



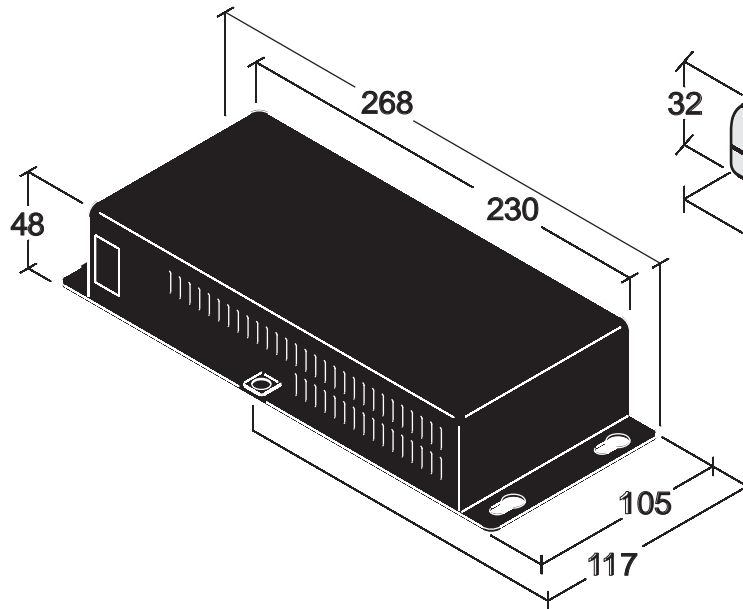
# Alien LED Downlight™ user manual

**Martin®**

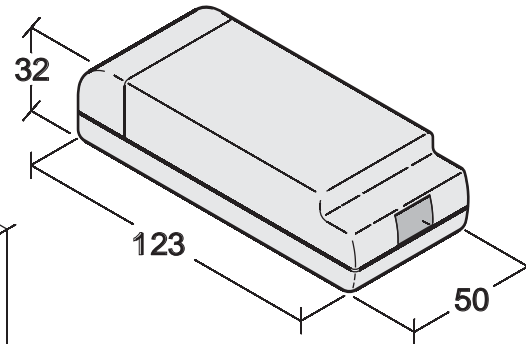
# Dimensions

All dimensions are in millimeters

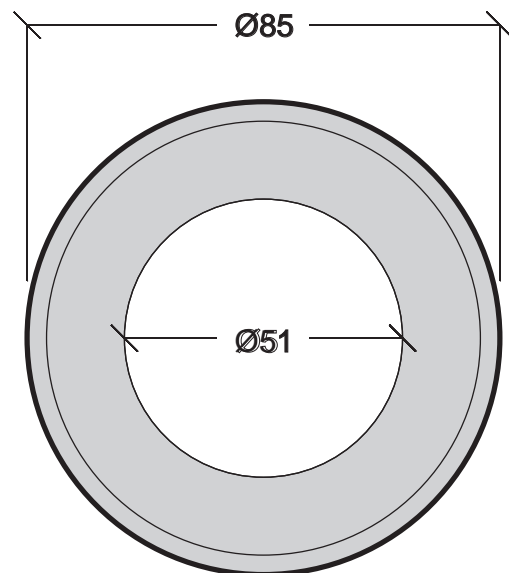
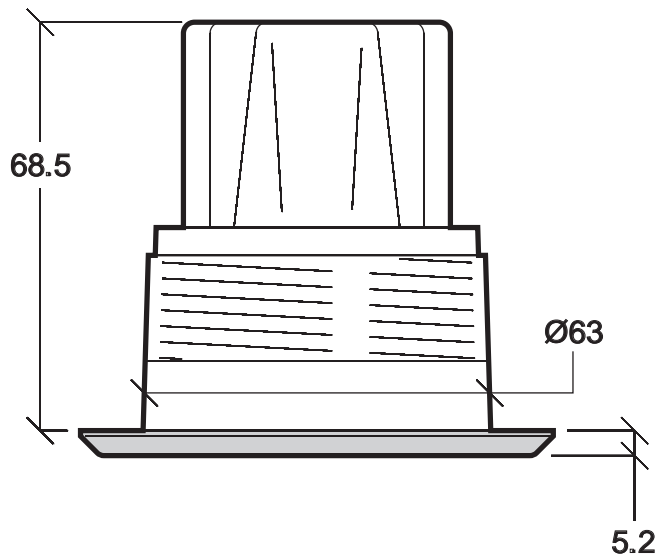
## Driver unit



## Transformer



## Luminaire



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P/N 35000215, Rev. C

# Safety Information



## WARNING!

**Read the safety precautions in this section before installing, powering, operating or servicing this product.**

The following symbols are used to identify important safety information on the product and in this manual:



**Warning!**  
Safety hazard.  
Risk of severe injury or death.



**Warning!**  
Hazardous voltage. Risk of lethal or severe electric shock.



**Warning!**  
Fire hazard.



**Warning!**  
Refer to user manual.



Warning! This product is for professional use only. It is not for household use. This product presents risks of injury or death due to fire hazards, electric shock and falls. **Read this manual** before installing, powering or servicing the fixture, follow the safety precautions listed below and observe all warnings in this manual and printed on the fixture. Install and operate the fixture only as described in this manual and in accordance with local laws and regulations. Refer any operation not described in this manual to a qualified technician.



If you have questions about how to operate the fixture safely, please contact your Martin supplier or call the Martin 24-hour service hotline on +45 8740 0000, or in the USA on 1-888-tech-180.



## PROTECTION FROM ELECTRIC SHOCK

- Shut down power to the entire installation at the main power distribution board and lock out power (by removing the power distribution fuse for example) before carrying out any installation or maintenance work.
- Disconnect the devices from AC power before removing or installing any cover or part and when not in use for an extended period.
- Connect the driver unit electrically to ground (earth).
- Do not connect the driver unit to an AC power source outside the voltage ranges and frequency specified in this manual
- Before applying power, check that the voltage selector switch on the driver unit is set to match the local power source voltage.
- Use only a source of AC power that complies with local building and electrical codes and has both overload and ground-fault (earth-fault) protection.
- Before using the devices, check that all power distribution equipment and cables are in perfect condition, are rated for the current requirements of all connected devices and are of suitable type for the location.
- Isolate the devices from power immediately if any cable or other component is damaged, cracked or deformed. Do not reapply power until repairs have been completed.
- Do not expose any part of a driver unit or transformer to water or any other fluid. Install these devices in dry locations only.

- Luminaires are IP67-rated but do not install them in a location where they may become immersed in water.
- Refer any service operation not described in this manual to an authorized Martin Service partner.



