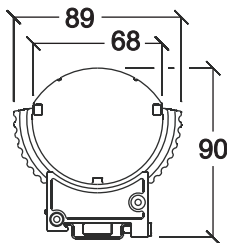
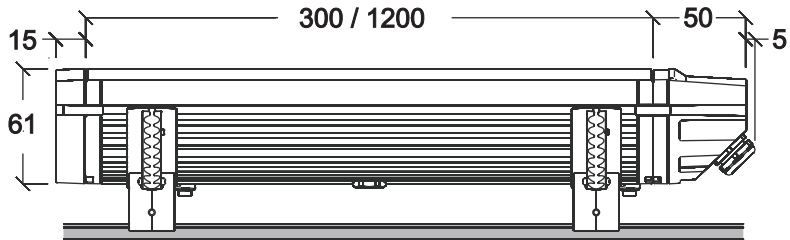


# Extube™ user manual



# Dimensions

All dimensions are in millimeters



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P/N 35000212, Rev. B

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# 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.



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



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



**Warning!**  
LED light emission. Risk of eye injury.



**Warning!**  
Fire hazard.



**Warning!**  
Refer to user manual.



**Warning!** Do not look at exposed LEDs from a distance of less than 2.2 m (7 ft. 3 in.) from the front surface of the Extube without suitable protective eyewear. At less than this distance, the LED emission can cause eye injury or irritation. Do not view the LED emission directly with any optical instrument that may concentrate the beam.



At distances of 2.2 m (7 ft. 3 in.) and above, light output is harmless to the naked eye.

This product is for professional use only. It is not for household use.

This product presents risks of severe 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 any 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 power distribution board and lock out power (by removing a fuse at the distribution board for example), before removing any input cap, end cap, other cover or part. Do not reapply power until all caps, retaining clips, covers and other parts have been correctly installed.
- Shut down power to the installation when it is not in use.
- Connect the fixture electrically to ground (earth).
- 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.
- Connect the fixture to AC power using an Extube input cap and the 13 A power cable supplied pre-installed on the input cap only. The power cable may not be changed by the user. If it is not suitable for your installation, contact Martin for assistance in selecting and installing an alternative power cable.
- Do not disassemble input or end caps or try to tap directly into power or DMX circuits inside input or end caps.
- Terminals inside the input cap are live when power is applied to the power cable. Do not apply power to the cable unless the input cap is installed on a fixture as described in this manual.
- Terminals inside the connector at the output end of the fixture are live when power is applied to the fixture. Do not apply power to the fixture unless an end cap is installed on the fixture as described in this manual.
- Before using the fixture, check that all power distribution equipment and cables are in perfect condition, rated for the current requirements of all connected devices, protected to IP67 or higher and of suitable type for the location (including water, pollution, temperature and UV resistance).
- Isolate the fixture from power immediately if any cap, cable, seal, cover or other component is damaged, cracked or deformed. Do not reapply power until the item has been repaired.
- Do not expose any part of the fixture to a high-pressure water jet.
- Do not immerse the fixture in water or any other fluid, or install it in a location where flooding may occur.
- Ensure that there is a drip loop in all cables that enter the fixture so that water does not run down the cable and collect at the cable entry.
- Refer any service operation not described in this manual to an authorized Martin Service partner.



## PROTECTION FROM BURNS AND FIRE



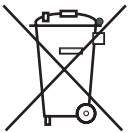
- Do not operate the fixture if the ambient temperature ( $T_a$ ) exceeds  $45^\circ\text{C}$  ( $113^\circ\text{F}$ ).
- The exterior of the fixture becomes hot, up to  $90^\circ\text{C}$  ( $194^\circ\text{F}$ ) during normal operation. Ensure that accidental physical contact with an installed fixture is impossible.
- Allow the fixture to cool for 20 minutes before servicing.
- Keep combustible materials (for example fabric, wood, paper) at least 0.5 m (20 in.) away from the fixture's front cover and light output. Keep flammable materials well away from the fixture.
- Do not modify the fixture 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.
- Install the fixture in a well ventilated area only. Provide a minimum clearance of 10 cm (4 inches) and ensure unrestricted airflow around the fixture.



## PROTECTION FROM INJURY



- Do not look at exposed LEDs from a distance of less than 2.2 m (7 ft. 3 in.) from the front surface of the fixture without suitable protective eyewear.
- Do not look at exposed LEDs with a magnifying glass or any other optical instrument that may concentrate the light output.
- 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 the DIN rail safely. Any nuts used must be self-locking.
- If the fixture is to be installed in a location where it may cause injury or damage if it falls, use a secondary means of attachment such as safety wires looped tightly around the fixture and anchored securely to the mounting structure or in the mounting surface.



### ***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.

# Contents

<b>Dimensions</b> .....	2
<b>Safety Information</b> .....	3
<b>Introduction</b> .....	9
Unpacking .....	10
Using for the first time .....	10
<b>Physical installation</b> .....	11
Location and orientation .....	11
Mounting the fixture .....	12
<b>Connections – general</b> .....	17
<b>AC power</b> .....	20
Connecting to power .....	21
<b>Control data link</b> .....	23
Connecting the data link .....	25
<b>Fixture setup</b> .....	26
Communication between MUM and fixtures .....	26
Fixture information .....	28
Fixture settings .....	29
<b>Operation</b> .....	33
Ambient temperatures .....	33
Status indication at power up .....	33
DMX control .....	33
<b>Service and maintenance</b> .....	34
Cleaning .....	34
Diffusers .....	35
Software installation .....	37
<b>DMX protocols</b> .....	39
<b>Troubleshooting</b> .....	41
<b>Specifications</b> .....	42

# Notes



# Introduction

Thank you for selecting an Extube™, a compact LED-based color-changing lighting fixture from Martin™. The Extube is available in short 300 mm (11.8 inch) and long 1200 mm (47.2 inch) models. All models can be plugged into each other end-to-end to form an unbroken line of light. Each 300 mm fixture or 300 mm segment of a 1200 mm fixture can be considered as one pixel that can be controlled separately via DMX, or fixtures and segments can be controlled together as a group.

This product features:

- Philips Rebel high-power LEDs
- RGBW (red, green, blue, white) color mixing, with RGB, RGBW, HSIC (hue, saturation, intensity, color temperature) and HSI color control options
- 100 W LED power and 1392 lumens total output (at very narrow beam angle) from 1200 mm models
- 25 W LED power and 348 lumens total output (at very narrow beam angle) from 300 mm models
- Four models available: one Very Narrow beam angle model with no diffuser fitted, and Narrow, Medium and Wide beam angles with corresponding diffusers installed
- DMX 512A control
- Remote configuration over the DMX data link using a PC with Martin MUM software
- Cascading auto-addressing (automatic DMX address setting of fixtures connected to a master fixture)
- Auto-sensing power supply unit with 100 - 120/200 - 240 V, 50/60 Hz operating range
- Clamp mounting system for standard 35 mm DIN rail
- Rapid end-to-end connection system

For the latest firmware updates, documentation, 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 user manual 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 following items are included with the Extube fixture:

- Two adjustable DIN rail mounting brackets
- Two locking clips for interconnecting fixtures

The following items are included with the Extube Power Connection Kit:

- Input cap with 1.8 m (5 ft. 10 in.) power and data cable tails
- End cap with integral DMX data link termination
- Four locking clips for securing input and end caps
- This user manual

# Using for the first time

Before applying power to the fixture:

- Carefully review “Safety Information” starting on page 3.
- Check that the local AC power voltage is within the range listed on the fixture’s serial number label.
- Install the fixture as described in this manual.

