TECHNOLOGY GUIDE

Smart Lighting for Data Installers

Introduction

As a data installer, you may already be installing structured cabling systems to support smart lighting and other IoT services & PoE devices.

However, if you haven't explored this new revenue stream yet or would just like to expand on what you already know, here's some information that might be helpful.

According to the Institute of Workplace and Facilities Management (IWFM)

"the knowledge gathered and analysed through IoT can help encourage a reduction in operational and maintenance costs, lower energy use leading to lower greenhouse emissions, promote building user well-being and stimulate demand for further IoT technological advancements."

Smart Lighting offers all these benefits, as well as improved staff productivity (when using IST flicker-free systems) – See the iDACS 'Technology Impact Report – Smart Lighting' for more details.

Scope

Structured cabling allows multiple clusters of RJ45 sockets to be pre-wired from a centralised 19" cabinet to zones in the suspended ceiling; using a consolidation point box, panel with enclosure or other surface mount outlet. This pre-tested and warrantied* cabling system makes it easier to add IP smart building devices, such as lighting, HVAC, sensors etc, as and when required.
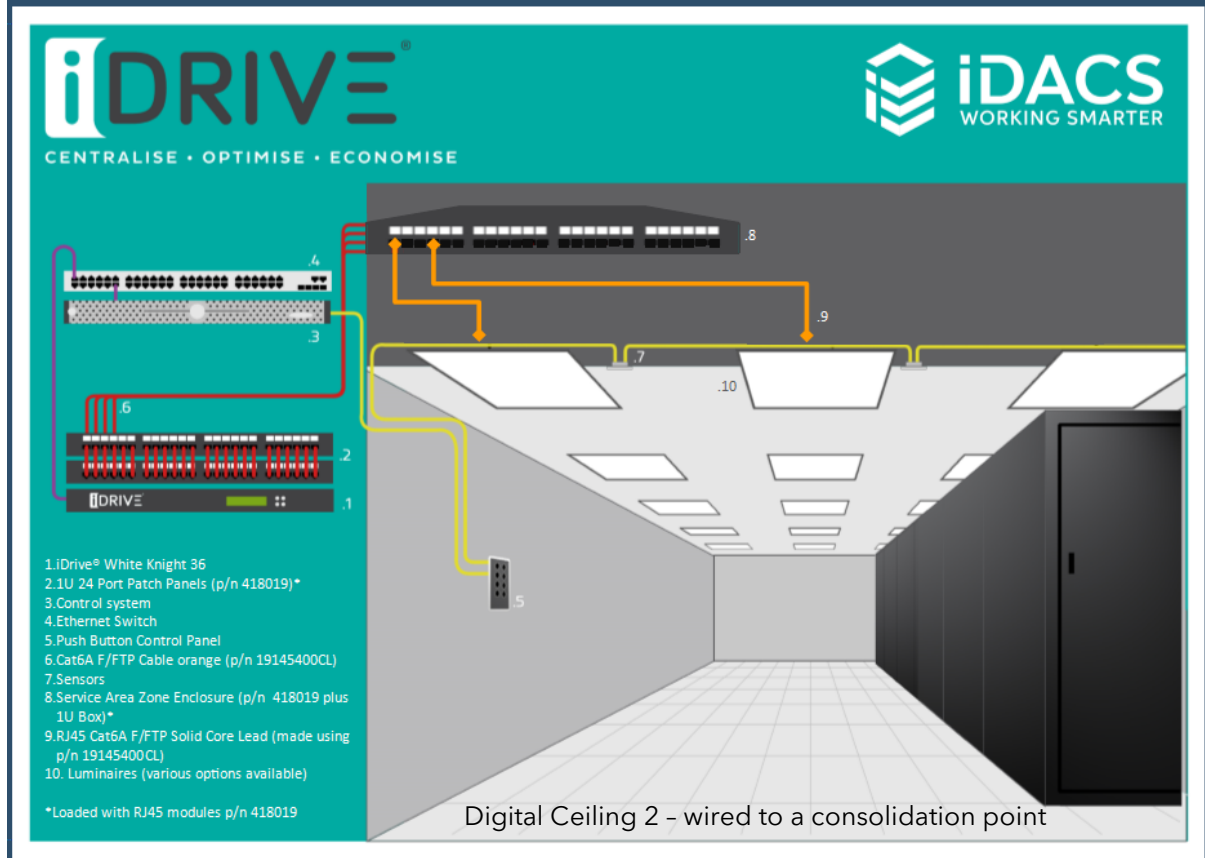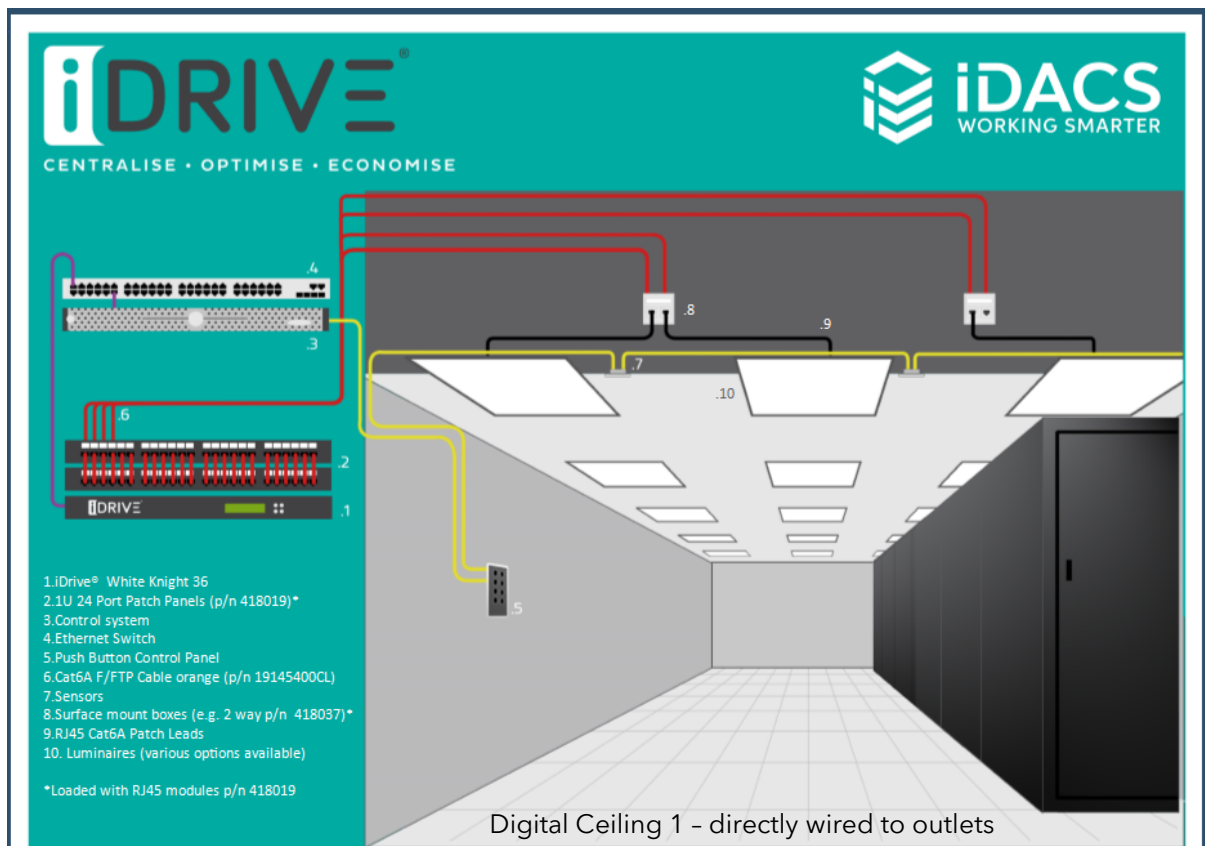The concept is known as 'digital ceiling'.