### PROTECTION FROM BURNS AND FIRE

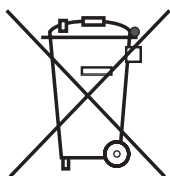


- Do not operate the devices if the ambient temperature ( $T_a$ ) exceeds  $40^\circ\text{C}$  ( $104^\circ\text{F}$ ).
- Provide free airflow and a minimum clearance of 50 mm (2.0 in.) around the devices and allow sufficient ventilation to ensure that the ambient temperature around driver units and transformers does not exceed  $40^\circ\text{C}$  ( $104^\circ\text{F}$ ) and the ambient temperature around luminaires does not exceed  $45^\circ\text{C}$  ( $113^\circ\text{F}$ ).
- Allow the devices to cool for 20 minutes before servicing.
- Do not illuminate surfaces less than 0.1 m (4 in.) from the front surface of the luminaire.
- Keep highly flammable materials well away from the devices.
- Do not modify the devices in any way not described in this manual or install other than genuine Martin parts. Do not stick filters, masks or other materials directly onto LEDs. Use only Martin approved accessories to mask or modify the light beam.
- Do not attempt to bypass thermostatic switches or fuses. Replace defective fuses with ones of the specified type and rating only.
- Provide a minimum center-to-center distance of 100 mm (4.0 in.) between Alien LED Downlight luminaires.



### PROTECTION FROM INJURY

- Do not look at LEDs with magnifiers or similar optical instruments that may concentrate the light output.
- The edges of devices and wing clips may cause cuts if not handled carefully. Protect yourself with gloves during installation and service.
- Ensure that all external covers, components and installation fittings are securely fastened.
- Block access below the work area and work from a stable platform whenever installing, servicing or moving the fixture.
- Ensure that all supporting structures, surfaces, fasteners and lifting equipment can bear the weight of all the devices they are intended to support plus an adequate safety margin, and that they conform to local building and safety regulations.
- Use a sufficient number of fasteners with sufficient corrosion resistance, dimensions and strength to mount devices safely. Any nuts used must be self-locking. Install locking washers under the heads of fasteners.



#### ***Disposing of this product***

Martin™ products are supplied in compliance with Directive 2002/96/EC of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), as amended by Directive 2003/108/EC, where applicable.

Help preserve the environment! Ensure that this product is recycled at the end of its life. Your supplier can give details of local arrangements for the disposal of Martin products.

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# Notes

# Introduction

Thank you for selecting the Alien LED Downlight™, a compact LED-based color-changing recessed spotlight system from Martin™. The system features:

- RGBW color mixing and HSI (hue, saturation, intensity) control options
- DMX-512A control or stand-alone operation
- Near unity power factor and ultra-high efficiency
- Switchable 100-120/208-240 V, 50/60 Hz operating range
- Optional trim rings (chrome, brass and white)

For the latest documentation, product specifications and other information about this and all Martin Professional™ products, please visit the Martin website at <http://www.martin.com>

Comments or suggestions regarding this document may be e-mailed to [service@martin.dk](mailto:service@martin.dk) or posted to:

Service Department  
Martin Professional A/S  
Olof Palmes Allé 18  
DK-8200 Aarhus N  
Denmark

## Unpacking

The Alien LED Downlight standard model, high-power model and driver unit are supplied packed separately. Labels on the luminaire or luminaire wiring identify standard and high-power luminaires.

The following items are included with the Alien LED Downlight standard model, P/N 90353030:

- 2 x downlight luminaires with mounting hardware and stainless steel trim ring
- 1 x transformer with 100 mm patch cable and RJ-45 T-connector

The following items are included with the Alien LED Downlight high-power model, P/N 90353040:

- 1 x high-power downlight luminaire with mounting hardware and stainless steel trim ring
- 1 x transformer

The following items are included with the Alien LED Downlight driver, P/N 90734510:

- 1 x Alien LED Downlight driver unit
- 1 x 3-pin male XLR to male RJ-45 adapter
- This user manual

## Using for the first time

Before applying power to the system:

- Review “Safety Information” on page 3.
- Check that the local AC power voltage is within the ranges listed on the fixture’s serial number label and that the voltage selector switch on the driver unit is set to match the local AC power voltage.

# Physical installation



**Warning!** Read "Safety Information" on page 3 before installing the Alien LED Downlight.

**The safety and suitability of installation location, anchoring method, mounting hardware and electrical installation is the responsibility of the installer. All local safety regulations and legal requirements must be observed when installing and connecting the Alien LED Downlight. Installation must be carried out by qualified professionals only.**



**The ambient temperature around driver units and transformers must not exceed 40° C (104° F). The ambient temperature around luminaires must not exceed 45° C (113° F). Provide ventilation as necessary to ensure these levels are not exceeded. Leave at least 50 mm (2.0 in.) of free space and allow airflow around driver units, transformers and luminaires.**

**Contact your Martin™ supplier for assistance if you have any questions about how to install this product safely.**

## Location and orientation



**Warning!** Install luminaires, transformers and driver units at least 50 mm (2 in.) away from thermal insulation material and well away from highly flammable materials.

Downlight luminaires are designed to be installed in a ceiling or wall recess with a ceiling or wall thickness of 5 - 22 mm (0.2 - 0.85 in.).

Allow for service access to driver units and transformers.

**Important!** When installing luminaires in a row or group, ensure homogenous light distribution by orienting them all in the same direction (i.e. with the luminaire wiring facing in the same direction on all luminaires).

## Mounting and fastening luminaires

Luminaires can be fixed into position by two methods:

- A tank nut on the 2-inch BSP thread on the luminaire housing, for which a 63 mm (2.5 in.) diameter cutout in the ceiling or wall is required. Access to the ceiling or wall recess is required in order to tighten the tank nut. The tank nut mount is recommended in indoor and outdoor installations.
- A plasterboard clip system, for which a 70 mm (2.8 in.) diameter cutout in the ceiling or wall is required. Access to the ceiling or wall recess is not required in order to fasten the luminaire, as the luminaire is pushed into position from outside the recess and the wing clips spring open to hold the luminaire in position. The plasterboard clip system is recommended in indoor installations only.

In both methods, high-pressure nitrile O-rings ensure a gas and vapor seal when the luminaire is correctly installed.

### Tank nut mounting

1. Use a hole saw mounted on a power drill to drill a 63 mm (2.5 in.) diameter circular hole in the mounting surface.
2. Push the luminaire up into the hole, install a suitable washer and nut on the 2-inch BSP thread in the luminaire housing, and tighten the nut to secure the luminaire.



## Plasterboard clip mounting

1. See Figure 1. Check that the trim ring is fully fastened onto the luminaire and that the first of the supplied nitrile O-rings is located in the recess in the trim ring.
2. Clip the plasterboard mounting collar supplied with the fixture over the luminaire housing and place the second nitrile O-ring (arrowed in Figure 1) over the collar so that the collar is sandwiched between two O-rings.
3. Use a hole saw mounted on a power drill to drill a 70 mm (2.8 in.) diameter circular hole in the mounting surface.
4. Pass the luminaire cable through the mounting hole and make any necessary connections.
5. Pressing the wing clips in towards the center, pass the luminaire housing through the mounting hole. The wing clips will move outwards as they pass through the hole and into the recess until they hold the luminaire firmly in position when fully inserted into the mounting hole.

