall or other network blocking the DAW or it's plugin container from accessing the loopback network interface.
- If you're using 2 systems, one for plugin and one for meter, your router may be blocking the connection.

IGMP Snooping is a router feature that disables UDP multicast packet forwarding between network segments, for example the plugin host is connected to the router via Ethernet, and the meter app is on an iPad using wifi. The iPad may fail to receive the multicast broadcast from the plugin and will not automatically find it.

- Some routers offer the option to enable/disable this feature and will allow the meter app to see the plugin.

This is usually not an issue if both plugin and meter systems use the same connection method (both on wifi connected to the same Network, or both using ethernet and connected to the same switch/router)

You see the plugin in the connection panel but when you click on a server nothing changes:

This time the issue is Unicast UDP not crossing the WiFi↔Ethernet bridge.
Some consumer and prosumer routers block or de-prioritise UDP unicast between their wired and wireless segments even though they're on the same subnet.
Sometimes this is one way, sometimes 2 way, and is called AP isolation or client isolation and it's often on by default on WiFi access points, especially on the 5GHz band. AP client isolation and WiFi↔Ethernet blocking makes the router simply refuse to forward frames between its wireless segment and wired segment, or between two wireless clients. It just drops the frame based on source/destination MAC address policy.

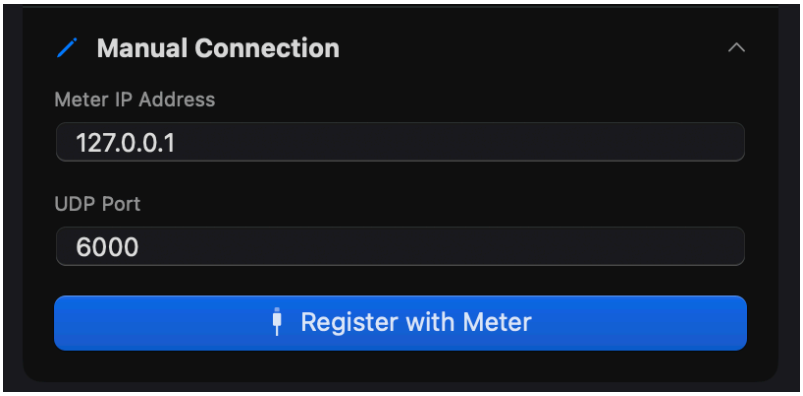
- The solution involves disabling AP isolation on the router (one checkbox, fixes everything)
- Both devices on the same WiFi segment (sidesteps the WiFi↔Ethernet crossing entirely)
- Both devices on the same Ethernet segment usually works, (unless network policy uses port isolation on a managed switch)

Plugin is behind a NAT:

- For NAT, and all of the above, manual connection may work but some features like spectrogram may not function correctly as they require 2 way communication between plugin and meter app.

Manual Connection Configuration

Open the client app preferences > Connection tab > Manual Connection:
Enter the plugin server machine IP.
In the plugin Manual Connect field add the meter app IP address.
Port has to be the same on both machines.



Default UDP ports:

- Meter data: **6000–6002**
- Registration / discovery: **5000**
- Note: Discovery uses Multicast UDP. Some routers may block multicast traffic. Manual connection is provided as a fallback.
- For multi-room installations the plugin will not connect automatically but will show a list of available servers in Connection panel.
- Plugin can advertise a custom name to help with identification.
- Different ports can be used to separate rooms or to adjust to specific network environments.
- Previously selected servers are automatically stored in preferences for quick start connection.
- Automatic network discovery will not work reliably if a plugin instance is running on the host system.
- If the network list is not populated by an available plugin host, try switching to another preference tab and back to connection to refresh the list.
- A plugin will stop broadcasting its beacon when bound to a client meter app and will not show up in Connection panel.
- Multiple same-host Audio Applications can run at the same time and each have a meter plugin active. The User can switch between them using the Connection panel.
- In case a plugin stops responding, a manual disconnect on the offending plugin will generally fix the issue.
- Manual selection of the correct Network Interface (NIC) may be needed on Plugin host systems with multiple network connections. (This has to be set before connecting to the plugin)
- Automatic reconnect is temporarily disabled while in the preferences connection panel. This “pause” may help troubleshoot multiple plugin connection issues.

