TunneLogic system

Keeps you moving

See what our tunnel lighting control and monitoring system can do to keep you moving
TotalTunnel: 4 key building blocks

The TotalTunnel program is Philips’ connected lighting approach to tunnel lighting and includes four key building blocks:

**Luminaires**
To support main tunnel lighting techniques.

**Guidance lighting**
To guide the traffic and to secure a safe exit.

**System for lighting control**
From basic controls to elaborate monitoring systems, our solutions give you full connectivity and control over the total lighting system.

**Services**
From concept design and commissioning to lifecycle services, Philips can deliver a complete project and protect your investment.
Total Solution

TunneLogic is a key part of the TotalTunnel solution - a complete one-stop shop covering project design, product selection, right through to lifecycle services management. Within each building block Philips offers a range of options from simple solutions that deliver unbeatable value to high performance alternatives. We select the components according to your specific needs, and then combine them to create a total lighting system that is unique to your project. So whether your focus is on the cost of the initial investment or the Total Cost of Ownership over the entire lifetime, Philips can build the right solution for you.
TunneLogic
Intelligent tunnel lighting controls

TunneLogic is our dedicated tunnel control and monitoring system designed specifically for LED technology. Our control system, which is easy to install, commission, operate and maintain provides the customer with safe lighting control and health information relating to the lighting system. TunneLogic helps to minimize the complicated electrical design and it significantly reduces labor, traffic management, and capital expenditure. When used together with high-performance Philips tunnel LED luminaires, optimal system performance will be achieved.

Whatever your tunnel project requirements, whether it be new build, refurbishment, retrofit of a short underpass, or a tunnel of many kilometers, Philips offers an end-to-end lighting control system package for any type of tunnel project. Intelligent control systems offer a dynamic approach to realizing the project objectives and meeting client specifications.

Installation timescales are critical and with the minimal system components and plug-and-play methodology, on-site installation is quick and simple affording the installer capital efficiencies over many other systems. The lighting control software user-friendly interface offers operators and maintainers easy navigation menus for monitoring lighting system status and providing operational control either locally or via a SCADA network. Historical system data is easily accessible for photometer trending, system faults and stage burn hours, always providing the operator with information to suit their specific requirements.

High performance and system longevity are crucial to ensure your tunnel network is operational and traffic is kept moving freely. TunneLogic is designed to ensure optimal performance of the lighting system throughout the tunnel. With demonstrable project evidence in demanding conditions across many countries, partnering with Philips provides the best of opportunity for project cost, comfort and care.
Features of the TunneLogic system

Easy configuration and commissioning

TunneLogic is specifically designed to provide a control system solution that is easy to configure, install and commission. Using the PC-based configuration wizard tool, we can easily build your tunnel project’s profile and configuration parameters off site. Once completed, upload of the data file is via a USB memory device onto the Master Control Unit (MCU) during the commissioning stage. Furthermore, with minimal system components and plug and play methodology, the system architecture is simple to design and install ensuring optimal benefits and flexibility for reducing installation costs. Integration is easy using a standard Modbus SCADA interface (Serial or Ethernet).

Extensive monitoring and control (system health)

The TunneLogic graphical user interface provides simple navigation for ease of control and monitoring functions. Structured tabs allow access for extensive data logging management on photometer status, system faults and stage burn hours and control functions. Local and remote access provides the benefit of monitoring system performance and technical support to efficiently plan system maintenance and repair, reducing functional closures and lowering traffic disruption.

Applications

Short underpasses  High-speed road tunnels  Long tunnels
Lighting performance

Optimum performance is achieved as a system solution with luminaries and controls. Since TunneLogic is fully dedicated for LED technology, continuous dimming and L20 control of the lighting system provides the exact level of light needed at any given time to provide significant energy savings over other switched stage solutions. In addition to communication redundancy and failsafe configuration options, TunneLogic is a safe, robust solution for increasing system longevity and maintaining operational performance.