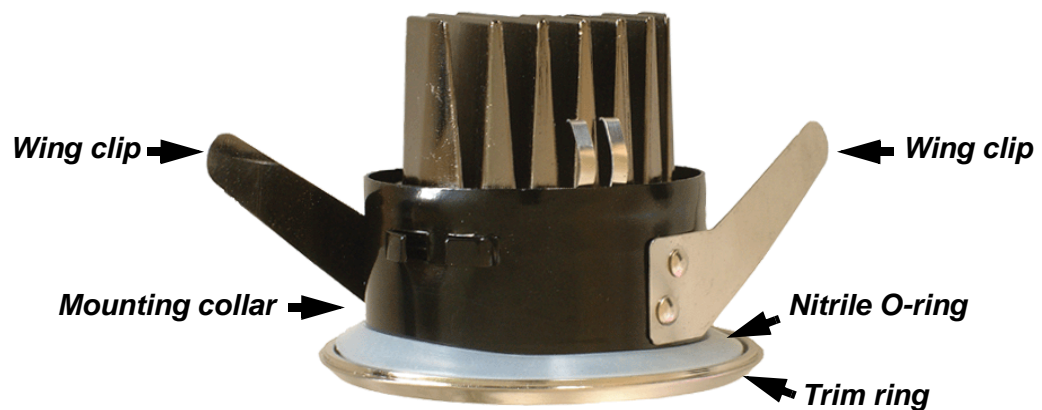


Figure 1: Plasterboard mount collar

## Mounting and fastening driver units and transformers

Fasten driver units and transformers securely to a flat surface in a location that is accessible for service. Respect all local safety, fire and building regulations governing the installation of electrical equipment in cavities or plenums. Allow free airflow and at least 50 mm (2 in.) of free space around all devices. Allow sufficient ventilation to ensure that the ambient temperature will not exceed 40° C (104° F).

When choosing a location for a driver unit, bear in mind that access to the DIP switch is required if you need to change the DMX address or if you run luminaires in stand-alone operation and need to change stand-alone programs.

# System overview

Figure 2 gives a schematic overview of the Alien LED Downlight system layout.

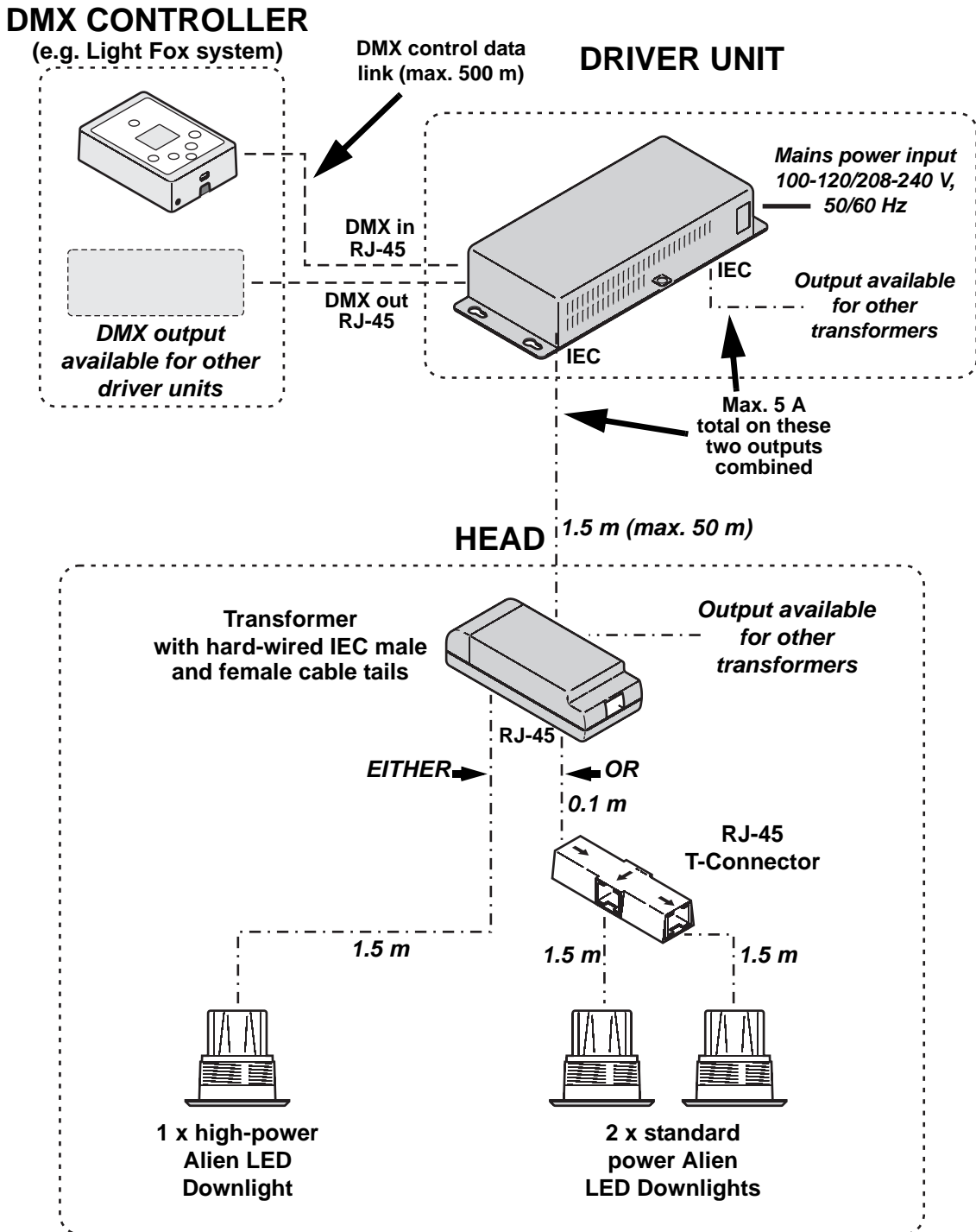


Figure 2: Schematic cable and device layout

The Alien LED Downlight™ system comprises:

1. A driver unit that relays signals from a DMX controller such as the Martin Light Fox™ to the rest of the system via combined power/data cables. The driver unit also stores stand-alone programs that it can run on the rest of the system without the need for a DMX controller.
2. A 'head' consisting of:
  - a. A transformer/receiver unit that accepts power/data signals from the driver unit and applies variable intensity power to the different colored LEDs in the downlight or downlights connected to it.
  - b. Either one high-power or two standard model IP67-rated downlight luminaires.

