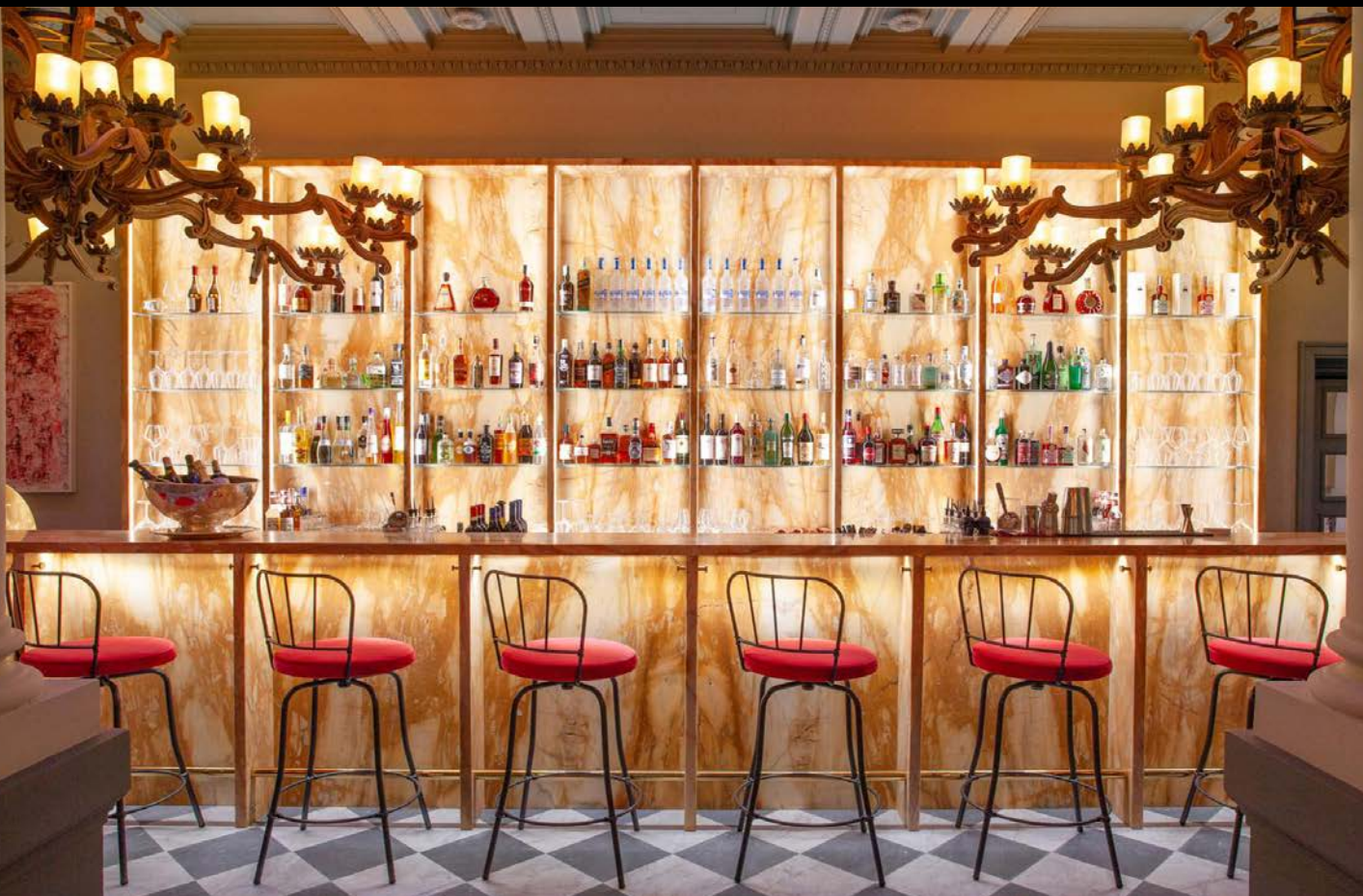


Casambi Whitepaper

Wireless lighting control for: Hospitality



Updated: January 2025

CASAMBI

Introduction

The hospitality sector covers a broad range of businesses from hotels, restaurants, bars, cafes and all manner of entertainment venues. Whether for business or pleasure, we all regularly engage with this sector.