The communication is 2-way and both systems need to be able to talk to each other. If you receive meter data, but can’t control the plugin, the app needs to reconnect to the plugin. This is especially important for Spectrogram rendering, since the meter app has to configure the plugin to be in the correct mode and select the channel for FFT processing. Without 2 way communication this feature will not work.
If a connection issue becomes unsolvable, the connection preferences are saved to the file “~/Library/Preferences/UDPAudioMeter/UDPMeterAppSettings.plist” and deleting this file will clear any stuck “retry to connect” problems.

Plugin UI — Parameters

Update Rate:
Controls how frequently meter data is sent to the client.

- Higher values increase client CPU usage

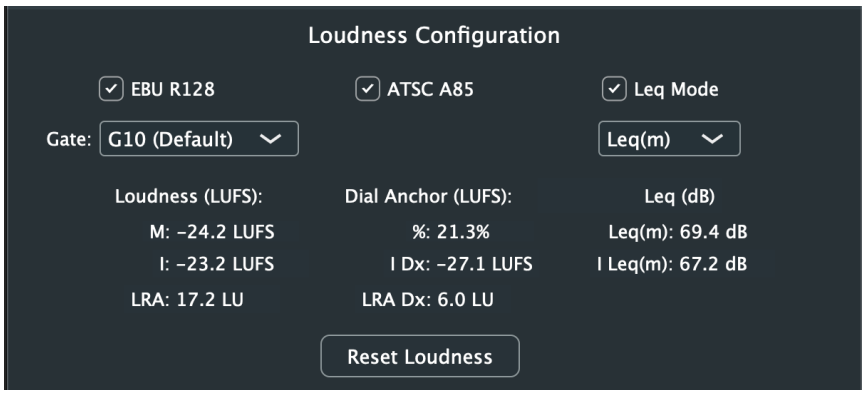
- Recommended default: 30 updates/sec

RMS Window:
Determines RMS averaging time

- Larger window → smoother display, more delay
- Available values: 70 ms, 100 ms, 130 ms
- Recommended: 100 ms

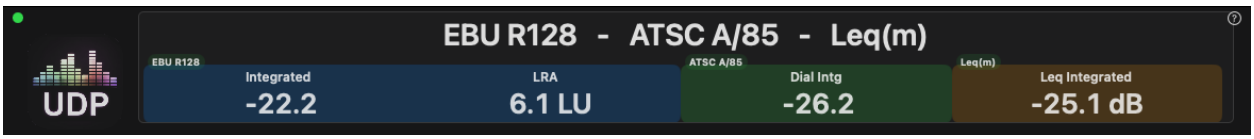
Peak Mode:
The plugin transmits peak values using

- Standard Pro Tools peak
- True Peak (4× oversampling, higher CPU cost — especially in Atmos workflows)
  True Peak is optional to preserve the primary goal of offloading heavy visual processing.



Loudness:

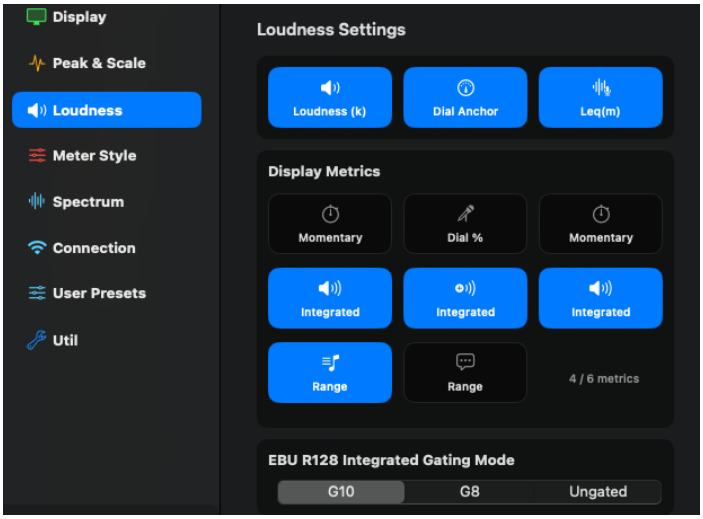
UDP Audio Meter Plugins and Capture app feature 3 loudness measuring engines. EBU R128 or loudness measurement compliant with ITU-R BS.1770-4 with optional G10/G8/Ungated. Also available is ATSC A/85 Dialnorm style dialogue anchor based loudness referencing using Dolby Dialogue Intelligence methodology. Lastly we have Leq measurement using A, C or M (TASA compliant) weighing.