## Maximum cable lengths

To ensure the quality of the data signal in the system, do not exceed the following maximum permitted cable lengths:

Cable	Supplied length	Max. length
DMX data link from DMX controller to Driver Unit	Not supplied	500 m (1640 ft.)
Power/data link from Driver Unit to daisy-chained Driver Unit	Not supplied	50 m (164 ft.)
Power/data link from Driver Unit to transformer	1.5 m (4.9 ft.)	50 m (164 ft.) total (i.e. to last transformer on link)
Power/data link from transformer to high-power luminaire	1.5 m (4.9 ft.)	1.5 m (4.9 ft.)
Power/data link from transformer to T-connector	100 mm (3.9 in.)	100 mm (3.9 in.)
Power/data link from T-connector to standard luminaires	1.5 m (4.9 ft.)	1.5 m (4.9 ft.)

**Table 1: Maximum permitted cable lengths**

# AC power



**Warning!** Read “Safety Information” on page 3 before attempting to install this product. Lock out power to the entire installation before working on cables and connections.

**Electrical installation must be carried out by qualified professionals only.**



**For protection from dangerous electric shock, the driver unit must be grounded (earthed). The AC power distribution system must be fitted with current overload and ground-fault (earth-fault) circuit breakers as well as a means to isolate devices from power and lock out power so that it cannot be reapplied during service.**

**The Alien LED Downlight driver unit can be connected to AC power at 100-120/208-240 V nominal, 50/60 Hz. Do not connect to power at any other voltage or frequency.**

**Important! Do not connect any component in the Alien LED Downlight system to an electrical dimmer system. Doing so can damage the electronics.**

See Figure 2 on page 10 for a schematic diagram of cable layout. If you require help with planning or installing an Alien LED Downlight system, please contact your Martin supplier for assistance.

The Alien LED Downlight driver unit is protected by a 5 A slow-blow primary fuse (note that fuses are not user-serviceable). See “Specifications” on page 27 for details of typical current drawn.

Power factor figures are given under “Specifications” on page 27. When operating on mains power at 208 - 240 VAC, a power factor of 0.9 minimum is obtained when at least two heads are installed.

## Setting to the local power voltage

Before connecting the driver unit to power, check that the voltage selector switch on the side of the driver unit is set to:

- 115 V if the local AC mains power voltage is 110-120 V, or
- 230 V if the local AC mains power voltage is 208-240 V.


The unit adapts automatically to 50 Hz or 60 Hz AC power.

## Connecting to power

The Alien LED Downlight driver unit does not have a power on/off switch. Power is applied as soon as the unit is connected to power.

The driver unit is supplied with a hard-wired UL-approved power cable with wires that are EU color-coded (brown, blue, yellow/green) ready for connection to a single-phase 3-wire (live, neutral, ground/earth) power distribution system.

You may need to fit the power cable with a power plug that is suitable for your AC power outlets. If so, install a grounding-type (earthed) plug that is rated 10 A minimum. Follow the plug manufacturer's instructions. Table 2 shows some possible pin identification schemes. If pins are not clearly identified, or if you have any doubts about proper installation, consult a qualified electrician.

Wire colors (USA)	Wire colors (EU)	Conductor	Symbol	Screw (USA)
black	brown	live	L	yellow or brass
white	blue	neutral	N	silver
green	yellow/green	ground (earth)		green

**Table 2: Conductor identification**

To connect to power:

1. Shut down power at source and ensure that it cannot be reapplied, even accidentally, by removing a distribution circuit fuse for example.
2. Connect the conductors in the Alien LED Downlight driver unit power cable to the distribution circuit as follows:
  - Connect the yellow/green wire to ground (earth)
  - Connect the blue wire to neutral
  - Connect the brown wire to live.
3. Check that all installation work is completed and carry out appropriate tests and safety checks before applying power.

## Power source quality

The Alien LED Downlight system includes combined power and data cables. The system is robust and can withstand normal mains power disturbances, but more serious interference on the mains power circuit can cause individual downlights in multiple installations to lose step temporarily, typically for a fraction of a second, until they recover and normal operation is resumed. If momentary loss of step occurs, check the quality of your incoming mains power and ensure that Alien LED Downlight cables are separated from any other cables that may be carrying large amounts of noisy power.

# Connecting heads

Whether you use DMX control or stand-alone operation, you need to connect heads so that luminaires can draw power from transformers. See Figure 2 on page 10.



**Warning!** Ensure that the total current draw on both of the driver unit's output sockets added together does not exceed 5 A maximum.

Connect only Alien LED Downlight components to the Alien LED Downlight system, and connect them only as shown in Figure 2 on page 10. Use only the cables supplied with the system, and check that cables are in perfect condition before use.

**Important!** Before connecting two standard luminaires to a transformer, look carefully at the RJ-45 T-connector used to branch the cable from the transformer. See Figure 2. The RJ-45 sockets that must be used for input and output are clearly marked with arrows. Observe these markings carefully, or you will damage the circuits in the T-connector.

Power cables that carry a strong current can affect the data signal in Alien LED Downlight cables (see "Power source quality" on page 13). Route Alien LED Downlight system cables as far as possible from potential sources of interference.

To connect heads:

1. Each transformer is hard-wired with a 1.5 m (4.9 ft.) power/data cable tail with an IEC male connector. Connect the cable tail of the first transformer to the IEC female power/data output socket of the first driver unit.
2. Continue linking transformers by connecting their cable tails to either a power/data output socket on another transformer or a power/data output socket on a driver unit, up to a maximum of 10 transformers in total per driver unit.
3. Each Alien LED Downlight luminaire is hard-wired with a 1.5 meter (4.9 ft.) cable tail with an RJ-45 connector. Connect **either**:
  - a. two standard luminaires via the supplied 100 mm power patch cable and RJ-45 T-connector **or**
  - b. one high-power luminaireto the RJ-45 output socket of each transformer.

See Figure 2. If you connect two standard luminaires using a T-connector, use the connector with the inward-pointing arrow for input from the transformer and use the two outward-pointing arrows for output to the luminaires.

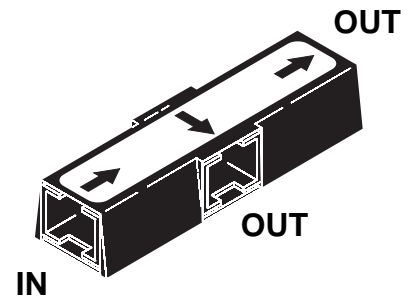


Figure 2: RJ-45 T-connector

# Control data link

The Alien LED Downlight system can be operated using a standard DMX dynamic lighting control system if driver units are connected to a DMX controller via a control data link. Unlike the combined power/data cables from driver units to the heads, the control data link from a DMX controller to driver units carries data only.

## Planning the data link

Before planning the data link, study Figure 2 on page 10 and the guidelines below. If you are unsure about any aspect of installation, contact your Martin supplier for assistance.

