VDO Sceptron™ Family
User Manual

Martin®
by HARMAN

Dimensions

All dimensions are in millimeters

Fixture / optical accessories

with tube diffuser

with square diffuser

with flat diffuser

with round diffuser

28 | 27

32 | 27

42 | 27

42 | 27

74 | 50

320 / 1000

100 | 100

Sliding bracket

40

54

27

Ø 13

90

Parallel couplers

50
40
30
35
45

80
70
60
65
75

VDO Sceptron User Manual P/N 35000284 Rev. G

Contents

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 document:

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

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

Warning!
Fire hazard.

Warning!
Refer to user manual.

Warning!

- *Read this user manual before installing and operating the Martin® VDO Sceptron™. Keep this manual for future reference.*
- *Follow the safety precautions given in this user manual and in the manuals of all the devices you connect to it. Observe all warnings given in manuals and printed on devices. Make sure that everyone who is involved in working on or using the VDO Sceptron has read and understood these safety precautions and warnings.*
- *Install, connect, operate and service devices only as described in this manual and in connected devices' manuals and only in accordance with local laws and regulations. All Martin manuals are supplied with devices and are also available for download from www.martin.com.*
- *The VDO Sceptron is not for household use. It presents risks of severe injury or death due to fire and burn hazards, electric shock and falls. It must be installed by qualified technicians only.*
- *The VDO Sceptron does not have user-serviceable parts. LEDs are not replaceable. Refer any operation not described in this manual to Martin Global Service or Martin authorized service agents.*

If you have any questions about how to install, operate or service the fixture safely, please contact your Martin distributor (see www.martin.com/distributors for details) or in the USA call 1-844-776-4899.

PROTECTION FROM ELECTRIC SHOCK

- Read and respect the directions given in the user manuals of all the devices that you intend to connect to the VDO Sceptron, particularly the instructions, warnings and limits that apply to:
  - system layout,
  - connections to other devices,
  - specified cables,
  - maximum cable lengths, and
  - maximum number of devices that can be connected.
- Use only the cables specified in this manual and on the Martin website at www.martin.com to interconnect devices in the installation. If the specified cables are not long enough for an intended cable run, consult Martin for assistance in finding or creating a safe alternative solution.

- Provide a means of locking out AC mains power that allows power to the installation to be shut down and made impossible to reapply, even accidentally, during work on the installation.
- Shut down power to the installation during service and when it is not in use.
- Before applying power to the installation, check that all power distribution equipment and cables are in perfect condition and rated for the current requirements of all connected devices.
- Isolate the installation from power immediately if any product, power cable or power plug is in any way damaged, defective or wet, or if it shows signs of overheating.
- Do not immerse a VDO Sceptron fixture in water or expose it to high-pressure water jets.
- Do not allow the total length (including fixtures and cable) of a linked chain of VDO Sceptron fixtures to exceed 50 m (164 ft.) from the 48 VDC power source (Martin P3 PowerPort 1500™, Martin P3 PowerPort 1000 IP™, Martin DMX PowerPort 375™, Martin IP66 PSU 240W™ or other external power supply unit) to the last VDO Sceptron at the end of the chain.
- If you supply a chain of VDO Sceptron fixtures with DC power from a generic 48 VDC external PSU and the DC output used does not have constant overcurrent protection that limits current to 8 A, install an inline fuseholder with a 7.5 A or 8 A fuse on the circuit that you connect to the DC output.

Safety limits for connecting devices

Do not exceed the maximum safety limits given in the following tables.

Martin P3 PowerPort 1500 safety limits

If you supply VDO Sceptron fixtures with DC power from a Martin P3 PowerPort 1500:
- Do not connect more than one chain of fixtures to one DC output on the P3 PowerPort 1500. Since the P3 PowerPort 1500 has four DC outputs, you can connect a maximum of four chains of fixtures to one P3 PowerPort 1500.
- Do not exceed the maximum total length of fixtures that you can include in one chain (see Table 1).
- Do not exceed a maximum total length of 50 m (164 ft.) for a chain, including fixtures and cable, measured from the P3 PowerPort 1500 to the end of the chain (see Table 1).

Type of fixture in chain	Maximum total length of fixtures in chain	Maximum total length of chain (fixtures and cable)
VDO Sceptron 10	10 m	50 m
VDO Sceptron 20	20 m	50 m
VDO Sceptron 40	40 m	50 m

Table 1: Maximum length of VDO Sceptron fixtures and chain per P3 PowerPort 1500 output

Besides the above limits, each output of a P3 PowerPort 1500 can drive a maximum of 63 fixtures regardless of the length of the fixtures. This may affect the VDO Sceptron 40. If you are creating a chain containing VDO Sceptron 40 320 mm fixtures, you must stop and create a new chain if you reach 63 fixtures.

Martin P3 PowerPort 1000 IP safety limits

If you supply VDO Sceptron fixtures with DC power from an output on a Martin P3 PowerPort 1000 IP:
- Do not connect more than one linked chain of VDO Sceptron fixtures to one DC output. Since the P3 PowerPort 1000 IP has four DC outputs, you can connect a maximum of four chains of fixtures to one P3 PowerPort 1000 IP.
- Do not exceed the maximum total length of fixtures that you can include in one chain given (see Table 2).
- Do not exceed a maximum total length of 50 m (164 ft.) for a chain, including fixtures and cable, measured from the P3 PowerPort 1000 IP to the end of the chain (see Table 2).

Type of fixture in chain	Maximum total length of fixtures in chain	Maximum total length of chain (fixtures and cable)
VDO Sceptron 10	7 m	50 m
VDO Sceptron 20	14 m	50 m
VDO Sceptron 40	27 m	50 m

Table 2: Maximum number of VDO Sceptron fixtures per P3 PowerPort 1000 IP output

Besides the above limits, each output of a P3 PowerPort 1000 can drive a maximum of 63 fixtures regardless of the length of the fixtures. This may affect the VDO Sceptron 40. If you are creating a chain containing VDO Sceptron 40 320 mm fixtures, you must stop and create a new chain if you reach 63 fixtures.

Martin DMX PowerPort 375 safety limits

If you supply VDO Sceptron fixtures with DC power from a Martin DMX PowerPort 375:
- Do not connect more than one chain of fixtures to the DMX PowerPort 375's hybrid DC power and data output.
- Do not exceed the maximum total length of fixtures that you can include in one chain (see Table 3).
- Do not exceed a maximum total length of 50 m (164 ft.) for a chain, including fixtures and cable, measured from the DMX PowerPort 375 to the end of the chain (see Table 3).

Type of fixture in chain	Maximum total length of fixtures in chain	Maximum total length of chain (fixtures and cable)
VDO Sceptron 10	10 m	50 m
VDO Sceptron 20	20 m	50 m
VDO Sceptron 40	40 m	50 m

Table 3: Maximum length of VDO Sceptron fixtures and chain per DMX PowerPort 375

Martin IP66 PSU 240W safety limits

You can supply VDO Sceptron fixtures with DC power from a Martin IP66 PSU 240W external power supply unit (this unit was previously called the 'Martin Tripix Power IP66'). If you use this unit to supply DC power:
- Do not connect more than one linked chain of VDO Sceptrons to the DC power output of the Martin IP66 PSU 240W.
- Do not exceed the maximum total length of fixtures that you can include in one chain (see Table 4).
- Do not exceed a maximum total length of 50 m (164 ft.) for a chain, including fixtures and cable, measured from the Martin IP66 PSU 240W to the end of the chain (see Table 4).

Type of fixture in chain	Maximum total length of fixtures in chain	Maximum total length of chain (fixtures and cable)
VDO Sceptron 10	7 m	50 m
VDO Sceptron 20	14 m	50 m
VDO Sceptron 40	27 m	50 m

Table 4: Maximum number of VDO Sceptron fixtures per Martin IP66 PSU 240W

Generic 48 VDC external PSU safety limits

If you supply a chain of VDO Sceptron fixtures with DC power from a 48 VDC external PSU (power supply unit) that you obtain yourself, you must not exceed **the lowest** of these limits:

- Do not create a chain that will exceed the maximum power rating of the PSU output used to supply that chain with power (to find the power consumption of the chain, multiply the number of fixtures in the chain with the wattage per fixture according to Table 5).
- Do not exceed the maximum total length of fixtures and the maximum total length of cable that you can connect in one chain (see Table 5).
- Do not create a chain with a total length of more than 50 m (164 ft.).

Each time you reach (a) the maximum total length of fixtures in one chain, or (b) 50 m (164 ft.) total length of the chain, or (c) the PSU output's maximum power rating – *whichever you reach first* – you must create a new chain of fixtures that is connected to a new 48 VDC power output.

Type of fixture in chain	Wattage per fixture	Maximum total length of fixtures in chain	Maximum total length of chain (fixtures and cable)
VDO Sceptron 10, 1000 mm	33 W	10 m	50 m
VDO Sceptron 10, 320 mm	11 W		
VDO Sceptron 20, 1000 mm	16.5 W	20 m	50 m
VDO Sceptron 20, 320 mm	5.5 W		
VDO Sceptron 40, 1000 mm	8.5 W	40 m	50 m
VDO Sceptron 40, 320 mm	3 W		

Table 5: Maximum number of VDO Sceptron fixtures per 48 VDC external PSU (provided that PSU rating in watts is not exceeded).

PROTECTION FROM BURNS AND FIRE

- The VDO Sceptron is cooled by convection. Ensure sufficient ventilation by providing free airflow around the fixture and keeping a minimum distance of 10 mm (0.4 in.) between the fixture and any surfaces or objects around it.
- Do not operate the VDO Sceptron if the ambient temperature (Ta) around the fixture exceeds 55° C (131° F).
- Do not modify the VDO Sceptron in any way not described in this manual or install other than genuine Martin parts. Use only accessories approved by Martin.

PROTECTION FROM INJURY

- Read carefully the chapter "Physical installation" on page 11 and respect the limits and instructions given in that chapter, or you may install items in such a way that they can collapse or fall, causing serious or lethal injury.
- If a fixture may cause injury or damage if it falls, secure it as described in this manual with a secondary attachment such as a safety cable that is approved by an official body such as TÜV as a safety attachment for the weight that it secures. The safety cable must comply with EN 60598-2-17 Section 17.6.6 or BGV C1 / DGUV 17 and it must also be capable of bearing a static suspended load at least ten times (or more if required by locally applicable regulations) the weight that it secures.
- Use at least one safety cable per fixture: do not loop a safety cable through the bracket of more than one fixture.
- Eliminate as much slack as possible from the safety cable (by looping it more than once around the rigging truss, for example). If the primary attachment fails, the safety cable must catch the fixture before the fixture has dropped 10 cm (4 in.).