# Physical installation



**Warning! Read "Safety Information" on page 3 before installing the Extube.**

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



**If no diffuser is installed (Very Narrow models are supplied with no diffuser installed), make sure that it is impossible for LEDs to be viewed from a distance of less than 2.2 m (7 ft. 3 in.).**

**The Extube must be clamped onto a 35 mm DIN top-hat rail that is securely anchored to a suitable flat surface. Ensure that the supporting structure can bear the weight of all installed devices plus an adequate safety margin.**

**To ensure a waterproof seal, the supplied locking clips must be used to fasten fixtures to each other and to fasten input and end caps onto fixtures.**

**Install fixtures on DIN rail one by one and install locking clips after fixtures are mounted. Do not try to lift a line of interconnected fixtures, or you may damage input and output caps and locking clips, creating a safety risk.**

**If there is a danger that fixtures may cause injury or damage if they fall, install two secondary attachments such as safety cables per fixture as described under "Safety attachment" on page 14.**

**Make sure that there will be at least 10 cm (4 inches) of free space and unrestricted airflow around the Extube.**

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

## Location and orientation

The Extube can be installed outdoors. It is rated IP65 and will withstand rain and other low-pressure water projections, but:

- Do not expose it to high-pressure water jets from any direction.
- Do not immerse it in water or any other fluid.

- Do not install it in a location where flooding may occur.
- Arrange drip loops in both power and DMX cables.

The Extube requires free airflow around it to ensure adequate cooling:

- Do not cover the fixture or locate it in an unventilated space.
- Allow 10 cm (4 inches) free space around the fixture.

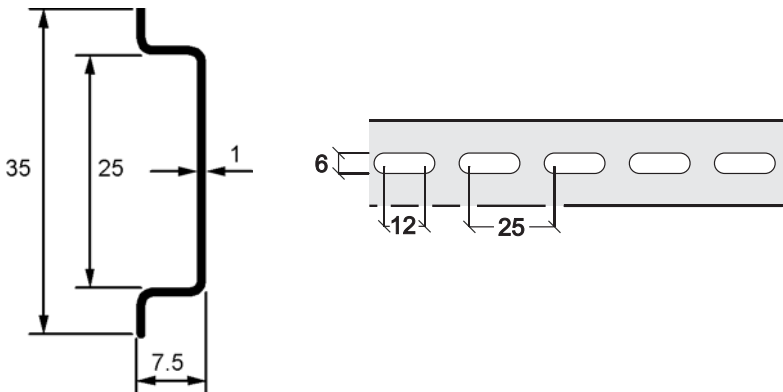
Keep combustible materials (for example fabric, wood, paper) at least 0.5 m (20 in.) away from the fixture's front cover and light output. Keep flammable materials well away from the fixture.

The housing can reach temperatures up to 90° C (194° F). Restrict public access or locate the fixture so that it cannot accidentally be touched.

## Mounting the fixture

### DIN rail

The Extube is designed to be mounted on standard 35 mm top-hat DIN rail.



**Figure 1: Martin DIN rail dimensions**

Corrosion-resistant DIN rail can be ordered from Martin (see "Accessories" on page 45). Dimensions for the DIN rail supplied by Martin are given in Figure 1.

Note that you cannot fasten Extube mounting clamps directly over screws used to fasten DIN rail to the mounting surface. If a DIN rail mounting screw is in the way of a mounting clamp, move it to another slot in the DIN rail. Alternatively, slightly loosen the 2.5 mm Allen screw that fastens the

mounting clamp to the central slot in the back of the Extube housing, slide the clamp a few millimeters to one side and retighten the screw.

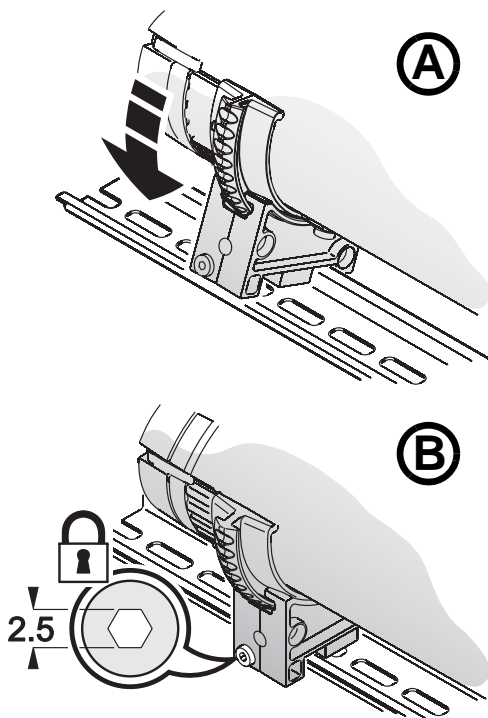
Note that you must install extra screws through the DIN rail into the mounting surface to secure Extube fixtures in vertical installations (see “Vertical mounting” on page 14).

## Mounting

**Important!** *Mount fixtures on the DIN rail one at a time. Do not lift a line of interconnected fixtures, as you may damage connections or clips.*

To mount the Extube on a surface using DIN rail:

1. Fasten the DIN rail securely to the mounting surface.
2. See Figure 2. The Extube mounting bracket has a hooked profile on one side. Hook this profile over the top of the DIN rail and swing the bracket down (see **A**). Use a 2.5 mm Allen key to tighten the mounting clamp screw (see **B**).

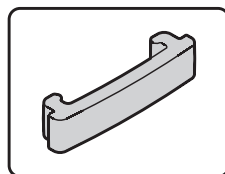


**Figure 2: Mounting on DIN rail**

## Adding fixtures to form a line

To add another fixture:

1. Hook the additional fixture over the DIN rail, then slide it along the rail and into position so that the connections in the ends of the fixtures engage fully.
2. Fasten the fixtures to each other by pressing the supplied locking clips into the slots provided in the ends of fixtures. Locking clips



**Figure 3: Locking clip**

can be released by levering them outwards at one end with a small flat-blade screwdriver.

3. See Figure 2. Tighten the additional fixture's clamp mounting screws.

### Vertical mounting

The mounting clamp screws will not hold the product securely on the DIN rail if Extubes are installed vertically. You must therefore insert screws in the mounting surface through the DIN rail mounting holes (see **C** in Figure 4) so that Extube mounting clamps rest against these screws and secure the fixture.

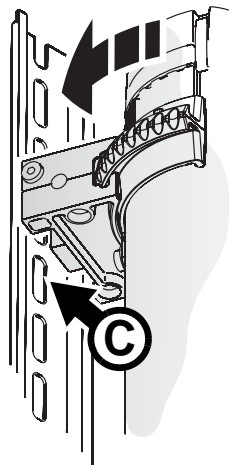


Figure 4: Vertical mounting on DIN rail

### Safety attachment

When installing Extubes in an area where they could fall and cause damage or injury, loop two safety cables or similar secondary attachments that can hold ten times the weight they secure tightly around each Extube and fasten each safety attachment to a separate anchoring point in the mounting surface itself, not the DIN rail.

### Adjusting tilt angle

The Extube can be tilted through 90° (see Figure 5).

