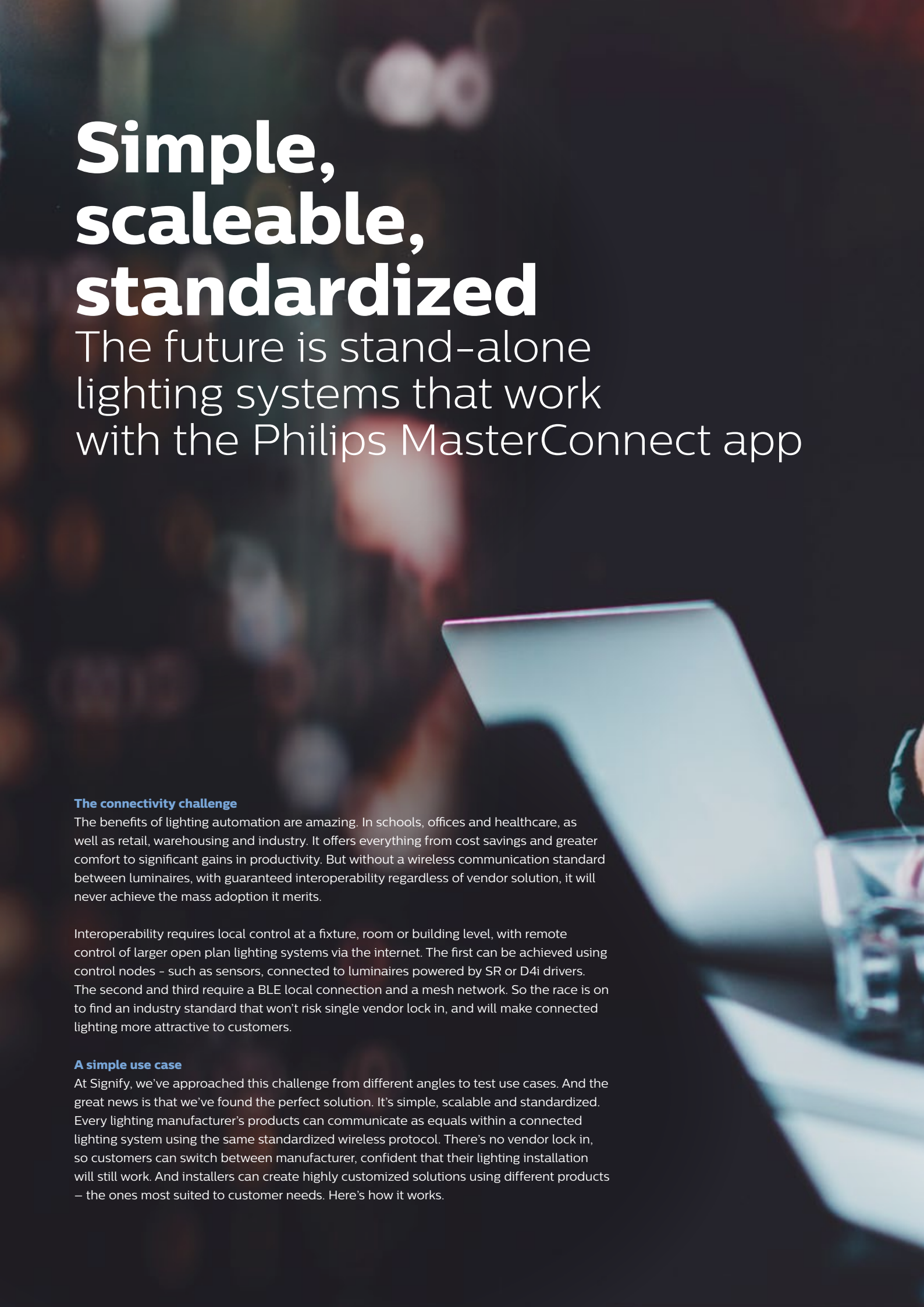
Simple, scaleable, standardized

The future is stand-alone lighting systems that work with the Philips MasterConnect app



The connectivity challenge

The benefits of lighting automation are amazing. In schools, offices and healthcare, as well as retail, warehousing and industry. It offers everything from cost savings and greater comfort to significant gains in productivity. But without a wireless communication standard between luminaires, with guaranteed interoperability regardless of vendor solution, it will never achieve the mass adoption it merits.

Interoperability requires local control at a fixture, room or building level, with remote control of larger open plan lighting systems via the internet. The first can be achieved using control nodes - such as sensors, connected to luminaires powered by SR or D4i drivers. The second and third require a BLE local connection and a mesh network. So the race is on to find an industry standard that won't risk single vendor lock in, and will make connected lighting more attractive to customers.

A simple use case

At Signify, we've approached this challenge from different angles to test use cases. And the great news is that we've found the perfect solution. It's simple, scalable and standardized. Every lighting manufacturer's products can communicate as equals within a connected lighting system using the same standardized wireless protocol. There's no vendor lock in, so customers can switch between manufacturer, confident that their lighting installation will still work. And installers can create highly customized solutions using different products – the ones most suited to customer needs. Here's how it works.