Loudness Panel:

The top bar can show up to 6 loudness metrics from the 3 different measurement engines, grouped by colour. Clicking this bar resets the Integrated measurements.

The loudness engines can be independently enabled or disabled using the plugin loudness configuration section or using the Preferences > Loudness panel in the Meter App. The toggle switches in the Meter app enable or disable the engines or display items with the exception of the Leq button. This button will cycle through the different Leq weighing options with each tap.



Click "→" Button in the plugin Loudness Configuration section to switch view to the Plugin Loudness Panel

Latency Compensation:

Latency compensation introduces a pre-read buffer to align meter visuals with audio arrival when network/client delay is present.

Important:

Latency compensation will only properly work on a Master Fader
This setting delays the audio output by the displayed amount
Video sync offset must be adjusted accordingly
This parameter can only be adjusted while the transport is stopped

Signal Flow

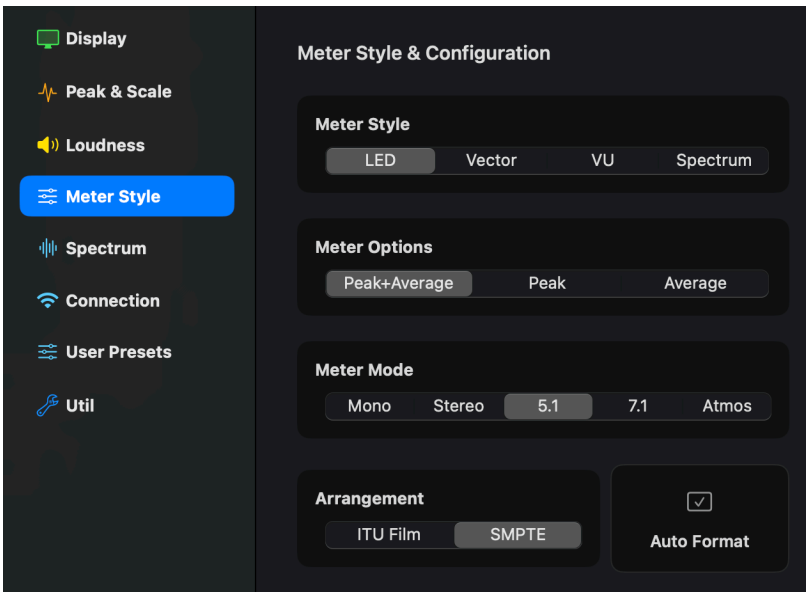
```
Plugin input ──► delayBuffer ──► output (DELAYED)
      └──► meter UDP send (PRE-delay)
```

This ensures meter visuals remain synchronized even with slower networks.
Wi-Fi latency is typically ~10 ms. Plugin Render < 15 ms. But screen refresh or wifi traffic can alter these numbers.
The plugin latency is usable without compensation (e.g., on Aux tracks), using wired network (latency < 0.2ms) but the option is available when needed.

Client Meter Styles

The client applications provide four visualization styles:

1. **LED Meter** (two colour schemes)
2. **Vectorscope + LED** Hybrid
3. **VU Meter**
4. **Spectrum Analyzer**



Additional Features

- Scalable User Interface (MacOS Only)
- Audio Suite Loudness Analyzer
- Plugin Loudness Panel View
- Stereo pair phase indicators
- Customizable Loudness panel - shows only the items you need to see
- 3 Different scales DBFS, DBU and VU
- Show / Hide Scale Labels
- Peak, RMS and Peak+RMS options
- VU Meter with accurate analogue ballistics
- ITU or SMPTE channel arrangement
- Vectorscope RMS (solid) vs Peak (light overlay) visualization
- Red Phase warnings in vectorscope view when correlation exceeds ±90° between adjacent speakers
- Spectrogram is designed for single-channel analysis due to higher CPU/network cost
- TimeCode Display for most DAW's and external Midi Timecode support with port refresh (R) button.
- Custom studio logo / picture of your child or pet in place of the Prefs button
- User defined channel name badges

Client Controls

"P" key or **Tap** top-left icon → Preferences
Tap Loudness panel → Reset loudness
Tap meters → Reset peaks
Tap spectrogram → Frequency and level details
Top-right **"?"** For detailed instructions
Top-left status dot → Connection state indicator
Swipe left (iOS only) switch to Spectrogram view
Swipe right (iOS only) switch back to previous view

Uninstall:

To uninstall the software, simply run the Uninstaller.