### ***Alien LED Downlight control principles***

- Downlights are controlled by sending color and intensity commands from the DMX controller over the data link to driver units. The driver units then relay these commands to the heads over combined power/data cables.
- A head consists of one transformer that must be connected to either one high-power or two standard downlight luminaires. Two standard luminaires connected to one transformer will behave identically.
- A maximum of 10 heads may be connected to one driver unit. A driver unit can control up to 4 heads – or groups of heads – independently. This means for example that you can control one head and 3 groups, each containing 3 heads, as four independent groups that show four independent lighting effects. To give another example, you can also put all 10 heads into one group and control them together, so that they all show the same lighting effects.
- One DMX universe has 512 DMX control channels available in the data signal. Channels 1 - 479 are available for use in an Alien LED Downlight system.
- The driver unit uses 4 DMX control channels to control a head:
  - one channel for red, one for green, one for blue and one for white in RGBW mode, or
  - one channel for hue, one for saturation, one for intensity and one redundant channel in HSI mode.
- Since the driver unit can control up to 4 heads independently, it uses up to 16 DMX channels in total (4 groups x 4 channels = 16).

### ***Cable and link details***

- Use RS-485 (also known as EIA-485) data cable for the data link. RS-485 cable has low capacitance and a characteristic impedance of 85 to 150 Ohms. It is electrically shielded and has at least 1 twisted pair of conductors. The minimum recommended wire size is 0.25 mm<sup>2</sup> (24 AWG) for runs up to 300 meters (1000 ft.) and 0.32 mm<sup>2</sup> (22 AWG) for runs up 500 meters (1640 ft). CAT 5 network cable conforms to the RS-485 specification and is suitable for the data link.
- The maximum permitted control data cable length before a control signal amplifier is required is 500 meters (1640 ft.).
- Devices that are connected to a controller via a data link must be 'daisy-chained', i.e. the data cable must be connected in one single chain.
- Each chain may contain a maximum of 32 Alien LED Downlight driver units or similar devices.
- An optically isolated amplifier-splitter such as the Martin RS-485 Opto-Splitter (P/N 90758060) must be used to:
  - extend a control data link beyond 500 meters (1640 ft.), or
  - branch the link into further single chains, each containing a maximum of 32 devices. The Martin Opto-Splitter allows a link to be branched into four new chains, or
  - extend the link if the maximum of 32 devices is reached.
- Each chain on the link must be terminated with a DMX termination plug in the output of the last device in the chain.

- Long parallel runs of AC power and control data cables may cause interference on the data link and must be avoided. Even if not required by law, separate conduits must be used for power and data cables.

## Connecting the data link



**Warning!** Before working on cables and connections, isolate the entire installation from power and lock out power so that it cannot be reapplied.

**Connect either one high-power or two standard Alien LED Downlight luminaires to each transformer.**

**Connect a maximum of ten transformers directly or indirectly to any one driver unit. The total current draw for both output sockets on a driver unit added together must not exceed 5 A.**

**Read “Planning the data link” on page 15 before starting work and refer to Figure 2 on page 10 while connecting the data link.**

To connect the data link:

1. Isolate the installation from power and ensure that power cannot be reapplied.
2. Run data cable with suitable connectors from the DMX output socket on the DMX controller to the RJ-45 DMX input socket on the first driver unit on the link.
3. If there are more driver units in the installation, continue linking them in a single chain, connecting DMX output to DMX input sockets.
4. On the last driver unit in each chain on the link, insert an RJ-45 DMX termination plug (available from Martin, P/N 91613082) in the DMX output socket.
5. After making all connections, set up the fixtures as described under “System setup” on page 18 before applying power.

## Connection pinouts

### **XLR connection**

Many DMX lighting controllers have XLR output connectors. To connect these to the RJ-45 connectors in the Alien LED Downlight system, use an XLR to RJ-45 adapter, (included with driver unit). If you need to rewire XLR connectors, pin numbers are normally marked on connectors. Connectors must be wired using the standard XLR DMX pin-out:

- Pin 1: Cable shield
- Pin 2: DMX Data 1 - (cold)
- Pin 3: DMX Data 1 + (hot)

Pins 4 and 5 on 5-pin XLR connectors are available for Data 2 connections in DMX 512-A or similar systems. They must be wired as follows:

- Pin 4: DMX Data 2 - (cold)
- Pin 5: DMX Data 2 + (hot)

**Important!** To avoid ground/earth loop interference, ensure that the DMX cable shield does not come into contact with the shell or body of XLR connectors.

### **RJ-45 connection**

RJ-45 connectors are easiest to manage if CAT 5 cable is used for the data link. RJ-45 cable connector pins are numbered from the left looking at the face of the connector with the locking clip on top (see Figure 3). Connectors must be wired according to the 568-B system using the standard RJ-45 pin-out for DMX applications:

- Pin 1 (White/orange): DMX data hot (+)
- Pin 2 (Orange): DMX data cold (-)



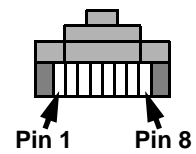
- Pins 7 (White/brown) and 8 (Brown): Common

Pins 3 and 6 are available for Data 2 connections in DMX 512-A or similar systems. They must be wired as follows:

- Pin 3 (White/green): Available for Data 2 hot (+)
- Pin 6 (Green): Available for Data 2 cold (-)

Pins 4 and 5 are not used in currently available lighting control systems but can be wired as follows:

- Pin 4 (Blue)
- Pin 5 (White/blue)



**Figure 3: RJ-45 cable connector pins**

# System setup

The Alien LED Downlight system is set up using the DIP switch (see Figure 4) and the yellow **Program** button on the side of the driver unit.



Figure 4: DIP switch

## Setting up stand-alone operation

In stand-alone operation, no DMX controller is required. Instead, pre-programmed lighting effects stored in the driver unit memory are sent to the Alien LED Downlight luminaires for display when stand-alone operation is enabled.

Both static and dynamic effects are stored in the driver unit memory. If more complex effects are required than those available, you will need to add a DMX controller to the system and use DMX control.

### Enabling stand-alone operation

See Table 3 on page 19. To enable stand-alone operation, set the DIP switch pins on the driver unit to a value from 480 to 511 to select one of the stand-alone programs stored in the driver unit as shown in the table. All the downlights connected via transformers to the driver unit will now display the selected stand-alone lighting effect each time the driver unit is powered on.

If the system is powered on when you select a stand-alone program on the DIP switch, allow several seconds for the selection to take effect.

Enabling a stand-alone program overrides any DMX signal sent to the driver unit.