In order to maintain their competitive edge, many in the field are transitioning away from the traditional model based solely on “a place to stay” to offering environments that can deliver memorable experiences; combining products, services and ambiance – all the ingredients to form a destination’s brand identity.

Whichever niche a business occupies, a positive experience depends on a lot of factors, including visual impact. Visual information accounts for 80% of all the information a human receives.¹ In an industry where first impressions count, garnering instant attention is not easy. Lighting plays a vital role because it can transform the atmosphere of an establishment, attracting the customer to a new experience by appropriately enhancing the brightness and texture of the place and products.

Decorative and technical luminaires in association with a lighting control system can be used to ensure that illuminance levels, brightness, and color temperature are always adjusted to suit the needs of each service.

Casambi’s Bluetooth Low Energy-based technology provides lighting designers and manufacturers with the ability to wirelessly link devices together enabling the creation of customizable smart lighting networks. This solution is significantly contributing to a modern-day revolution in how hospitality companies are self-branding and promoting new experiences for which every detail counts. Thanks to its simplified system architecture and user interfaces, Casambi is easy and fast to specify, install, commission, and use.

The Casambi system enables the setting of lighting control scenes, dimming of illuminance levels, the activation of lighting in response to presence detection, the use of daylight, and the controlling blinds - to mention but a few of its capabilities. By using only the right light in the right place at the right time, Casambi also contributes to energy conservation and maintenance cost reductions.

1. “Good Lighting for Hotels and Restaurants”. The licht.de series

Trends in the hospitality sector

Today the hospitality industry is under immense pressure to recalibrate business models - continuously adapting to ongoing uncertainties and following new emerging trends. Many new opportunities are surfacing:

Remote work is driving a new demand

As a result of the pandemic, many employers adopted a hybrid or flexible approach to working remotely. Enjoying the perks of remote work, people will book extended trips beyond what traditionally may have been a quick weekend getaway.²

Now, hotels and guesthouses need to accommodate a more discerning guest who may work and holiday during the same stay. Flexible spaces are key to keeping up with this demand. It is crucial to provide spaces where guests can relax, rest, and work. Multi-functional spaces that can be customized by staff and guests per their use is more efficient than the provision of separate spaces for each activity.

Personalized experiences

Guests expect to be recognized and treated as individuals, rather than just another anonymous customer. The generic one-size-fits-all offering is falling out of fashion given that customers are demanding experiences that meet their specific needs.

Hyper-personalized services (food and drink, special activities, spa services, etc.) combined with technology can provide great experiences and cultivate guest loyalty. Smart technologies can raise the level of service; from providing mobile check-in, contactless payments, voice control and biometrics, to larger-scale technological platform-based services that provide predictive analytics and use big data to create one-to-one interactions between the guest and the host at scale.³

Sustainability

All over the world, people are waking up to the virtues of pursuing sustainability. A 2021 study found that 81% of travelers surveyed said they plan to choose a sustainable accommodation option in the coming year. The share of green-minded travelers has risen consistently since the survey was first conducted.⁴ Many hospitality businesses are adopting sustainable initiatives and eco-friendly practices are fast becoming the norm. There are simple examples such as the implementation of towel reuse programs in hotels and energy-saving strategies for lighting. Or more progressive initiatives such as green building certifications with a full analysis of environmental and sustainable practices.

2. "Design Forecast 2022". Gensler.

3. "2022 Top Hospitality Industry Trends". EHL Insights. <https://hospitalityinsights.ehl.edu/hospitality-industry-trends>

4. "Hotel Sustainability: 27 Statistics Illustrating the Growth of ESG in the Hotel Industry". Hotel Tech Report. Accessed in November, 2022. <https://hoteltechreport.com/news/hotel-sustainability-statistics>

How it works

Casambi's Bluetooth Low Energy-based mesh technology provides lighting designers and manufacturers with the ability to wirelessly link devices together enabling the creation of customizable smart lighting networks.

Essentially luminaires, switches and sensors gain Casambi connectivity by either incorporating Casambi chips or by using Casambi's external Bluetooth modules. Minimal hardware is required. No cables, no internet, no routers are needed to run a network.

Mesh networking is a low-latency, low-power mesh network protocol, which in layman's terms translates to a fast, battery-life-extending, and highly reliable connection. Mesh networks are self-healing. If one smart device in the network suddenly becomes unavailable, in a mesh network, signal flow automatically reroutes through other devices, increasing reliability through multiple nodes and redundancy of nodes. There is no single point of failure. Every single device in the system contains the same, full intelligence of the network, eliminating the need for additional controllers, gateways, or hubs. The larger the lighting network, the stronger the mesh.