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Global product
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The commission app is available for download under the name of **Philips field app MC.** From Q3 onwards, this app will be renamed to Philips MasterConnect app for full inclusion of the new generation of Philips MasterConnect LED lamps that are Bluetooth enabled.

Connecting systems with the Philips MasterConnect app

Our new connected system guarantees interoperability by using our intuitive Philips MasterConnect app to control drivers, sensors, switches, and potentially gateways, in a connected lighting network. The MasterConnect app provides customers a simple and quick lighting system with features that add value beyond illumination. The system is set-up and configured via BLE technology, with an innovative point and trigger approach that uses a torch to commission lights into the network.

It's a completely scalable concept with wireless components that are easy to design into the system to add more features and functionality. So you can create a simple stand-alone system, a sophisticated gateway solution – or anything else in between (see Figure 1). A wide range of products are available within our portfolio, including wireless drivers, sensors, switches, allowing to build a connected system to satisfy the specific needs of any application. The wireless connected system is easy to install. It only requires a Bluetooth connection via the app, which means installers can configure it in the field, even without an internet connection.

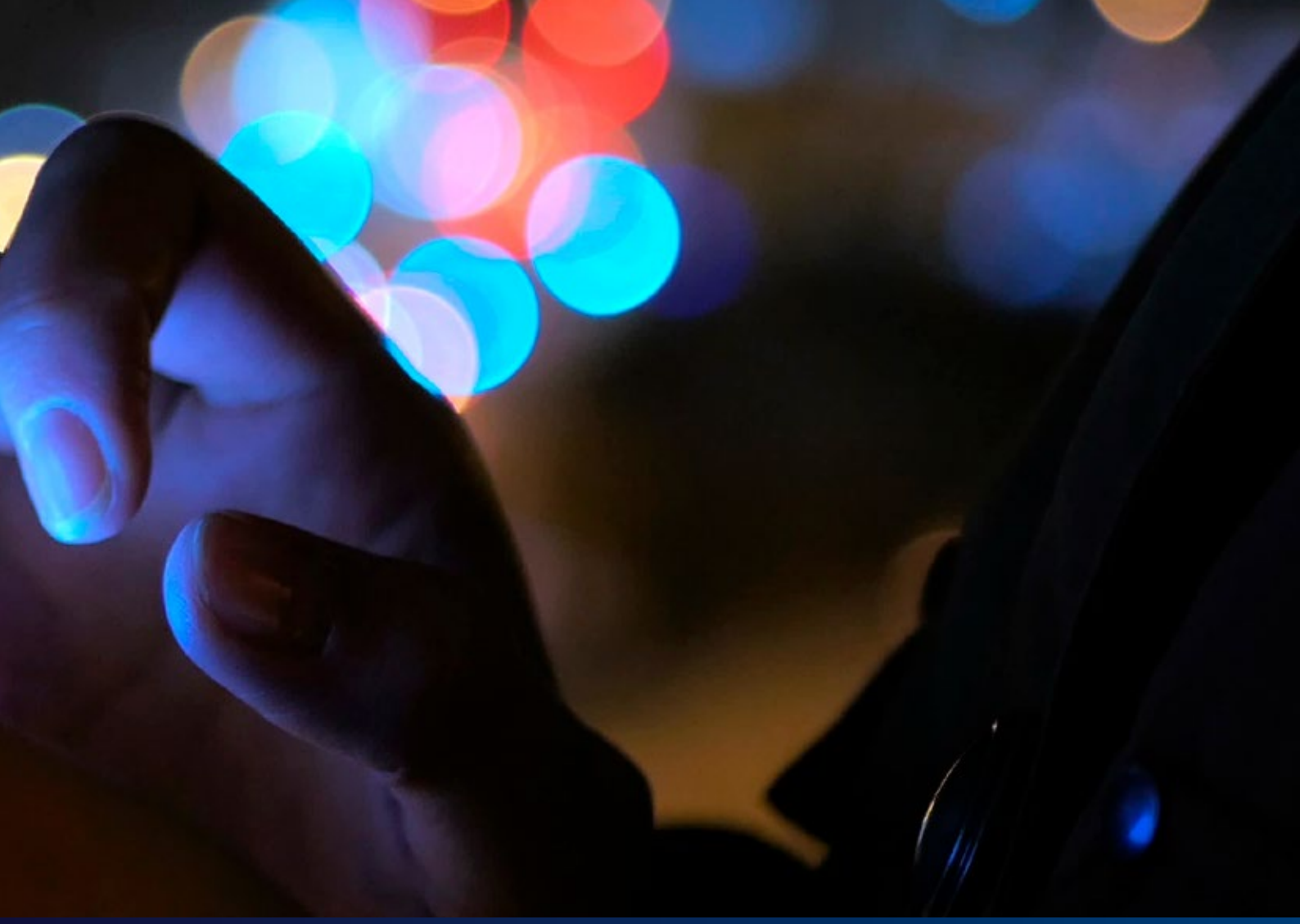
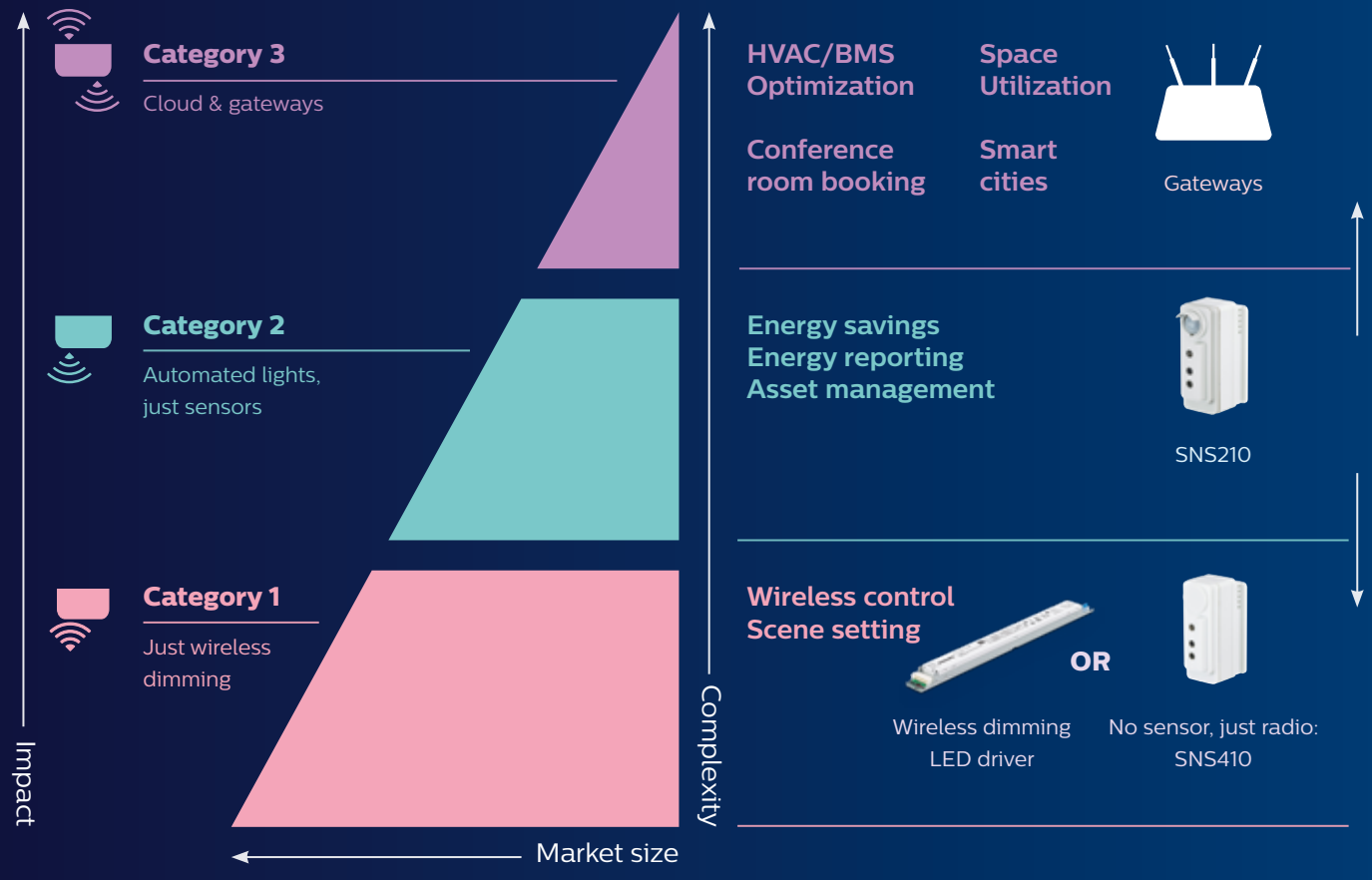