Value	DIP switch setting	Stand-alone program
		
	10 987654321	
480	x 111100000	All off
481	x 111100001	W 100%
482	x 111100010	RGB 100%
483	x 111100011	RGBW 100%
484	x 111100100	Cyan
485	x 111100101	Blue
486	x 111100110	Light green
487	x 111100111	Green
488	x 111101000	Light yellow
489	x 111101001	Red
490	x 111101010	Pink
491	x 111101011	Magenta
492	x 111101100	Purple
493	x 111101101	Full spectrum color scroll
494	x 111101110	Yellow/orange scroll
495	x 111101111	Pinks scroll
496	x 111110000	Blues scroll
497	x 111110001	Whites scroll
498	x 111110010	Blue fade to white scroll
499	x 111110011	Light green fade to white scroll
500	x 111110100	Green fade to white scroll
501	x 111110101	Light yellow fade to white scroll
502	x 111110110	Red fade to white scroll
503	x 111110111	Pink fade to white scroll
504	x 111111000	Magenta fade to white scroll
505	x 111111001	Purple fade to white
506	x 111111010	White Warmth 1
507	x 111111011	White Warmth 2
508	x 111111100	White Warmth 3
509	x 111111101	White Warmth 4
510	x 111111110	White Warmth 5
511	x 111111111	White Warmth 6

Table 3: Stand-alone program DIP-switch settings

## Setting up DMX operation

In DMX operation, commands from a DMX controller are sent to the driver units and then relayed to the heads. The transformers in the heads translate the commands into dynamic lighting effects by varying power to the LEDs in the luminaires.

A driver unit can relay commands to up to 4 different groups of heads independently. All heads are supplied set to group 1 by default. If you want all heads to show the same lighting effects, go straight to "Setting driver units' DMX addresses" below.

If you want to show different lighting effects on different heads connected to the same driver unit, continue Alien LED Downlight, you must first assign the heads into groups. All heads are supplied assigned to group 1 by default. To assign them to a different group, you must first initialize them and then set them to the new group number:

### Configuring heads

1. Connect all the heads you want to include in a particular group to the driver unit. Disconnect all the heads you do NOT want to include in that group.
2. Power the driver unit on.
3. Set all the driver unit's DIP switch pins to **OFF**.
4. Move one DIP switch pin as follows:
  - Move pin 2 to **ON** to set heads to group 2, or
  - Move pin 3 to **ON** to set heads to group 3, or
  - Move pin 4 to **ON** to set heads to group 4.
5. Hold the yellow **Program** button pressed in for 10 seconds until the luminaires blink green to show that the heads connected to the driver unit are now assigned to the desired group.
6. If a transformer has previously been assigned to a group other than group 1, it will blink red and refuse to accept the new group. If this happens, reset the transformer by setting all the DIP switch pins on the driver unit to **ON** and holding the yellow 'Enter' button pressed in for 10 seconds. This initializes the transformer and sets it to the default group 1. You should now be able to assign the heads to the new group.
7. Repeat this procedure until all heads are assigned to groups, then use the DIP switch pins to set the driver unit's DMX address as described below.

### Setting driver units' DMX addresses

When heads have been assigned to groups, you must set up the driver units and controller:

1. Set up the DMX controller so that 16 channels are allocated to each driver unit.

*For example, if you have three driver units, allocate:*

  - Channels 1 - 16 to driver unit 1
  - Channels 17 - 32 to driver unit 2
  - Channels 33 - 48 to driver unit 3.
2. Set each driver unit to receive commands on the 16 channels reserved for it on the DMX controller. You do this by setting the driver unit's DMX address as a binary number on the driver unit's DIP switch. The DMX address is the first of the DMX channels used to receive commands from the controller.

*In our example, set DMX addresses as follows*

  - Set driver unit 1 to DMX address 1 (binary number **00000001** on the DIP switch)
  - Set driver unit 2 to DMX address 17 (binary number **000010001** on the DIP switch)
  - Set driver unit 3 to DMX address 33 (binary number **000100001** on the DIP switch)
3. See "DIP Switch settings table" on page 22 for a quick way of finding the binary numbers you need to set on the DIP switch. Alternatively, use the Martin DIP Switch Calculator, available

for use and download free of charge at <http://www.martin.dk/service/dipswitchpopup.htm> (see Figure 5).

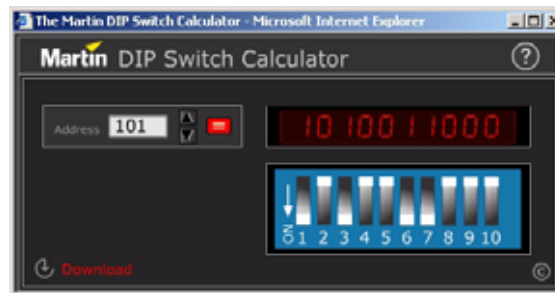


Figure 5: Martin™ DIP Switch Calculator

### Setting the color control mode to RGBW or HSI

To set the Alien LED Downlight system to **RGBW** mode, set pin 10 of the DIP switch on the driver unit to **OFF**. The 4 DMX channels used for each head connected to that driver unit will now control the intensity of red, green, blue and white LEDs.

To set the Alien LED Downlight to **HSI** mode, set pin 10 of the DIP switch on the driver unit to **ON**. The first 3 DMX channels used for each head connected to that driver unit will now control hue, saturation and intensity. The fourth channel is redundant and has no function.

## DIP Switch settings table

To use this table, first find the DMX address in the main block in the table. Then read the settings for pins 1 - 5 to the left and read the settings for pins 6 - 9 above the address. "0" means OFF and "1" means ON.

For example, to set the DMX address to 101, you need to set DIP switch pins 1, 3, 6 and 7 to ON, as highlighted in the table.

DIP switch pins setting 0 = OFF 1 = ON					#9	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	
					#8	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
					#7	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
					#6	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
#1	#2	#3	#4	#5																	
0	0	0	0	0		32	64	96	128	160	192	224	256	288	320	352	384	416	448	480	
1	0	0	0	0	1	33	65	97	129	161	193	225	257	289	321	353	385	417	449	481	
0	1	0	0	0	2	34	66	98	130	162	194	226	258	290	322	354	386	418	450	482	
1	1	0	0	0	3	35	67	99	131	163	195	227	259	291	323	355	387	419	451	483	
0	0	1	0	0	4	36	68	100	132	164	196	228	260	292	324	356	388	420	452	484	
1	0	1	0	0	5	37	69	101	133	165	197	229	261	293	325	357	389	421	453	485	
0	1	1	0	0	6	38	70	102	134	166	198	230	262	294	326	358	390	422	454	486	
1	1	1	0	0	7	39	71	103	135	167	199	231	263	295	327	359	391	423	455	487	
0	0	0	1	0	8	40	72	104	136	168	200	232	264	296	328	360	392	424	456	488	
1	0	0	1	0	9	41	73	105	137	169	201	233	265	297	329	361	393	425	457	489	
0	1	0	1	0	10	42	74	106	138	170	202	234	266	298	330	362	394	426	458	490	
1	1	0	1	0	11	43	75	107	139	171	203	235	267	299	331	363	395	427	459	491	
0	0	1	1	0	12	44	76	108	140	172	204	236	268	300	332	364	396	428	460	492	
1	0	1	1	0	13	45	77	109	141	173	205	237	269	301	333	365	397	429	461	493	
0	1	1	1	0	14	46	78	110	142	174	206	238	270	302	334	366	398	430	462	494	
1	1	1	1	0	15	47	79	111	143	175	207	239	271	303	335	367	399	431	463	495	
0	0	0	0	1	16	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496	
1	0	0	0	1	17	49	81	113	145	177	209	241	273	305	337	369	401	433	465	497	
0	1	0	0	1	18	50	82	114	146	178	210	242	274	306	338	370	402	434	466	498	
1	1	0	0	1	19	51	83	115	147	179	211	243	275	307	339	371	403	435	467	499	
0	0	1	0	1	20	52	84	116	148	180	212	244	276	308	340	372	404	436	468	500	
1	0	1	0	1	21	53	85	117	149	181	213	245	277	309	341	373	405	437	469	501	
0	1	1	0	1	22	54	86	118	150	182	214	246	278	310	342	374	406	438	470	502	
1	1	1	0	1	23	55	87	119	151	183	215	247	279	311	343	375	407	439	471	503	
0	0	0	1	1	24	56	88	120	152	184	216	248	280	312	344	376	408	440	472	504	
1	0	0	1	1	25	57	89	121	153	185	217	249	281	313	345	377	409	441	473	505	
0	1	0	1	1	26	58	90	122	154	186	218	250	282	314	346	378	410	442	474	506	
1	1	0	1	1	27	59	91	123	155	187	219	251	283	315	347	379	411	443	475	507	
0	0	1	1	1	28	60	92	124	156	188	220	252	284	316	348	380	412	444	476	508	
1	0	1	1	1	29	61	93	125	157	189	221	253	285	317	349	381	413	445	477	509	
0	1	1	1	1	30	62	94	126	158	190	222	254	286	318	350	382	414	446	478	510	
1	1	1	1	1	31	63	95	127	159	191	223	255	287	319	351	383	415	447	479	511	