Fitting LED luminaires and sensors to this system is pretty straightforward as they are generally fitted with an RJ45 socket, so can be easily plugged in using a standard Cat6A RJ45 patch lead. This also makes it easier to carry out moves, adds, changes and maintenance.
This strategy reduces issues potentially arising from incorrect wiring and significantly accelerates the luminaire connection process.

See suggested digital ceiling wiring diagrams 1&2 on the next page.

*Datwyler offer a 25 Year system warranty.

iDRIVE®
CENTRALISE · OPTIMISE · ECONOMISE

1. iDrive® White Knight 36
2. 1U 24 Port Patch Panels (p/n 418019)*
3. Control system
4. Ethernet Switch
5. Push Button Control Panel
6. Cat6A F/FTP Cable orange (p/n 19145400CL)
7. Sensors
8. Surface mount boxes (e.g. 2 way p/n 418037)*
9. RJ45 Cat6A Patch Leads
10. Luminaires (various options available)

*Loaded with RJ45 modules p/n 418019

Digital Ceiling 1 – directly wired to outlets

iDRIVE®
CENTRALISE · OPTIMISE · ECONOMISE

1. iDrive® White Knight 36
2. 1U 24 Port Patch Panels (p/n 418019)*
3. Control system
4. Ethernet Switch
5. Push Button Control Panel
6. Cat6A F/FTP Cable orange (p/n 19145400CL)
7. Sensors
8. Service Area Zone Enclosure (p/n 418019 plus 1U Box)*
9. RJ45 Cat6A F/FTP Solid Core Lead (made using p/n 19145400CL)
10. Luminaires (various options available)

*Loaded with RJ45 modules p/n 418019

Digital Ceiling 2 – wired to a consolidation point

COLLABORATE   CONNECT   TRANSFORM

Category 6A cabling must be used for connectivity, as the maximum current carrying capacity per cable core is 500mA thus allowing up to 2A forward current to be used with the attached LED luminaires.

In cases where luminaires, etc are not fitted with an RJ45 socket, you may need to solder the cable directly to the device's PCB

The easiest method to enable RJ45 terminated LED luminaires is as follows:
1) Purchase a 3m Category 6A patch lead (p/n 653512)
2) Cut the 3m patch lead in half to create two 1.5m length cables with an RJ45 plug on one end.
3) Remove 10mm from the outer jacket to show the 4 pairs
4) Separate the 4 pairs into solid colours and striped colours
5) Strip at least 5mm of insulation from each conductor core
6) Twist all solid colour conductors together and crimp onto a pin style terminal
7) Twist all striped colour conductors together and crimp onto a pin style terminal
8) Solder the pin style terminals to the LED boards where solid colour conductors are soldered to LED +ve and stripped coloured conductors to the LED –ve terminals

| Pin Number	RJ45 T-568A	RJ45 T-568B	LED Polarity
1	White/Green	White/Orange	LED -
2	Green	Orange	LED +
3	White/Orange	White/Green	LED -
4	Blue	Blue	LED +
5	White/Blue	White/Blue	LED -
6	Orange	Green	LED +
7	White/Brown	White/Brown	LED -
8	Brown	Brown	LED +

Table 1: Cross-reference between RJ45 and LED connectivity

As highlighted in table 1 the LED +ve cable should be connected to all solid-coloured RJ45 cores whilst the LED –ve cable should be attached to all stripped coloured RJ45 cores.