Figure 1: The MasterConnect app offers a three-tier system of use cases



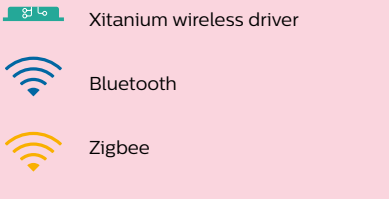
Category 1
Getting started
A simple stand-alone system

This indoor lighting architecture is a stand-alone system enabling a basic use-case of wireless dimming through usage of wireless lighting components. A simple network or group of wireless drivers, together with a switch, can be easily set up via the Philips MasterConnect app. This enables dimming and scene setting using a Zigbee Green Power (ZGP) energy harvesting switch (see Figure 2).

At any point in time, this wireless network or group can be adapted to the facility manager's requirements or building layout changes, or expanded by adding in more luminaires - all via the MasterConnect app (see Figure 3).

It is also possible to enjoy functionality over and above scene control by adding external room-based sensors, such as the Philips EasyAir Occupancy Daylight ZGP sensors (see Figure 4). For example, occupancy detection and daylight harvesting can enable energy savings by switching lights on or off, or reducing lighting levels when there is sufficient natural light. Task tuning can also be used to personalize light levels to suit individual needs, improving both concentration and productivity.

