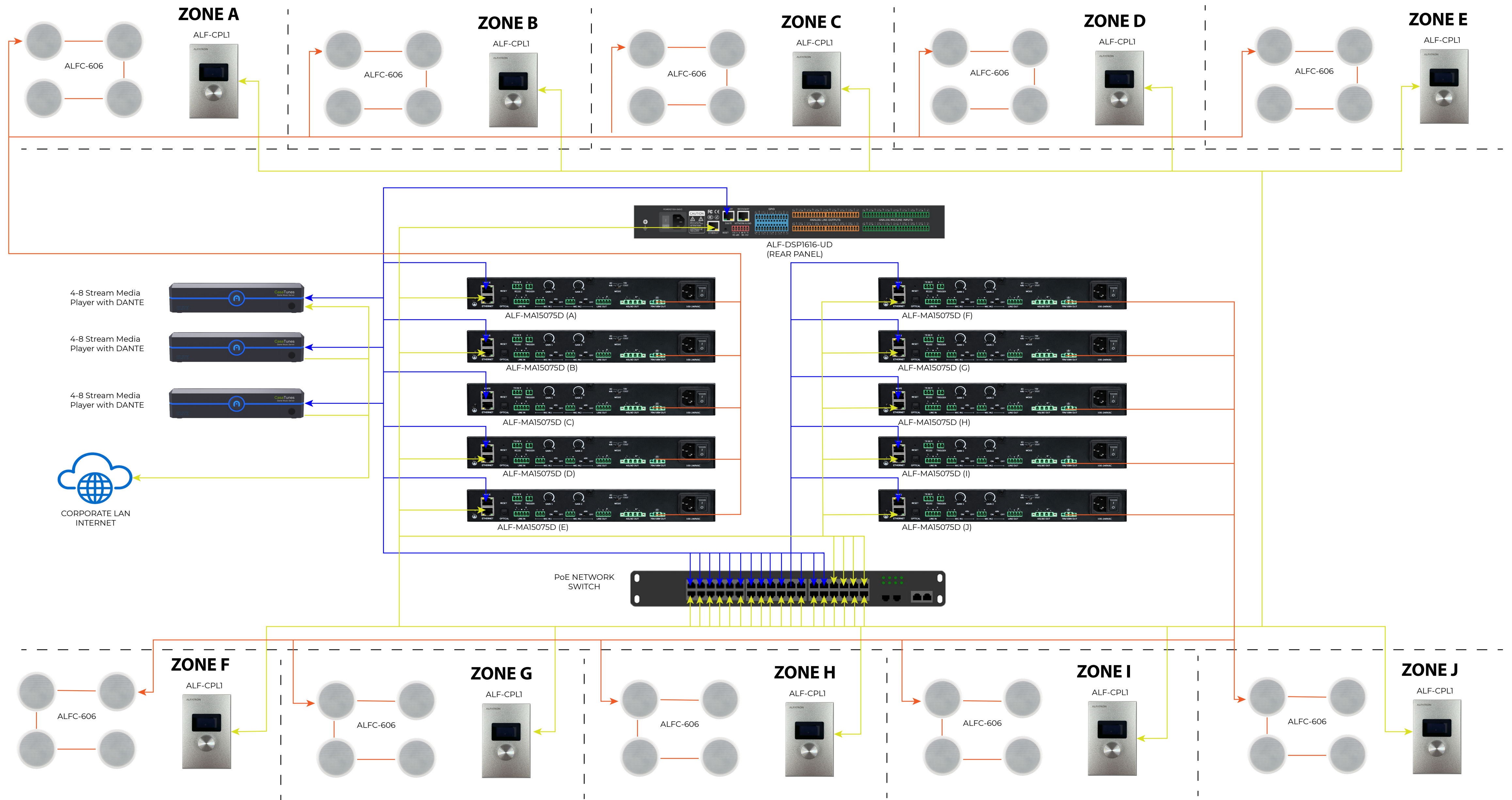




ALF-DSP1616-UD
BACKGROUND MUSIC SYSTEM



HDMI



LAN



DANTE



USB 3.0



USB 2.0



USB-C



HDBT



SPEAKER



AUDIO

The Solution

This multi-zone background music system is built around the ALF-DSP1616-UD, which serves as the central processing, routing, and control engine for the entire installation. Designed for environments such as hospitality venues, retail spaces, corporate buildings, and large commercial facilities, the system enables flexible audio distribution across multiple independent zones, allowing each area to operate individually while still being part of a centrally managed platform.