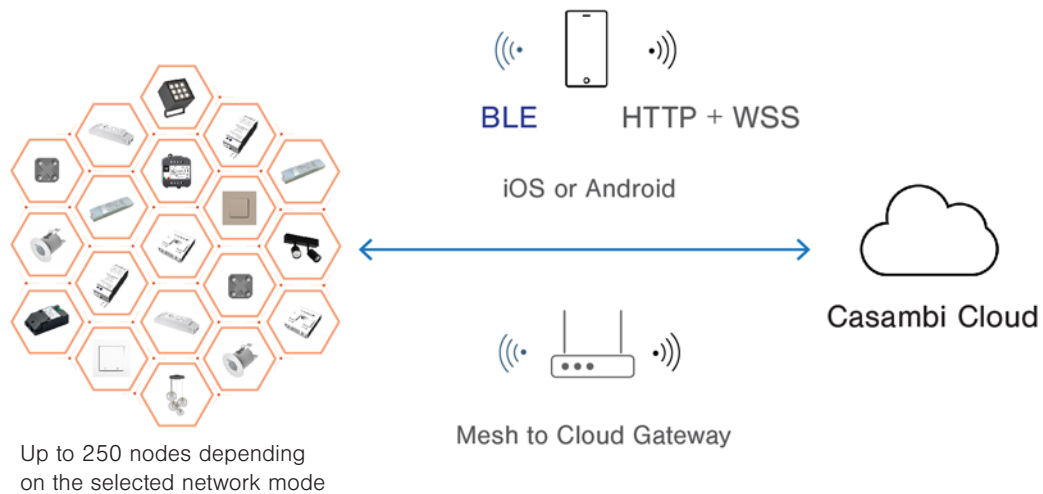


Up to 250 nodes depending
on the selected network mode

Casambi Stand-alone mesh network

All system configurations and end user controls are managed via the Casambi App on mobile devices, available for free on iOS and Android.

The Casambi network operates without an internet connection. An internet gateway can be used if it is required to have remote control over the network or to interface building management systems via a cloud connection.



Casambi wireless mesh network with internet gateway

Casambi benefits for hospitality

Casambi caters well to today's hospitality facilities by directly answering the need for powerful and highly customizable lighting control. Such benefits include:

Enhanced lighting design for front of house areas

- **Ambience is everything for front-of-house areas:** A unique atmosphere can be created through the lighting control system, which allows personalized daylight controls to balance artificial light with daylight or to generate smooth transitions between interior and exterior spaces. Circadian scenes, RGBW/TW controls, and subtle transition between multiple time-based light scenes that run and fade through the day are other functionalities available in the Casambi solution.
- **Flexibility to support design changes without hassle:** With Casambi's wireless lighting control solution, everything can be rewired in the software. Control groups, light scenes, automation programming can be created and changed time and again without having to consider any physical communication cables, as per a traditional wired system.
- **Discrete and easy installation:** Casambi technology is fast and easy to integrate into bespoke luminaires for unique, showstopping lighting installations.

