



CENTRALISE • OPTIMISE • ECONOMISE

Is It Really Smart Lighting Without Smart Cabling?

Smart Cabling
Infrastructure

Easily Maintained

Intelligent Buildings

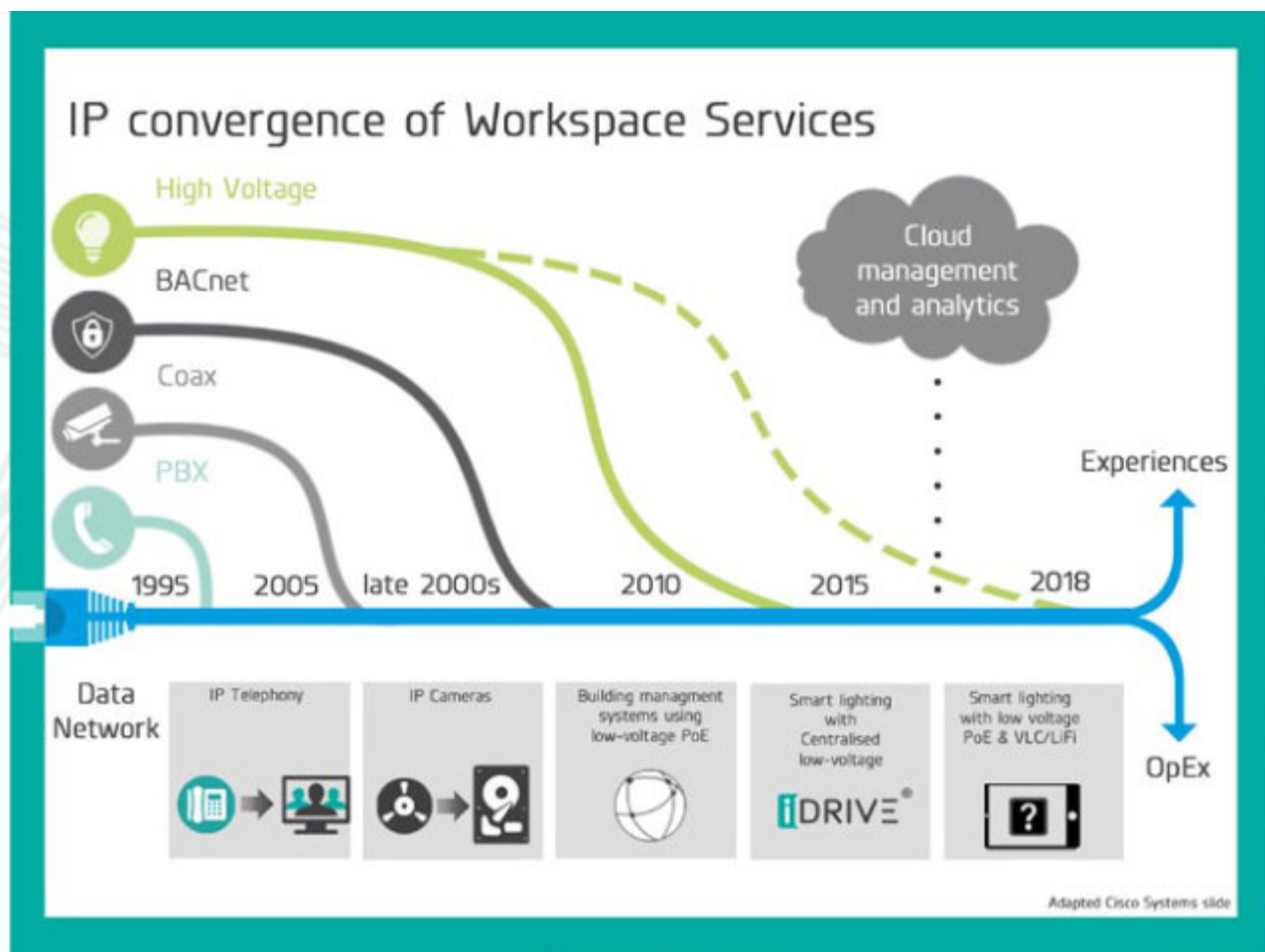
Ethernet-Powered
Networked Lighting



1.0 What is the "Digital Ceiling" Concept?

We are in the midst of the Internet of Things (IoT) revolution, within which lighting is playing an increasingly important role. Ceilings are becoming "digital", with installed devices connected via Ethernet securely to the internet, enabling communication with us, applications and each other. For lighting projects involving hundreds and thousands of devices, such as luminaires and sensors, wired solutions are the only viable option and the way in which the cables are installed within digital ceilings is critical.

