Competence in Communication Technologies

Evolution of Headend Systems

HEADEND MARKET IN 2023: UNLOCKING NEW OPPORTUNITIES



As a pioneer in the TV reception and distribution industry, AXING has embraced the challenge of revolutionizing headend solutions for hospitality applications, enabling signal transmission with unparalleled reliability on a global scale. With a keen focus on user experience, AXING consistently strives to meet evolving customer expectations.
In this article, we will take an extensive look at the historical advancements of headend technologies in the context of hospitality TV. We will delve into the evolution of these technologies, tracing their development over time. Additionally, we will explore strategic approaches to capitalize on the thriving hospitality TV market and identify untapped opportunities for growth and innovation. By examining the past and looking to the future, we aim to provide valuable insights for industry professionals seeking to navigate the dynamic landscape of hospitality TV and make informed decisions for their businesses.

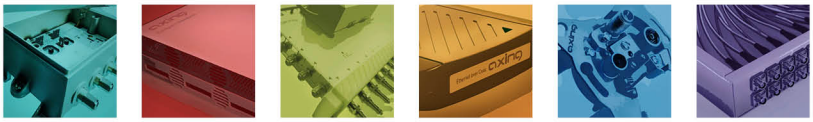
An Overview of the Evolution of Headend Systems

In residential and hospitality networks, encompassing hotels, hospitals, and multi-dwelling units, televisions have long been recognized as essential entertainment tools. To enable the reception of TV channels from various external sources such as satellite, terrestrial, cable, and IP, and subsequently convert them into a standardized format for delivery to in-room TVs, the industry relies on a centralized TV system called a "headend."
The headend serves as a critical component in the infrastructure of different verticals within the hospitality industry. It acts as a centralized hub that receives signals from multiple sources and processes them to ensure compatibility and optimal delivery to individual TVs. By consolidating and converting diverse signals into a common format, the headend simplifies the distribution process, facilitating seamless access to a wide range of TV channels for guests or residents.
The utilization of headend systems in the hospitality industry offers numerous advantages. It enables the efficient management and distribution of TV content, ensuring that guests or residents can access their preferred channels and enjoy an enhanced viewing experience. Moreover, by centralizing the TV system, it becomes easier to implement upgrades, perform maintenance, provide centralized decryption and introduce new features or technologies without disrupting the entire network.
Overall, the deployment of headend systems represents a fundamental approach employed across various verticals in the hospitality industry. These systems play a vital role in delivering a comprehensive and satisfying TV experience, meeting the diverse needs and preferences of guests or residents.

The Early Days: Analogue Systems

In the early days of hospitality networks, headend systems relied primarily on analogue technology. These systems involved the reception of television signals through antennas, which were then distributed to various guest rooms via coaxial cables. While these systems that used PAL TV format served their purpose, they were limited in terms of channel capacity (40 - 60 channels containing only one program per channel — depending on the VSB/DSB modulator selection) and lacked the flexibility to accommodate emerging technologies.

Modernizing Video Delivery for The Hospitality Network: Transition to Digital Headends



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Then, the digital transformation brought about a significant advancement in hospitality television systems, allowing a more effective RF spectrum and the use of cutting-edge digital modulation techniques (QAM), which allowed for a greater number of TV services with better picture quality. The introduction of hotel TVs with built-in DVB-C/T digital receivers after 2008 further boosted this transaction.
Additionally, it became possible to bring a broad range of RF signals as well as higher frequencies into hotel rooms with superior MER and CNR values as a result of significant advancements in RF distribution systems powered by fiber optical systems.