Cost savings

Next to all the benefits already mentioned, the entire system is a low cost, feature rich system. Not only is the system inexpensive to buy, you save costs in other ways post-purchase. As explained, the continuous dimming ensures the right lighting levels at every moment by precise L20 control. Additionally, the easy commissioning reduces design and engineering time, which also reduces costs and provides the opportunity to open the tunnel earlier.

Features/Benefits of Philips

On top of all the benefits of the TunneLogic system, Philips is your ideal partner to collaborate with. Having more than 65 years of combined market experience, Philips is always able to deliver a tailor-made solution.

In particular because TunneLogic is part of the TotalTunnel package, which comprises:

- LED luminaires: TunneLogic is fully integrated with Philips luminaires (FlowStar, FlowLine, ClearFlood, T-Line)
- Guidance tunnel lighting: To guide the traffic and to secure a safe exit
- Controls: TunneLogic system
- Service: Full local support available for all project phases

By combining our four building blocks for success, we can create lighting solutions for you that offer precise levels of quality, guidance, control and service support.
Low cost, but feature rich lighting control system as part of the TotalTunnel package.”
Benefits for users

Every tunnel has a range of stakeholders. Each has their own list of requirements when it comes to the value and benefits that any lighting control system should demonstrate. Philips is at the forefront of the industry and can address all the key issues regarding tunnel lighting and controls. With our expertise and experience we can create the best possible solution; one that fits the requirements of your tunnel project in terms of cost, comfort and care.

Features/Benefits for different users

Tunnel owners and operators
TunneLogic is efficient, reliable, safe, and easy to control and maintain. Clear information on the health of the lighting system optimizes and protects your investment.

Tunnel users
TunneLogic ensures the right lighting levels at every stage of the tunnel due to precise L20 control, thereby decreasing the black hole effect and maximizing the safety of tunnel users. Remote access to the system means continuous monitoring is possible without the need to close the tunnel, and thus reducing traffic disruption.

Tunnel installation companies
Our lighting solutions are available as a completely integrated system with clearly defined responsibilities on system integration. System architecture has been designed to be modular, plug and play and simple to commission to reduce installation time and minimize costly road closures.

Tunnel maintenance companies
Our solutions are long lasting and easy to maintain, with service packages and predictable expenses to help estimate your TCO and reduce tunnel closures and traffic disruption. System information on the health of the lighting is accessible via the SCADA interface or remotely, so that routine maintenance can be planned efficiently.
System Specifications
Master Control Unit (MCU)

General Characteristics

- Input voltage range: 100–240Vac
- Input frequency: 50/60Hz
- Input current: 1.0A max.
- Housing: IP54 powder-coated steel RAL7021 with removable glass door

Operating Characteristics

- Control output: 4x RS-485 sockets
- RS-485 configuration: 4x radial or 2x ring network
- RS-485 max. length: 1km before repeater required
- Max. repeaters: 10 per network
- Max. DALI Group Gateways (DGG) per RS-485 Section: 100
- Max. DGGs per system: 254
- Maximum luminaires per DGG: 20x FlowStar-3, 30x FlowStar-2, 60x FlowStar-1 / FlowLine
- Maximum luminaires per system: 5100x FlowStar-3, 7650x FlowStar-2, 15300x FlowStar-1 / FlowLine
- Switching groups: Up to 10
- Luminance meter inputs: 2x RS-485 sockets
- Functional Lighting Groups (FLGs): 8
- SCADA connection: Serial / Ethernet Modbus
- User Controls: 15” touch-screen panel PC

Software Features

- User access levels: 3 (‘view only’, ‘maintenance’ and ‘full access’)
- Individual user PIN codes: Yes
- Lighting stage override: Yes
- System event logging: Yes

Wiring Characteristics

- Supply connection: 2m flying lead with Line, Neutral and Earth connections
- RS-485 Bus connector
- RS-485 luminance meter connector: 4x circular 4-pole
- RS-485 cable: See RS-485 specs
- SCADA connection: Serial or Ethernet

Temperature Characteristics

- Operating temperature: -20˚C to +50˚C ambient
- Operating humidity: 0% to 90% RH non-condensing
- Storage temperature: -25˚C to +70˚C ambient
- Storage humidity: 0% to 90% RH non-condensing