"Smart cabling" is a plug and play concept devised by IST, based on a DC structured cabling infrastructure, where every luminaire is connected back to a centralised location to allow two-way communication. Smart cabling is the only way of future-proofing lighting projects for the smart, connected world and the digital ceilings of the future. Rethinking the way smart lighting installations are cabled for large scale projects will not only reduce installation, commissioning and maintenance costs, but it may actually save lives!



2.0 Essential Elements of the Digital Ceiling

iDrive® has been the global leader in smart, centralised LED power since 2010. The technology offers our global clients intelligent, Ethernet-based, 1U rack-mounted LED power solutions designed for installations in a central location, up to 300m from the luminaire. This enables exceptionally easy access, installation and maintenance.

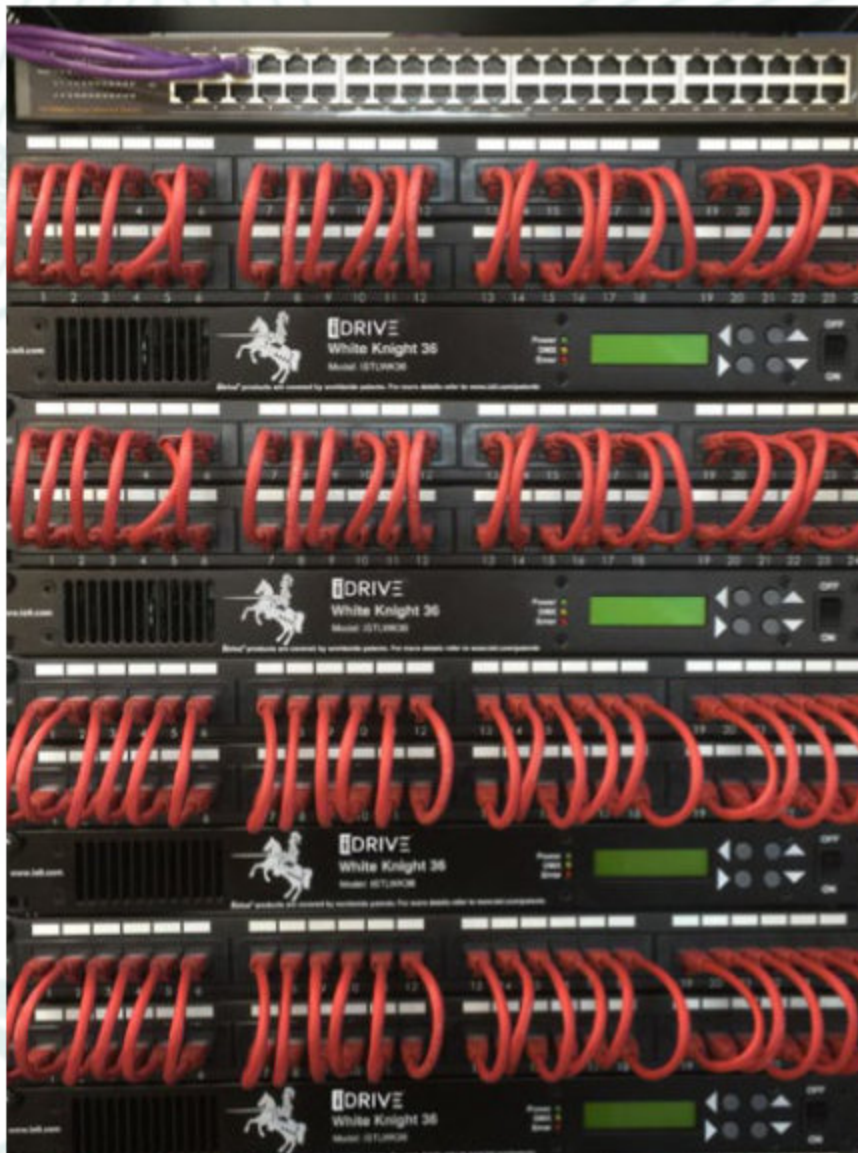
By combining centralised iDrive® LED power supplies with support for our clients' projects in the form of smart cabling design, IST is able to realise the digital ceiling concept today, whilst simultaneously reducing the overall costs, associated ROI timescales and simplifying future maintenance requirements significantly.

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3.0 Why Smart Cabling and Centralised Power is Essential for the Digital Ceiling

The advantage of using a structured cabling infrastructure is that multiple clusters of RJ45 sockets can be installed in the ceiling of a project and located back at the 19" cabinet, already tested and installation-ready. Once in place, the second stage of installing luminaires, LED power solutions and controls can commence.