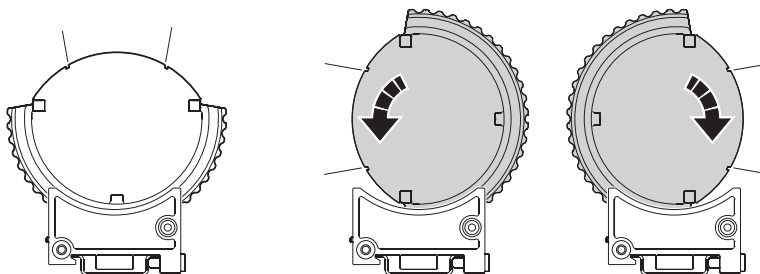
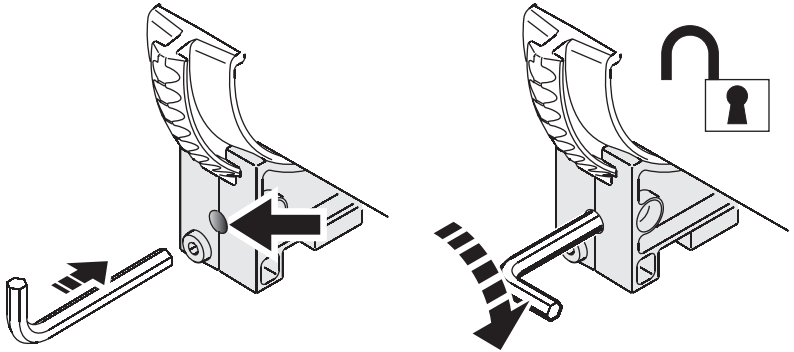


Figure 5: Tilt range

To adjust the tilt angle:

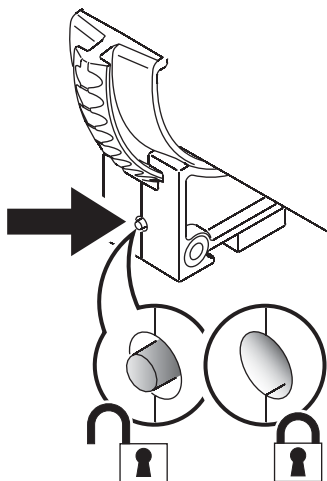
1. See Figure 6. Insert a 4 mm Allen key in the holes next to the mounting clamp screws on the mounting brackets of all interconnected fixtures. Engage the Allen key in the screw inside each hole, apply a little inwards pressure and twist a quarter-turn clockwise to release the tilt lock.



**Figure 6: Releasing the tilt lock**

2. Adjust the fixture(s) to the desired tilt angle.
3. Re-insert the Allen key and twist a quarter-turn counter-clockwise to reapply the tilt lock.

4. Check that the tilt lock is applied on all the mounting brackets. See Figure 7. A small button on the opposite side of the mounting bracket to the tilt lock screw indicates whether the tilt lock is applied or not.



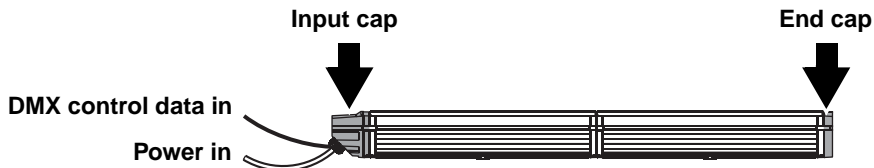
**Figure 7: Tilt lock indicator**



# Connections – general

This section lists some general principles that apply to Extube installations. Read “Safety Information” on page 3, “AC power” on page 20 and “Control data link” on page 23 before starting installation work.

See Figure 8. The Extube must be connected to power and control data by plugging an Extube input cap into the input end of the fixture.



**Figure 8: Connecting fixtures to data and power**

A second Extube can be plugged into the output end of this fixture, a third Extube can be plugged into the output end of the second fixture, and so on until the connected fixtures reach the maximum permitted length (see “Maximum interconnected length per power input” on page 43).

It is not possible to continue the DMX link after a line of Extube fixtures.



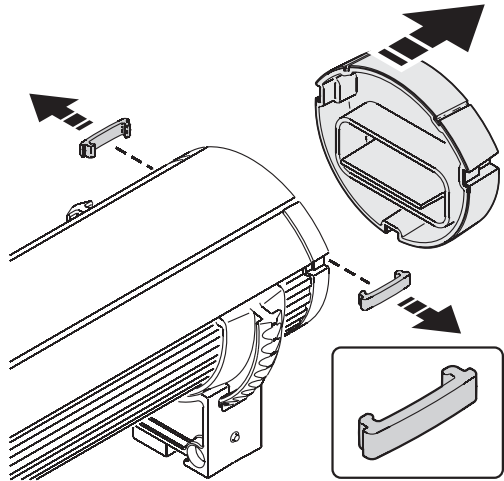
**Warning! Do not exceed the maximum length specified under “Maximum interconnected length per power input” on page 43 for a line of Extube fixtures connected to each other and supplied with power via one input cap, or you will overload the power cable and other components and create a serious safety risk.**

## Input and end caps

If another Extube is not plugged into the output end of a fixture, an end cap must be installed as shown in Figure 8.

Input and end caps are supplied in Extube Connection Kits that must be ordered separately. Each kit contains one input cap with 1.8 m (71 in.) power and data cable tails, one end cap and four locking clips. Kits are available with standard EU wire colors for EU markets and with standard US wire colors for US markets (see “Accessories” on page 45 for details).

When installing input and end caps, use the locking clips provided with the caps to secure them to the fixture. Clips are installed by pressing them into the slots provided in fixtures and end caps (see Figure 9). Clips can be released by levering them outwards at one end with a small flat-blade screwdriver.



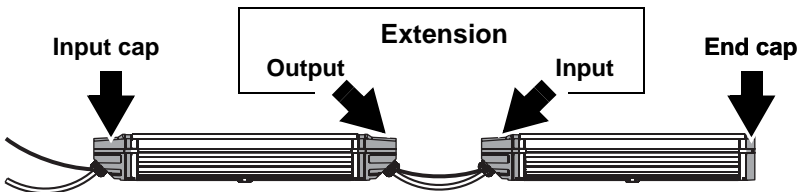
**Figure 9: Input and end cap clips**



**Warning!** Do not apply power to an installation unless all input caps and end caps are installed and secured with two clips per cap.

### Extension kits

See Figure 10. It is possible to create a gap in a line of Extube fixtures (to pass a door, window or corner, for example) but keep the fixtures connected to each other by using an Extube Extension Kit that is available as an accessory. Fixtures connected to each other using an extension kit can be controlled together as a group.



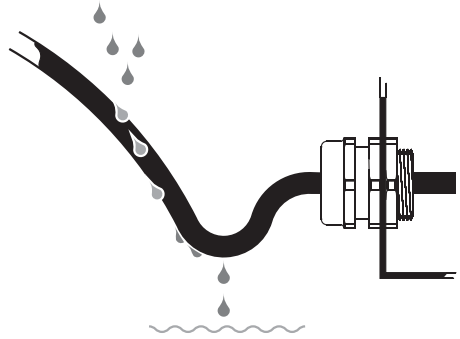
**Figure 10: Extension kit**

Extension kits are available with 250 mm (9.8 in.) or 2 m (78 in.) cable lengths in EU versions for EU markets and US versions for US markets

(see "Accessories" on page 45 for details). Output and input caps must be secured with two locking clips each.

### **Cable entry and drip loops**

Ensure that cables enter fixtures from below. See Figure 11. If necessary, form a drip loop in the cable just before it enters the fixture.



**Figure 11: Drip loop**

# 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 or removing any cover.



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



**Warning!** Do not exceed the maximum length specified under “Maximum interconnected length per power input” on page 43 for a line of Extube fixtures connected to each other and supplied with power via one input cap, or you will overload the power cable and other components and create a serious safety risk.

**Warning!** The electrical equipment and cable used to supply an Extube system with power must be in perfect condition, adequately dimensioned for current requirements and cable run lengths, and suitable for the installation environment, particularly with regard to water, pollution, thermal and UV resistance.