Personalized guest experience

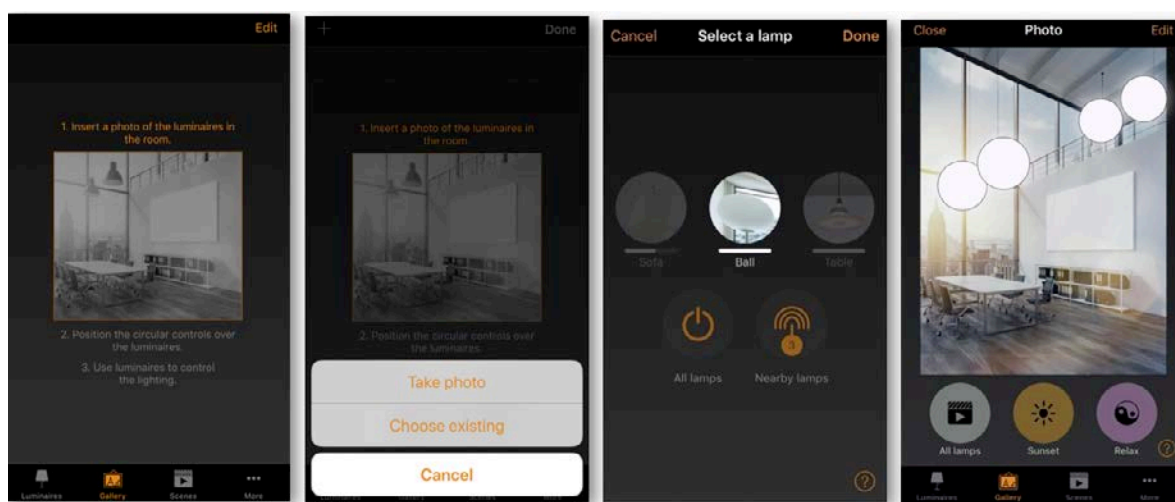
- **Personalization is a trend:** A personalized indoor environment largely relies on personalized lighting. Guests can customize their room's lighting with the Casambi App as the end user application:
 - Switching between light scenes and fine-tuning
 - Circadian scenes for a smooth transition between time zones for long-distance travelers
- **Casambi supports iBeacon profiles:** This is a great technology for those seeking a fully connected experience based on location awareness. In large hotels guests can be guided towards their destination, informed about certain activities or events based on their location. Or staff is alerted to approaching guests so they can be personally welcomed. All this happens using the iBeacon capabilities of Casambi's smart lighting control system with software integration that can be offered by Casambi ecosystem partners.

Best retrofit solution for energy efficiency and renovations

- **Hospitality services run 24/7:** therefore maximizing energy efficiency is of paramount importance. Further energy savings are made possible through daylight-responsive lighting, presence detection, time-based scenes, etc.
- **Through its modern API, Casambi networks can also be integrated into third-party dashboards and applications:** This enables network monitoring and the usage of collected data from a lighting installation. You can monitor and visualize all data from a Casambi network, such as energy consumption, failure states, occupancy patterns or air quality. Using real time data, you can improve the sustainability and efficiency of your lighting installation.
- **For renovations, pre-existing decorative luminaires or, for example, vintage switch plates can be souped up:** Existing luminaires with integral drivers, decorative fixtures with LED lamps, or even existing wall switches can gain wireless connectivity with the addition of a Casambi Bluetooth Unit (CBU).
- **Minimal disruption to ongoing operations:** It is not necessary to embark on surface reconstruction or the pulling of wires to configured a wireless lighting network, resulting in faster installation.

Improved efficiency for facility management

- **Saving energy:** By providing just the right amount of light when and where it is needed, it becomes possible to reduce energy consumption without compromising on aesthetics. Significant energy savings can be achieved in both front and back of house areas using a multiple control strategy combining occupancy detection and daylight responsive controls. With Casambi, any existing light installation can be upgraded to include wireless occupancy and daylight sensors. Controlled lamps work in lower temperatures and emit less heat, resulting in HVAC energy savings too - especially during the summer months.
- **Environmental monitoring:** Connected lighting can be used as an onramp for other applications such as remote air quality control or noise pollution monitoring.
- **Reduced operation and maintenance costs:** No controllers nor any special software licenses are required to use Casambi control. The active control of lighting levels helps to extend the luminaires' lifespan, which translates to fewer lamp replacements and additional labour maintenance savings – saving on the time and effort it takes to climb up, and switch out the lamp.
- **Intuitive interface on mobile devices:** The Casambi App has been designed by user interface experts with one core principle; regardless of technical proficiency, anyone can use it. Luminaires can be controlled remotely, and easily reconfigured and recommissioned from a smart device.
- **Gallery:** The Casambi App's Gallery feature allows you to upload photos of a space, or a floor plan, and mark the positions of the luminaires within the images. This helps to visually identify and intuitively interact with them - lightening the workload for technical staff. The restaurant staff, for example, can change light settings by simply touching the luminaires on the photo inside the App.



Gallery feature in Casambi App

How Casambi can help

Casambi's technology is integrated into fixtures, drivers, switches, sensors, and a diverse collection of modules, that together meet modern hospitality's lighting control demands.

Each hospitality establishment has its own unique needs and thus demands different lighting control strategies. Casambi offers different control types, functionalities and the ability to create up to 255 different scenes.