At the core of the system, the ALF-DSP1616-UD utilises a high-performance DSP architecture designed to replicate and automate the functions of a professional audio engineer. Its processing engine is capable of handling complex, real-time audio tasks with precision, ensuring consistent audio quality across all zones. With support for 16 analogue inputs and 16 analogue outputs, along with 16x16 Dante audio channels.

The DSP's advanced processing capabilities include a full suite of tools such as parametric and graphic EQ, dynamic range control (compression and limiting), automatic gain control (AGC), gating, ducking, delay, and matrix mixing, allowing detailed tuning of background music levels and tonal balance for each zone. Audio content is sourced from third-party music streaming devices, which are connected via Dante and delivered directly into the DSP, ensuring high-quality, low-latency audio transmission. The DSP then routes selected audio streams to the required zones and distributes them via Dante to the ALF-MA15075D amplifiers, maintaining a fully digital signal path from source to amplification while reducing analogue cabling and improving system reliability.

Each zone is equipped with an ALF-CPL1 wall controller, providing intuitive and immediate local control. Users can select between available music sources, adjust volume levels, or mute audio within their specific zone without impacting other areas, allowing different zones to operate independently with unique audio requirements.

For centralised management, a PC can be connected to the DSP to access the control software, enabling full configuration of routing, processing, and system parameters. Alternatively, a third-party control system can be integrated to provide a custom graphical user interface for centralised control, offering features such as global source selection, scheduling, zone grouping, and system monitoring.

Overall, this solution delivers a scalable and high-performance background music system where the ALF-DSP1616-UD provides powerful DSP processing and flexible routing, Dante enables efficient and future-ready connectivity, local controllers offer simple user interaction, and central control options ensure complete system management across all zones.

ALF-DSP1616-UD Overview

The ALF-DSP1616-UD is a high-capacity audio digital signal processor designed for complex and multi-zone audio systems requiring advanced routing, processing, and control. It features 16 analogue inputs and 16 analogue outputs, along with extensive Dante audio networking, enabling seamless integration of both local and networked audio sources across multiple rooms or zones.

Engineered for scalability and flexibility, the DSP allows any input to be routed to any output or combination of outputs, making it ideal for divisible spaces, multi-room venues, and large commercial environments. Its powerful processing engine supports a full suite of audio tools, including parametric and graphic EQ, compression, gating, feedback suppression, automatic gain control (AGC), ducking, delay, and matrix mixing, ensuring precise control and optimisation of audio performance throughout the system.

With built-in USB audio support, the unit can interface directly with external devices for playback or recording, while IP, RS-232, RS-485, and GPIO control options enable seamless integration with third-party control systems and automation platforms. This makes it easy to manage source selection, volume levels, and system configurations across multiple zones.

All configuration and system management is handled through an intuitive PC-based software interface, allowing detailed control of signal routing, processing parameters, and system behaviour. The software also supports customisable user interfaces and access permissions, enabling tailored control for integrators, technicians, or end users while maintaining system security. Designed for demanding installations, the ALF-DSP1616-UD provides a centralised, flexible, and scalable solution for managing audio across multiple spaces, with Dante networking simplifying distribution and future expansion.

ALF-MA15075 Overview

The ALF-MA15075D is a professional multi-channel power amplifier designed for high-performance audio distribution in commercial and conferencing environments. It delivers reliable and efficient amplification with a focus on flexibility, supporting both low-impedance and constant voltage speaker systems to suit a wide range of installation requirements.

The amplifier features Dante audio networking, allowing it to receive audio directly over the network from compatible DSP processors and other Dante-enabled devices. This enables a streamlined, fully digital signal path that reduces the need for analogue cabling while maintaining high audio quality and system scalability. It can also integrate easily into hybrid systems where both networked and analogue audio sources are present.

Designed for stable and consistent operation, the unit provides clean power output across multiple channels, making it suitable for driving distributed speaker systems such as ceiling speakers as well as front-of-house loudspeakers. Its architecture ensures efficient performance with low distortion, delivering clear and intelligible audio for speech and program material.

With straightforward control and integration options, the amplifier can be managed as part of a larger AV system, working seamlessly alongside DSP platforms and control systems. This makes it an ideal solution for meeting rooms, training spaces, and commercial installations requiring dependable, network-enabled amplification.