The Rise of IP-Based Headends: IPTV Systems

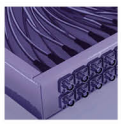
The big bang of TV streaming services in recent years is a major indicator of how much broadcasting has changed in the last decade. With a large demand on new technologies and platforms, viewers' preferences for watching television have changed from accessing only a handful national services to consuming a variety of content provided by different sources. And these new services enabling seamless access to video content has resulted with a demand to make hospitality televisions capable more than just linear TV.
With the advent of internet protocol (IP) technology, headend systems in hospitality networks embraced another transformation. IP-based headend systems leveraged the power of network infrastructure to deliver television content, merging traditional broadcast channels with on-demand services and interactive features. This shift allowed for greater scalability, flexibility, and the integration of advanced services such as video-on-demand and personalized guest experiences.
So as currently the last stop in our journey, the installation of IPTV systems into hospitality networks and the use of twisted-pair cables as the transmission medium opened a new door to provide users with the greatest and richest TV viewing experience, and these developments were welcomed by the global SMATV headend market. But what comes next?

Convergence Of Technologies and Modern Headends as A Result: Harmony of Software and Hardware







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There is a major convergence of technologies across terrestrial and satellite networks, including terrestrial fiber, multi-orbit GEO/LEO/MEO satellites, software defined ground stations and 5G mobile communication networks which all are contributing to a new ecosystem also at hospitality industries. In line with this, headend equipment and TV distribution architecture at hospitality networks are evolving to a more content demanding environment. On the hospitality industry, we have historically seen slower progress in comparison to the current innovations in telcos, but certainly, major advances at IP domain and fiber systems will deliver a new software-depended system architecture.
Equipment suppliers will need to ensure the key focus is built on user experience. Primary offering from previous generations of headends that are fine-tuned for simplicity are still not strong enough from a modern integrator perspective. In addition to this, consumer expectations are in constant evolution and tend to increase as the other technologies they are in contact rapidly improve and evolve.
In hospitality TV industry where products were traditionally based on hardware, we now rely also more on software. For many years, choosing from a limited number of TV services made available by the venue owner was the only option for TV use in a hospitality networks. We are now introducing an interactive and user defined TV experience thanks to innovative middleware technology.

Acknowledging the Elephant in the Room: Exploring the Benefit and Obstacles of IPTV Middleware

In principle, IPTV middleware is a piece of software that establishes connections between several software programs to allow for compatibility and information sharing. An IPTV Middleware server is now more fundamental than ever, especially to build an interactive experience that requires to have included content and subscriber management capabilities.

The Beauty: Empowering Customization and Interactivity

IPTV middleware has revolutionized the way viewers interact with television content. With its advanced features and user-friendly interfaces, viewers can enjoy a personalized and immersive TV experience. Middleware enables service providers to offer an extensive range of interactive features, including video-on-demand, time-shifting, and catch-up TV, enhancing viewer satisfaction and engagement. This level of customization empowers viewers to tailor their content consumption to their preferences, transforming the way they enjoy television.

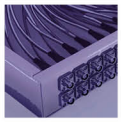




Attractive features of IPTV Middleware at a quick glance:
- Billing management
- Compatibility with various set top boxes and hospitality TVs (manufacturer / brand independent!)
- Customer centric customized welcome pages and menus
- Customer centric viewing experience with channel sorting (per language), service grouping and VOD possibilities
- Centralized channel management eliminating the need for TV's to rescan channels after any input modification (i.e. change on a particular satellite transponder)
- Pay TV, VoD, AoD
- Interaction with customers, staff and the hospitality system (PMS)
- Targeted advertising for customers





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- Google Chromecast solution for screen mirroring with mobile devices (iOS or Android)
- AirPlay functionality in all hotel rooms (no AppleTV® needed in the hotel room)

The Challenges: Complexity and Integration Hurdles

IPTV middleware has emerged as a powerful tool in the realm of television content delivery, offering an unseen of benefits for service providers and viewers alike. However, the paradigm shift from linear TV to interactive systems in hotels presents additional problems that integrators and equipment providers must address.
The key issue here is that the hotel technicians are unable to take advantage of the advanced capabilities of this modern period due to the Middleware servers' confusing and unintuitive interfaces. To completely meet new needs and incorporate them into adaptable and scalable systems, an ideal partner should offer a perfect harmony of function and use.