Category 1 solutions aim to enable a project in a cost-effective way and are ideal for room-based applications. Either it's within retail and hospitality, office or industry segments, it's easy to compose your system by using wireless components with the MasterConnect app.



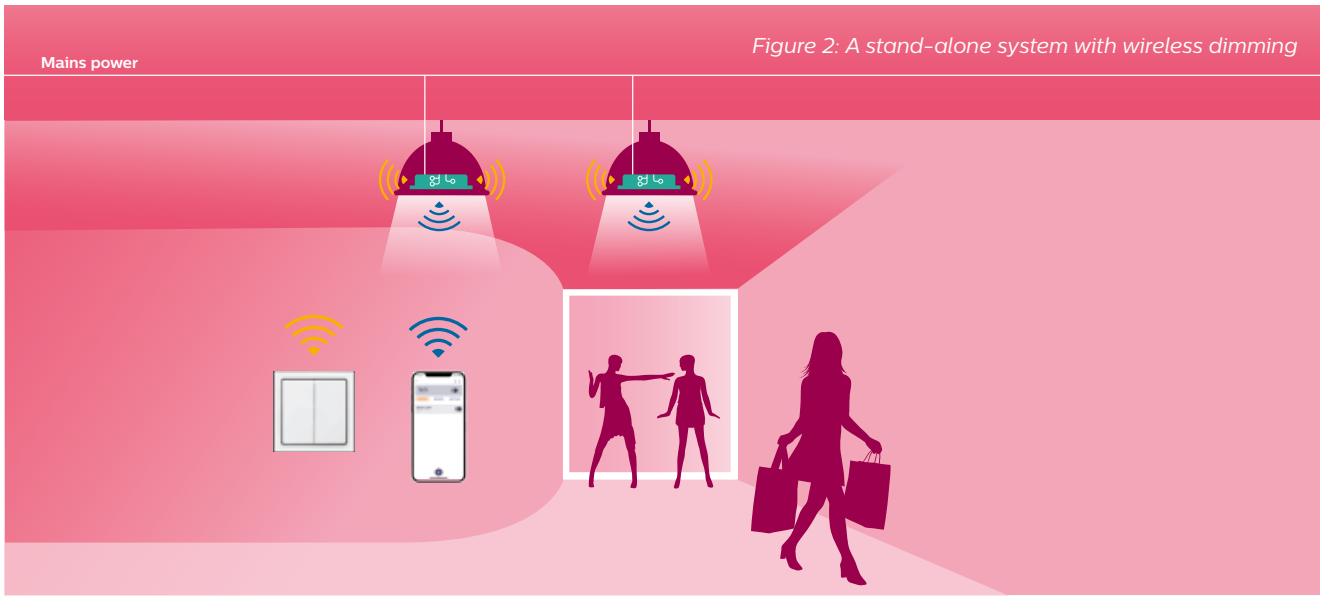


Figure 2: A stand-alone system with wireless dimming

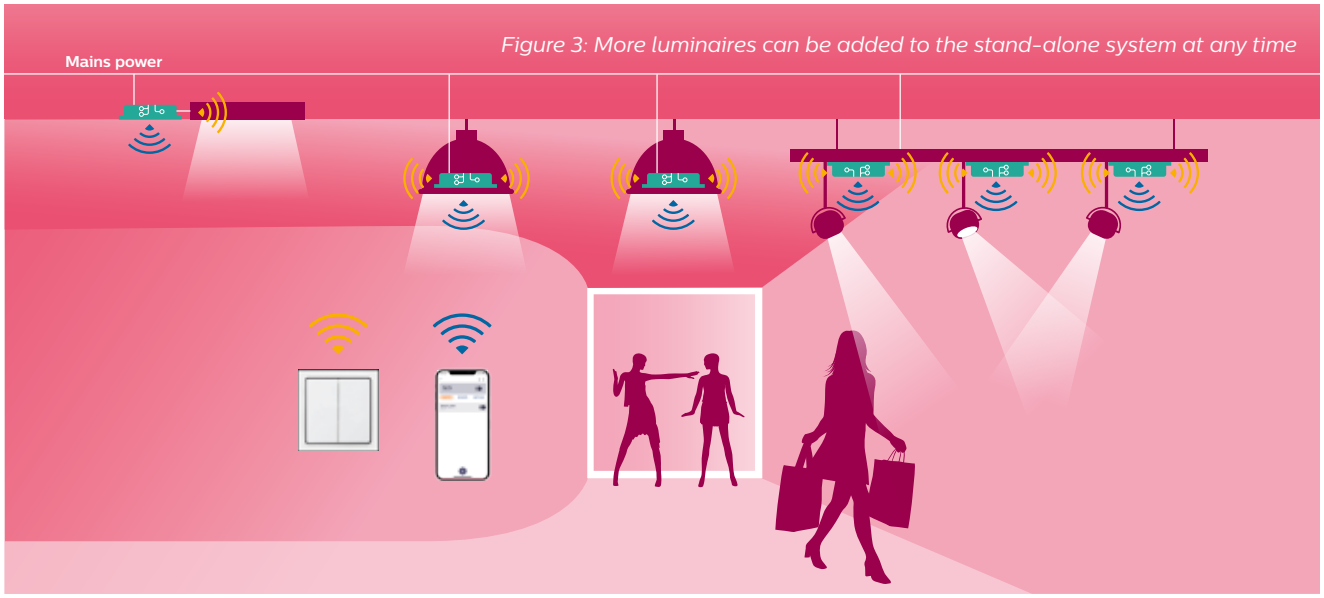


Figure 3: More luminaires can be added to the stand-alone system at any time

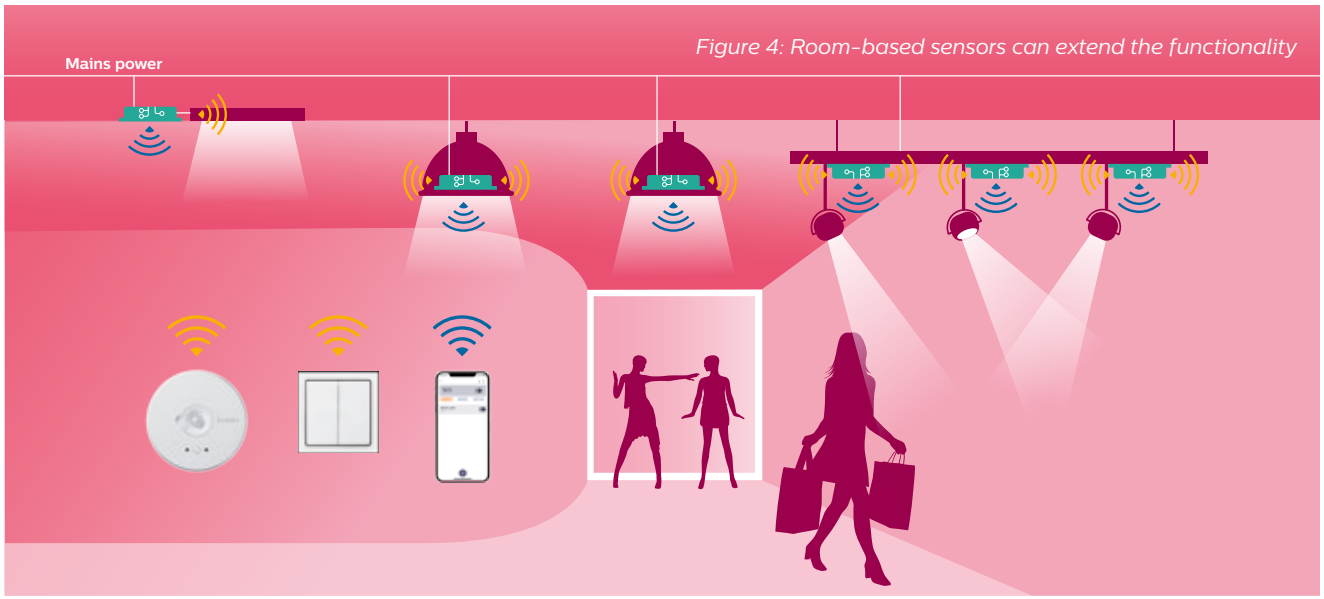


Figure 4: Room-based sensors can extend the functionality

Category 2
Get more control
A stand-alone system with granular dimming

But what if you want to take things to the next level?

In our category 2 use-case, we've added an extra degree of control over your lighting installation. The benefits are clear for both a facility manager- who is offered more energy savings, scene-setting possibilities and human-centric features, as well as for those using the lights- who are offered a more comfortable lighting experience.