**Warning!** For protection from dangerous electric shock, the fixture must be grounded (earthed). The AC mains power distribution system must be fitted with both current overload and ground-fault (earth-fault) circuit breakers, as well as a means to isolate fixtures from power and lock out power during service.

**Important!** Do not connect the Extube to an electrical dimmer system. Doing so can damage the electronics.

If you require help in planning or dimensioning the power distribution system, please contact your Martin supplier for assistance.

If there is a break or cut at any point in a cable (for example at a connection point), and if this is exposed to water, moisture can be drawn up the inside of the cable due to the vacuum effect of temperature fluctuations during operation. Ensure that the fixture is protected from the entry of water via the power cable by using IP65-rated connectors or junction boxes, or by protecting connectors with weatherproof housings.

The Extube does not have a power on/off switch. Power is applied to the fixture as soon as it is connected to power.

## AC mains power voltage and frequency

The Extube accepts AC power at 100 - 120 and 200 - 240 V nominal, at 50 or 60 Hz. Do not connect the fixture to power at any other voltage or frequency.

## Current draw and fuse ratings

See "Typical Power and Current" on page 44 for details of current drawn by Extube fixtures.

Extube 300 mm fixtures are protected by a 1 amp slow-blow primary fuse and 1200 mm fixtures are protected by four 1 amp slow-blow fuses. Fuses are located internally on the power PCB and are not user-serviceable. If you suspect that a fuse has blown, please contact your Martin supplier for assistance.

## Connecting to power

An Extube fixture or group of fixtures draws power via the 13 A power cable tail installed on an Extube power input cap.

Details of standard US and EU conductor identification systems are given in Table 1.


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

Table 1: Conductor identification



**Warning! Terminals inside the input cap are live when power is applied to the power cable. Terminals inside the connector at the output end of the fixture are live when power is applied to the fixture. Do not apply power to the power cable unless the input cap is installed on the fixture and an end cap is installed either on the fixture or on the last fixture in a line of interconnected fixtures.**

To connect Extubes to power:

1. Lock out power to the installation.
2. Install an end cap on the fixture or on the last fixture in a line of fixtures.
3. Connect the power cable on the input cap to the power distribution circuit as follows:
  - Connect the green wire (US models) or yellow/green wire (EU models) to ground (earth)

- Connect the white wire (US models) or blue wire (EU models) to neutral
  - Connect the black wire (US models) or brown wire (EU models) to live.
4. Install the input cap on the fixture you want to supply with power, check that all installation work is completed and carry out appropriate tests and safety checks before applying power to the installation.

### **Power plug**

If you decide to fit the supplied power cable with a plug that is suitable for your AC mains power outlets, install a grounding-type (earthed) plug that is rated 13 A minimum, following the plug manufacturer's instructions. Table 1 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. Ensure that all connections are sufficiently protected from water.

# Control data link

Extube fixtures must be connected via a data link to allow DMX control. The following considerations must be taken into account when planning the data link:

- RS-485 data cable designed for exterior use is required for outdoor installations. 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 to 500 meters (1640 ft.). CAT 5e network cable designed for direct burial can be used in outdoor installations, but you are recommended to run it inside conduit.
- CAT 5e network cable is suitable for the control data link in indoor installations. Installation-type cable is acceptable for fixed installations. Flexible patch-type cable with good bend and torsion recovery is required in movable installations (Martin patch cables are recommended).
- 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, use separate conduits for power and data cables.
- The maximum permitted control data cable length before a control signal amplifier is required is 500 meters (1640 ft.). An optically isolated amplifier-splitter such as the Martin™ RS-485 Opto-Splitter™ (P/N 90758060) must be used to extend a link beyond this length.
- If you want to control more than one single line of interconnected Extubes, you must either use one DMX output from your controller for each line of fixtures or use an optically isolated amplifier-splitter to split the data link into one branch for each line of Extubes. The Martin RS-485 Opto-Splitter allows you to split a link into four branches.
- Each link or branch of a link must be terminated by installing an end cap on the last fixture.
- One DMX universe has 512 DMX control channels available. If individual control of the fixtures in an installation is required, each fixture must be given its own channels until the limit of 512 is reached. At this point, a new DMX universe must be created.
- The number of fixtures that can be individually controlled in one DMX universe depends on the number of DMX channels they use. If Extubes are set to HSI mode, for example, each fixture requires 3 DMX channels. The total number of Extubes that can be linked in one DMX universe will therefore be  $512/3 = 170$ .

When planning DMX cable layout, remember that the maximum current-carrying capacity of cables and fixtures limits the length of the line

of fixtures that can be connected via one input cap (see "*Maximum interconnected length per power input*" on page 43), including lines of fixtures that are interconnected using Extube Extension Kits.

## Data connection pinouts

### XLR connection

XLR connectors are suitable if the DMX controller has XLR output sockets. DMX cable is recommended for the data link in this case. XLR 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)

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 suitable if the DMX controller has RJ-45 output sockets. CAT 5e network cable is recommended in this case. 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 12). Connectors must be wired according to the 568-B system using the standard RJ-45 pin-out for DMX applications:

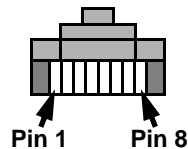
- Pin 1 (White/orange): DMX data hot (+)
- Pin 2 (Orange): DMX data cold (-)
- Pins 7 (White/brown) and 8 (Brown): Common

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 12: RJ-45 cable connector pins**



# Connecting the data link



**Warning! Lock out power to the entire installation before working on cables and connections or removing any cover.**

**Warning! Thermal expansion and contraction during use can result in a powerful vacuum effect. Make sure that data connections are totally protected from water, or moisture may be sucked up the inside of the cable.**

The Extube Connection Kit that must be ordered separately (EU type: P/N 91610086, US type: P/N 91610087) is supplied with a 1.8 meter (5 ft.10 in.) data cable tail for data connection. The cable contains input conductors that are identified as follows:

- 1 x shield = data common
- 1 x white wire = data hot (+)
- 1 x green wire = data cold (-)

To connect a fixture to the data link:

1. Connect the conductors in the power input cap's data cable tail to the data link, respecting the above color code. If required, install an XLR or RJ-45 DMX input connector on the data cable for connection to a DMX control device, respecting the pinouts described in "Data connection pinouts" on page 24. Standard procedure is to use a male connector on a fixture's data input cable tail and a female connector on the data output cable tail. Do not connect the shield conductor to ground (earth) or allow it to come into contact with a connector shell, as this may cause interference.
2. To continue a data link to other fixtures, you must either branch the link with a splitter-amplifier such as the Martin™ RS-485 Opto-Splitter™ (P/N 90758060) or use an Extube Extension Kit (available as accessories in 250 mm and 2000 mm lengths), respecting the limits specified under "Maximum interconnected length per power input" on page 43. Do not try to disassemble or take a DMX signal from an Extube input or end cap.
3. Protect any connectors that are not weatherproof-type in a weatherproof housing.

# Fixture setup

The Martin MUM™ (Multi-Utility Manager) application is required to set up Extube fixtures. MUM allows you to program and configure Martin lighting products from a Windows PC (a laptop is most convenient) and features an intuitive GUI (graphic user interface).

Using MUM, you can connect to and set up one Extube fixture or one interconnected line of fixtures at a time. After you have set up an Extube installation, you can run a simple test sequence using MUM, but for full control you must connect a DMX controller to the data link.

A written record of how fixtures have been set up using MUM will assist the person who operates the installation with a DMX controller.