In the era of smart lighting, luminaires should be supplied with an RJ45 socket, enabling the installer to use pre-made RJ45 patch leads to connect the pre-terminated ceiling socket with the luminaire and/or sensors. This strategy reduces issues potentially arising from incorrect wiring and significantly accelerates the luminaire connection process. Any future maintenance is also simplified.



The image above shows the iDrive® White Knight 36 1kW Ethernet LED driver installed over 3U within a cabinet, with 24 1-48W independently configurable output ports and the 24 way patch panel, which corresponds to the points in the digital ceiling. Installing the ports at the front of the cabinet simplifies connectivity of the outputs considerably. Use of very small patch cables reduces cabling costs and the need for additional cable management, plus simplifies any future maintenance which is a key aspect for consideration for any digital ceiling project.

The example above shows an Ethernet switch, which interconnects the Ethernet LED drivers plus any additional Ethernet devices with your desired Ethernet control solution. (If the preference is for DALI or DMX control, this switch will not be required but the need for smart cabling remains the same.) Using the smart cabling principle, over 300 x 1-48W configurable lighting ports can be installed in a single cabinet.

■ The health and wellbeing of users of commercial spaces is one of the most important considerations for any intelligent building ■

3.1 How is this Possible?

The reason IST's smart cabling system is possible in such a compact solution is down to its patented Hybrid LED driver technology, which offers world-beating efficiency and high power density solutions in 1U rack formats. Higher efficiency means lower energy costs and less wasted heat, which improves the lifetime of the whole system, whilst the 1kW Ethernet 1U solution reduces the space required within the cabinets, reducing costs further.

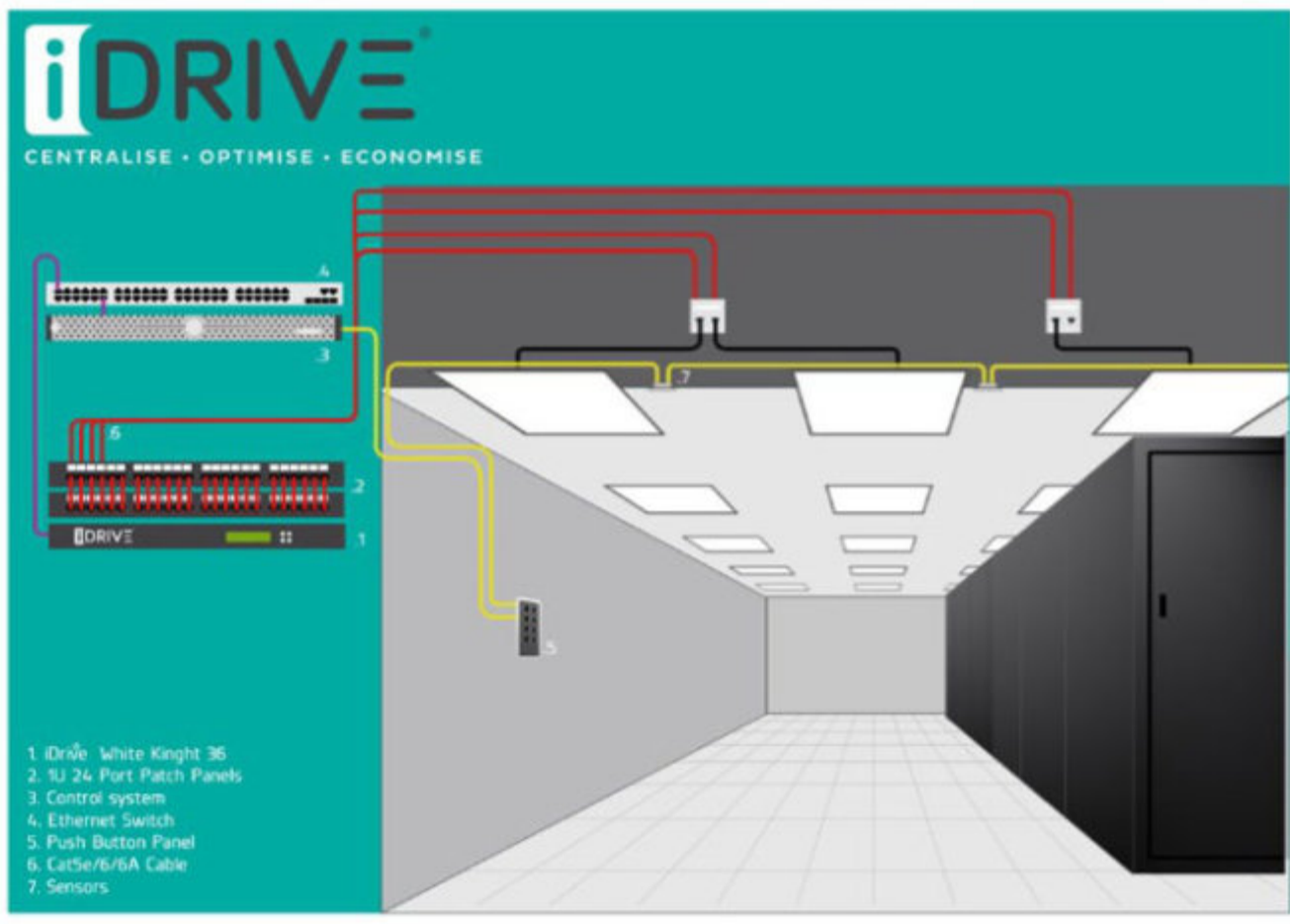
3.2 Why only 24 ports for a 36 Channel Ethernet LED Power Solution?