- Ensure that the installation hardware and supporting surface or structure can hold at least 10 times the weight of all the devices they support.
- Block access below the work area and work from a stable platform whenever installing, servicing or moving the VDO Sceptron.
- As soon as work is completed, check that all hardware and components are securely fastened to supporting structures.
- Do not add more than three (3) flightcase extenders to one VDO Sceptron flightcase base unit.
- Do not use the VDO Sceptron without an optical accessory installed on the front of the fixture as directed in this manual. Optical accessories for the VDO Sceptron are listed under "Accessories" on page 51. An updated list is available on the Martin website at www.martin.com

PROTECTION FROM INJURY CAUSED BY WIND

- In any location where an array of VDO Sceptron fixtures may be exposed to the wind, follow the precautions listed below and the instructions in the Physical Installation chapter of this user manual.
- Ensure that professional technicians:
  - are in attendance at the installation at all times,
  - constantly monitor weather forecasts and local wind speed, and
  - remove all fixtures from the installation immediately if constant or gusting wind speed that exceeds Force 8 on the Beaufort scale (74 km/h, 46 mph or 20 meters/sec.) is forecast or present at the installation location.

Introduction

Thank you for selecting a product from the Martin® VDO Sceptron™ family. These compact LED-based display fixtures are designed to integrate into a Martin P3™ video system, where they can display video from a variety of sources. They can also be controlled using DMX. Use of an RDM-compliant DMX controller also allows two-way communication and remote management of VDO Sceptron fixtures from the controller if you are not using a P3 system controller to set up and manage fixtures.

The VDO Sceptron combines flexibility and simplicity with high-quality video display capabilities. Multiple VDO Sceptron fixtures can be combined in ways that give exceptional creative flexibility. Clip-on optical accessories available from Martin allow the appearance and display characteristics of fixtures to be changed in seconds. The accessories include a clip-on wallwasher lens designed for illuminating surfaces. A hybrid (power and data) cabling system allows VDO Sceptron fixtures to be daisy-chained for easy setup and minimal cabling.

The VDO Sceptron is a linear array of LEDs encapsulated in resin in an aluminum profile to give a rugged IP65-rated fixture. It offers the following features:

- IP65-rated fixtures and connectors
- Fast, flexible mounting options
- Range of clip-on optical accessories
- Three pixel pitch (LED center-to-center distance) options: 10, 20 or 40 mm
- Two fixture lengths: 320 mm (12.6 in.) and 1000 mm (39.4 in.)
- Individually controllable pixels
- High-quality 16-bit per color RGB image processing technology
- Pixel-level brightness and color calibration for optimal image quality
- P3 and DMX control with automatic protocol detection (Art-Net & sACN via P3 System Controller)
- Intuitive pixel mapping and addressing using a Martin P3 system controller
- Single hybrid cable transmits both power and data
- External power and data processor from the Martin P3 PowerPort range and simple cabling system

For dimensions drawings of all the products in the VDO Sceptron family, please see the VDO Sceptron Product Support pages on the Martin website at www.martin.com

Martin user documentation is supplied with products and available for download from www.martin.com, where you can also find the latest specifications, firmware updates and support information for all Martin products.

Precautions to avoid damage

Important! To get the best out of the VDO Sceptron and avoid causing damage that is not covered by the product warranty, read the following information carefully. Make sure that everyone who is involved in working on or using the VDO Sceptron has read and understood this information.

Excessive dirt buildup causes overheating and may damage the product. Damage caused by inadequate cleaning is not covered by the product warranty.

Operating temperature precautions

- Exposing the VDO Sceptron to direct sunlight or operating it in an ambient temperature that exceeds the specified maximum of 55° C (131° F) when showing average video content may reduce the lifetime of the product.
- VDO Sceptron fixtures have an internal thermal sensor. If the sensor measures excessive temperature, a thermal protection cutout shuts down the fixture. The fixture will not function normally again until the temperature has fallen to a safe level.
- When using a Martin P3 System Controller you can enable "Thermal Throttling" functionality. This feature gradually dims fixtures if they get hot, avoiding full thermal shutdowns.

VDO Sceptron overview
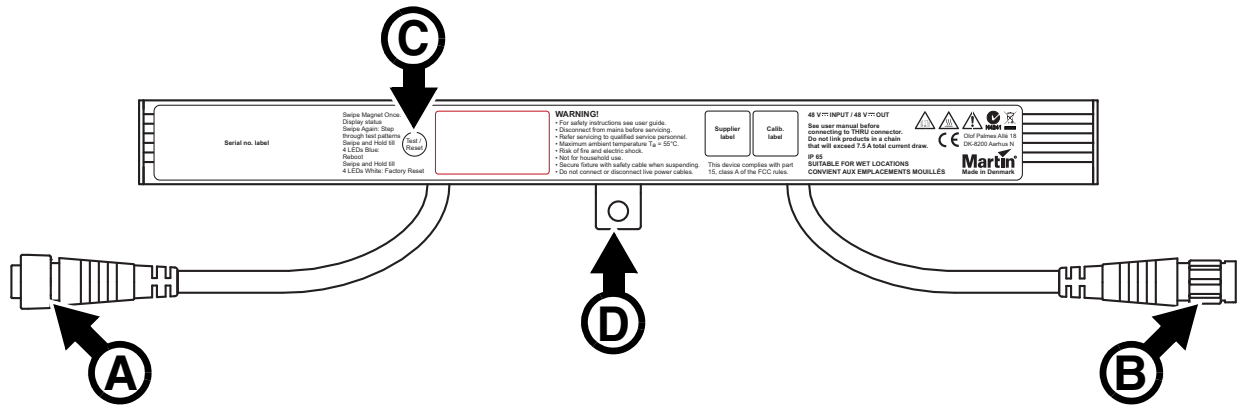
320 mm fixture illustrated

A - 48 VDC power + P3 video data BBD-type male input connector

B - 48 VDC power + P3 video data BBD-type female output (thru) connector

C - Magnetic control sensor (encased inside fixture) – can be activated using accessory tool

D - Safety cable attachment

Figure 1: Overview

Physical installation

⚠️ *Warning! Read "Safety information" on page 4 and "Precautions to avoid damage" on page 9 on before installing the VDO Sceptron. Read this chapter for important information about installation safety.*

Different installation methods and hardware are required depending on size of fixture, orientation, number of fixtures fastened together and conditions in the installation location: (a) indoors on a static structure or (b) in a location that is exposed to wind, vibration or other forces. Read this chapter carefully before installing VDO Sceptron fixtures and use the method that is suitable for the installation site.

The VDO Sceptron can be installed in any orientation. The most evenly matched optical characteristics when viewing an installation from the side at an angle are obtained when all VDO Sceptron fixtures are oriented vertically, but unevenness will hardly be noticeable in horizontal strips, and then only when viewed from the side.

Allow free airflow and at least 10 mm (0.4 in.) of clearance around the product. Check that the product will not be exposed to direct sunlight or heat from other lighting, for example.

The VDO Sceptron is designed to withstand low-pressure water projections but is not designed for permanent installation in wet locations. Do not submerge it or expose it to high-pressure water jets. If you need to create a permanent installation in a wet location, consider using the Exterior Pixline™ range of products from Martin.

A small amount of water may enter and appear between the clip-on optical cover (diffuser) and the fixture – this is normal and can be ignored, but remove the cover and wipe the fixture and cover dry before storage.

Wind precautions

⚠️ *Wind can create a risk of serious or lethal injury and damage due to falling fixtures. Follow the instructions in this chapter carefully.*

If fixtures are to be installed in a location where they can be exposed to wind force, take these precautions:
- Observe all locally applicable laws, regulations and codes regarding safety of structures and installations.
- Follow the instructions in this chapter for installing in locations that are exposed to wind. A location that is exposed to wind is not a stable location as defined in this manual.
- Suspend fixtures from a structure that is capable of holding the fixtures securely without any safety risk when fixtures are exposed to wind pressure.
- Ensure that weather forecasts and local wind speed are constantly monitored while the installation is in place.
- Ensure that all fixtures are removed from the installation immediately if constant or gusting wind speed exceeding Force 8 on the Beaufort scale (74 km/h, 46 mph or 20 meters/sec.) is forecast or present.

Captive fasteners

A channel for M6 fasteners (bolt heads and nuts) is provided in the profile on the back of VDO Sceptron fixtures. See Figure 2. To fasten brackets etc. to a fixture, pass each fastener through the cutout next to the cable tail and slide it into the channel. The channel holds the fastener captive so that you can tighten against it.
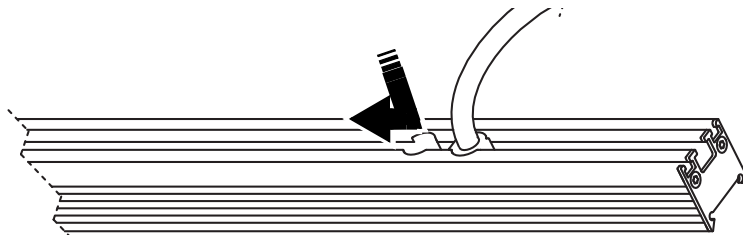
Figure 2: Inserting a bolt head or nut into a channel in a fixture

Installing a safety cable

Safety cable attachment brackets and fasteners are supplied with fixtures. If you install a VDO Sceptron fixture in a location where it may cause injury or damage if it falls, you must install a safety cable bracket on the fixture and secure it with a secondary attachment (such as a safety cable) that will prevent the fixture from falling if the primary attachment fails.

Figure 3: Safety cable bracket

To install a safety cable attachment bracket and safety cable:

1. Place the fixture with the LEDs facing downwards on a surface that will not scratch or damage the fixture.
2. See Figure 2. Slide the bracket's nut into the channel in the back of the fixture. On 1000 mm fixtures, slide the nut until it is as close as possible to the center of the fixture.
3. See Figure 3. Tighten the supplied Torx bolt into the nut to a torque of 8 Nm so that the safety cable attachment bracket is held securely.
4. Obtain a safety cable that is approved as a secondary attachment for the weight it will secure. Pass the safety cable through the bracket on the fixture.
5. As soon as you have fastened the fixture in the installation location, pass the safety cable through a secure anchoring point and secure the cable so that it will catch the fixture and prevent any injury or damage if the sliding brackets or other primary attachments fail.