To connect a PC running MUM to an Extube:

1. Obtain the MUM application, a DABS1 adaptor and interface cables. These are available as a set from Martin, P/N 90758090.
2. Connect the DABS1 adaptor to your PC using the USB cable supplied in the set.
3. Connect the DABS1 adaptor to the Extube or line of Extubes using an XLR connector connected to the Extube data input cable.
4. Apply power to the Extube and start the MUM application, referring to the MUM user manual and helpfile if necessary. MUM will automatically detect the DABS1 and Extubes. It will retrieve and display information and current settings from the first Extube in the line.

## Communication between MUM and fixtures



When there is a connection to an Extube:

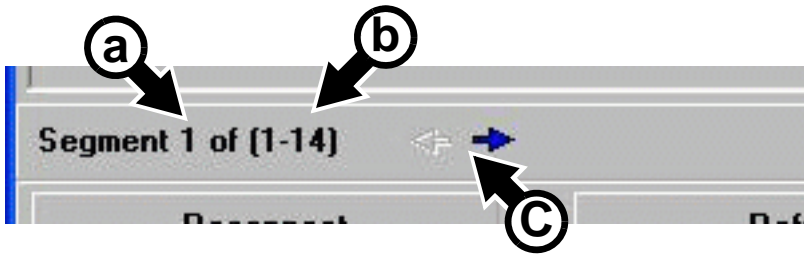
- The **Reconnect** button at the bottom of every window in MUM lets you re-initialize communication with the fixture or establish communication if you connect to a new Extube.
- The **Refresh** button retrieves and displays fresh fixture information.
- The **Close** button closes the MUM application.

## Communicating with segments

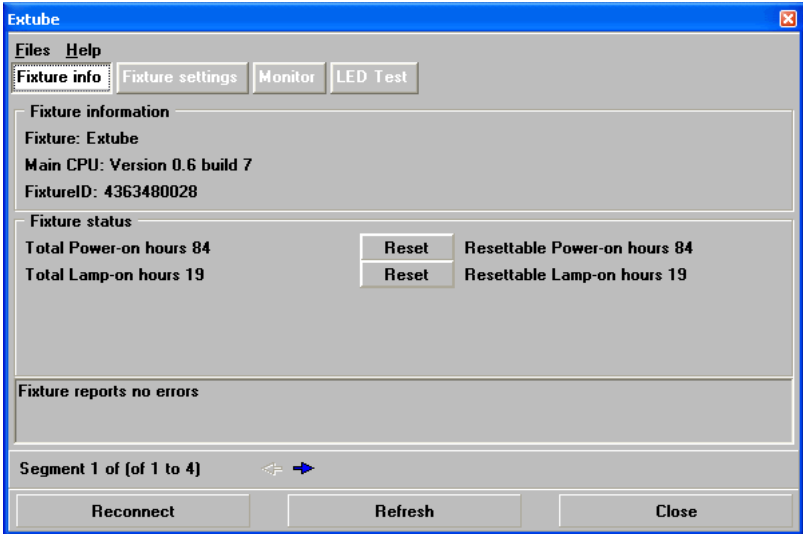
A segment consists of either a single 300 mm Extube or a 300 mm section of a 1200 mm Extube. Depending on how you set up the installation, segments can be controlled separately or put into groups.

MUM lets you select which segment to communicate with and gives you information about segments. In the example below:

- a.** MUM is communicating with segment 1.
- b.** The installation ranges from 1 to 14 segments, i.e. there are 14 segments in total.
- c.** Use the arrows to scroll between segments.



# Fixture information



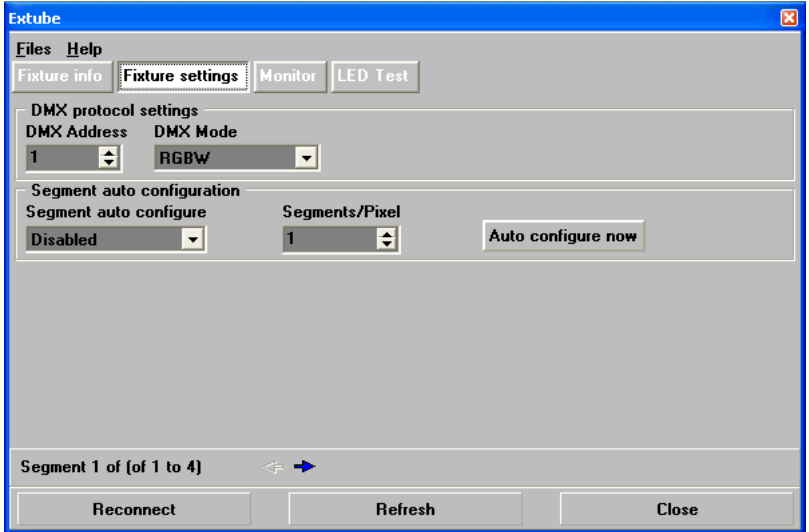
The **Fixture info** window identifies the fixture and software version installed.

The **Fixture info** window also displays information about the number of hours the fixture has been powered on and the number of hours LEDs have been active. In both cases, one non-resettable counter shows the total number of hours since manufacture and one resettable counter shows the number of hours since the counter was last reset.

The Extube's software monitors operation. If it detects an error, it displays diagnostic information in the **Fixture info** window.

The segment information above the **Reconnect** button tells you which segment MUM is retrieving fixture information from. You can use the segment selection arrows to scroll between segments and retrieve information from all the segments you have connected to.

# Fixture settings



The **Fixture settings** window lets you select DMX modes (i.e. color control options), group segments into pixels, and set DMX addresses.

## DMX mode

The **Fixture settings** window lets you select a DMX mode (RGB, RGBW, HSI or HSIC color control) for the fixtures or pixels in your installation. It is possible to set different pixels to different DMX modes by scrolling between pixels using the scroll arrows and changing the DMX mode setting for each pixel.

## Individual and grouped control of segments

The **Fixture settings** window lets you control 300 mm Extubes or 300 mm segments of 1200 mm Extubes individually, or put them into groups that behave identically and are controlled as one pixel.

For example, if you select **1** in the **Segments/Pixel** box, each 300 mm segment in the line of fixtures is controlled individually as one pixel that is 300 mm long.

If you select **3** in the **Segments/Pixel** box, the 300 mm segments are put into groups of three segments. You then control each group of segments as one pixel that is 900 mm long.

## DMX address setting

The DMX address, also known as the start channel, is the first of the DMX channels used to receive instructions from the controller. For individual control, each pixel must have its own channels. Thus, if a pixel has DMX address 1 and uses 3 channels because it is set to RGB mode, it will use channels 1 - 3. Channel 4 is available as the DMX address of the next pixel, and so on.

The Extube features 'cascading' auto-addressing. This means that once you have connected MUM to the first Extube in an interconnected line and set the first pixel's DMX address, you can automatically set the DMX addresses of all the pixels in that line. In this case, the first pixel you connect to acts as a 'master' and the others act as 'clients'.

When **Segment auto configure** is set to **Enabled**, the 'master' pixel updates the DMX addresses of all the 'client' pixels in the line each time you click on **Auto configure now** or apply power to the installation. As there is no need to update addresses each time power is applied, leave **Segment auto configure** set to **Disabled** when you are not setting DMX addresses.

### Grouped control of one complete line of Extubes

If you intend to use a DMX controller to operate one Extube or one line of interconnected Extubes only, and you want all the segments to behave identically:

1. Set **DMX address** to **1**.
2. Enter the total number of segments in your installation in the **Segments/Pixel** box.
3. Select **Enabled** in the **Segment auto configure** drop-down box.
4. Click on **Auto configure now** to set the DMX address of all segments to **1**.