UDP Audio Meter Connect

UDP Audio Meter Connect is a background application that provides the same core functionality as the UDP Audio Meter plug-in. It interfaces with the UDP Meter HAL virtual audio driver, managing audio routing, metering data transmission, and user-defined configuration settings.

The application runs in the macOS menu bar, providing quick access to system status and controls.

Dolby Atmos Renderer Use Case (Single-Machine Monitoring)

UDP Audio Meter Connect can be integrated directly into a single-machine monitoring workflow, using the audition path from the **Dolby Atmos Renderer**.

By inserting the UDP Meter driver into the renderer's output path, metering can be performed without requiring additional hardware or a secondary system. The driver can mirror the renderer's output while simultaneously transmitting metering data to UDP Audio Meter clients.

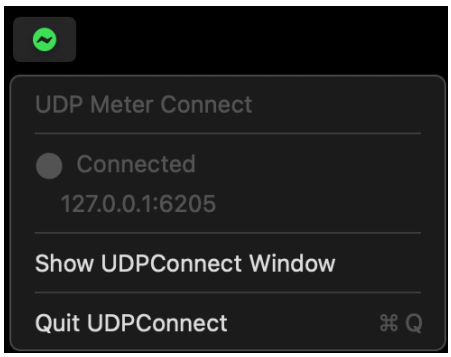
This enables accurate loudness and signal monitoring of Atmos renders in real time, while preserving the existing monitoring chain. The approach is particularly useful for QC, broadcast compliance, and mix verification workflows where a dedicated meter is required alongside the renderer output.

Menu Bar Status Indicators

When active, the application appears as an icon in the top menu bar. The icon reflects the current system state:

- **Grey Wave** – Connected to the UDP Meter driver
- **Orange Play Icon** – Audio is being routed through the driver
- **Green Wave** – Connected to a UDP Audio Meter client
- **Green Play Icon** – Metering data is actively being transmitted

Clicking the menu bar icon opens a status menu with connection details and access to the main application window.



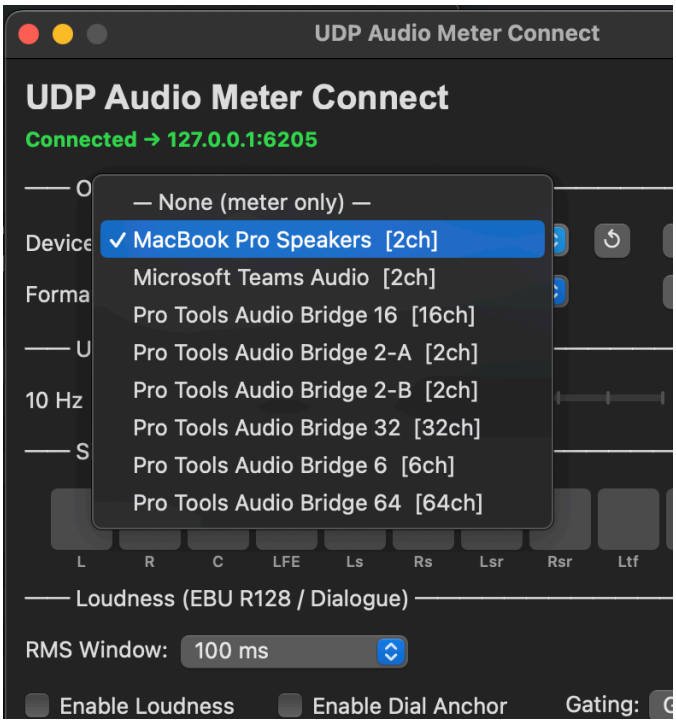
Licensing

A registration icon is located at the top of the application window, consistent with the plug-in interface.