Product dimensions

- Height: 518mm (plus connectors)
- Width: 478mm (plus brackets)
- Depth: 155mm (170mm with door fitted)

Compliance

- CE marking: Yes
- C-Tick: Yes
- IEC62386: Yes
- RoHS: Yes

Product Data

- Full product name: LFC7620/00 MASTER CONTROL UNIT ASSY ZS
- Order code: 9137 030 88809
- Net weight per piece: 24kg (18.5kg without door)
System Specifications
DALI Group Gateways (DGG)

General Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage range</td>
<td>100-240Vac</td>
</tr>
<tr>
<td>Input frequency</td>
<td>50/60Hz</td>
</tr>
<tr>
<td>Input current</td>
<td>0.25A</td>
</tr>
<tr>
<td>Housing</td>
<td>IP66 Stainless steel (AISI 304)</td>
</tr>
</tbody>
</table>

Operating Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control output</td>
<td>1 x DALI</td>
</tr>
<tr>
<td>DALI unit qty.</td>
<td>1 DALI universe of 64 addresses</td>
</tr>
<tr>
<td>DALI power supply</td>
<td>Inbuilt rated 220mA @ 16Vdc typ. Overload and short circuit protected (auto restart)</td>
</tr>
<tr>
<td>DALI max. current</td>
<td>250mA</td>
</tr>
<tr>
<td>DALI insulation system</td>
<td>Basic (1.5kV surge)</td>
</tr>
<tr>
<td>Maximum luminaires</td>
<td>20x FlowStar-3, 30x FlowStar-2, 60x FlowStar-1 / FlowLine</td>
</tr>
<tr>
<td>Control inputs</td>
<td>1x RS-485 data connection, 1x DyNet® serial port, 1x AUX programmable dry contact input</td>
</tr>
<tr>
<td>DyNet DC Supply</td>
<td>12-15Vdc @ 120mA, Service switch + diagnostic LED</td>
</tr>
<tr>
<td>User Controls</td>
<td></td>
</tr>
<tr>
<td>Diagnostic functions</td>
<td>Driver output failure reporting, Driver failure reporting, DALI line short / overload detection, LED run time tracking for each driver, Device online / offline status</td>
</tr>
<tr>
<td>Switching groups</td>
<td>Select 1 of 10 colored groups</td>
</tr>
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</table>

Wiring Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply connector terminals</td>
<td>Line, Neutral, Earth</td>
</tr>
<tr>
<td>Conductor size</td>
<td>Max. 1x 2.5mm² Cu</td>
</tr>
<tr>
<td>RS-485 connector</td>
<td>Circular, pre-molded multi-pole in/out series connection</td>
</tr>
<tr>
<td>Output connector terminals</td>
<td>DALI-, DALI+</td>
</tr>
<tr>
<td>Conductor size</td>
<td>Max. 1x 2.5mm² Cu</td>
</tr>
</tbody>
</table>

Temperature Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>-20°C to +50°C ambient temperature</td>
</tr>
<tr>
<td>Operating humidity</td>
<td>0% to 90% RH non-condensing</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25°C to +70°C ambient</td>
</tr>
<tr>
<td>Storage humidity</td>
<td>0% to 90% RH non-condensing</td>
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Product dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Height</td>
<td>200mm (+ connectors)</td>
</tr>
<tr>
<td>Width</td>
<td>200mm (+ brackets)</td>
</tr>
<tr>
<td>Depth</td>
<td>120mm (+ brackets)</td>
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</table>

Compliance

<table>
<thead>
<tr>
<th>Standard</th>
<th>Compliance</th>
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<tbody>
<tr>
<td>CE marking</td>
<td>Yes</td>
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<tr>
<td>C-Tick</td>
<td>Yes</td>
</tr>
<tr>
<td>IEC62386</td>
<td>Yes</td>
</tr>
<tr>
<td>RoHS</td>
<td>Yes</td>
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Product Data