The reason for suggesting 24 ports is that patch panels tend to be typically presented over 24 ports per 1U. The iDrive® 1k White Knight solution has 36 independent outputs, but because typical luminaire options in commercial applications will be in the region of 30-40W output, 24 channels at this wattage is likely to fully utilise the power output capability of the LED power solution. There is an argument that to have a fully maintainable system, you should wire every channel and install 36 available ports within the cabinet to simplify connectivity, in the event a channel needs to be changed. If this is the preferred option, it would mean using an additional 24 port patch panel and making 36 ports active. The decision about 24 or 36 ports is simply down to customer preference, cost and available space within the cabinet.

- ▣▣ Using the smart cabling principle, over 300 x 1-48W configurable lighting ports can be installed in a single cabinet ▣▣

4.0 If You are Thinking about 'Lighting as a Service (LaaS)', You Should Consider a Smart Cabling Strategy

Many within the lighting community agree that LaaS is the future for commercial buildings, but it would be impossible to provide this service efficiently and professionally without maintainable power supplies, controls and luminaires over a smart structured cabling infrastructure. Ensuring smart buildings are wired with a structured cable infrastructure enables simple changes, fault finding, capability for future expansion, whilst drastically simplifying maintenance.



5.0 Should Every Lighting Project be Installed in this Way?

iDrive® centralised LED drivers have been specified globally since 2010 for white commercial lighting, as well as architectural and entertainment (RGB, RGBW etc.) projects. Our philosophy is that smart cabling is essential for white interior luminaires in digital ceilings, within smart buildings. For architectural and entertainment projects, where luminaires are installed in extremely harsh environments not ideal for power electronics, we would recommend smart+ cabling (high rated cabling and ruggedised connectors) as precaution.

6.0 Can Smart Cabling for Lighting Installations Really Save Lives?

The health and wellbeing of users of commercial spaces is one of the most important considerations for any intelligent building deploying digital ceilings. iDrive® patented centralised LED driver technology offers the best quality for health in the lighting market, due to the non-pulsing, low ripple-current outputs. Installing lighting over a smart cabling DC infrastructure rather than the typical AC mains topology will also significantly reduce the potential risk of serious injury for installers and maintainers.

6.1 What About Biodynamic White Light... is it Possible with Smart Cabling?

Absolutely! The iDrive® systems have been designed with biodynamic lighting in mind. Each biodynamic luminaire could be connected using a single RJ45 port per channel (2 per luminaire), or a single luminaire connected across a single RJ45 connection, depending on the future needs of the building.

7.0 Is this Concept Available Now?

Yes, so there is no need to wait until new Power over Ethernet standards are agreed in the years ahead and no danger that you make a decision on a proprietary solution destined to take you down a dead-end.

iDrive® will future-proof your installation by designing the appropriate layout for your cabinet(s), specifying the correct number of digital ceiling points required, as well as non-proprietary controls to meet your exact needs.

8.0 For avoidance of doubt... why smart cabling?

There are so many reasons for moving to this concept immediately. Firstly we are moving toward a connected world, so the typical bus structure we use in lighting today is not viable. Cost savings, future proofing and professionalism are justifiable reasons in their own right but most of all, it comes back down to maintenance. It is paramount for any building to be easily maintained and optimised over time. Being truly smart and intelligent means if the time comes where you need to make a change, you already have the strategy in place to do so.

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If you have any further questions, please contact sales@iDriveLED.com

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