- The same machine-based license used for the plug-in authorizes the Meter Connect application.
- If unlicensed, the application operates in **demo mode for 5 minutes**, after which functionality is restricted until a valid license is applied.

Output Device and Format

This section defines how the virtual driver operates. Two modes are available:



1. Meter Only

- The driver operates as its own clock master
- No audio is forwarded to external devices
- Only metering data is transmitted to UDP Audio Meter clients

2. Linked to Output Device

- The driver synchronizes its clock to a selected output device
- Audio is forwarded to the linked device
- Metering data is transmitted simultaneously to UDP Audio Meter clients

Using External Audio Interfaces

The driver forwards **output streams only**. To incorporate input channels from your audio interface into your DAW:

1. Open **Audio MIDI Setup**
2. Create an **Aggregate Device**
3. Add:
   - Your audio interface (set as **clock master**)
   - The UDP Meter device

This allows simultaneous routing to both speakers and the meter.

Recommendation:

- Use **"Meter Only" mode** when working with aggregate devices
- Alternatively, use the plug-in for metering during recording sessions

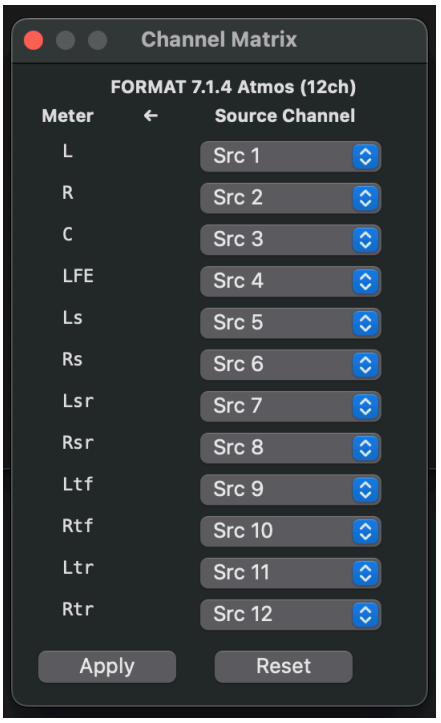
Note on Latency:

- The plug-in supports latency compensation
- The driver uses fixed latency, applied only when chained to an output device

Channel Routing and Driver Behaviour

The virtual driver provides a **32-channel audio device**:

- Inputs are routed **1:1 to outputs**
- This simplifies chaining with most audio interfaces
- No DAW output reconfiguration is required when switching devices



Workflow Example:

1. Configure DAW outputs for your audio interface
2. Switch the system output to the UDP Meter device
3. Link your interface via the Meter Connect app

All channels will remain aligned automatically.

Meter Channel Configuration

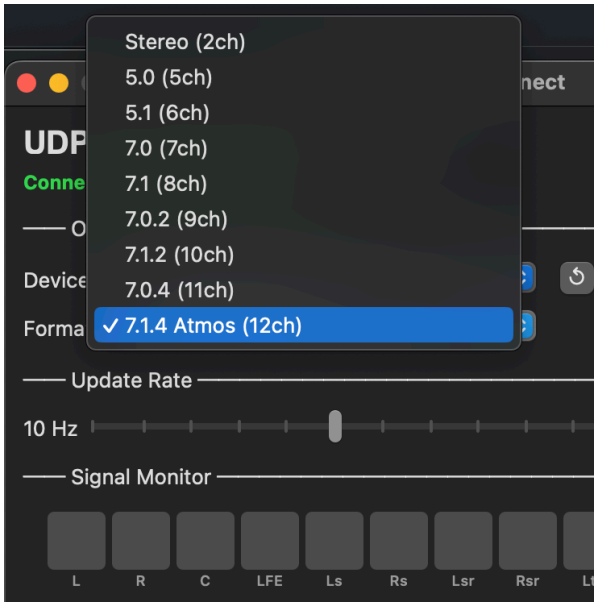
The driver supports 32 channels of audio, of which up to 12 can be assigned to the UDP Audio Meter.