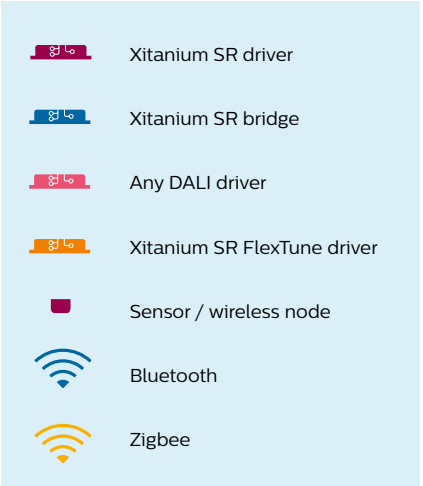
Philips EasyAir SNS210 sensors in every luminaire (see Figure 5) respond to occupancy in specific areas. In case motion is detected, the Zigbee mesh will inform all the other luminaires in the network. As a response to the trigger, the whole network will react in the same way by switching the lights on to a defined individual dim level, or dim down in case of vacancy. This way, every light could be set to its own dim level, thereby enabling granular control. And if you add switches, not only these can control lights for entire group but also for sub-groups or zones. The lights gradually light up to full brightness when people arrive at their workstations, or dim down to background levels when they leave, maximize energy savings when people take lunch breaks, attend a meeting, or leave work in the evening. And daylight harvesting via the sensors automatically saves even more energy.