When installing multiple fixtures, you can loop one safety cable through the attachment brackets of more than one fixture and through the anchoring point, but only do this if:

• the safety cable is rated for the total weight it secures,
• the anchoring point can support at least ten times the weight it secures, and
• the arrangement will catch all the items supported and prevent injury or damage if the primary attachment fails.

Installing a sliding bracket

Sliding brackets for the VDO Sceptron allow you to fasten fixtures to a truss using a rigging clamp or to a surface or other structure using M12 bolts passed through the bracket.

In locations with stable conditions only (i.e. no wind, movement, vibration or other forces) you can fasten the brackets to fixtures using the spring-loaded fasteners supplied with the brackets. **In all other situations** you must remove the supplied spring-loaded fasteners and fasten the brackets to fixtures using M6x16mm bolts and self-locking nuts. Read all of this chapter carefully for information about the requirements of different situations.

Installing with spring-loaded fasteners

To install a sliding bracket on a VDO Sceptron fixture using the supplied spring-loaded fasteners:

1. See Figure 4. Place the fixture with the LEDs facing downwards on a surface that will not scratch or damage the fixture. Push one of the spring-loaded mounting screws **B** on a bracket **A** down with your thumb so that the nut **C** on the screw is pushed down and away from the bracket.
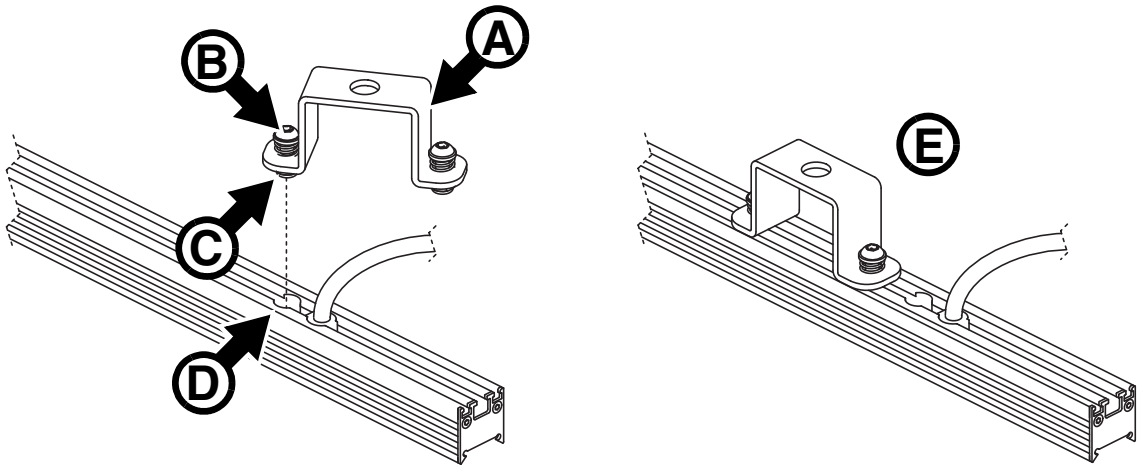
Figure 4: Installing a sliding bracket with spring-loaded fasteners

2. Pass the nut **C** through the cutout **D** in the rear of the fixture and into the channel in the rear of the fixture. Slide the nut towards the center of the fixture until you can pass the second nut in the bracket through cutout **D** while pressing down on the second spring-loaded screw.
3. Pressing down on both spring-loaded screws, slide the bracket a few centimeters towards the center of the fixture and release the screws. When you have finished, the bracket should be as shown at **E**, with both nuts securely held in the channel in the rear of the fixture.

Installing with M6 bolts

To install a sliding bracket on a VDO Sceptron fixture using M6 bolts:

1. See Figure 5. Remove the spring-loaded fasteners **F** from the sliding bracket, removing the two Torx screws with their washers, springs and self-locking nuts. Keep all these items safe for possible future use.
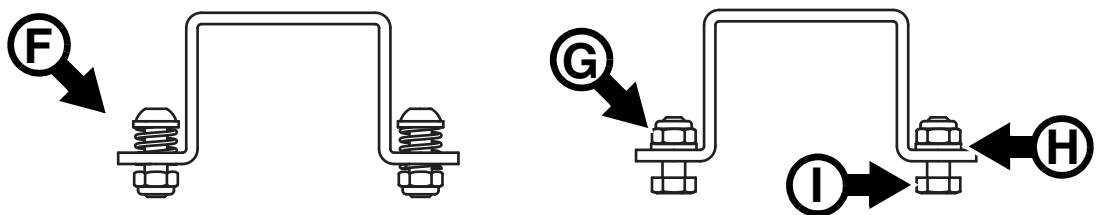
Figure 5: Sliding bracket fasteners

2. Install grade 8.8 strength M6x16mm bolts, washers and self-locking nuts **G** on the bracket. Put the washer between the nut and the sliding bracket at **H**.
3. Pass the bolt heads **I** through the cutout and into the channel in the rear of the fixture (see Figure 2 on page 11) and when the bracket is in position, tighten the nuts **G** to a torque of 8 Nm.

Reinstalling spring-loaded fasteners

Warning! If you do not install the original washer between the head of each Torx screw and the spring when reinstalling spring-loaded fasteners, there is a danger that the fastener may fail.

To re-install the original spring-loaded fasteners on a sliding bracket:

1. See Figure 5. Remove the M6 nuts **G**, washers **H** and bolts **I** from the bracket.

2. Reassemble the spring-loaded fasteners as shown at **F**. Install the original washer between the head of the screw and the spring. If you do not install the washer, there is a danger that the fastener may fail! Use a new grade 8.8 strength M6 self-locking nut. Hold the nut with a wrench/spanner while you tighten the screw to 1 Nm against the pressure from the spring.

Installing parallel couplers

The parallel couplers available from Martin (see "Accessories" on page 51) let you install fixtures parallel to each other with regular spacing between fixtures. Figure 6 shows the center-to-center spacings between parallel fixtures that you can obtain by passing the coupler mounting screws through different combinations of holes.
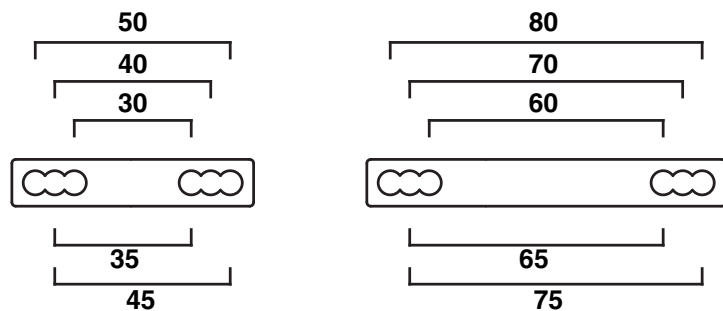
Figure 6: Parallel couplers

In locations with stable conditions only (i.e. no wind, movement, vibration or other forces), you can use the thumbscrews that are supplied with parallel couplers to fasten fixtures parallel to each other. **In all other situations** you must remove the thumbscrews and fasten the couplers to fixtures using grade 8.8 strength M6x16mm bolts, washers and self-locking nuts. Read the instructions for different types of installation and different conditions later in this chapter carefully.

To fasten a parallel coupler to a fixture:

1. Install a safety cable attachment bracket close to the center of the fixture (see "Installing a safety cable" on page 12).

2. Pass the coupler bolt head through the cutouts and into the channels in the rear of the two fixtures to be joined (see Figure 2 on page 11).

3. Depending on the instructions later in this chapter, fasten the coupler to the fixtures with either grade 8.8 strength M6x16mm bolts, washers and self-locking nuts or with the thumbscrews supplied with the couplers. See Figure 7. Install parallel couplers (arrowed) as close as possible to the ends of fixtures but allow space for sliding brackets.
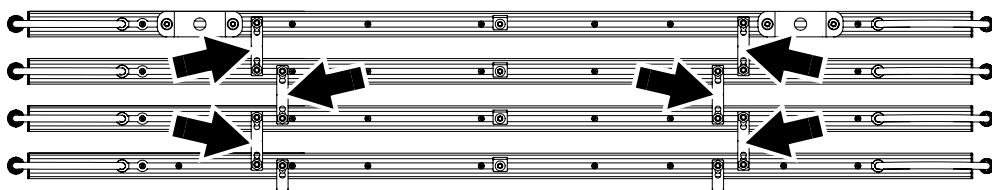
Figure 7: Installing parallel couplers

Joining fixtures end-to-end

End-to-end coupler accessories available from Martin allow accurate end-to-end alignment of VDO Sceptron fixtures.

End-to-end couplers and VDO Sceptron profiles are strongly constructed, but do not expose end-to-end joins to bending, shear or torsion stress. A VDO Sceptron fixture can apply a very large leverage force if it is allowed to hang horizontally when it is only supported at one end. You may only use an end-to-end coupler

to support weight if you are hanging fixtures vertically downwards in a chain in stable conditions (i.e. in a location that is free of wind, vibration and movement). In all other situations, support the weight of each fixture independently so that no end-to-end coupler is subjected to bending, shear or torsion stress. See "Suspending a vertical chain of fixtures joined end-to-end" on page 19.

Where fixtures are mounted horizontally in locations with stable conditions only (i.e. no wind, movement, vibration or other forces), you can use the thumbscrews that are supplied with end-to-end couplers to join the ends of fixtures. **In all other situations** you must remove the thumbscrews and fasten the couplers to fixtures using grade 8.8 strength M6x16mm bolts and washers. Read the instructions for different types of installation and different conditions later in this chapter carefully.

To join two fixtures using an end-to-end coupler:

1. See Figure 8. Slide the coupler into the channels in the rear of the fixtures until both fixtures meet in the center of the coupler.
2. If using thumbscrews, tighten all four thumbscrews on the coupler. In all other situations, remove the thumbscrews and tighten four M6x16mm bolts with washers into the couplers. Use a torque wrench to tighten to a torque of 6 Nm.