Ensuring Reliability: A Blueprint for Delivering Robust Solutions in a Competitive Market

Healthy market competition is essential to a well-functioning industry. The fundamentals of economics demonstrate that consumers benefit from lower prices, better goods and services, greater variety, and improved innovation when suppliers compete. Of course, all equipment providers are striving to deliver great TV services for as low cost as possible and this cost pressure is brining several issues to integrators as well as venue owners such as:

- Utilizing systems without redundant power supplies, rendering the entire TV infrastructure vulnerable to a simple power supply failure.
- Being limited to a restricted number of input/output configurations that lack the necessary flexibility.
- Experiencing performance issues caused by inadequate RF characteristics of the units, leading to unstable signal reception.
- Inability to leverage cloud-based remote access technologies for headend systems, hindering configuration of connected devices and software updates without the need for physical network visits.
- Deploying technologies that lack future-proof capabilities, such as IPTV-unready solutions instead of Hybrid DVB/IPTV headend systems, potentially rendering the entire existing system obsolete.

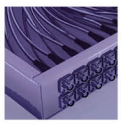
Different Networks' Individual Solutions

For equipment suppliers and integrators, the transition from analogue (PAL) to digital (DVB-C and DVB-T) systems opened a world of opportunities. Looking closely at this rapidly evolving environment, the widespread adoption of IP based TV systems (IPTV) at hospitality networks is the next big technological breakthrough that we are already experiencing. Understanding changes and being able to adapt headend equipment are essential in such a dynamic market since various networks and facilities have diverse needs.
For instance, even a 50-year-old hotel with outdated coax-based infrastructure should not be left behind in the digital era. It is crucial for them to offer their guests a premium and immersive TV experience, complete with an extensive selection of satellite feeds from across the globe. This ensures that the hotel can distribute hundreds of TV services to any number of TV sets within its premises. To provide guests with the best and most up-to-date experience, an Ethernet over Coax (EoC) system can be implemented, leveraging the existing coaxial cable network. This allows for the simultaneous transmission of television and internet data through the same cable. Similarly, by integrating a Cable Modem Termination System (CMTS) into the existing network, a robust internet distribution system can be established without the need for new cables or lengthy conversion processes.
In a similar scenario commonly observed in Europe, hotels with a significant number of rooms, such as over 300, face a limitation with their TVs lacking built-in IPTV tuners, despite having a functional IP infrastructure in place. This poses a challenge in delivering IPTV services without relying on external set-top boxes, which hotels typically aim to avoid. To address this issue, if the hotel is considering implementing a new DVB-C Headend infrastructure today, their ideal solution would be a future-proof system capable of supporting IPTV upgrades. This can be achieved by adopting Hybrid DVB/IPTV headend systems that offer both DVB-C/T outputs and IP streamers, ensuring compatibility with evolving IPTV technologies.
By addressing these challenges and incorporating flexible solutions, hotels can seamlessly integrate advanced TV services into their existing infrastructure, regardless of its age or limitations. This enables them to enhance the guest experience, embrace the digital revolution, and stay competitive in an ever-evolving industry.
By leveraging innovative hardware and software technologies, the industry can cater to the changing needs and preferences of guests, ensuring their stay is enriched with personalized entertainment options. And here at AXING, we offer cutting-edge and integrated solutions – designed maintain network reliability and meet individual customer requirements.