**Table 4: DMX address DIP switch settings**

Note that:

- DIP switch pin 10 is reserved for setting driver units to RGBW or HSI modes.
- DMX addresses from 480 and upwards are not available because the DIP switch settings that correspond to these addresses are reserved for setting stand-alone operation.

# Operation

## Ambient temperatures

Devices can be operated within the following temperature ranges only:

- Alien LED driver units can be operated at ambient temperatures from 5° C (41° F) to 40° C (104° F).
- Alien LED Downlight transformers can be operated at ambient temperatures from 0° C (32° F) to 40° C (104° F).
- Alien LED Downlight luminaires can be operated at ambient temperatures from -25° C (-13° F) to 45° C (113° F).

## Status LEDs on the driver unit

Colored LEDs on the driver unit indicate current system status:

- Green = mains power on
- Yellow = valid DMX signal is present at DMX input
- Red = driver unit is in program mode

## DMX-controlled operation

When the Alien LED Downlight system is set up for DMX-controlled operation, faders on the DMX controller are used to control color and intensity. The control method depends on which color control mode the Alien LED Downlight system is set to (see “Setting the color control mode to RGBW or HSI” on page 21):

In **RGBW** mode, four channels on the controller are used to control the intensity of red, green, blue and white from 0% to 100%.

In **HSI** mode, three channels on the controller are used to control hue, saturation and intensity.

- Hue is controlled in the following order: Red → Orange → Amber → Yellow → Green → Cyan → Blue → Indigo → Violet → Magenta → Red.
- Saturation and Intensity can be varied from 0% to 100%.

When the Alien LED Driver Unit is receiving a valid DMX signal, the yellow **DMX OK** LED next to the DIP switch on the Driver Unit lights.

## Stand-alone operation

When the Alien LED Downlight system is set up for stand-alone operation, downlights begin displaying their stand-alone scene as soon as power is applied to the driver.

# Service and maintenance



**Warning!** Read “*Safety Information*” on page 3 before carrying out service or maintenance work on the Alien LED Downlight installation. Isolate the entire installation from power and ensure that power cannot be reapplied before carrying out any work on the installation.

**Any service procedures not described in this section must be carried out by the Martin Service organization or its authorized agents.**

It is Martin policy to use the best quality materials available to ensure optimum performance and the longest possible component lifetimes. However, optical components in all lighting fixtures are subject to wear and tear over the life of the fixture, resulting in gradual changes in color rendition, for example. The extent of wear and tear depends heavily on operating conditions and environment, so it is impossible to specify precise lifetimes for optical components.

## Cleaning



**Warning!** Do not use a high-pressure water jet for cleaning.

Dirt and dust buildup reduces light output and inhibits cooling. Clean the Alien LED Downlight’s trim ring and front glass occasionally with a soft cloth dampened in a mild detergent solution. Do not use products that contain solvents, abrasives or caustic agents for cleaning, as they can cause surface damage.



# DMX protocol

## RGBW Mode

Channel	Value	Percent	Function
1	0 - 255	0 - 100%	<b>Red</b> Intensity 0 →100%
2	0 - 255	0 - 100%	<b>Green</b> Intensity 0 →100%
3	0 - 255	0 - 100%	<b>Blue</b> Intensity 0 →100%
4	0 - 255	0 - 100%	<b>White</b> Intensity 0 →100%

## HSI Mode

Channel	Value	Percent	Function
1	0 - 255	0 - 100%	<b>Hue</b> Red → Orange → Amber → Yellow → Green → Cyan → Blue → Indigo → Violet → Magenta → Red
2	0 - 255	0 - 100%	<b>Saturation</b> Zero (white) → Full
3	0 - 255	0 - 100%	<b>Intensity</b> Intensity 0 →100%
4			Redundant: has no function

# Troubleshooting

<b>Problem</b>	<b>Probable cause(s)</b>	<b>Remedy</b>
System is completely dead.	No power to driver unit.	Check power and connections.
	Fuse blown or device faulty	Disconnect driver unit power cable. Contact Martin for service.
One or more downlights responds incorrectly to control or does not respond at all.	Fault on DMX data link or combined power/data link.	Inspect connections and cables. Correct poor connections. Repair or replace damaged cables.
	Incorrect addressing.	Check that Driver Units have correct DMX addresses. Check that transformers are correctly assigned to groups. Check that driver unit is set to correct color control mode.
	Driver unit, transformer or downlight faulty.	Identify faulty device by bypassing devices until fault disappears. Alternatively, substitute devices with a known good device. Have faulty device tested and serviced by Martin service technician.
	Other device on DMX link defective.	Bypass devices on DMX link until the faulty device has been identified. Have faulty device tested and serviced by Martin service technician or device supplier.
One or more downlights cut out intermittently.	Driver unit or transformer is too hot.	Ensure adequate ventilation and free airflow around devices. Clean device, paying special attention to air vents. Check that ambient temperature does not exceed maximum permitted level. Contact Martin for service.
Unacceptable loss of step in multiple installations.	Noisy mains power or interference from noisy mains cables.	Test mains power quality and eliminate source of irregularities, or draw power from a different mains circuit. Check that Alien LED Downlight cables are not too close to other power cables.