*Slide fixtures all the way to center of coupler*
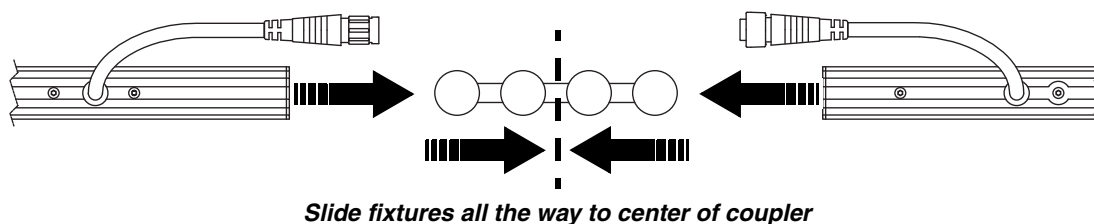
Figure 8: Installing an end-to-end coupler

Mounting a single fixture

All conditions

To mount a single 320 mm or 1000 mm fixture on a structure or surface in any orientation in a location that may be exposed to wind, vibration or other forces:

1. Install a safety cable attachment bracket close to the center of the fixture (see "Installing a safety cable" on page 12).
2. Install two sliding brackets on a 1000 mm fixture or one sliding bracket on a 320 mm fixture using grade 8.8 M6x16mm bolts (see "Installing with M6 bolts" on page 13).
3. Pass a grade 8.8 strength M12 bolt through the hole in the center of each sliding bracket to fasten the fixture to a rigging clamp, surface or structure. Secure the bolt with a self-locking nut.
4. If installing the fixture in a location where it may cause injury or damage if it falls, secure the fixture with a safety cable as described in "Installing a safety cable" on page 12.

Stable conditions only

To mount a single 320 mm or 1000 mm fixture on a structure or surface in any orientation in a location with stable conditions (no wind or other forces, no vibration, fixed and rigid supporting structure):

1. Install a safety cable attachment bracket close to the center of the fixture (see "Installing a safety cable" on page 12).
2. Install one sliding bracket in the center the fixture using spring-loaded fasteners (see "Installing with spring-loaded fasteners" on page 13).
3. Pass a grade 8.8 strength M12 bolt through the hole in the sliding bracket to fasten the fixture to a rigging clamp (such as the Superlight half-coupler rigging clamp, black, P/N 91602018 from Martin), surface or structure. Secure the bolt with a self-locking nut.
4. If installing the fixture in a location where it may cause injury or damage if it falls, secure the fixture with a safety cable as described in "Installing a safety cable" on page 12.

Suspending a curtain of horizontally oriented fixtures

All conditions, 1000 mm fixtures

To suspend horizontally oriented 1000 mm VDO Sceptron fixtures in a curtain that is hanging vertically downwards in a location that may be exposed to wind, vibration or other forces:

1. Install a safety cable attachment bracket close to the center of each fixture (see "Installing a safety cable" on page 12).
2. See Figure 9. Install two sliding brackets **A** on the top fixture and two on the bottom fixture using grade 8.8 M6x16mm bolts as described in "Installing with M6 bolts" on page 13. Use a torque wrench to tighten the bolts to a torque of 8 Nm.
3. You will need two parallel couplers each time you join two fixtures together. Remove the thumbwheels supplied with the parallel couplers and replace them with grade 8.8 strength M6 washers and self-locking nuts.
4. Fasten a maximum of 10 fixtures to each other as shown in Figure 9 using two parallel couplers **B** each time you join two fixtures together. Fasten the parallel couplers **B** to fixtures using grade 8.8 strength M6x16mm bolts and self-locking nuts with washers (see "Installing parallel couplers" on page 14). Use a torque wrench to tighten the bolts to a torque of 6 Nm. If you have joined ten fixtures as shown in Figure 9 and need to add more fixtures, you must start a new array.
5. Use grade 8.8 strength M12 bolts and self-locking nuts to fasten the brackets **A** to a stable structure that can safely hold at least ten times the weight of all the items it must support.
6. If installing the fixtures in a location where they may cause injury or damage if they fall, secure each fixture with a safety cable as described in "Installing a safety cable" on page 12.

Maximum ten fixtures. Four sliding brackets **A** fastened to fixtures with M6 bolts. Parallel couplers fastened with M6 bolts.

Figure 9: Installation method B – hanging curtain, other conditions

Stable conditions only, 1000 mm fixtures

To suspend horizontally oriented 1000 mm VDO Sceptron fixtures in a curtain that is hanging vertically downwards in a location with stable conditions (no wind or other forces, no vibration, fixed and rigid supporting structure):

1. Install a safety cable attachment bracket close to the center of each fixture (see "Installing a safety cable" on page 12).
2. See Figure 10. Install two parallel couplers **B** on a fixture as shown (see "Installing parallel couplers" on page 14).
3. Install two sliding brackets **A** on the fixture as shown, fastening the brackets to the fixture using grade 8.8 M6x16mm bolts (see "Installing with M6 bolts" on page 13). Use a torque wrench to tighten the bolts to a torque of 8 Nm.
4. Fasten up to a maximum of 10 fixtures to each other. Use two parallel couplers **B** with thumbscrews or grade 8.8 strength M6x16mm bolts with washers and self-locking nuts each time you join two fixtures together.

5. Use grade 8.8 strength M12 bolts with washers and locking nuts passed through the holes in the sliding brackets to fasten the sliding brackets **A** to a stable structure that can safely hold at least ten times the weight of all the items it must support.

6. If installing the fixtures in a location where they may cause injury or damage if they fall, secure each fixture with a safety cable as described in "Installing a safety cable" on page 12.

Maximum ten fixtures in horizontal orientation. Suspended vertically from two sliding brackets **A** fastened to fixtures with M6 bolts**.**

Figure 10: Installation method A – hanging curtain, stable conditions

Mounting on a non-vertical structure or surface

1000 mm fixtures, all conditions

To mount or suspend 1000 mm VDO Sceptron fixtures on a structure or surface in any situation where fixtures are not horizontally oriented and linked in a curtain that is hanging vertically downwards:
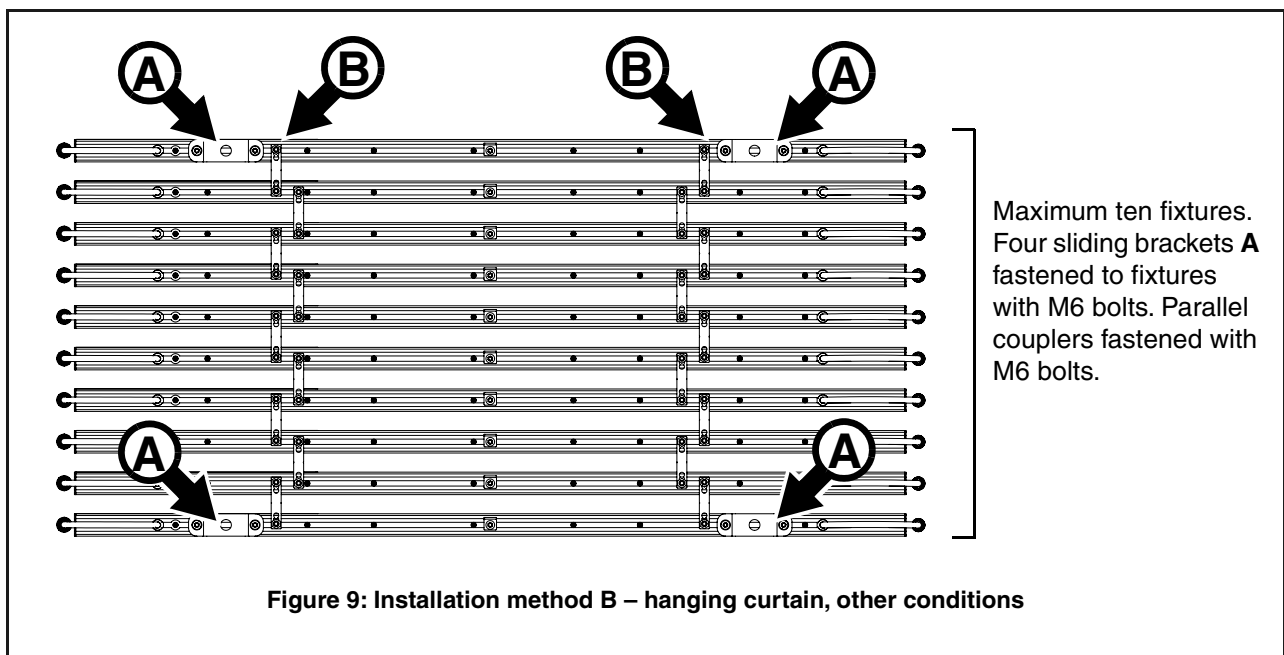
1. Install a safety cable attachment bracket close to the center of each fixture (see "Installing a safety cable" on page 12).

2. See Figure 11. Each time you need to join two fixtures together, obtain two parallel couplers. Remove the thumbwheels supplied with the parallel couplers and replace them with grade 8.8 strength M6 washers and self-locking nuts.

3. Fasten a maximum of 10 fixtures to each other as shown in Figure 11 using two parallel couplers **B** each time you join two fixtures together (see "Installing parallel couplers" on page 14). Fasten the parallel couplers **B** to fixtures using the M6 bolts and self-locking nuts. Use a torque wrench to tighten the nuts to a torque of 6 Nm. If you have joined ten fixtures as shown in Figure 11 and need to add more fixtures, you must start a new array of fixtures.

4. Install five sliding brackets A as shown in Figure 11 using grade 8.8 M6x16 bolts, washers and self-locking nuts (see "Installing with M6 bolts" on page 13).

5. Use grade 8.8 strength M12 bolts and self-locking nuts to fasten the brackets **A** to a stable structure that can safely hold at least ten times the weight of all the items it must support.

6. If installing the fixtures in a location where they may cause injury or damage if they fall, secure each fixture with a safety cables as described in "Installing a safety cable" on page 12.

Figure 11: Installation method C – mounting on a non-vertical structure or surface

Maximum ten fixtures. Five sliding brackets **A** fastened to fixtures with M6 bolts. Parallel couplers fastened with M6 bolts.

Warning!   ***Each array of fixtures joined together with parallel couplers must be supported by two sliding brackets installed on the first fixture and two sliding brackets installed on the last fixture. In groups containing from 6 to the maximum limit of 10 fixtures, you must also support the array with a sliding bracket installed at the center of the array as shown in Figure 11.***

320 mm fixtures, all conditions

Mounting 320 fixtures is similar to the procedure for 1000 mm fixtures shown in Figure 11, but only one sliding bracket **A** is required on each of the two outer fixtures, meaning that a total of three sliding brackets are required for an array containing maximum ten 320 mm fixtures.