You can now control all the segments in your installation as one pixel when you connect a DMX controller to the data link. The installation will use DMX channels 1 - 3 or 1 - 4, depending on the DMX mode you have selected.

### Individual control of one complete line of Extubes

If you intend to use a DMX controller to operate one line of interconnected Extubes with individual control of segments:

1. Set **DMX address** to **1**.
2. Enter **1** in the **Segments/Pixel** box.
3. Select **Enabled** in the **Segment auto configure** drop-down box.
4. Click on **Auto configure now** to automatically set the DMX addresses of all the segments in ascending order. If segments are in RGBW mode and require 4 DMX channels per pixel, for example, the first

segment's DMX address of the will be set to **1**, the next segment will be set to **5**, the next segment to **9**, and so on.

You can now control all the segments in your installation separately as individual pixels when you connect a DMX controller to the data link. Depending on the DMX mode you have selected, the installation will use 3 or 4 DMX channels per segment, starting at channel **1** on your controller.

### **Individual control of segments grouped into pixels**

To group segments into pixels and control pixels individually:

1. Set **DMX address** to **1**.
2. Enter the number of segments you want to control as one pixel in the **Segments/Pixel** box.
3. Select **Enabled** in the **Segment auto configure** drop-down box.
4. Click on **Auto configure now** to automatically set the DMX addresses of all the pixels in ascending order.

You can now control all the pixels in your installation separately when you connect a DMX controller to the data link. Depending on the DMX mode you have selected, the installation will use 3 or 4 DMX channels per pixel, starting at channel **1** on your controller.

### **Multiple lines of Extubes**

If you intend to use one DMX controller to control more than one line of interconnected Extubes, you must set up each line of Extubes separately by connecting a PC running MUM to the first fixture in each line.

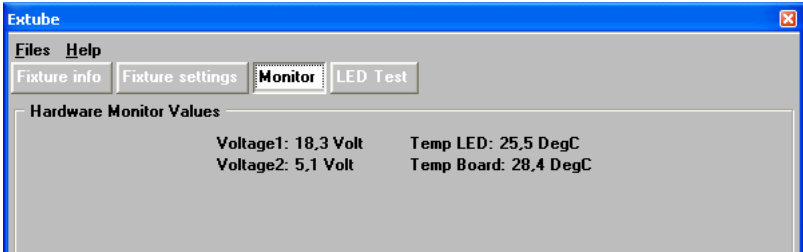
For each line of fixtures, you must set the DMX address of the first pixel you are connected to as described earlier in this section, and then use the auto-configure function to assign DMX channels to the other pixels in the line.

Regardless of which lines of interconnected Extubes pixels are in, pixels with the same DMX address will receive commands on the same DMX channels and behave identically. For individual control of pixels, you must give them different DMX addresses so that they use different DMX channels.

### **DMX address setting in multiple lines of Extubes**

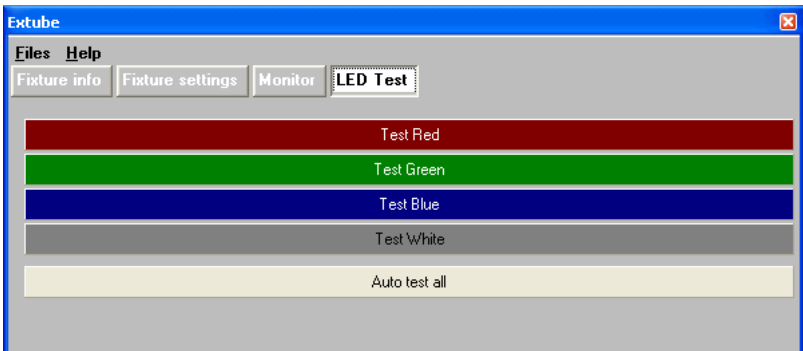
If you have other fixtures connected to your DMX controller, use the **DMX address** box in MUM to select an address for the Extubes that lets them use unoccupied DMX channels.

## Monitoring fixture parameters



PCB voltage data and LED and PCB temperatures for each segment can be displayed in MUM's **Monitor** window.

## LED Test



The Extube's LEDs can be activated without a DMX controller for test purposes in MUM's **LED Test** window.

**Auto test all** starts colors flashing in sequence. Flash speed can be adjusted.



# Operation



**Warning! Make sure that it is impossible for LEDs to be viewed from a distance of less than 2.2 m (7 ft. 3 in.).**

## Ambient temperatures

The Extube can be operated at ambient temperatures from -30° C (-22 F) to 45° C (113° F).

At temperatures below 0° C (32° F), leave the fixture permanently powered on. If light output is not required, dim LEDs to zero but keep power applied. The standby power will provide a little heat and help protect circuits and components from the effects of low temperature.

## Status indication at power up

When power is applied to an Extube installation with no DMX signal present, LEDs on 'master' segments flash blue and LEDs on 'client' segments flash green.

When power is applied to an Extube installation with a DMX signal present, LEDs do not flash a status indication.

## DMX control

To control an Extube installation, use a DMX controller to send values on the DMX channels that are assigned to the pixels in the installation. See "DMX protocols" on page 39 for details of commands and channels.

# Service and maintenance



**Warning! Read “Safety Information” on page 3 before carrying out service or maintenance work on the Extube. Lock out power to the entire distribution system before servicing or opening any cover.**

**Important! Excessive dirt and dust buildup degrades performance, causes overheating and will damage the fixture. The Extube requires cleaning at intervals that depend on the environment in which it is installed. Damage caused by inadequate cleaning is not covered by the product warranty.**

The Extube, its power input cap with installed cable, and its end cap are not user-serviceable. All service apart from cleaning, software renewal and the installation work described in this manual 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. LEDs will eventually require replacement if their characteristics are affected by wear and tear after an extended period of use and if you require fixtures to perform within very precise optical and color parameters. The expected lifetime (to 50% of initial output level) of the Extube’s LEDs is minimum 20 000 hours at full intensity.

## Cleaning

Regular cleaning is essential for fixture life and performance. Buildup of dust and dirt degrades the fixture’s light output and cooling ability.

Cleaning schedules will vary greatly depending on the operating environment. It is therefore impossible to specify precise cleaning intervals for the Extube. Inspect fixtures within their first few weeks of operation to see whether cleaning is necessary. Check again at frequent intervals. This procedure will allow you to assess cleaning requirements in your particular situation. If in doubt, consult your Martin dealer about a suitable maintenance schedule.



**Warning! The Extube is IP65 rated. This means that it will withstand water projections, but do not expose it to high-pressure water jets or immerse it in water or any other liquid.**

Clean the Extube's housing and front glass with a soft cloth dampened with a solution of water and a mild detergent such as car shampoo. Take care not to damage seals and wiring during cleaning. Do not use products that contain solvents, abrasives or caustic agents for cleaning, as they can cause surface damage to the fixture and its front cover.

