

DICENTIS Conference System

White Paper: OMNEO



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1 Summary

The DICENTIS conference system delivers world-class performance designed to last. Built on the OMNEO media networking architecture, DICENTIS integrates easily with other systems, features, and IT infrastructures, and the system will continue to evolve, as the open standards evolve. The result is a conference system of unmatched quality, longevity, security, and reliability.

2 The Challenge:

Deliver World-Class Performance in a Future-Proof System

Today's top echelon of conference systems must offer superior quality backed by secure, uninterrupted connectivity.

From a small boardroom with ten conference devices, to a large international summit building, as new positions are added or meeting needs change, conference center IT managers should be able to mix and match devices and move them around freely.

Conference systems should also be future-proof and scalable, able to accommodate new devices and features, and integrate easily with third-party equipment, standard cables, and additional subsystems. Conference systems should offer the flexibility and scalability to be installed, maintained, adapted and expanded without incurring extra hassle and cost. In addition, it is imperative that conference systems function smoothly within the larger IT infrastructure.

Unfortunately, proprietary systems with unique platforms and security protocols require specialists for installation, adaptation, and maintenance. They often require additional interfaces to be able to interact with third-party equipment or features. Integration with other systems or subsystems can be challenging, expensive, and even impossible. The "security by obscurity" idea is also an illusion. A skilled security person can break the security easily, while an IT manager without specialized system knowledge cannot secure the system again. Finally, the entire system lifetime is limited by the proprietary platform, which does not evolve like an open-standard platform. An expensive, state-of-the-art system becomes obsolete within five years in today's world. Experience shows that there is no client benefit to a proprietary system.

In contrast, the best conference system today should provide a vast range of conference devices with first-class performance, based on open-platform media networking architecture and standard IP security protocols. The open architecture should allow the system to evolve into the future. It should also enable secure, uninterrupted connectivity between devices, as well as seamless interaction between the conference system and other equipment and systems. Integration with third party equipment and systems should be quick and easy, because with open-standard IP protocols, no vendor-specific knowledge is required.

3 **Mastering the Challenge: DICIENTIS**

DICIENTIS delivers world-class performance in a conference system designed to last indefinitely, and offering unprecedented ease of integration. DICIENTIS is the most future-proof, secure, reliable, scalable, flexible, and cost-effective system of this caliber on the market today. How was this accomplished?

DICIENTIS is built on OMNEO, the open-standards based media networking platform from Bosch, which is based on "de facto" standard Dante™ IP and Ethernet connectivity. Bosch uses OMNEO for many applications and products, making it easy to integrate, maintain, and expand. Bosch is also dedicated to supporting customers through increasing the use of open standards.

Specifically designed to deliver studio-quality, low-latency audio, OMNEO's evolving open-standard IP and Ethernet connectivity also make DICIENTIS the most easily integrated and future-proof conference system on the market. OMNEO also provides a unique, end-to-end security seal on audio and data transmission, by using standard Transport Layer Security (TLS) and AES encryption.

Bosch will continue to build professional audio devices on the OMNEO platform. OMNEO allows customers to take full advantage of compatibility with other devices and systems that utilize Audinate's Dante™ by integrating them easily into the DICIENTIS system. It also offers optimal expansion potential, since over 800 products worldwide already use Dante™, and the number is growing rapidly. DICIENTIS is the first full IP based conference system that uses this.

What difference does all of this make? Is it possible to imagine a conference system so easy to integrate, that 800 conference devices, 100 interpreter consoles with more than 2000 IP addresses, and 4 subnets can be installed and operational for a crucial conference in two weeks? Yes! Bosch just made this happen. This is all possible because of the auto discovery of all the Bosch devices. This makes setting up a DICIENTIS system fast and easy.

Standardization is the key. It is what makes DICIENTIS perfect for any size professional conference network, from a single council meeting room, to an international conference center. Regardless of the number of devices connected or the size of the area covered, DICIENTIS offers a world-class multimedia experience, with unparalleled future-proofing, security, reliability, scalability, flexibility and cost-effectiveness.

4 Performance

Speech Intelligibility is the first priority of the DICENTIS conference system.

The system is based on standardized Ethernet technology, offering a full Gb of Ethernet bandwidth in every device. This enables DICENTIS to deliver uncompressed 24 bits/48 kHz digital audio. The result is high quality, synchronized multi language, low-latency audio. Bosch's patented, intelligent "Digital Acoustic Feedback Suppression" automatically optimizes intelligibility, no matter how low or high the volume. Microphones and loudspeakers can operate simultaneously without acoustic feedback, to enhance the face-to-face meeting experience.

From 10 speakers to 10,000, in one room or in 100 different rooms, the system will provide a natural, uninterrupted audio connection, for maximum intelligibility and the best possible conference experience.

5 Future-Proofing

After performance, future-proofing is the most vital aspect of any system today. The pace of technological advancement continues to accelerate, and businesses cannot afford to lock themselves into expensive systems which need to be replaced every five years. Before the availability of open-platform systems, every technology offered restricted expansion possibilities and a limited lifetime. Basing new systems on open-platform architecture ensures that they can evolve with the evolving platforms, extending their flexibility and their lifetimes indefinitely.

The fact that IP technology has survived and matured over four decades of development proves that it is also the best of the best. It is constantly evolving, sustainable, and is used all over the world.

That is why Bosch created the OMNEO platform based on standard Ethernet in 2007, and why Bosch will continue to create systems which use the OMNEO platform and the Dante™ IP protocol.