To mount 320 mm VDO Sceptron fixtures on a structure or surface in any situation where fixtures are not horizontally oriented and linked in a curtain that is hanging vertically downwards:

1. Install a safety cable attachment bracket close to the center of each fixture (see "Installing a safety cable" on page 12).
2. Each time you need to join two fixtures together, obtain two parallel couplers. Remove the thumbwheels supplied with the parallel couplers and replace them with grade 8.8 strength M6 washers and self-locking nuts.
3. Fasten a maximum of 10 fixtures to each other using two parallel couplers each time you join two fixtures together (see "Installing parallel couplers" on page 14). Fasten the parallel couplers to fixtures using the M6 bolts and self-locking nuts. Tighten to a torque of 6 Nm. If you have joined ten fixtures and need to add more fixtures, you must start a new array of fixtures.
4. Install three sliding brackets using M6 bolts and self-locking nuts (see "Installing with M6 bolts" on page 13), fastening one bracket to each of the two fixtures at the sides of the array and one bracket at the center of the array.
5. Use grade 8.8 strength M12 bolts and self-locking nuts to fasten the three brackets to a stable structure that can safely hold at least ten times the weight of all the items it must support.
6. If installing the fixtures in a location where they may cause injury or damage if they fall, secure all fixtures with safety cables as described in "Installing a safety cable" on page 12.
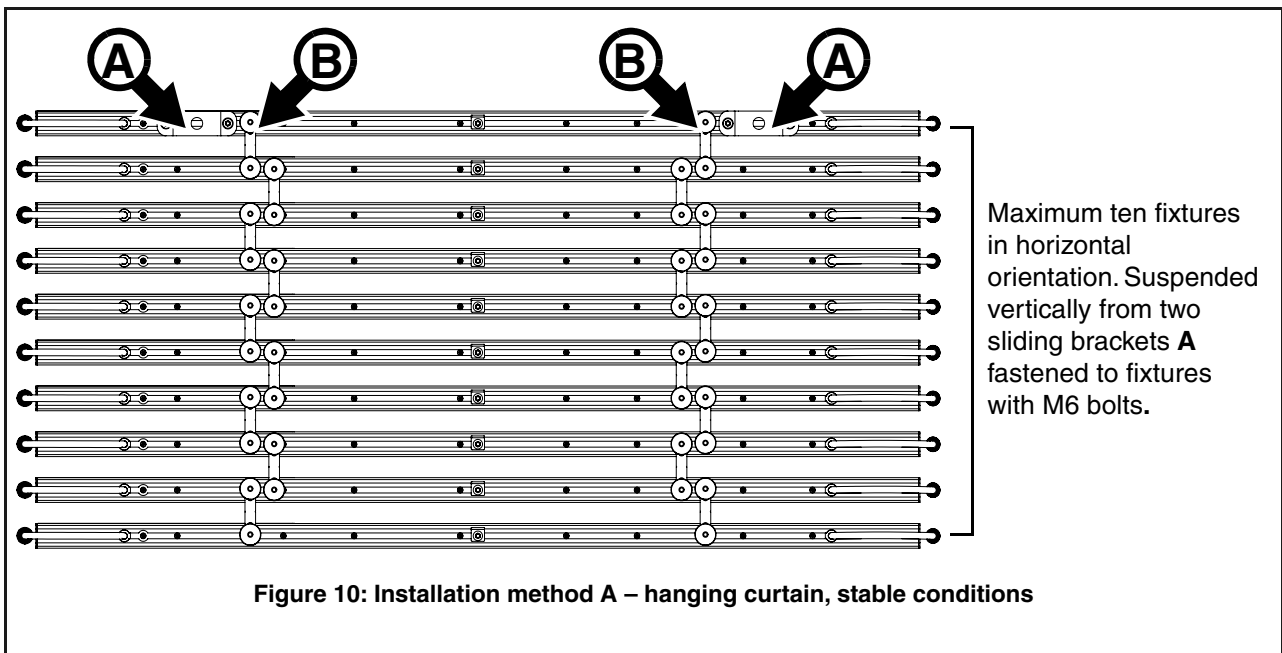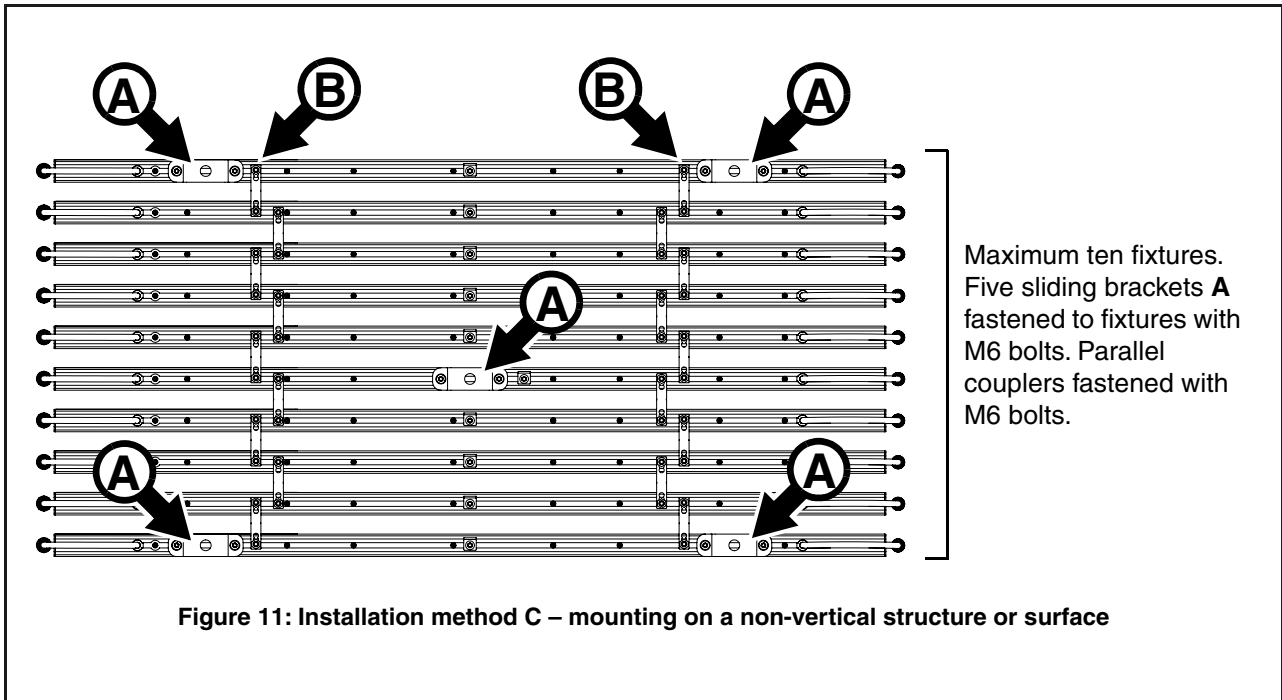
Suspending a vertical chain of fixtures joined end-to-end

You can install a vertical chain up to 6 meters in length containing VDO Sceptron fixtures oriented vertically. The chain must be mounted on a vertical structure or surface using sliding brackets. Fixtures must be joined using end-to-end couplers. You must remove thumbscrews from brackets and couplers and replace with grade 8.8 strength M6x16mm bolts, washers and self-locking nuts.

1000 mm and 320 mm fixtures, all conditions

You can install a vertical chain up to 6 meters in length containing VDO Sceptron fixtures oriented vertically. The chain must be mounted on a vertical structure or surface using sliding brackets. Fixtures must be joined using end-to-end couplers. You must remove thumbscrews from brackets and couplers and replace with grade 8.8 strength M6x16mm bolts, washers and self-locking nuts.

To suspend a line of VDO Sceptron fixtures hanging vertically:

1. Install a safety cable attachment bracket close to the center of each fixture (see "Installing a safety cable" on page 12).

2. See Figure 12. You will need one end-to-end coupler each time you join two fixtures together and a minimum of one sliding bracket for each fixture. Remove the thumbwheels supplied with the parallel couplers and sliding brackets and replace them with grade 8.8 strength M6 washers and self-locking nuts (see "Installing with M6 bolts" on page 13).

3. Install the sliding brackets on the fixtures using M6 bolts, washers and nuts (see "Installing a sliding bracket" on page 12). Use a torque wrench to tighten nuts to a torque of 8 Nm.

Vertical chain: maximum 6 fixtures. One sliding bracket **A** fastened to each fixture with M6 bolts. End-to-end couplers **C** fastened with M6 bolts.

Figure 12: Vertical chain of fixtures mounted on vertical surface or structure

4. Install the top fixture on the surface or structure, fastening it securely using an M12 fastener passed through the sliding bracket. The surface or structure must be capable of holding at least ten times the weight of all the items it will support.

5. If the fixture will cause injury or damage if it falls, secure it with a safety cable as described in "Installing a safety cable" on page 12.

6. Continue installing up to a maximum of six fixtures as shown in Figure 13. Secure each fixture with a safety cable. Use an end-to-end coupler **C** each time you join two fixtures together (see "Joining fixtures end-to-end" on page 14). Fasten the end-to-end couplers **C** to fixtures using the M6 bolts and self-locking nuts. Tighten all four nuts on each coupler to a torque of 6 Nm.

7. If you reach the limit of 6 fixtures and need to add more fixtures, start a new chain of fixtures.
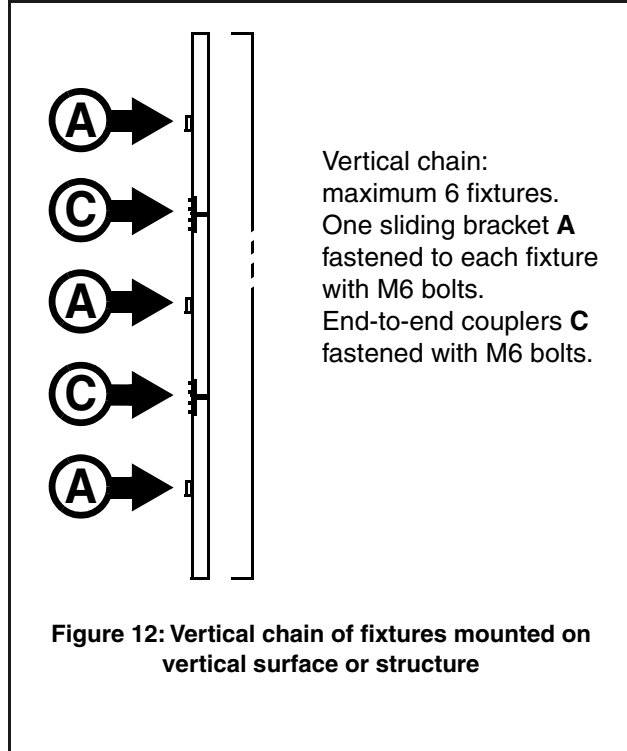
1000 mm and 320 mm fixtures, stable conditions only

To suspend a chain of VDO Sceptron fixtures hanging vertically in a location with stable conditions (no wind or other forces, no vibration, fixed and rigid supporting structure):

1. Install a safety cable attachment bracket close to the center of each fixture (see "Installing a safety cable" on page 12).