<table>
<thead>
<tr>
<th>Data</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
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<td>LCN7632/00 DALI GROUP GATEWAY ASSY SST</td>
</tr>
<tr>
<td>Order code</td>
<td>9137 030 89409</td>
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<tr>
<td>Net weight per piece</td>
<td>3.0kg</td>
</tr>
</tbody>
</table>
Specifications
Luminance meter

**General Characteristics**

- **Input voltage range**: 100–240Vac
- **Input frequency**: 50/60Hz
- **Input current**: 1.5A
- **Housing**: IP66 powder coated steel

**Operating Characteristics**

- **Control output**: Internal RS-485 connection terminals
- **RS-485**: max. length 1km before repeater required

**Wiring Characteristics**

- **Supply connector terminals**: Line, Neutral, Earth
  - Max. 1x 3.0mm² Cu
- **RS-485 connector terminals**: D+, D–, SGND
  - Max. 1x 2.0mm² Cu

**Temperature Characteristics**

- **Operating temperature**: -20°C to +50°C ambient temperature
- **Operating humidity**: 0% to 90% RH non-condensing
- **Storage temperature**: -30°C to +70°C ambient
- **Storage humidity**: 0% to 90% RH non-condensing

**Product dimensions**

- **Height**: 123mm (without optional wiper unit)
- **Length**: 463mm
- **Width**: 162mm

**Compliance**

- **CE marking**: Yes
- **RoHS**: Yes

**Ordering Data**

- **Full product name**: LRL7620/01 LUMIOS III ADDR #1
  - **Order code**: 9137 003 70603
- **Full product name**: LRL7620/02 LUMIOS III ADDR #2
  - **Net weight per piece**: 4.5 kg
  - **Order code**: 9137 003 70703
- **Full product name**: LRL7621/01 LUMIOS III +WIPER ADDR #1
  - **Order code**: 9137 003 71103
- **Full product name**: LRL7621/02 LUMIOS III +WIPER ADDR #2
  - **Net weight per piece**: 5kg
  - **Order code**: 9137 003 71203
### General Characteristics

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<th>Value</th>
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<tbody>
<tr>
<td>Input voltage range</td>
<td>100–240 Vac</td>
</tr>
<tr>
<td>Input frequency</td>
<td>50/60Hz</td>
</tr>
<tr>
<td>Input current</td>
<td>0.5A max</td>
</tr>
<tr>
<td>Housing</td>
<td>IP66 Stainless steel (AISI 304)</td>
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### Operating Characteristics

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<tr>
<th>Specification</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Control input</td>
<td>1x RS-485 data connection</td>
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<tr>
<td>Control output</td>
<td>1x RS-485 data connection</td>
</tr>
<tr>
<td>RS-485 max. length</td>
<td>1km before repeater required</td>
</tr>
<tr>
<td>Max. Repeaters</td>
<td>10 per network</td>
</tr>
<tr>
<td>Max. DGGs per RS-485 per section</td>
<td>100</td>
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<tr>
<td>User Controls</td>
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### Wiring Characteristics

<table>
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<th>Specification</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Supply connection terminals</td>
<td>Line, Neutral, Earth</td>
</tr>
<tr>
<td>Conductor size</td>
<td>Max. 1x 4mm² Cu</td>
</tr>
<tr>
<td>RS-485 connectors</td>
<td>Circular, pre-molded multi-pole in/out series connection</td>
</tr>
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### Temperature Characteristics

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Operating temperature</td>
<td>-20°C to +50°C ambient</td>
</tr>
<tr>
<td>Operating humidity</td>
<td>20% to 90% RH non-condensing</td>
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<tr>
<td>Storage temperature</td>
<td>-25°C to +75°C ambient</td>
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<tr>
<td>Storage humidity</td>
<td>20% to 90% RH non-condensing</td>
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### Product dimensions

<table>
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<th>Value</th>
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<td>Height</td>
<td>200mm (plus connectors)</td>
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<tr>
<td>Width</td>
<td>200mm (plus brackets)</td>
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<tr>
<td>Depth</td>
<td>120mm (plus brackets)</td>
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### Compliance

<table>
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<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
<td>CE marking</td>
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<td>C-Tick</td>
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<tr>
<td>RoHS</td>
<td>Yes</td>
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### Ordering Data