Channel Matrix

- Allows custom routing from driver outputs to meter inputs
- Useful when interface output layouts differ from meter expectations

Format Selection

- Determines how many channels are sent to the meter
- Limits available channels in the Channel Matrix



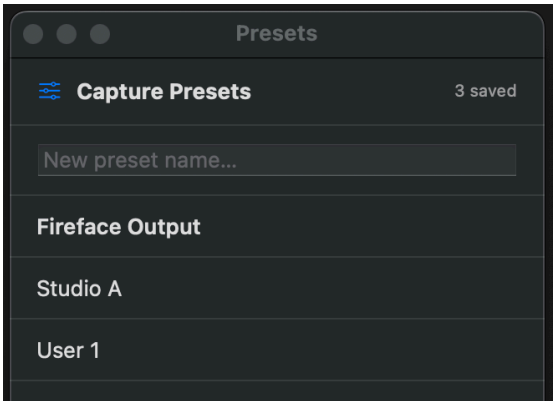
Signal Monitor

- Displays active channels for the selected format
- Indicates signal presence

User Presets

The User Presets section allows saving and recalling configurations, including:

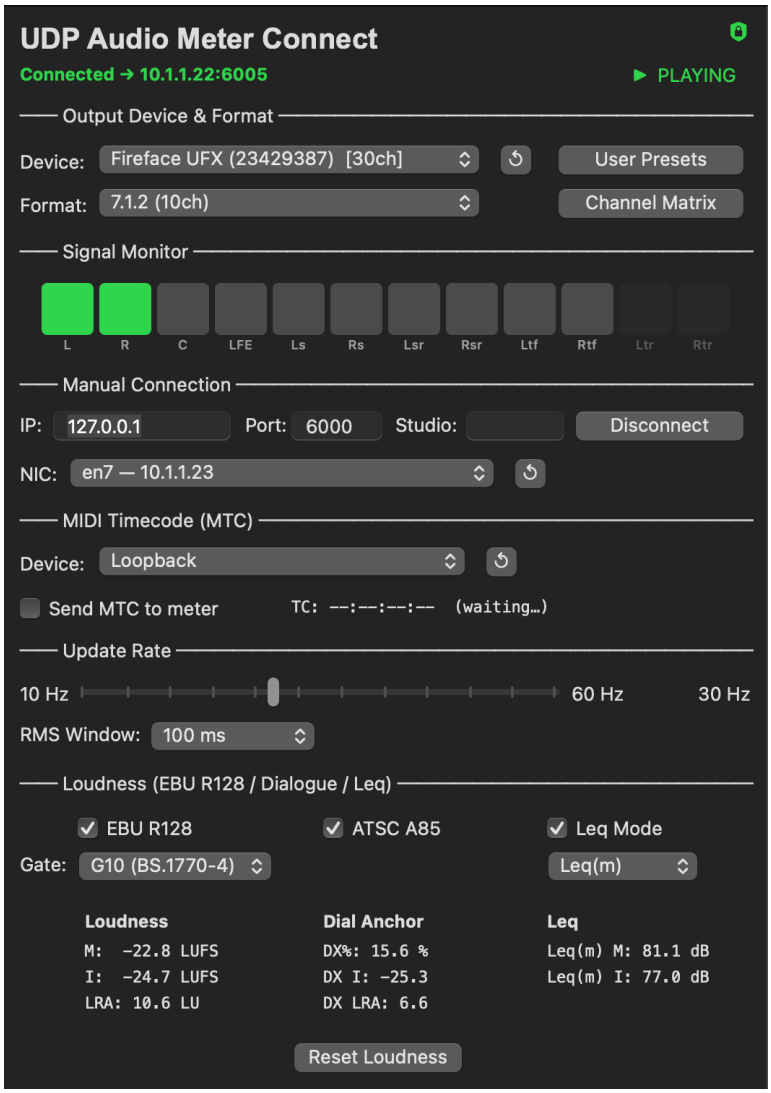
- Linked output devices
- Channel routing (matrix)
- MTC source settings
- Loudness preferences



Additional Settings

The following controls mirror those found in the plug-in:

- **Update Rate**
- **RMS Window**
- **Loudness Panel Settings**
- **Manual Connection Controls**
- **Studio Name** (useful in multi-room environments)