Application for restaurants

Casambi caters well to fine dining, fast food joints and every niche in between. Scenes can be set to promote appropriately comfortable dining experiences. As an example; for a dining room opened for multiple time slots, some control types and functionalities can be considered:

Control Type	Functionality
Manual Control	Staff can switch between preset lighting scenes, dim lights down/up or adjust color temperature easily from the Casambi App or using wireless smart switches. Scenes: Daytime – Sunset/ Dinner – Night - Cleaning
Circadian Scene	The color temperature (K) of ambient lighting follows a customized profile that runs automatically based on the time of day (i.e. Running smoothly from 4000K to 6500K from sunrise till noon, 6500K to 2400K from noon till end of day)
Daylight Harvesting	Light outputs of luminaires that are close to the windows are adjusted based on the amount of available daylight measured by a daylight sensor.
Motion Detection (Presence)	Ideal for back-of-house areas such as storage rooms or staff corridors. Occupied: Run scene Unoccupied for 10 minutes: Turn off lights

Application for hotel rooms

A single hotel room will have multiple purposes; it can be a place to work, a place to relax and, indeed, a place to sleep. Each occupant will have their own preferences and different perceptions of brightness.

To help guests feel at home, some control types and functionalities can be considered in a standard hotel room:

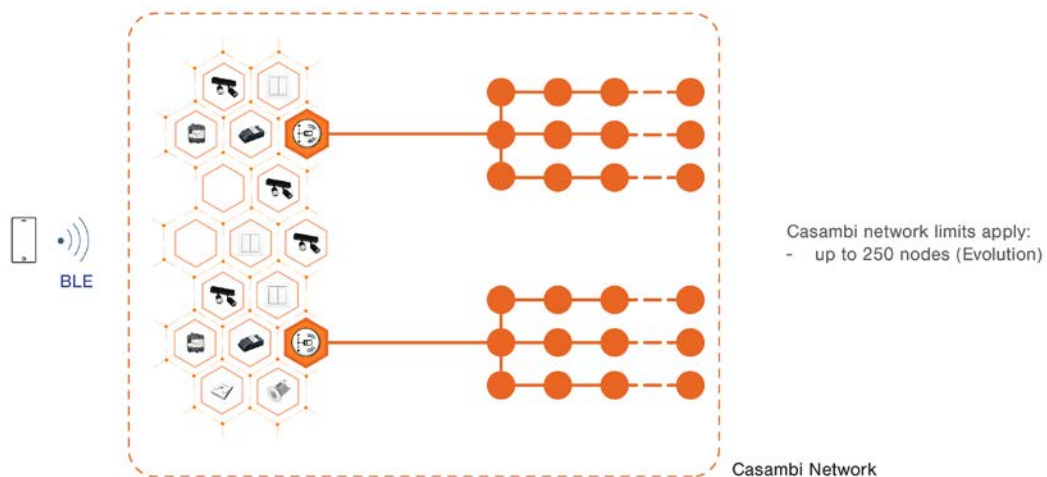
Control Type	Functionality
Manual Control	Guests can switch between preset light scenes (i.e. Welcome-Relax-Work-Night), dim lights down/up or adjust color temperature using smart wireless switches on the wall.
Circadian Scene	The color temperature (K) of ambient lighting follows a customized profile that runs automatically based on the time of day (i.e. Running smoothly from 4000K to 6500K from sunrise till noon, 6500K to 2400K from noon till end of day)
Motion Detection (Presence)	During the night scene, sensors placed under the bed switch on wayfinding lights that are placed close to the floor for easy access to the bathroom.

Casambi X DALI

Casambi offers users unparalleled flexibility with wireless, wired, and hybrid options. Whether leveraging entirely wireless capabilities or opting for traditionally trusted wired solutions, users can effortlessly mix and match to tailor lighting networks to specific project requirements.

A hybrid solution might entail control of luminaires through wired DALI means alongside wireless Casambi Ecosystem products in the same lighting controls system. This adaptability ensures that Casambi remains applicable across diverse settings, empowering users to choose the most fitting configuration for their needs.