Datwyler Structured Cabling Kit List

1) For standard office-based installs

Cable: p/n 19145400CL (supplied on 500m drums)
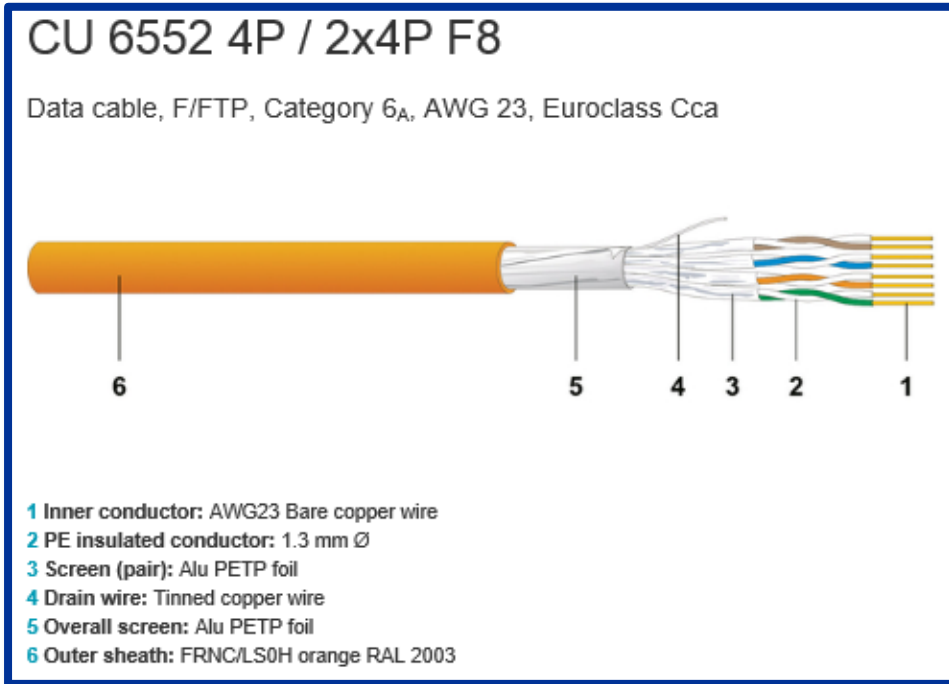
RJ45 Module / Socket: p/n 418061   (to mount in panels & outlets)

Patch Panel: p/n 418019 (other options available)

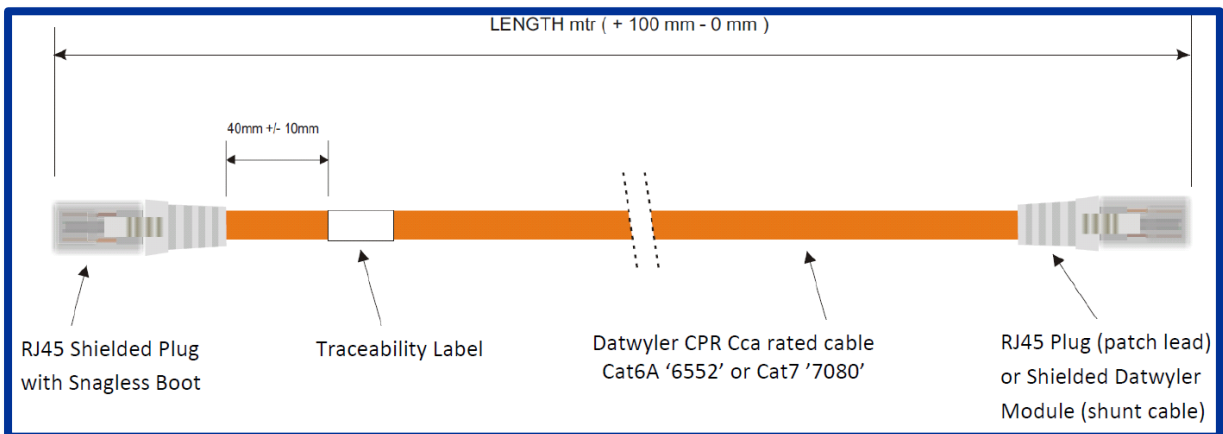**Consolidation Point Box:** p/n 417483 + 417484 (12 port – other options avail.)