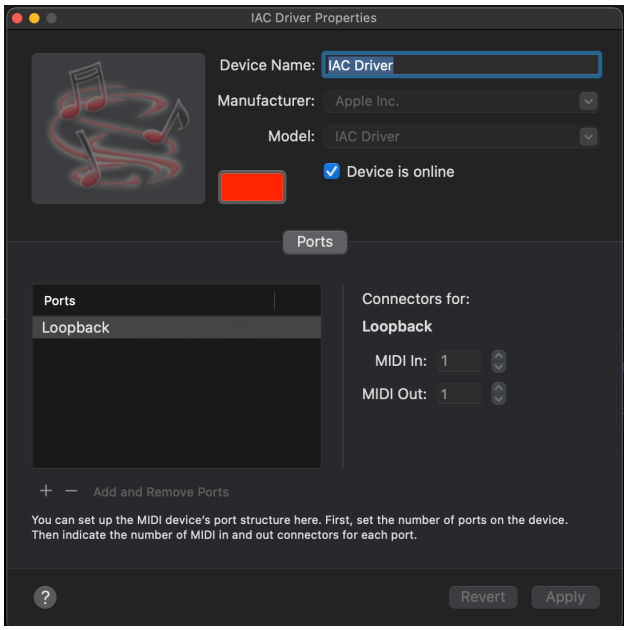
Timecode (MTC) Integration

Unlike the plug-in, the Meter Connect application does not have direct access to DAW timeline position. Timecode must be transmitted using **MIDI Time Code (MTC)**.

Setting Up MTC via IAC Driver (macOS)

1. Enable the IAC Driver

1. Open **Audio MIDI Setup**
2. Go to **Window → Show MIDI Studio**
3. Double-click **IAC Driver**
4. Enable **"Device is online"**
5. (Optional) Rename the bus (e.g., *Loopback*)
6. Click **Apply**



2. Configure Your DAW and Meter Connect

- **In your DAW (Sender):**
  Set **MIDI Output** to *IAC Driver (Bus 1)*
- **In UDP Audio Meter Connect (Receiver):**
  Select *IAC Driver (Bus 1)* as the MIDI input device
- Enable:
  "Send MTC to Meter"

Summary

UDP Audio Meter Connect provides a flexible, system-level alternative to the plug-in, enabling:

- Centralized metering control
- Seamless integration with external devices
- Network-based meter distribution
- Custom routing and format handling

For recording workflows requiring latency compensation, the plug-in may be preferred. For system-wide monitoring the driver and Meter Connect app provide a powerful and efficient solution.

Known Issues

Clicks and pops may be heard when the chained output audio device is the laptop speakers and the device is used directly by an audio app. (Audio is normal if the app is using the UDP Driver as it's output) This appears to be a coreaudio mixer issue only on some devices.

Integrated loudness measuring can be inaccurate when the UDP driver is used as the system output device because other system audio events or silence will offset the energy calculation.

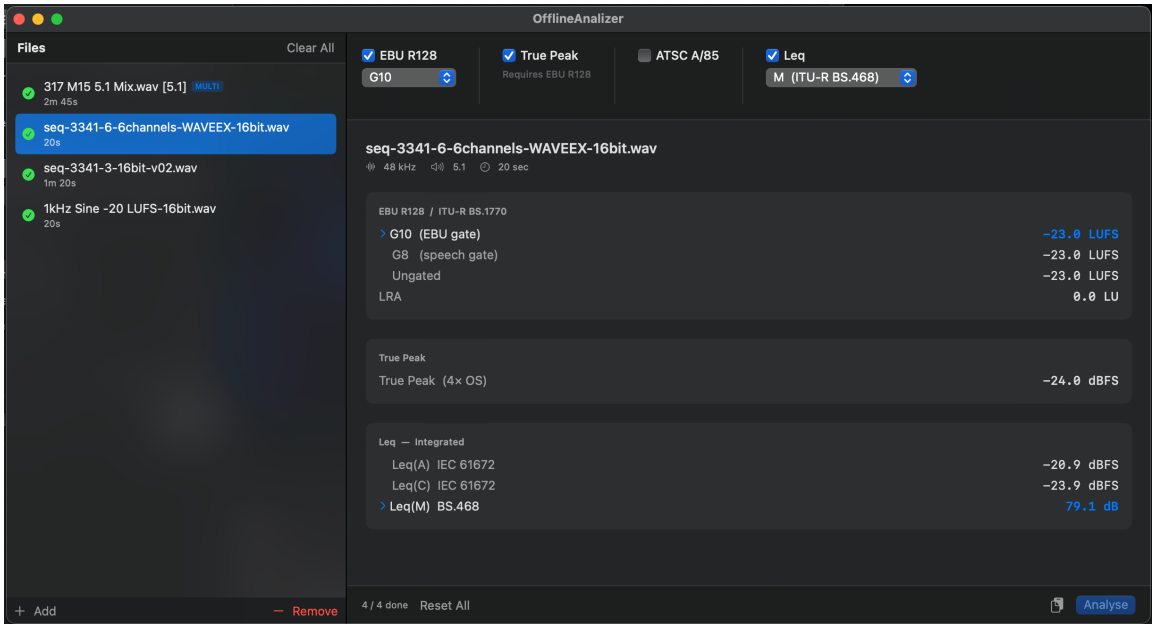
The host Operating System may delay releasing the network resources on reconnect and the ports will not be available for the automatic retry-on-fail system. In this case changing the port number before clicking the selected meter source (plugin or connect) will generally solve the issue.