**Table 5: Troubleshooting**

# Specifications

## Physical

### Luminaire

Installation depth	69 mm (2.7 in.)
Maximum protrusion from mounting surface	6 mm (0.2 in.)
Trim ring outer diameter	85 mm (3.3 in.)
Luminaire housing diameter at widest point	63 mm (2.5 in.)
Weight	330 g (11.6 oz.) including cable

### Transformer

Length	123 mm (4.8 in.)
Width	50 mm (2.0 in.)
Height	32 mm (1.3 in.)
Weight	385 g (13.6 oz.) including cables

### Driver Unit

Length	268 mm (10.6 in.)
Width	117 mm (4.6 in.)
Height	48 mm (1.9 in.)
Weight	1720 g (60.7 oz.) incl. cable

## Dynamic Effects

Color mixing	RGBW, HSI
Red	0 - 100%
Green	0 - 100%
Blue	0 - 100%
White	0 - 100%

## Control and Programming

Required control hardware	Alien LED Driver Unit
Color control modes	RGBW, HSI
DMX channels	3/4 per independently controlled luminaire or group of luminaires
Protocol	USITT DMX512-A
DMX address setting	DIP switch on Driver Unit
Stand-alone options	31 pre-programmed static/dynamic scenes/sequences in Driver Unit

## Photometric Data

Light source	Luxeon Rebel high power emitters
Total LED power	± 9 W per standard luminaire, ± 18 W per high-power luminaire
Half-peak angle	45° as standard, super-wide lens available as optional accessory

## Construction

### Luminaire

Housing	Steel and aluminum
Trim ring	Brushed stainless (standard), chrome, white or brass
Protection rating	IP67

### Transformer

Housing	Flame-retarded GE Cyclopol C2100(HF) PC/ABS resin
Protection rating	IP20

### Driver Unit

Housing	Steel
Protection rating	IP20

## Installation

Location	Recessed, ceiling or wall
Orientation	Any
Minimum clearance around device	50 mm (2.0 in.)
Ceiling thickness	5 mm (0.2 in.) - 22 mm (0.9 in.)
Luminaire external thread for retaining nut	2-inch BSP
Diameter of mounting hole	70 mm (2.8 in.) with plasterboard retainer, 63 mm (2.5 in.) with 2" BSP nut
Max. cable length, driver unit to transformer	50 m (164.0 ft.)
Max. cable length, driver unit to daisy-chained driver unit	50 m (164.0 ft.)
Max. cable length, transformer to luminaire	1.5 m (4.9 ft.)

## Connections

### Luminaire

Controlled power input . . . . . Hard-wired 1.5 m (4.9 ft.) cable tail with male RJ-45 connector

### Transformer

Combined power & data input . . . . . Hard-wired 1.5 m (4.9 ft.) cable tail with  
male (C14) IEC connector  
Combined power & data through . . . . . Hard-wired 1.5 m (4.9 ft.) cable tail with  
female (C13) IEC socket  
Output to luminaire(s) . . . . . Female RJ-45 socket

### Driver Unit

Power input . . . . . Hard-wired 1.5 m (4.9 ft.) cable tail without power plug  
Combined power & data output to transformers . . . . . 2 x female (C13) IEC chassis sockets

## Electrical

AC power . . . . . 100-120/208-240 V, 50/60 Hz, switch-selectable at Driver Unit  
Main fuse . . . . . 5 A slow-blow (not user-serviceable)

## Maximum power and current

### Driver unit with 1 head (1 high-power or 2 standard luminaires)

100-120 V, 50/60 Hz . . . . . 18 W, 0.2 A, PF 0.98  
208-240 V, 50/60 Hz . . . . . 18 W, 0.1 A, PF 0.86

### Driver unit with 10 heads (10 high-power or 20 standard luminaires)

100-120 V, 50/60 Hz . . . . . 180 W, 1.4 A, PF 0.98  
208-240 V, 50/60 Hz . . . . . 180 W, 0.8 A, PF 0.96

*PF = power factor.*

## Thermal

Cooling . . . . . All devices convection-cooled

Maximum ambient temp. (Ta max.) . . . . . Standard luminaire 45° C (113° F)  
High-power luminaire 45° C (113° F)  
Driver unit 40° C (104° F)  
Transformer 40° C (104° F)

Minimum ambient temp. (Ta min.) . . . . . Standard luminaire -25° C (-13° F)  
High-power luminaire -25° C (-13° F)  
Driver unit 5° C (41° F)  
Transformer 0° C (32° F)

Maximum surface temperature, steady state . . . . . Standard luminaire, Ta=45° C: 80° C (176° F)  
High-power luminaire, Ta=45° C: 85° C (185° F)  
Driver unit, Ta=40° C: 60° C (140° F)  
Transformer, Ta=40° C: 70° C (158° F)

Total heat dissipation, 1 driver unit + 1 head (calculated, +/- 10%) . . . . . 62 BTU/hr.  
Total heat dissipation, 1 driver unit + 10 heads (calculated, +/- 10%) . . . . . 620 BTU/hr.

## Approvals



For EU market



For US and Canadian markets

### Luminaire

UL1598 CSA 22.2 No. 250  
BSEN 60598-2-2:1997 with BSEN 60598-1:2004

### Transformer

UL1310 CSA C22.2 No. 223  
BSEN 61347-2-13:2006 with BSEN 61347-1:2001

### Driver Unit

UL1598 and CSA 22.2 No.250  
BS EN 61347-2-11\_2002 with BS EN 61347-1:2001

## Included Items

Standard Downlight Set . . . . . 2 x standard-power luminaires, 1 x transformer,  
. . . . .all cables and connectors  
High-Power Downlight Set . . . . . 1 x high-power luminaire, 1 x transformer,  
. . . . .all cables and connectors  
Driver Unit. . . . . driver unit with hard-wired power cable,  
. . . . . 3-pin male XLR to male RJ-45 adapter, user manual

## Accessories

Chrome trim ring . . . . . P/N 91611301  
Brass trim ring . . . . . P/N 91611302  
White trim ring . . . . . P/N 91611303  
Super wide lens . . . . . P/N 91610093  
RJ-45 DMX termination plug . . . . . P/N 91613028  
5-pin male XLR to male RJ-45 adapter . . . . . P/N 11840111  
5-pin female XLR to male RJ-45 adapter . . . . . P/N 11840112  
3-pin male XLR to male RJ-45 adapter . . . . . P/N 11840087  
3-pin female XLR to male RJ-45 adapter . . . . . P/N 11840086  
RJ-45 patch cable, 600 mm . . . . . P/N 11840105  
RJ-45 patch cable, 5 m. . . . . P/N 11840095

## Ordering Information

Alien LED Downlight Standard Luminaire Set . . . . . P/N 90353000  
Alien LED Downlight High-power Luminaire Set . . . . . P/N 90353040  
Alien LED Downlight Driver Unit. . . . . P/N 90734510

*Specifications subject to change without notice. Please see [www.martin.com](http://www.martin.com) for latest product information and specifications.*





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