In this use case, it is also possible to bring existing DALI luminaires into the system by integrating a Philips Xitanium SR bridge with luminaire-mounted sensors (see Figure 6). This gives customers the flexibility to control occupancy sensing, energy savings, and scene setting for downlight applications - or for group of luminaires that use multiple DALI drivers. That could be the case in refurbishment projects where the existing DALI setup could be re-used.

It is also possible to create a simple tunable white system by using a Philips Xitanium SR FlexTune driver and Philips EasyAir SNS210 MC in each luminaire (see Figure 7). Thanks to the unique FlexTune dimming feature, these drivers can be dimmed down to 1% using the manual ZGP switch, while maintaining color accuracy and consistency across the full tuning range. This is widely recommended for classroom environments as it can make a positive contribution to the students' level of concentration.

One of the main benefits provided by our connected system that works with the Philips MasterConnect app is the easy and quick commissioning. In projects involving hundreds of luminaires, the in-field commissioning is extremely time-consuming, leading to increased installation costs. For this reason, we have innovated the torch-based commissioning as part of our connected system. This technique proves to be very effective: point the torch towards the built-in sensor, to which the MasterConnect app immediately responds by recognizing the luminaire and adding it to the mesh network. Benefit from all the advantages of a point and trigger approach - no training required and reduced installation costs compared to conventional wired or wireless systems available in the market.

Category 2 solutions are ideal for luminaire-based control applications. Even though implying a higher initial investment cost compared to category 1 solutions, it enables much more energy savings. For maximized benefits, consider applying this solution to offices (corridors, conference rooms, corridors), schools (classrooms, canteen, toilets), hospitals (patient wards, reception area), or other suitable applications.