Industry Leading Headends from AXING





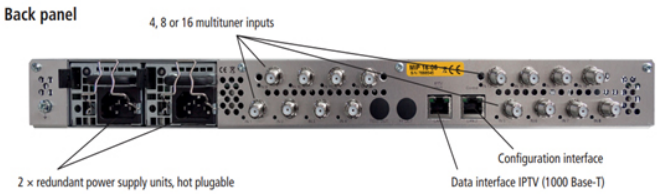



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AXING headend solutions stands out as a testament to innovation, flexibility, and resilience, offering an exceptional price-performance ratio in the market. This headend series is designed to cater to a wide range of requirements and configurations.
Depending on the chosen configuration, the AXING headends can receive signals from various sources, including DVB-S/S2/S2X, DVB-T/T2, DVB-C, HDMI, IP, FM, DAB+ and USB. This versatility allows for seamless integration with different broadcast standards, ensuring compatibility with diverse TV systems. Additionally, the headend is equipped with modulation capabilities, enabling the selected programs to be efficiently converted into IP, DVB-C and DVB-T/T2, formats for distribution.
To cater to the needs of pay TV services, the AXING headends are available with CI (Common Interface) slots. These slots enable the reception and decryption of pay TV channels, providing additional options for content delivery and monetization.
Flexibility is a key feature of the AXING headends. The devices can be expanded and enhanced with the help of software extensions. This adaptability allows for the addition of new functionalities or the customization of existing features, ensuring that the headend system can evolve with changing requirements and technological advancements.
Here is a quick look at the main features of MIP IPTV streamer:



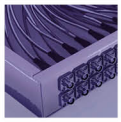
- Independent multituner inputs
- Transmodulates DVB-S/S2/S2X/T/T2/C into 512 SPTS or 8/16 MPTS
- Multistream at DVB-T2 and DVB-S2X
- Two redundant power supplies
- Re-multiplexing | Cross-multiplexing
- Decryption of encrypted program packages possible via CA modules • Flexible and efficient mapping of programs to CA modules
- LCN sorting, PID filtering
- Web-based configuration
- Suitable for AXING SMARTPortal
- Supports SNMP
- Interface for CASimulcrypt Server
- 19" housing, 1RU

What Comes After?

In conclusion, headend systems have come a long way in the context of hospitality networks. From analogue systems to digital and IP-based solutions, the industry has witnessed remarkable advancements. As we look ahead, it is clear that the future of headend systems will be characterized by increased integration, enhanced content management, and the seamless delivery of cutting-edge services, ultimately elevating the guest experience to new bak_heights.
We are going to see a larger integration of TV and Internet at hospitality television networks as the world becomes even more data-hungry





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than it is now. Even soccer events are being streamed by OTT carriers since OTT has already overtaken traditional pay TV in several regions of the world. In order to incorporate these new services into hotel TV headend systems, AXING is actively monitoring customer consumption patterns. Finally, rest assured that the AXING has +40 years' experience on providing the best hardware and software that will tackle any challenges that the future brings to us.

From Antenna To Televisions: Where Integrators Shine!

There is an old joke about Satellites. ''Two satellites decide to marry. The wedding wasn't much, but the reception was amazing.''
Reliable signal transmission and distribution is the backbone of a facility's successful operation. From signal reception at the satellite dish and final distribution either on the coax, ethernet or fiber domain, signal quality and availability must be properly engineered and managed. Here at AXING, we know every facility has its unique challenges. Therefore, we engineer and provide integrated solutions from project planning to final delivery including:

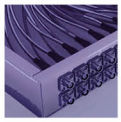
- Close support for the combination of hardware, software, and services to meet complex technical needs.
- Bill of Material (BOM) and planning support.
- Support in the development of the bid, technical and commercial proposal, and presentation of the solution to the customer – remotely and locally.
- Trouble shooting and maintenance as after sales services.

Providing Integrated Technologies for Signal Reception and Distribution!
With over 40 years in the business, AXING AG is a leading equipment supplier of the global satellite and cable communications industries. Our large range of products are used in multifamily residential buildings, hospitality applications and telecommunication networks by worldwide broadcasters, satellite, cable and telecom operators.
While AXING sells directly to some of the verticals they exist, such as the satellite operators and the broadcasters on top of the well-established distributor channels, company has the vision to expand their sales channels and partner with more of the systems integrators who can introduce company to new verticals and help them to increase sales in some of their existing markets.

Article as PDF.





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