## Diffusers

**Important! To avoid damaging the aluminum alloy housing, use plastic bicycle tire levers – not bare metal tools – to lever off front glass retaining strips.**

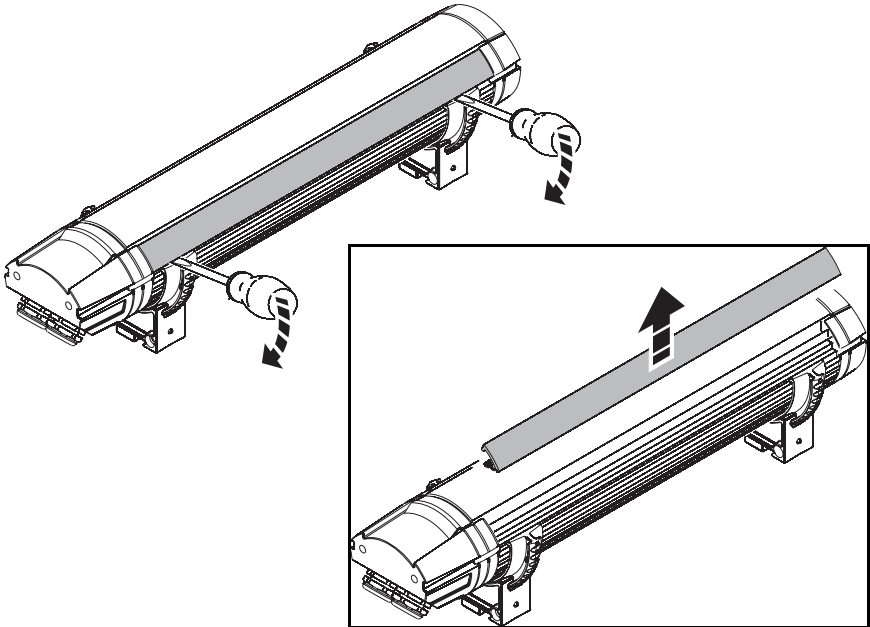
Extube fixtures are provided with no diffuser to give a Very Narrow beam angle or with a Narrow, Medium or Wide diffuser filter installed at the factory. Diffuser filters can be identified by notches at one end as follows:

- 1 notch – Narrow
- 2 notches – Medium
- 3 notches – Wide

If you need to replace or install a diffuser filter:

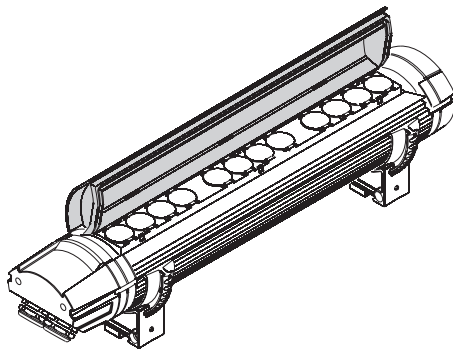
1. Cut power to the installation and allow to cool for at least 20 minutes.
2. See Figure 13 on page 36. Look carefully under the metal strips on either side of the front glass. On one side of the front glass, the strip is an integral part of the housing and there is no gap between strip and housing. On the other side of the front glass, there is an extra ridge under the outer edge of the strip and a narrow gap where the strip meets the housing. This strip is the front cover retaining strip and can be levered off the housing to release the front glass.
3. Using plastic bicycle tire levers or similar tools that will not damage the Extube's metal alloy surfaces between the front cover retaining strip and the housing, lever up and remove the front cover retaining strip. If plastic levers are not available, large flat-bladed screwdrivers with a piece of paper folded at least 4 times and then folded over the blade to prevent metal-to-metal contact can be used in an emergency, but

great care must be taken. Damage caused by metal levers is not covered by the product warranty.



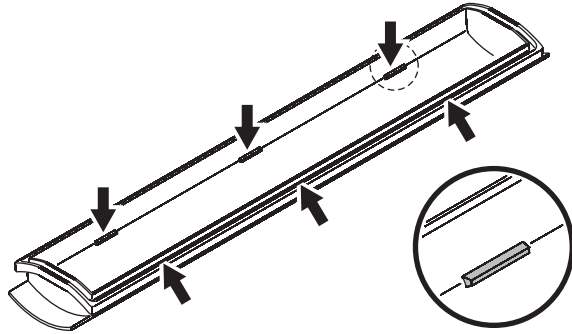
**Figure 13: Opening the front glass**

4. See Figure 14. Hinge the front glass up and out of the housing.



**Figure 14: Removing the front glass**

5. See Figure 15. The diffuser filter is held in place by tabs (arrowed) in the front cover. Unclip the filter from the tabs and remove it. If installing a new diffuser filter, ensure that it is clipped under all the tabs.



**Figure 15: Diffuser filter retaining tabs**

6. Check that all seals in the front glass are correctly seated, engage the side of the front glass opposite the retaining strip in the housing and hinge the front glass down onto the housing.
7. Check that the front glass and retaining strip are correctly aligned and clip the retaining strip firmly back into place on the housing. To ensure a waterproof seal, make sure the strip is clipped into the housing along its full length and holds the front glass securely.

## Software installation

It may be necessary to upload new software (i.e. firmware) to the Extube if you believe that the product has a software-related fault or if you want to update to a newer version. Software updates are available from the Martin website (<http://www.martin.com>) and can be installed via the DMX data link with the following items:

- The Martin Uploader application, version 5.0 or later, downloadable free of charge from the Support area of the Martin website.
- The Extube main CPU software update file, downloadable free of charge from the Support area of the Martin website (this file can be downloaded automatically from within the Martin Uploader application)
- A Martin Universal USB-DMX Interface or similar PC/fixture hardware interface and a Windows PC (if you have a Martin MP-2 Uploader device, it can also be used).

To install new software:

1. Connect the uploader hardware to an Extube fixture's data input connector. The software will be uploaded to that fixture and all Extube fixtures that are powered on and connected via the DMX link.
2. Upload the fixture software as described in the uploader's help file or user documentation.
3. Disconnect the uploader hardware and reconnect the fixture to the DMX link.
4. Cycle power off and on. Check that the fixture operates correctly. If it does not, cycle power off and on again and check that the fixture now operates correctly. If it still does not, repeat the upload procedure.

# DMX protocols

## RGB Mode

**Start code = 0**

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%

## RGBW Mode

**Start code = 0**

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

Start code = 0

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%

In HSI mode, white color temperature is fixed at 5500 K.

## HSIC Mode

Start code = 0

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 saturation
3	0 - 255	0 - 100%	<b>Intensity</b> Intensity 0 → 100%
4	0 - 255	0 - 100	<b>Color Temperature Control</b> 2000 - 10 000 K

In HSIC mode, a DMX value of 191 (75%) must be sent on channel 4 to obtain a white color temperature of 5500 K.



# Troubleshooting

<b>Problem</b>	<b>Probable cause(s)</b>	<b>Remedy</b>
Fixture is completely dead.	No power to fixture.	Check power and connections.
	Primary fuse blown.	Isolate fixture from power. Contact Martin for service.
One or more fixtures responds incorrectly to control or does not respond at all.	Fault on DMX link.	Inspect connections and cables. Correct poor connections. Repair or replace damaged cables.
	Incorrect fixture addressing.	Check fixture is set to correct DMX mode. Check number of channels required by fixture's DMX mode and check fixture addresses.
	Fixture defective.	Have faulty fixture 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.
LEDs cut out intermittently.	Fixture is too hot.	Ensure free airflow around fixture. Clean fixture. Check that ambient temperature does not exceed maximum permitted level. Contact Martin for service.

**Table 2: Troubleshooting**

# Specifications

## Physical

Length	300 mm (11.8 in.) / 1200 mm (47.2 in.), add 70 mm (2.8 in.) if end cap and power input module installed
Width	89 mm (3.5 in.) including mounting bracket
Height	90 mm (3.5 in.) including mounting bracket and DIN rail
Weight	300 mm model: 750 g (26.5 oz.) 1200 mm model: 3 kg (6.6 lbs.)