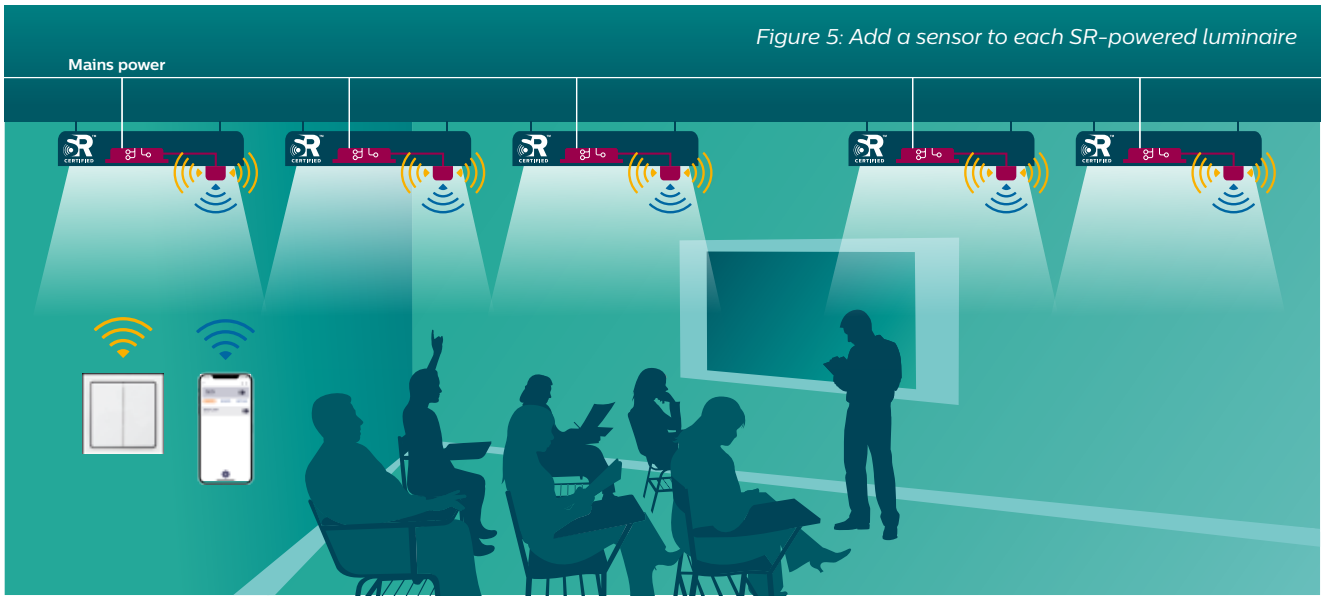


Figure 5: Add a sensor to each SR-powered luminaire

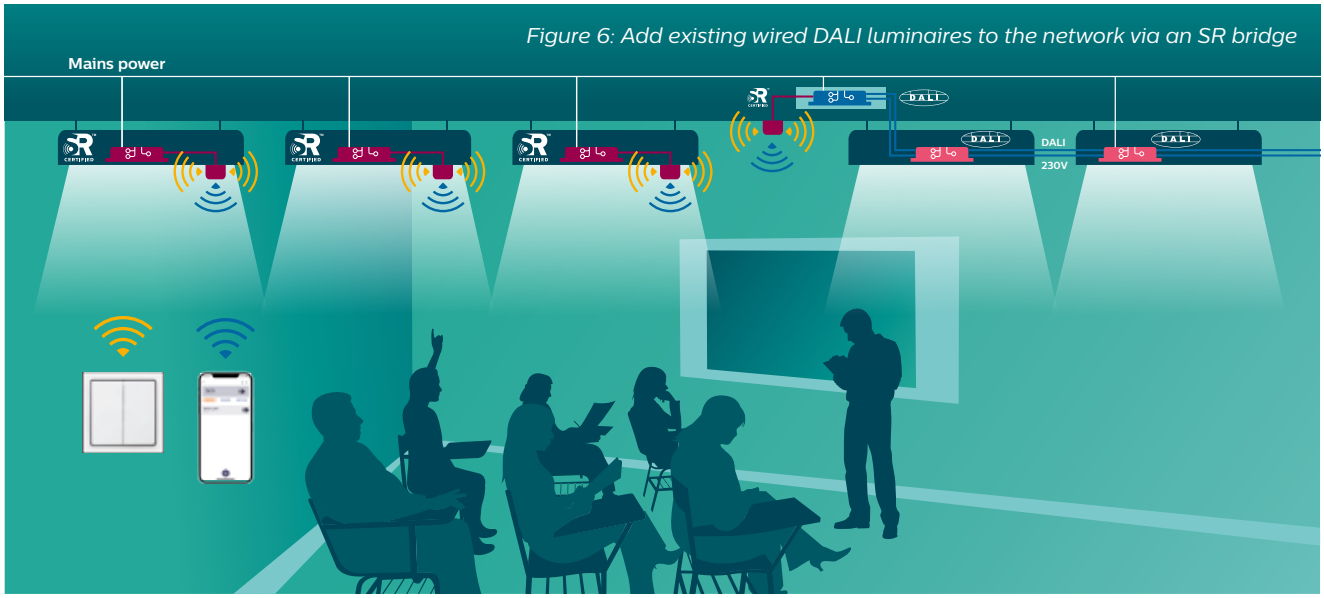


Figure 6: Add existing wired DALI luminaires to the network via an SR bridge

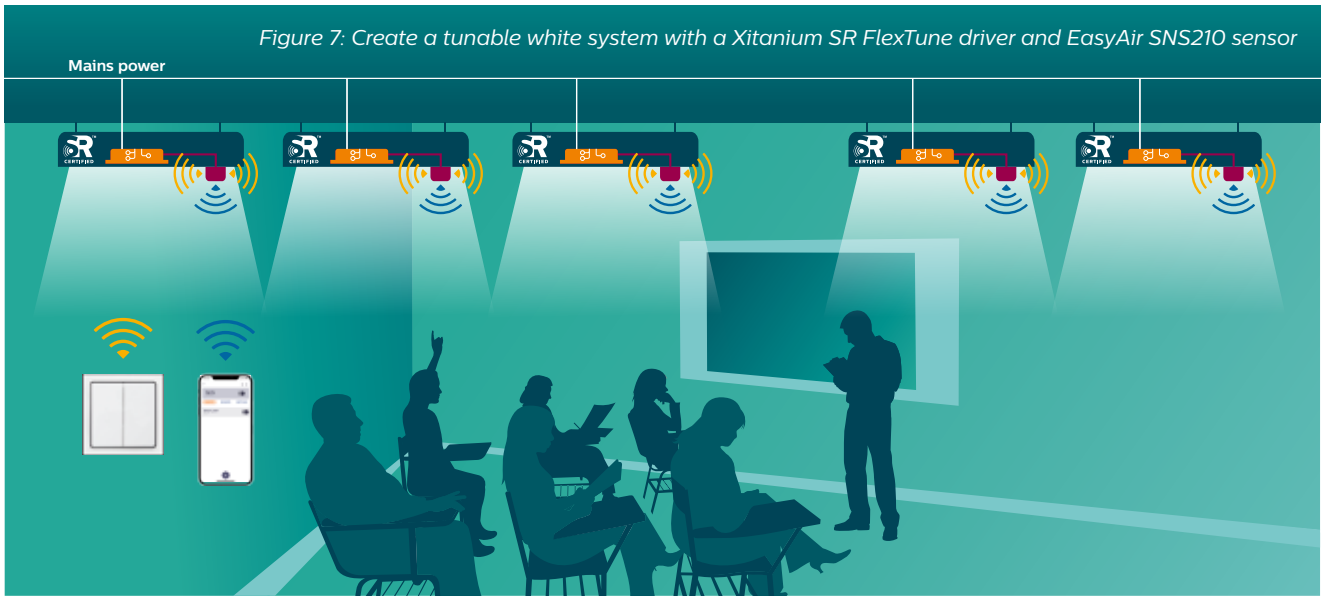


Figure 7: Create a tunable white system with a Xitanium SR FlexTune driver and EasyAir SNS210 sensor

Category 3
Get full integration
An integrated IoT solution with gateway

- Xitanium SR driver
- Xitanium wireless dim. driver
- Xitanium SR bridge
- Any DALI driver
- Sensor / wireless node
- Bluetooth
- Zigbee
- IP

But this may still not be enough. What if customers have more ambitious ideas to create a bigger infrastructure that can deliver significant commercial, operational and financial advantages?