2. See Figure 13. You will need one end-to-end coupler each time you join two fixtures together and a two sliding brackets for the top fixture. Remove the spring-loaded fasteners from the sliding brackets and replace them with grade 8.8 strength M6 washers and self-locking nuts (see "Installing with M6 bolts" on page 13). Remove the thumbwheels supplied with the parallel couplers and replace them with grade 8.8 strength M6 washers and self-locking nuts (see "Installing with M6 bolts" on page 13).

3. Install the sliding brackets on the fixtures using M6 bolts, washers and nuts (see "Installing a sliding bracket" on page 12). Use a torque wrench to tighten nuts to a torque of 8 Nm.

Vertical chain, stable conditions: maximum 6 fixtures. Two sliding brackets **A** fastened to top fixture with M6 bolts. End-to-end couplers **C** fastened with M6 bolts.

Figure 13: Vertical chain of fixtures mounted on vertical surface or structure, stable conditions only

4. Install the top fixture on the surface or structure, fastening it securely using an M12 fastener passed through the sliding brackets. The surface or structure must be capable of holding at least ten times the weight of all the items it will support.

5. If the fixture will cause injury or damage if it falls, secure it with a safety cable as described in "Installing a safety cable" on page 12.

6. Continue installing up to a maximum of six fixtures as shown in Figure 13. Secure each fixture with a safety cable. Use an end-to-end coupler **C** each time you join two fixtures together (see "Joining fixtures end-to-end" on page 14). Fasten the end-to-end couplers **C** to fixtures using the M6 bolts and self-locking nuts. Use a torque wrench to tighten all four nuts on each coupler to a torque of 6 Nm.

7. If you reach the limit of 6 fixtures and need to add more fixtures, start a new chain of fixtures.
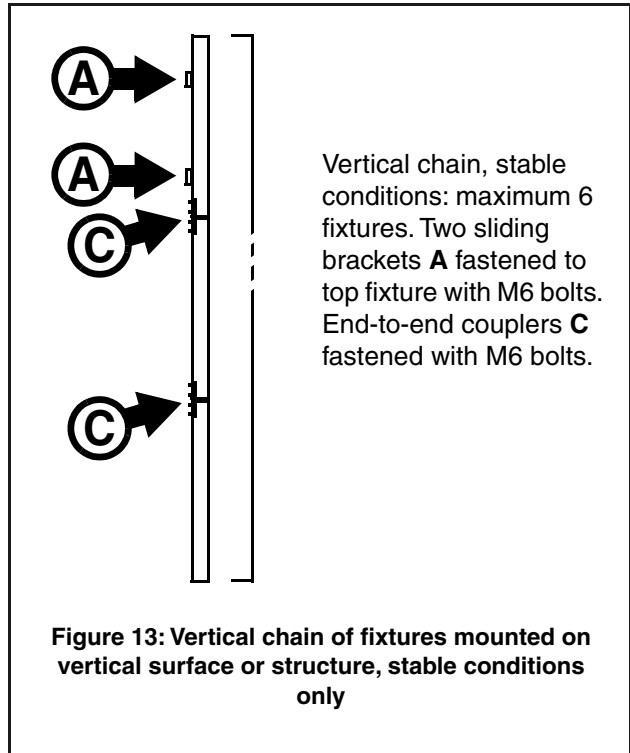
Installing and removing optical accessories

The VDO Sceptron must be used with an optical accessory (clip-on diffuser or lens) installed on the front of the fixture. A wide range of these accessories is available from Martin (see "Accessories" on page 51). They clip onto the front of fixtures and can be installed and removed in seconds.

To aid removal of optical accessories, we recommend that you use one of the two solutions available from Martin for the VDO Sceptron: either the Magnetic Swiper Test Tool or the Lens Removal Jaws that can be clipped onto pipe grips. See "Accessories" on page 51.

Figure 14: Installing and removing a diffuser

To install an optical accessory:

1. Block access below the work area and work from a stable platform.

2. See Figure 14. Push one side of the diffuser / lens into the front of the fixture, then push the other side down also (see **A**) so that both sides clip into place.
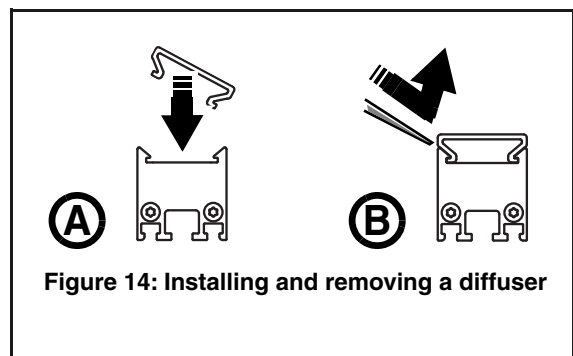
To remove an optical accessory:

1. Block access below the work area and work from a stable platform.
2. Grasp the diffuser with pipe grips and the jaws available from Martin, or press the lever ends of two Magnetic Swiper Test Tools (see **B** in Figure 14) between one side of the diffuser / lens and the fixture. Lift the diffuser out of its clip and away from the fixture. If you use the Test Tool, you may need to use two at the same time to lever a diffuser away from a fixture.

System installation

⚠️ *Warning! Read "Safety information" on page 4 and "Precautions to avoid damage" on page 9 carefully before installing a VDO Sceptron system.*

Warning! Connect the VDO Sceptron only to the devices and using only the Martin cables specified in this manual.

Warning! Do not exceed the maximum numbers of devices that can be connected in chains and maximum cable lengths specified in "Protection from electric shock" starting on page 4 and in the manuals of the other devices in the system.

The VDO Sceptron is designed to display either Martin P3 video or DMX-controlled lighting effects. It automatically recognizes and responds to either a Martin P3 or a DMX data signal. The next sections explain how to create a VDO Sceptron installation to display P3 video data or DMX-controlled lighting effects.

Even when VDO Sceptrons are used in a P3-driven setup, you can still control them using DMX or Art-Net fed into the P3 System Controller. See "DMX via P3 System Controller" starting on page 45 for details.

Installing a P3 system

See Figure 16 for an overview of the elements and layout of a Martin P3 video display system.

To install a system that displays P3 video on VDO Sceptrons, see the overview in Figure 16 and follow these directions:

1. Make sure that no devices in the installation can be connected to AC mains power until all installation work is complete.
2. Read "Safety information" on page 4 and "Precautions to avoid damage" on page 9.
3. Connect VDO Sceptron fixtures together in chains either directly using the fixtures' cable tails and BBD connectors or by adding Martin hybrid cables with BBD connectors (see "BBD extension cables" on page 52).
   Warning! Do not exceed the maximum total length of fixtures and total cable length per chain given in "Safety limits for connecting devices" on page 5.
4. If necessary to protect from water, dirt, etc., install blanking caps (see "Connectors" on page 52) on the output connectors of the last fixtures on the chain.
5. Connect each chain of VDO Sceptrons to one of the four 4-pin female XLR hybrid (48 VDC power + P3 data) outputs on a P3 PowerPort 1500 using a Martin hybrid 4-pin male XLR to BBD adapter cable, P/N 91616046 (see Figure 15). Alternatively, connect each chain of VDO Sceptrons to one of the 4 outputs on a P3 PowerPort 1000 IP. This device has BBD connectors, so no adapter cable is needed.

4-pin XLR-to-BBD Input Cable, P/N 91616046
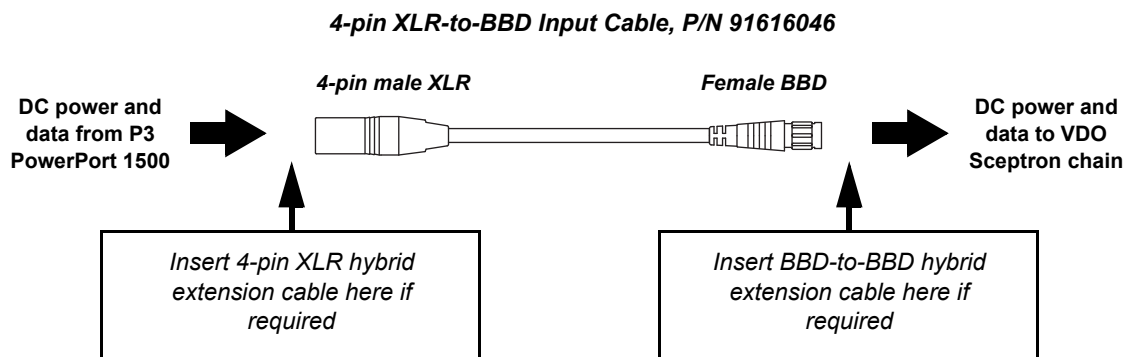
Figure 15: Power and P3 video data input

6. If necessary, add a Martin 4-pin XLR hybrid extension cable to the 4-pin XLR-to-BBD adapter cable so that you can extend the hybrid link to the P3 PowerPort 1500. Suitable extension cables are available from Martin in various lengths. See "Accessories" on page 51.

7. Create a P3 video data link from a Martin P3 system controller such as the P3-050, P3-150, P3-300 or P3 PC to the P3 PowerPort 1500 or P3 PowerPort 1000 IP (see the products' user manuals for details).

8. If required, continue the P3 video data link in a daisy-chain by connecting the P3 data throughput of one P3 PowerPort 1500 to the P3 data input of the next, as described in the P3 PowerPort 1500 user manual. You can connect up to fifty P3 PowerPort 1500s in a P3 data daisy-chain like this. If you need to connect more than fifty P3 PowerPort 1500s, use an unmanaged Ethernet switch to split the P3 data link into branches, each containing less than fifty P3 PowerPort 1500s.

9. Connect the P3 PowerPort 1500 to AC mains power at 100 - 240 V, 50/60 Hz as described in its user manual.

10. connect the P3 system controller to AC mains power and power the controller on.