## Dynamic Effects

Color mixing	RGBW
Red	0 - 100%
Green	0 - 100%
Blue	0 - 100%
White	0 - 100%
Color temperature control	2 000 - 10 000 K continuous mixing

## Control and Programming

Color control modes	RGB, RGBW, HSI, HSIC
Control system	DMX
DMX channels	3/4
Grouped pixel control options	1 x 3 (all as one group) on 300 mm models, 1 x 12 (all as one group) or 4 x 3 on 1200 mm models
DMX address setting	Auto-addressing and Martin MUM software
26-bit control (internal)	RGBW, RGB, HSI, HSIC color mixing
Protocol	USITT DMX512-A
Receiver	RS-485
Firmware update	Serial upload via DMX link

## Optics

Light source	Luxeon Rebel high power emitters
White LED	Neutral white, 3 500 - 4 500 K, CRI 75
Total LED power	300 mm (11.8 in.) models approx. 25 W 1200 mm (47.2 in.) models approx. 100 W
Min. LED lifetime (to 50% of initial output)	30 000 hours at full intensity
Very Narrow (no diffuser), Narrow, Medium and Wide beam angles available	

### **Total output per 300 mm segment (balanced white, 5600 K)**

Very narrow (19° half-peak) . . . . .	348 lm
Narrow (27° half-peak) . . . . .	324 lm
Medium (34° half-peak) . . . . .	301 lm
Wide (40° half-peak) . . . . .	259 lm

*For full photometric data please see [www.martin.com](http://www.martin.com)*

### **Construction**

Housing . . . . .	Aluminum
Finish . . . . .	Clear anodized, black or white
Front glass . . . . .	UV-resistant clear polycarbonate
Mounting brackets . . . . .	PA6 nylon
End covers and caps . . . . .	PA6 nylon
Protection rating . . . . .	IP 65

### **Installation**

Orientation . . . . .	Any
Vertical aiming . . . . .	+/- 90°
Mounting . . . . .	.35 mm top-hat profile DIN rail

### **Maximum interconnected length per power input**

100 V, 60 Hz . . . . .	11 m
110 V, 60 Hz . . . . .	13 m
120 V, 60 Hz . . . . .	13 m
208 V, 60 Hz . . . . .	22 m
230 V, 50 Hz . . . . .	26 m
240 V, 50 Hz . . . . .	26 m

### **Connections**

Power connection . . . . .	1.8 m cable tail
Data connection . . . . .	1.8 m cable tail
Fixture-to-fixture . . . . .	Quick IP65 plug-in system

### **Electrical**

AC power . . . . .	100-120/200-240 V nominal, 50/60 Hz
Power supply unit . . . . .	Integrated, auto-sensing multi-voltage

## Typical Power and Current

### 300 mm models

100 V, 60 Hz . . . . .	32 W, 0.4 A, PF 0.992
110 V, 60 Hz . . . . .	32 W, 0.3 A, PF 0.992
120 V, 60 Hz . . . . .	32 W, 0.3 A, PF 0.990
208 V, 60 Hz . . . . .	32 W, 0.2 A, PF 0.980
230 V, 50 Hz . . . . .	32 W, 0.2 A, PF 0.980
240 V, 50 Hz . . . . .	32 W, 0.2 A, PF 0.980
Standby power . . . . .	3 W

### 1200 mm models

100 V, 60 Hz . . . . .	128 W, 1.4 A, PF 0.992
110 V, 60 Hz . . . . .	128 W, 1.2 A, PF 0.992
120 V, 60 Hz . . . . .	128 W, 1.2 A, PF 0.990
208 V, 60 Hz . . . . .	128 W, 0.7 A, PF 0.980
230 V, 50 Hz . . . . .	128 W, 0.6 A, PF 0.980
240 V, 50 Hz . . . . .	128 W, 0.6 A, PF 0.980
Standby power . . . . .	12 W

*Measurements made at Ta (ambient temperature) 25° C (77° F).*

*Measurements made at nominal voltage. Allow for a deviation of +/- 10%.*

## Thermal

Cooling . . . . .	Convection
Maximum ambient temperature (Ta max.) . . . . .	45° C (113° F)
Minimum ambient temperature (Ta min.) . . . . .	-30° C (-22 F)
Maximum surface temperature, steady state, Ta=40° C . . . . .	90° C (194° F)

## Approvals



EU safety . . . . .	EN 60598-1, EN 60598-2-1, IEC/EN 60825-1
EU EMC . . . . .	EN 55 015, EN 55 103, EN 61 000-3
US safety (pending) . . . . .	UL 1598
Canadian safety (pending) . . . . .	CAN/CSA C.22.2 No. 250

## Included Items

### Extube 300 mm, Extube 1200 mm

- 2 x adjustable mounting brackets for DIN rail
- 2 x locking clips

### Extube Power Connection Kit

- User manual
- Input end cap with 1.8 m power and control data cable tails pre-installed
- End cap with integral DMX link termination
- 4 x locking clips

### **Extube 250 mm Extension Kit**

Input and output end caps with 250 mm (9.8 in.) cables pre-installed  
4 x locking clips

### **Extube 2000 mm Extension Kit**

Input and output end caps with 2000 mm (78.7 in.) cables pre-installed  
4 x locking clips

### **Accessories**

250 mm (9.8 in.) Extube Extension Kit, EU/US .....P/N 91610094  
2000 mm (78.7 in.) Extube Extension Kit, EU/US .....P/N 91610095  
Four 300 mm Diffusers, Narrow .....P/N 91610098  
Four 300 mm Diffusers, Medium.....P/N 91610099  
Four 300 mm Diffusers, Wide .....P/N 91610100  
DIN Rail Set (ten 2 m lengths) .....P/N 91602009

### **Spare parts**

Adjustable DIN Rail Mounting Bracket ..... P/N 55545030  
Locking Clip (Input and End Caps, Fixture Interconnection)....P/N 23402500

### **Ordering Information**

Extube Power Connection Kit, EU type.....P/N 91610086  
Extube Power Connection Kit, US type.....P/N 91610087  
Extube 300 mm, Aluminum, Narrow .....P/N 90352200  
Extube 300 mm, Aluminum, Medium .....P/N 90352300  
Extube 300 mm, Aluminum, Wide.....P/N 90352400  
Extube 300 mm, Aluminum, no diffuser .....P/N 90352500  
Extube 300 mm, Black, Narrow .....P/N 90352201  
Extube 300 mm, Black, Medium .....P/N 90352301  
Extube 300 mm, Black, Wide .....P/N 90352401  
Extube 300 mm, Black, no diffuser .....P/N 90352501  
Extube 300 mm, White, Narrow .....P/N 90352202  
Extube 300 mm, White, Medium.....P/N 90352302  
Extube 300 mm, White, Wide .....P/N 90352402  
Extube 300 mm, White, no diffuser.....P/N 90352502  
Extube 1200 mm, Aluminum, Narrow .....P/N 90352210  
Extube 1200 mm, Aluminum, Medium .....P/N 90352310  
Extube 1200 mm, Aluminum, Wide.....P/N 90352410  
Extube 1200 mm, Aluminum, no diffuser .....P/N 90352510  
Extube 1200 mm, Black, Narrow .....P/N 90352211  
Extube 1200 mm, Black, Medium .....P/N 90352311  
Extube 1200 mm, Black, Wide .....P/N 90352411  
Extube 1200 mm, Black, no diffuser .....P/N 90352511  
Extube 1200 mm, White, Narrow .....P/N 90352212  
Extube 1200 mm, White, Medium.....P/N 90352312

Extube 1200 mm, White, Wide . . . . . P/N 90352412  
Extube 1200 mm, White, no diffuser . . . . . P/N 90352512

*Custom colors are available by special order – please contact your Martin distributor for details.*

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