DICENTIS is only one of the many future-proof systems which will mark a new era of system sustainability. Future open-platform systems from Bosch will include professional public address, intercom, and sound systems, among many others.

6 Security

DICENTIS uses internationally recognized encryption standards for all audio and data. For highly sensitive meetings, this encryption offers the best protection against eavesdropping, unauthorized access, and data tampering. Why?

Proprietary security with a secret protocol sounds good. Nobody knows the code except the specialists. Unfortunately, decrypting the code is usually not hard for a skilled person, since, in contrast to the well-known open standards, the proprietary solution is not designed by industry-leading security experts.

That is why DICENTIS uses Transport Layer Security, secure sockets layer (TLS-SSL), invented and under continuous development by security experts. TLS-SSL is the most powerful, legal security on the market, used to secure bank transactions and the most sensitive data all over the world.

TLS-SSL secures each control and communications channel between every device in the DICENTIS system, and it seals off the system from external and even internal network access, to create a watertight conference ecosystem. What does this mean, in reality? No hacker will be able to access the system, turn on a participant's microphone, and broadcast his conversation on YouTube.

Parliamentary votes are safe from tampering. Is this hard to install? No, this is done automatically. For instance, all DICENTIS multimedia, discussion devices and interpreter desks have an automatic unique key generator inside to ensure a secure connection.

IP audio streams are secured by the most advanced encryption legally available. All devices within one system share a secret and securely stored system key. The actual message encryption doesn't use this system key but uses the Diffie-Hellman key exchange algorithm to negotiate a specific session encryption key. Meaning, even if somebody would steal a device to obtain access to the system key, it would still not be possible to decrypt any recorded message from the system.

7 Reliability

Meeting managers need to be able to rely on the conference system completely. The full DICENTIS system uses standardized Ethernet connectivity, and while this enables scalability and easy integration with other Ethernet systems, it is also fully a mature and proven technology. Even large conferences with complex topologies can rely on DICENTIS for consistent multimedia quality and transmission.

DICENTIS uses Ethernet-compatible Rapid Spanning Tree Protocol (RSTP) to enable a redundant cabling topology that is fault tolerant. During a meeting, if one cable fails, RSTP automatically reroutes the information through the redundant cable. Whether the configuration is daisy-chained or star-wired, RSTP keeps every participant's device up and running, and the meeting continues! For optimal reliability, technicians can use star wiring with the Power over Ethernet (PoE) supply.

DICENTIS also includes an OMNEO surveyed solution, DOCENT. Using DOCENT, a meeting technician can pull up a visual map of every device in the system. Any device incorrectly registered or disconnected will be instantly identified and the technician can quickly correct the problem.

8 Scalability

The DICENTIS system can grow with you to accommodate any size conference.

Each DICENTIS device accommodates up to 1 GB bandwidth, but generally requires no more than a few Mb to deliver optimal performance. Replacing part of the infrastructure equipment (switches/ routers) allows customers to scale up to 10/25 or even 100 GB if needed, so that bandwidth is unrestricted regardless of the topology and growing needs. No need to replace DICENTIS hardware to cover this.

Each DICENTIS device has a built-in Ethernet switch to allow for easy daisy-chain connections, which can accommodate up to 40 devices (21 when redundant cabling is used). When the network gets bigger, DICENTIS uses the well-known concept of sub-netting to keep the system stable and manageable. This is the same principle which makes today's internet one worldwide network. In theory, the number of connections is unlimited, although currently, the DICENTIS system can manage up to 40 subnets. So, depending on the configuration, it is potentially possible for a single DICENTIS system to accommodate up to 10,000 devices.

9 Flexibility

DICENTIS is built on the OMNEO architecture, which is based on standard IP protocols and Dante™ audio streaming. Using standard IP means that other IP equipment, such as access control, building management, PC's, etc., can be integrated into the DICENTIS network. Dante™ compatibility also enables DICENTIS to integrate over 800 amplifiers, microphones, line inputs and outputs, recorders, and other products that use Dante™. Customers can expand and adapt their systems to suit any needs!

Each DICENTIS device also offers 1 GB bandwidth, but often only needs a few Mb. Why waste extra bandwidth? DICENTIS Multimedia devices already include internet activity and social media functionality. The DICENTIS platform also allows adding functions and devices to communicate directly with the system through the software Application Programming Interface (API). Customers can create apps to add customized functions that can be complimentary to the DICENTIS system; for example, add a customized meeting control. Customization is limited purely by the imagination!

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Maintainability

Not only is DICENTIS quick and easy to install and integrate, it is also easy to maintain. Because it cooperates and connects with other systems through standard IP protocols and Ethernet, adapting, repairing and securing the system only has to be done once. Technicians only need to know how to configure, operate, and maintain a single network, and standard routers, cables, and switches are replaced quickly and easily. Technicians can use network tools to get a quick and clear overview of their network and connected devices. To get this overview, technicians can use DOCENT.

11 Cost-Effectiveness

Using standard protocols and equipment in a single, open-platform network also saves money. No expensive special equipment is required. Instead, off-the-shelf products, self-designed apps, and existing third-party systems can be integrated using standard cables. Sharing infrastructure with other applications will further reduce customer cost, since there is no need to install multiple networks next to each other. Bosch will continue to use standard IP, security, and connectivity protocol and equipment to offer customers worldwide the ultimate, cost-effective solution.

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Conclusion

Based on a standardized OMNEO media networking architecture, DICENTIS brings customers an unrivalled combination of world-class multimedia performance in a future-proof system. Reliable and secure, it integrates easily and offers the most flexible, scalable, and cost-effective conference solution on the market today.



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