The latest addition to Casambi’s DALI integration options, Salvador seamlessly integrates wired DALI drivers into the Casambi system, with a single unit capable of controlling up to 64 DALI drivers. DALI luminaires, when incorporated, will appear in the Casambi network as virtual luminaires, where they are programmed and controlled in the same way as Casambi Ready devices via the Casambi App. Salvador enables the extension of existing DALI networks and the creation of hybrid networks that consist of both Casambi Ready and DALI devices. Multiple Salvadors that are controlling DALI luminaires can be wirelessly connected to form a single Casambi mesh network. Notably, this product supports industry standards such as DALI D4i, DALI DT6, and DALI DT8. Additionally, Salvador features an integrated power supply, an internal Real-time clock (RTC) with backup energy storage, and cable strain relief to facilitate a smooth installation process.



Casambi Salvador enables the extension of existing DALI networks and creation of hybrid networks that consist of both Casambi ready and DALI devices.

Wireless emergency lighting

Modern emergency lighting systems must meet strict maintenance and testing requirements, including advanced control and communication functions.

There are several wireless emergency lighting solutions based on Casambi technology. These systems support DALI DT1 standard devices, meaning reliable interoperability with DALI self-contained emergency control gear, and enable wireless communication without the need for additional hardware or traditional DALI wiring. Emergency devices are easily paired using the Casambi App, allowing for an easy wireless upgrade for existing luminaires without a change of layout. Users can easily view the luminaires' signal strength and identify emergency devices from within the Casambi App.

These solutions provide automatic testing of individual luminaires, standard-compliant logs that available to download or access from cloud, and central monitoring via iPad or PC-based graphical user interfaces.

For more information on the wireless emergency systems based on Casambi technology, please refer to the Ecosystem section inside Casambi website.

Case studies

Casambi is a great lighting control solution for the hospitality sector. Our technology is tried and tested, and fast becoming the de facto standard in Europe.

To date, over 4 million Casambi Ready devices have been sold worldwide. Casambi has been specified in over 150,000 projects, spanning every application from small high-end residential to 10,000+ node industrial spaces. In addition to our Finland HQ, we have established regional headquarters in North America and APAC regions to serve our global networks. Casambi is deployed in highly sensitive environments, such as in hospitals and airport control towers. Our system is robust in design and has been certified as cyber-secure in accordance with global standards.

Koy Shunka Restaurant, Barcelona

The Michelin-starred restaurant Koy Shunka in Barcelona has been given an elegant and eye-catching upgrade courtesy of architecture and interior design company, Cortacans Arquitectos. A complete study of the current system was carried out with the objective to completely renew the lighting and its control system without causing disruptions to service.

For this installation, the luminaires were equipped with Tridonic modules and their Casambi Ready drivers, CBU-PWM4 modules, DLC1224-1Cv modules, and EnOcean pushbuttons - a personalized pushbutton panel was mounted with the latter for the triggering of scenes.

Site: Koy Shunka, Barcelona Spain

Casambi nodes: 120



Harrods Dining Hall, London

The historic Harrods Dining Hall, formerly known as the Meat & Fish Hall, is a popular culinary destination in London. The hall has undergone a dramatic transformation to offer a unique dining experience, all while respecting the building's heritage listing. It was decided to retain the existing tiled floor, walls, and ceiling, so a standard wired control installation was not an option.

Casambi's wireless lighting control solution was essential to bringing the layers of control required without installing new cabling that would disturb the historic environment. The project uses a range of Casambi modules such as CBU-TED and CBU-ASDs - to bring control to a range of decorative lighting, linear LEDs or narrow beam LED downlighting. The Casambi App allows Harrods' engineers to control, monitor, and adjust the lighting accordingly.

Site: Harrods Dining Hall

Location: London, UK

Casambi nodes: 170



Amadore Hotel and Restaurant De Kamperduinen, Kamperland

The Amadore Hotel & Restaurant de Kamperduinen in Kamperland, Netherlands, started its life as a hotel in the nineties but was eventually converted to a high-end hotel, restaurant, and wellness center. When the Amadore Group decided to go with a completely new vision for the establishment, they chose Casambi's wireless lighting control system for its full flexibility. Via integrated Casambi controls for dimming and scene control, for example, the lighting around every table area can be fine-tuned to evoke just the right mood.

An OEM track adapter with Casambi integrated as nodes are used to dim Luximprove Optiled AR111 arrays in the track spots. Using Casambi Evolution software, different timers have been combined with an integrated CBU Gateway to access the site remotely, 24/7.

Site: Amadore Hotel and Restaurant de Kamperduinen

Location: Kamperland, Netherlands

Casambi nodes: 869



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