<table>
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<tr>
<td>Full product name</td>
<td>LCN7622/00 RS485 REPEATER ASSY SST</td>
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<tr>
<td>Order code</td>
<td>9137 030 89609</td>
</tr>
<tr>
<td>Net weight per piece</td>
<td>3.0kg</td>
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</table>
Specifications Cables
RS-485

General Characteristics

Core

1˚ 1 shielded pair 1x2x0.75/2.5
2˚ 1 wire 0.34/1.4

Drain wire
Stranded tinned copper (22awg)

Tape
Binder tape

Braid
Tinned copper wire braid, approx. 90% coverage

Tape
Plastic tape overlapped

Jacket
Formable LSZH elastomer compound, Orange RAL 2003, Ø 7.6 ± 0.3 mm

Print legend
PHILIPS LIGHTING CONTROL SYSTEMS (RS485-TSSICS PUR)

Wire 0.34/1.4

Conductor
Stranded tinned copper wire (22awg), Ø 0.75 mm

Insulation
Polyethylene (PE), Ø 1.4 mm

Shielded pair 1x2x0.75/2.5

Conductor
Stranded tinned copper wire (22awg), Ø 0.75 mm

Insulation
Foamed Polyethylene (PE) with skin, Ø 2.5 mm

Formation
2 wires, blue and white twistedpair

Screen
Alulaminate foil overlapped

Electrical Data at 20°C

Conductor resistance
≤ 56 Ω/km

Screen resistance
≤ 9.2 Ω/km

Insulation resistance
≥ 10 GΩ/km

Operating voltage (peak)
≤ 500 V

Test voltage (rms 50Hz 1min)
2000 V

Shielded pair

Capacitance (1 kHz wire/wire)
Nom. 36.1 nF/km

Capacitance (1 kHz wire/screen)
Nom. 65.6 nF/km

Characteristic Impedance
Nom. 120Ω

Velocity of propagation
Nom. 78%

Mechanical and Thermal Characteristics

Conductor material
According to IEC 228 Class 5

Insulating material
According to DIN EN 50290-2-26 (VDE 0819) (HD 624.6)

Jacket material
According to F45052-F5100 (similar to DIN VDE 0282)

Flame retardant
According to IEC 60332-1-2

Oil resistant
According to EN 60811-404 (7 x 24h/90°C)

Operating temperature
-40°C to + 80°C

Storage temperature
-40°C to + 80°C

Min. bending radius
Repeated 8 x Ø
Single 4 x Ø

Weight (approx.)
69 kg/km

Other Characteristics

RoHS compliant
Yes 2011/65/EC

Hydrolysis resistant
Yes

Abrasion resistant
Yes

Halogen free
According to IEC 60754-1

Smoke density
According to IEC 61034

Available lengths

Cables are “made to order” and can be ordered in any length up to 300m

Product Data

Full product name
RS485 Link Cable (male/female)

Supplier order code
201G

Net weight per piece
0.1 + (N x 0.069) kg
(N=cable length in meter)
### General Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor</td>
<td>Stranded bare copper wire, 30/0.25mm (1.5mm²)</td>
</tr>
<tr>
<td>Insulation</td>
<td>LSZH FireFighter™, Ø 2.5mm</td>
</tr>
<tr>
<td>Formation</td>
<td>2 core purple numbered</td>
</tr>
<tr>
<td>Jacket</td>
<td>Formable LSZH elastomer compound, Grey RAL 7001, Ø 6.8 ± 0.3 mm</td>
</tr>
<tr>
<td>Print legend</td>
<td>PHILIPS LIGHTING CONTROL SYSTEMS (DALI PUR 2x1.5mm)</td>
</tr>
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</table>

### Electrical Data at 20°C

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor resistance</td>
<td>≤ 13.3 Ω/km</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>≥ 10 MΩ/km</td>
</tr>
<tr>
<td>Operating voltage (peak)</td>
<td>≤ 500 V</td>
</tr>
<tr>
<td>Test voltage (RMS 50Hz 1min)</td>
<td>2000 V</td>
</tr>
</tbody>
</table>