You can now configure the system at the P3 controller. See"System setup" on page 31.
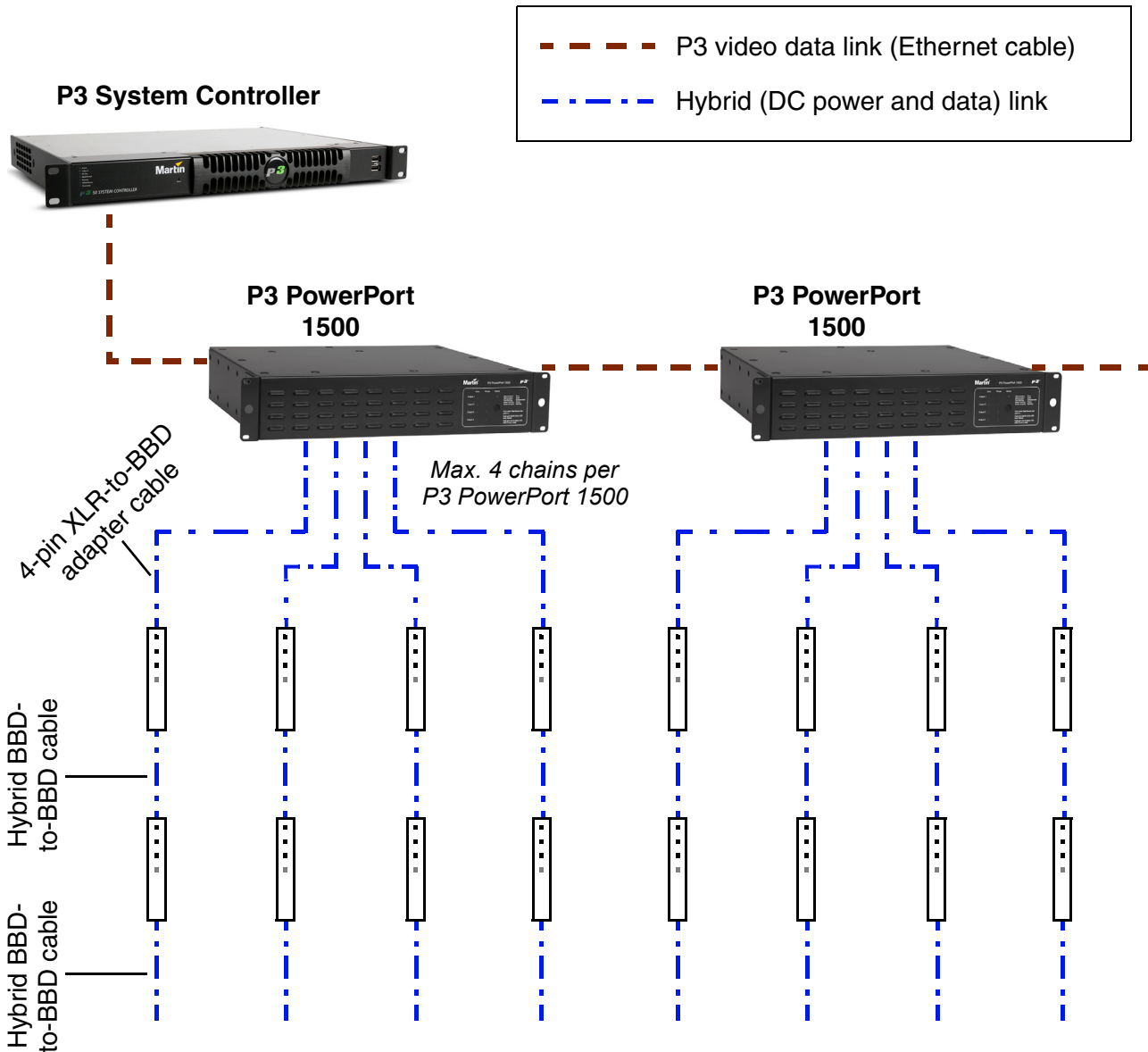
See "Safety limits for connecting devices" on page 5 before creating a chain

Figure 16: P3 system layout

Installing a DMX-controlled system

You can send DMX control data to VDO Sceptron fixtures in two ways:

- You can send a DMX or Art-Net signal to a P3 System Controller. The controller will then relay the DMX data to the VDO Sceptron fixtures. If you intend to do this, see "Installing a P3 system" on page 22 for cabling instructions and see "DMX via P3 System Controller" starting on page 45 for the available DMX modes.
- You can send a DMX control signal directly to VDO Sceptron fixtures. If you intend to do this, follow the cabling instructions in the section below and see "Direct DMX control" on page 40 for the available DMX modes.

In a DMX-controlled system, an RDM-compliant DMX lighting controller sends a DMX control data signal over a DMX link to the installation, and then over the hybrid link to the VDO Sceptrons.

The DMX link requires DMX cable. It can be maximum 300 m (1000 ft.) in length and must run in one single daisy-chain, but it can be extended or split into branches using an RDM-compliant amplifier/splitter such as the Martin RDM 5.5 Splitter™ (P/N 90758150). Alternatively, you can run the DMX signal from the controller over Ethernet cable using Art-Net protocol and convert it to a DMX-compliant signal with an Art-Net to DMX converter.

If you would like assistance with creating a DMX link, your Martin supplier will be glad to advise.

The number of VDO Sceptron fixtures that you can control on one DMX link is limited by the number of DMX channels the VDO Sceptrons will use and the 512 DMX channels available in one DMX universe at the DMX controller. Each time you have used 512 channels, you must create a new DMX link that is connected to a new DMX universe on the controller. Note that this limit applies to the *DMX link*. The maximum safety limits that apply to the chain of fixtures and cable (see "Safety limits for connecting devices" on page 5) take priority and must be respected in all cases.

If you need to take the DMX signal from the end of a chain of VDO Sceptron fixtures, connect a DMX Lead-out Cable (see "Accessories" on page 51) to the output connector of the last fixture on the chain. The Lead-Out Cable has a 5-pin female XLR connector with standard DMX pinout (pin 1 = shield, pin 2 = data cold/negative, pin 3 = data hot/positive, pins 4 and 5 are not used) that lets you draw off the DMX signal.

DC Power options in DMX installations

You can use any of the following power supply units to provide DC power in a DMX-controlled VDO Sceptron installation:

- Martin DMX PowerPort 375
- Martin P3 PowerPort 1500
- Martin IP66 PSU 240W external power supply unit
- generic external PSU (the Mean Well SP-480 48, for example).

The hardware and cables required are slightly different depending on which type of PSU you use to supply the installation with DC power. The three different types of installation are covered in the next three sections:

- If you are using a Martin DMX PowerPort 375, see "Installing a DMX system using the Martin DMX PowerPort 375" on page 25.
- If you are using a Martin IP66 PSU 240W, see "Installing a DMX system using the Martin IP66 PSU 240W" on page 27.
- If you are using a generic 48 VDC PSU, see "Installing a DMX system using a generic external 48 VDC PSU" on page 29.

Installing a DMX system using the Martin DMX PowerPort 375

DMX/RDM Controller

– – – – Daisy-chained DMX link (DMX cable)

– · – · – Hybrid (DC power and data) link

→ to additional DMX universes, if present

DMX PowerPort 375

DMX PowerPort 375

4-pin male XLR
to fem. BBD cable

4-pin male XLR
to fem. BBD cable

BBD-to-BBD
extension cable
(if needed)

BBD-to-BBD
extension cable
(if needed)
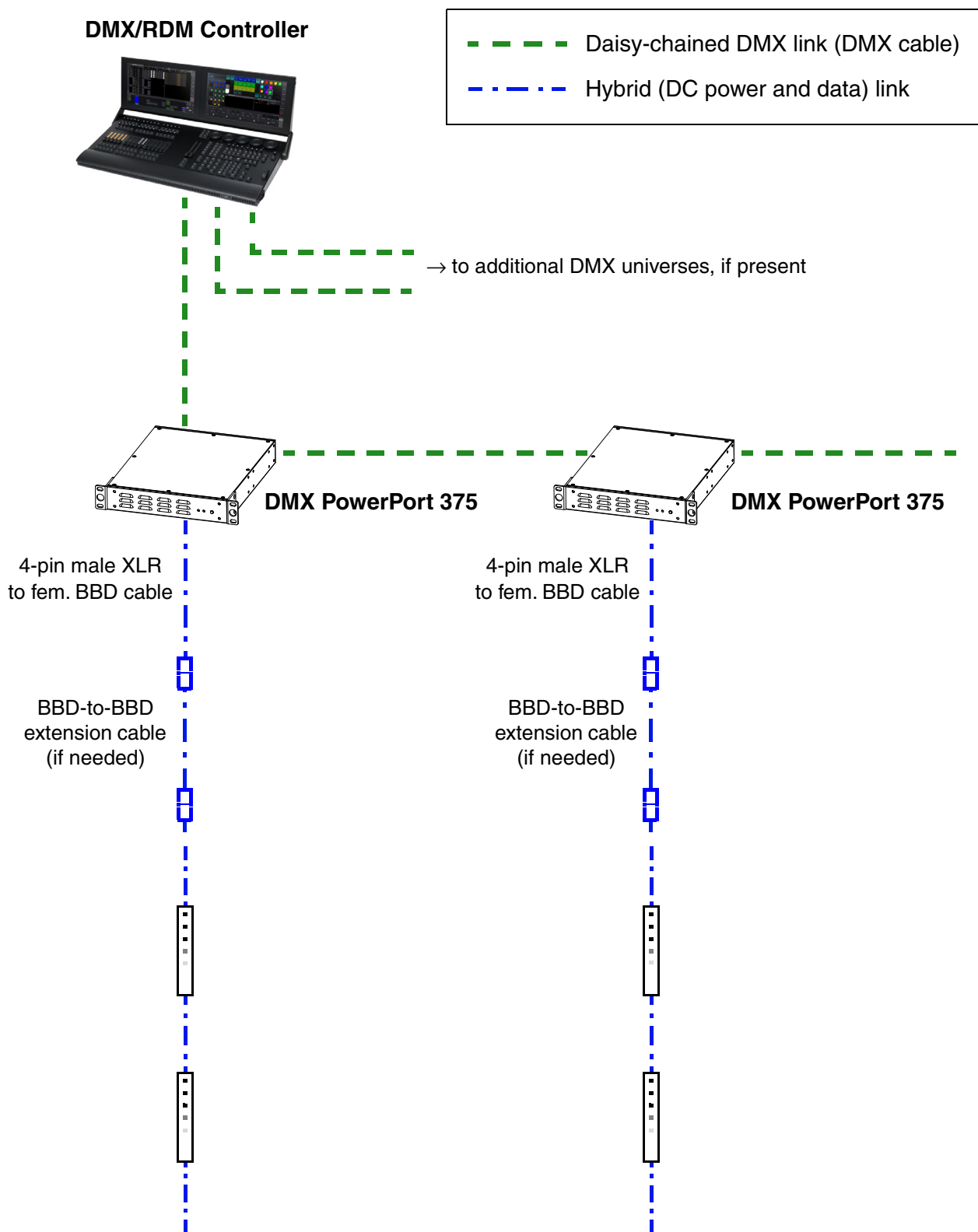
See "Safety limits for connecting devices" on page 5 before creating a chain

Figure 17: DMX-controlled system using the Martin DMX PowerPort 375

To create a DMX-controlled installation that draws DC power from the Martin DMX PowerPort 375 external power supply unit:

1. See Figure 17 on page 25 for an overview of this type of installation

2. Make sure that no devices in the installation can be connected to AC mains power until all installation work is complete.