COLLABORATE   CONNECT   TRANSFORM

Surface Mount Boxes: p/n 418037 (2 port) 418038 (4 port) 418039 (6 port)

1 Surface Mount Box for 2, 4 or 6
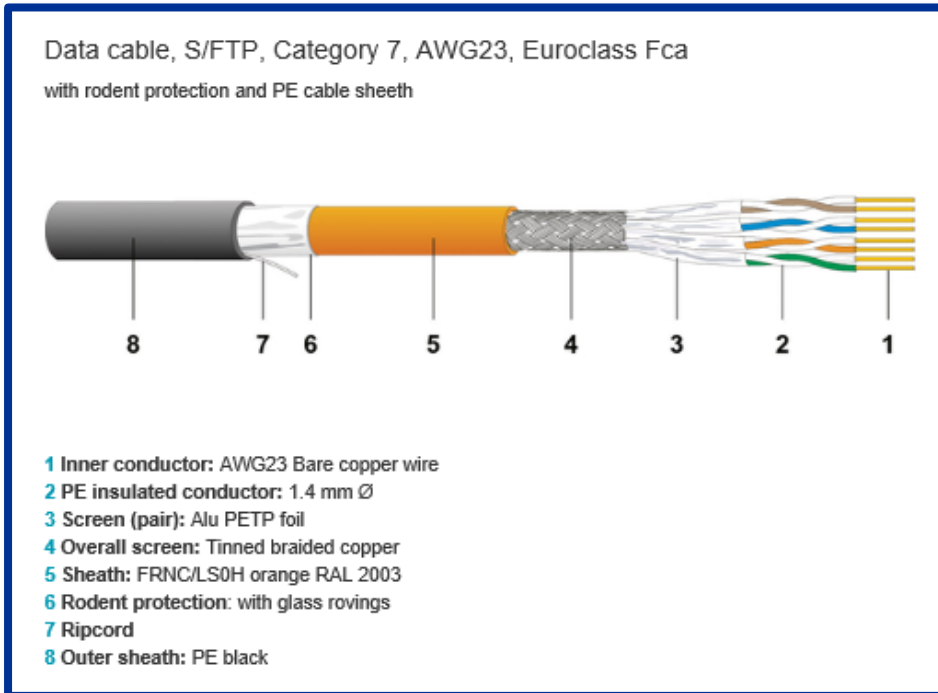Keystone modules with dust shutters

Patch Leads: p/n 653503 (0.5m) 653508 (1m) 653510 (2m) 653512 (3m)

(grey leads listed – other colours and lengths available)

Solid Patch Leads using Cat 6A 6552 cable: Made-to-order
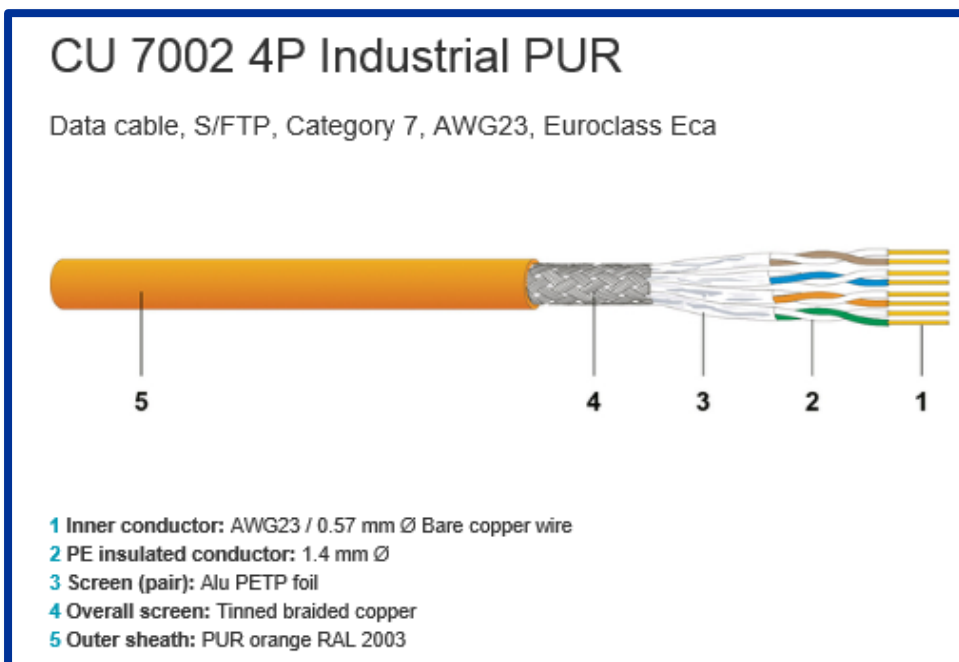