ALFC-606 Overview

The ALFC-606 is a compact 2-way ceiling loudspeaker designed to deliver clear, balanced audio for speech and background music in professional environments. Featuring a 6” woofer with a dedicated high-frequency driver and integrated backbox, it provides controlled sound dispersion and consistent performance, making it ideal for meeting rooms, training spaces, and commercial installations.

The speaker supports both low-impedance (8Ω) and constant voltage (70V/100V) operation, with selectable power taps of 30W, 15W, and 7.5W, allowing flexible system design and easy scalability across multiple zones. With a frequency response of 70Hz–20kHz and 90dB sensitivity (1W/1m), it ensures clear speech intelligibility and smooth audio reproduction across a wide coverage area.

Designed for distributed audio systems, the ALFC-606 is well suited for use as a primary or supplementary speaker, providing even sound coverage throughout a space. Its integrated backbox enhances acoustic performance while simplifying installation, making it a reliable solution for environments requiring consistent, high-quality overhead audio.

ALF-CPL1 Overview

The ALF-CPL1 is a compact wall-mounted control panel designed to provide simple and intuitive control of audio systems within individual zones. It enables users to manage key functions such as source selection, volume adjustment, and muting, making it ideal for multi-room audio environments where local control is required without accessing central equipment.

Designed for seamless integration with DSP-based systems, the ALF-CPL1 communicates over the network, allowing it to control routing and level adjustments within the central processor. This ensures that each zone can operate independently while still being part of a unified system, providing flexibility for applications such as background music, training spaces, and commercial venues.

The panel features a clean, modern interface with a rotary control and display, offering clear feedback and easy operation for end users. Its streamlined design allows for quick interaction, reducing the need for technical knowledge while maintaining precise control over audio settings.

With support for integration into larger control ecosystems, the ALF-CPL1 can work alongside central DSP software or third-party control systems, making it a versatile solution for both standalone zone control and fully automated AV environments.

Solution Bill of Quantities

- 1 x ALF-DSP1616-UD Digital signal processor
- 10 x ALF-MA15075D Amplifier
- 40 x ALFC-606 Ceiling loudspeakers
- 10 x ALF-CPL1 DSP control panel (optional)

Third Party Equipment

- 3 x 3rd party music streaming devices with Dante
- 1 x POE Network switch

Solution Use Cases

1. Divisible Venue – Combined Event Mode

In a combined configuration, Venue A, B, and C operate as a single large space for conferences, presentations, or events. All microphone inputs, including wireless and ceiling microphones, are routed into the ALF-DSP1616-UD, where audio is mixed and distributed across all rooms using Dante routing. The DSP ensures consistent levels and tonal balance throughout the combined space, while the ALF-MA15075D amplifiers receive audio over Dante to drive both the ALFW-81W front speakers and ALFC-606 ceiling speakers across all areas. This creates a unified audio experience with seamless coverage and synchronised sound throughout the entire venue.

2. Independent Room Operation

Each venue can function as a completely standalone room, with its own microphones and local audio sources routed independently through the ALF-DSP1616-UD. The DSP isolates audio paths so that activities in one room do not affect another, allowing simultaneous meetings or training sessions to take place. Users in each space control their environment the ALF-CPL1 wall controller, adjusting volume and source selection locally, while amplification and speaker systems operate independently within each room.

3. Multi-Room Presentation Distribution

In scenarios where a presentation or announcement needs to be shared across selected rooms, the DSP enables flexible routing of audio sources between spaces. For example, a presenter in Venue A can have their microphone and presentation audio routed to Venue B and/or Venue C via Dante, without physically reconnecting equipment. The ALF-DSP1616-UD manages level balancing and signal distribution, ensuring clear and consistent audio in all selected rooms, while unaffected rooms can continue operating independently if required.

4. Flexible Training & Breakout Sessions

The system supports dynamic room usage where spaces are frequently reconfigured for breakout sessions or group training. Each room can start as a combined space and then be divided into smaller areas, with the ALF-DSP1616-UD adjusting routing accordingly. Trainers can use local microphones and presentation audio within their assigned room, while the DSP ensures proper signal isolation and optimisation. The combination of Dante-enabled amplifiers, distributed speakers, and local ALF-CPL1 control allows quick transitions between room modes without manual reconfiguration, providing a highly adaptable audio environment.