Offline Analyzer

This bundled utility allows for faster than real time parallel loudness and true peak analysis.

Multiple files in different formats can be opened at the same time and will be processed using all the cpu cores available.

The results can be exported to a Tab delimited text file.



- Process Multiple Stems at once
- Only process the required metrics for speed
- 3 Loudness Engines available
- Interleaved or multi-mono files supported
- wav, aif, aiff, aifc, caf, mp3, m4a, aac, flac, ogg, opus, w64, bwf, rf64
- Mono, Stereo, 5.1, 7.1, 7.1.2, 7.1.4, 7.1.6
- SR: 44100, 48000, 88200, 96000
- 16, 24, 32 Bit

A valid license is required to use the utility

Licensing & Trial

The time-limited initial demo will run for 5 **minutes**, after which the DAW host must be restarted to re-enable the plugin. To obtain a 30-day trial license or to purchase a full permanent license:

1. Click the orange key icon in top right part of the plugin
2. Copy the complete challenge string
3. Email it to **udpaudiometer@gmail.com**

A Single Computer License permits installation and use on a single computer only.

A Multiple Computer License permits installation and activation on up to three (3) computers, provided that the Software is used by only one individual at any given time.

Feedback & Support

Send feedback to: **udpaudiometer@gmail.com**
Please include:
OS version
DAW name and version
Network configuration
Issue description or feature request

Release Notes:

Version 1.7

Optimized Offline Analyzer
Added Audio Suite Loudness Analyzer
Added Plugin Loudness Panel.

Version 1.6

Offline Analyzer Beta
Scalable Meter screen in MacOS.
Custom Channel Names.
Calibrated VU displays
Custom Logo can now navigate other folders or drag+drop picture

Version 1.5

UDP Meter HAL Driver and UDP Meter Connect App integration.
Leq measurement with A/C/M weighing.
Leq(m) TASA within 0.2 dB from VisLM measurement
Signal level fades out on transport stop.
Spectrogram defaults to send Center channel on initial launch
Filled bars in Peak only mode
Vectorscope opaque colour in Peak only mode
Loudness Status Bar colour grouped by measurement type

Version 1

VST3 release
Added NIC Selector
Adjusted quick host connection changeover
Visual UI Elements Tweaks
Added x.0 Surround Formats
Added Scale Labels show/hide Button
Memory leak and other bugs removed
Multiple Same-Host Applications running concurrently supported
Network discovery improvements
Code optimizations

Changes from Beta 3

iPad iOS client
Initial AU plugin support

Changes from Beta 2

Improved vectorscope rendering
Timecode display
Spectroscope fixes
Text scaling adjustments

Changes from Beta 1

Added G10, G8, and Ungated loudness modes
Dial Anchor alignment with Insight2 and VisLM (<0.3 LU difference)
Plugin-app command debugging for preset recall
Minor UI adjustments

Changes from Beta 0.1

Removed buggy AudioSuite option
Added Dial Anchor ATSC A/85 with gating
User presets
Multi-room UDP discovery/subscription
Bug fixes and optimizations

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Version 1.0

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