LENGTH mtr (+ 100 mm - 0 mm)

40mm +/- 10mm

RJ45 Shielded Plug
with Snagless Boot

Traceability Label

Datwyler CPR Cca rated cable
Cat6A '6552' or Cat7 '7080'

RJ45 Plug (patch lead)
or Shielded Datwyler
Module (shunt cable)

2) For installs outdoors or in harsh environments (e.g. cold storage areas)

Cable: p/n 19192300FZ (outdoor cable - supplied cut-to-length)

Data cable, S/FTP, Category 7, AWG23, Euroclass Fca
with rodent protection and PE cable sheeth

8 7 6 5 4 3 2 1

1 Inner conductor: AWG23 Bare copper wire
2 PE insulated conductor: 1.4 mm Ø
3 Screen (pair): Alu PETP foil
4 Overall screen: Tinned braided copper
5 Sheath: FRNC/LS0H orange RAL 2003
6 Rodent protection: with glass rovings
7 Ripcord
8 Outer sheath: PE black

p/n 18768900EK (industrial low temp cable - supplied on 1km drums)

CU 7002 4P Industrial PUR

Data cable, S/FTP, Category 7, AWG23, Euroclass Eca

5 4 3 2 1

1 Inner conductor: AWG23 / 0.57 mm Ø Bare copper wire
2 PE insulated conductor: 1.4 mm Ø
3 Screen (pair): Alu PETP foil
4 Overall screen: Tinned braided copper
5 Outer sheath: PUR orange RAL 2003

IP67 Rated RJ45 Sockets: p/n 309155 (Data Outlet) 309157 (Coupling Socket)

1 Data outlet IP67
2 Coupling socket IP67

RJ45 outlet IP67
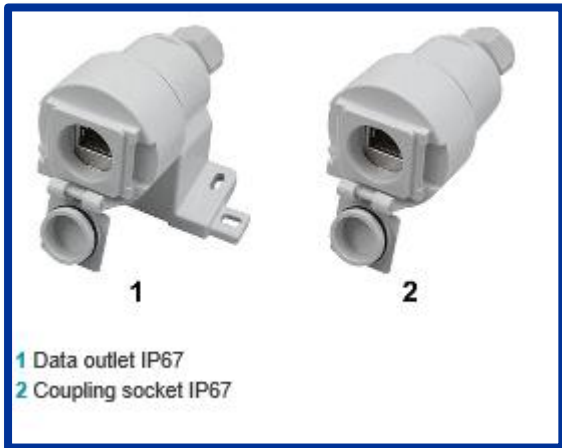
AP Outlet Box 417533 (1) 417530 (2)

-Order modules 418061 spearately-

IP67 Patch Leads: p/n 664508 (IP67-RJ45 1m PUR) 664510 (IP67-RJ45 2m PUR)

Other lengths and IP67-IP67 leads also available

RJ45 patch cords IP67 Cat.6$_A$ (IEC)

500 MHz, shielded, wiring 1:1

Standard version

Variant with IP67 RJ45 plugs on both sides

COLLABORATE   CONNECT   TRANSFORM

iDACS have partnered with IST, the leading innovators in smart lighting technologies.

Their range of flicker-free lighting systems promote well-being and improve productivity.

Our unique relationship with IST and their confidence in Datwyler's high-performance cabling systems, enables us to offer extended warranties for certified lighting installations.

Contact us today to find out more.