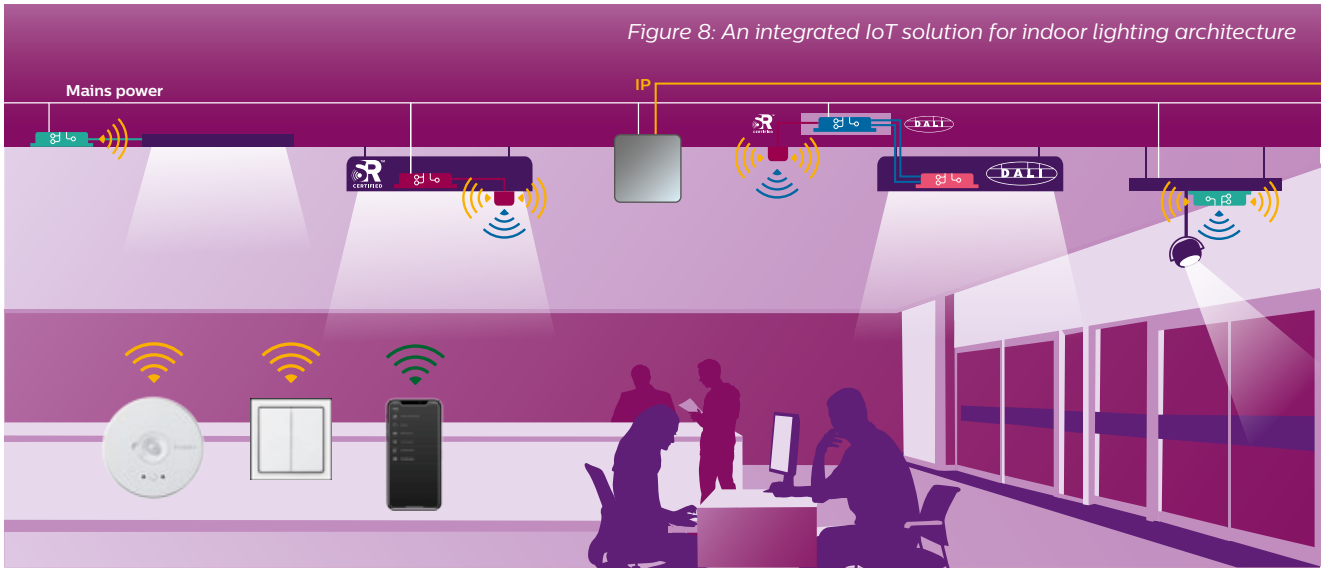
Once again, the Philips MasterConnect app is the solution that unifies all the components in a fully-integrated, connected network to add value beyond illumination (see Figure 8).

As you can see, this third use case builds on the previous two scenarios by connecting the MasterConnect app to luminaires, drivers, sensors, nodes. But in this instance, it is also connected to a gateway, which oversees all the lighting in the smaller networks.

The gateway to advanced features

This opens up a whole world of advanced use cases from scheduling to space utilization. For example, the gateway can be used to define complex scenarios, such as groups or sub-groups, that require different lighting or switch behavior at different times of the day. Energy metering and automated energy reporting can give valuable insights into how and where customers can save electricity. It is also possible to process occupancy information to identify vacant spots in flexible workspaces or meeting room reservations as part of a smarter building management system. And behind the scenes, the gateway gives customers access to valuable diagnostics and predictive maintenance data that can reduce operational costs and eliminate expensive downtime.

Figure 8: An integrated IoT solution for indoor lighting architecture



Open standards for maximized end-user choice

The real beauty of lighting systems that work with the Philips MasterConnect app is that they're built on open standards. That means a customer can start with a simple stand-alone lighting system, then add a suitable gateway when the building requires further upgrades. All without locking into any one vendor or facing compatibility problems with new products or component releases.

The future is simple, scalable, standardized

At Signify, we truly believe that connected lighting will become mainstream once the industry has recognized, interoperable and open standards. We pioneered the D4i intra-luminaire standard. Now our aim is to standardize wireless protocol to give it industry-wide inter-operability. We believe the Philips MasterConnect app is the first system-enabler to do just that. A solution that breaks down the barriers to mainstream connected lighting systems and paves the way for a smarter, connected future.

What next?

Analysts predict smart lighting will grow more than 21% a year between 2018 and 2023*. Much of it driven by wireless installation and the mainstream applications it supports. That's why we're putting BLE technology in our connected components. It will ensure every lighting system that works with the MasterConnect app can communicate directly with anybody's smartphones. And it makes the transition to a smart lighting infrastructure fast, cost effective and achievable in just a few taps of the app. As technologists find even more ways to use this infrastructure to help us live smarter lives, BLE and connected systems promise even more exciting possibilities in the future.

To learn more about lighting components that work with the MasterConnect app for a wide range of applications, access our website **www.lighting.philips.co.uk/oem-emea/products/connected-lighting**

*Mordor Intelligence: Global Smart Lighting Market Size, Share – Segmented by Product Type, Light Source, Communication Technology, Application, and Region – Growth Trends and Forecast (2018 – 2023).

Figure 9: Our vision of connected lighting systems built on open standards