### Available lengths

Cables are “made to order” and can be ordered in any length up to 300m

### Product Data

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Full product name</td>
<td>DALI Link Cable (female/female)</td>
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<tr>
<td>Supplier order code</td>
<td>272G</td>
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<tr>
<td>Net weight per piece</td>
<td>0.1 + (N x 0.071) kg</td>
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### Mechanical and Thermal Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Conductor material</td>
<td>According to IEC 228 Class 5</td>
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<tr>
<td>Insulating material</td>
<td>According to DIN EN 50290-2-26 (VDE 0819) (HD 624.6)</td>
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<tr>
<td>Jacket material</td>
<td>According to F45052-F5100 (similar to DIN VDE 0282)</td>
</tr>
<tr>
<td>Flame retardant</td>
<td>According to IEC 60332-1-2</td>
</tr>
<tr>
<td>Oil resistant</td>
<td>According to EN 60811-404 (7 x 24h/90°C)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40°C to + 80°C</td>
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<tr>
<td>Storage temperature</td>
<td>-40°C to + 80°C</td>
</tr>
<tr>
<td>Min. bending radius</td>
<td>Repeated 6 x Ø Single 4 x Ø</td>
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<tr>
<td>Weight (approx.)</td>
<td>71 kg/km</td>
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### Other Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
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<tbody>
<tr>
<td>RoHS compliant</td>
<td>Yes 2011/65/EC</td>
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<tr>
<td>Hydrolysis resistant</td>
<td>Yes</td>
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<tr>
<td>Abrasion resistant</td>
<td>Yes</td>
</tr>
<tr>
<td>Halogen free</td>
<td>According to IEC 60754-1 and VDE 0282</td>
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<tr>
<td>Smoke density</td>
<td>According to IEC 61034</td>
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<tr>
<td>NEN1010 compliant</td>
<td>Yes</td>
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</tbody>
</table>
Specifications Cables

LED Extension Lead

**General Characteristics**

Conductor: Stranded bare copper wire, 50/0.25mm (2.5mm²)
Insulation: LSZH FireFighter™, Ø 3.0mm
Formation: 2 wires, black and red twisted
Jacket: LSZH-PUR compound, Grey RAL 7001, Ø 7.8 ± 0.3 mm
Print legend: PHILIPS LIGHTING CONTROL SYSTEMS (T-LINE PUR 2x2.5mm)

**Mechanical and Thermal Characteristics**

Conductor material: According to IEC 228 Class 5
Insulating material: According to DIN EN 50290-2-26 (VDE 0819) (HD 624.6)
Jacket material: According to F45052-F5100 (similar to DIN VDE 0282)
Flame retardant: According to IEC 60332-1-2
Oil resistant: According to EN 60811-404 (7 x 24h/90°C)
Operating temperature: -40°C up to + 80°C
Storage temperature: -40°C up to + 80°C
Min. bending radius: Repeated 6 x Ø
Single 4 x Ø
Weight (approx.): 103 kg/km

**Electrical Data at 20°C**

Conductor resistance: ≤ 7.98 Ω/km
Insulation resistance: ≥ 10 MΩ/km
Operating voltage (peak): ≤ 500 V
Test voltage (rms 50Hz 1min): 2000 V

**Available lengths**

Cables are “made to order” and can be ordered in any length up to 200m

**Also available**

1.5mm² cores
4.0mm² cores

**Product Data**

Supplier order code: 115G
Full product name: LED Extension Lead
Net weight per piece: 0.05 + (N x 0.103) kg
(N=cable length in meter)

**Other Characteristics**

RoHS compliant: Yes
Hydrolysis resistant: Yes
Abrasion resistant: Yes
Halogen free: According to IEC 60754-1
Smoke density: According to IEC 61034
Control Network / Topology

Client SCADA tunnel management system

SCADA link: Modbus over Serial or Ethernet

Remote access

Master Control Unit

RS-485 Ring Bus 1
DALI Group Gateways (DGGs)

Portal Photometers

RS-485 Ring Bus 2

Luminaires

Local DALI sub-networks