3. Read "Safety information" on page 4 and "Precautions to avoid damage" on page 9.

4. Connect VDO Sceptron fixtures together in chains either directly using the fixtures' cable tails and BBD connectors or by adding Martin hybrid cables with BBD connectors (see "BBD extension cables" on page 52).

   Warning! Do not exceed the maximum total length of fixtures and total cable length per chain given in "Safety limits for connecting devices" on page 5.

5. If necessary to protect from water, dirt, etc., install blanking caps (see "Connectors" on page 52) on the output connectors of the last fixtures on the chain. There is no need to install DMX termination plugs, as fixtures have integral DMX termination.

6. See Figure 18. Connect a Martin Power + Data Input Cable, 4-pin male XLR to female BBD (P/N 91616046) to the start of each chain.

4-pin XLR to BBD Input Cable, 0.25 m, P/N 91616046

Combined DMX and DC power from DMX PowerPort 375

4-pin male XLR

To VDO Sceptron chain

Female BBD
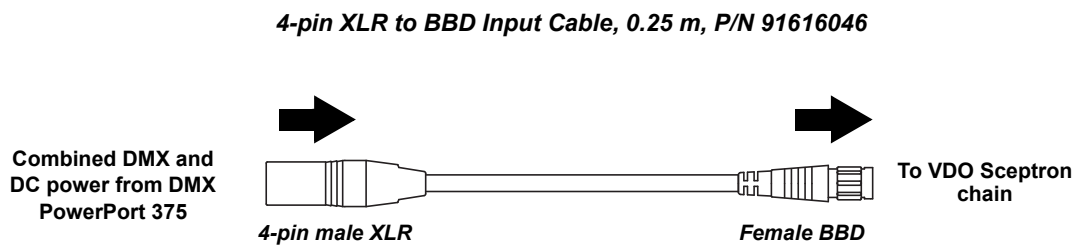
Figure 18: Martin PowerPort 375 connection to a VDO Sceptron chain

7. Connect the 4-pin XLR connector on the cable to the hybrid (DC power and DMX data) output of a Martin DMX PowerPort 375.

8. Connect the DMX controller to the DMX PowerPort 375 using standard DMX cable and a 5-pin male XLR connector.

9. To extend the DMX link, connect the first DMX PowerPort 375 to the next DMX PowerPort 375 using standard DMX cable with one male and one female 5-pin XLR connector. Continue adding DMX PowerPort 375 devices to the link. You can connect up to a recommended maximum of 32 devices on one DMX link, but if you want individual control of fixtures or segments on the link, bear in mind that 512 channels are available per DMX universe. To use more than 512 channels you will need to create a new DMX universe on a new DMX link.

10. Apply AC mains power to the DMX PowerPort 375 devices on the link.

11. Apply AC mains power to the DMX controller.

You can now configure the system. See "System setup" on page 31.

Installing a DMX system using the Martin IP66 PSU 240W
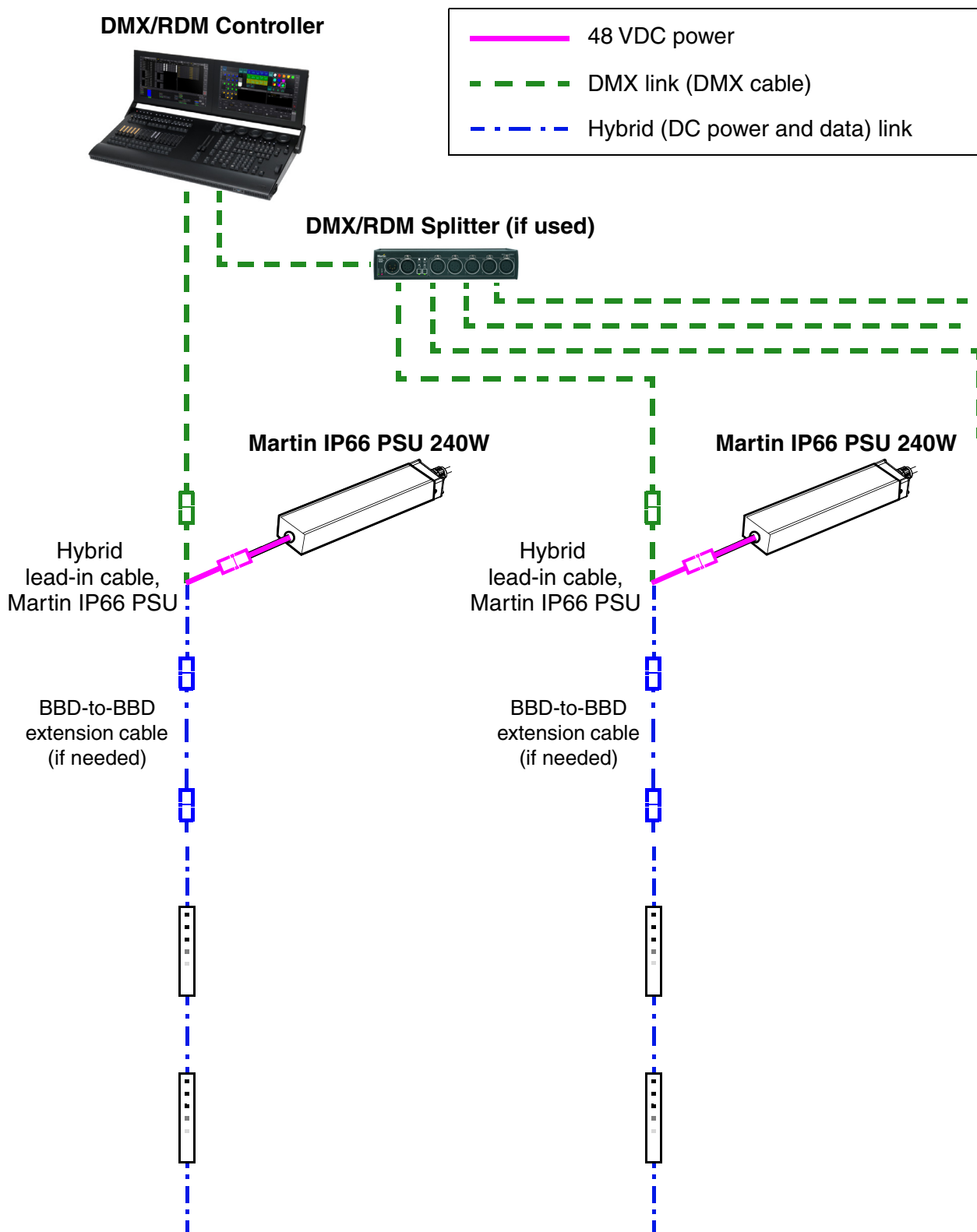
See "Safety limits for connecting devices" on page 5 before creating a chain

Figure 19: DMX-controlled system using the Martin IP66 PSU 240W

To create a DMX-controlled installation that draws DC power from the Martin IP66 PSU 240W external power supply unit:

1. See Figure 19 on page 27 for an overview of this type of installation

2. Make sure that no devices in the installation can be connected to AC mains power until all installation work is complete.

3. Read "Safety information" on page 4 and "Precautions to avoid damage" on page 9.

4. Connect VDO Sceptron fixtures together in chains either directly using the fixtures' cable tails and BBD connectors or by adding Martin hybrid cables with BBD connectors (see "BBD extension cables" on page 52).

   Warning! Do not exceed the maximum total length of fixtures and total cable length per chain given in "Safety limits for connecting devices" on page 5.

5. If necessary to protect from water, dirt, etc., install blanking caps (see "Connectors" on page 52) on the output connectors of the last fixtures on the chain. There is no need to install DMX termination plugs, as fixtures have integral DMX termination.

6. See Figure 20. Connect a Martin 5-pin male XLR female and male Martin IP66 PSU 240W to female BBD adapter cable (P/N 91616050) to the start of each chain.

   • Connect the 5-pin male XLR connector on the adapter cable to a DMX link that carries a DMX signal from an RDM-compliant DMX controller.

   • Connect the male Martin IP66 PSU 240W connector on the adapter cable to the DC output of a Martin IP66 PSU 240W.

   • Connect the female BBD connector on the adapter cable to the male BBD connector at the start of the chain of VDO Sceptron fixtures.

XLR5+Martin IP66 PSU 240W to BBD Input Cable, 0.25 m, P/N 91616050
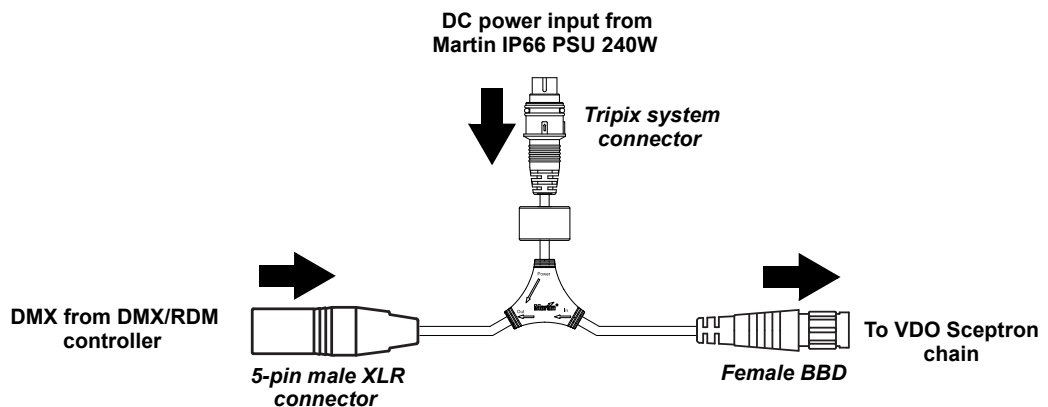
Figure 20: Martin IP66 PSU 240W and DMX connections to a VDO Sceptron chain

7. Install a mains power cable on the Martin IP66 PSU 240W and connect it to AC mains power.

8. Apply AC mains power to the DMX controller.

You can now configure the system. See "System setup" on page 31.

Installing a DMX system using a generic external 48 VDC PSU
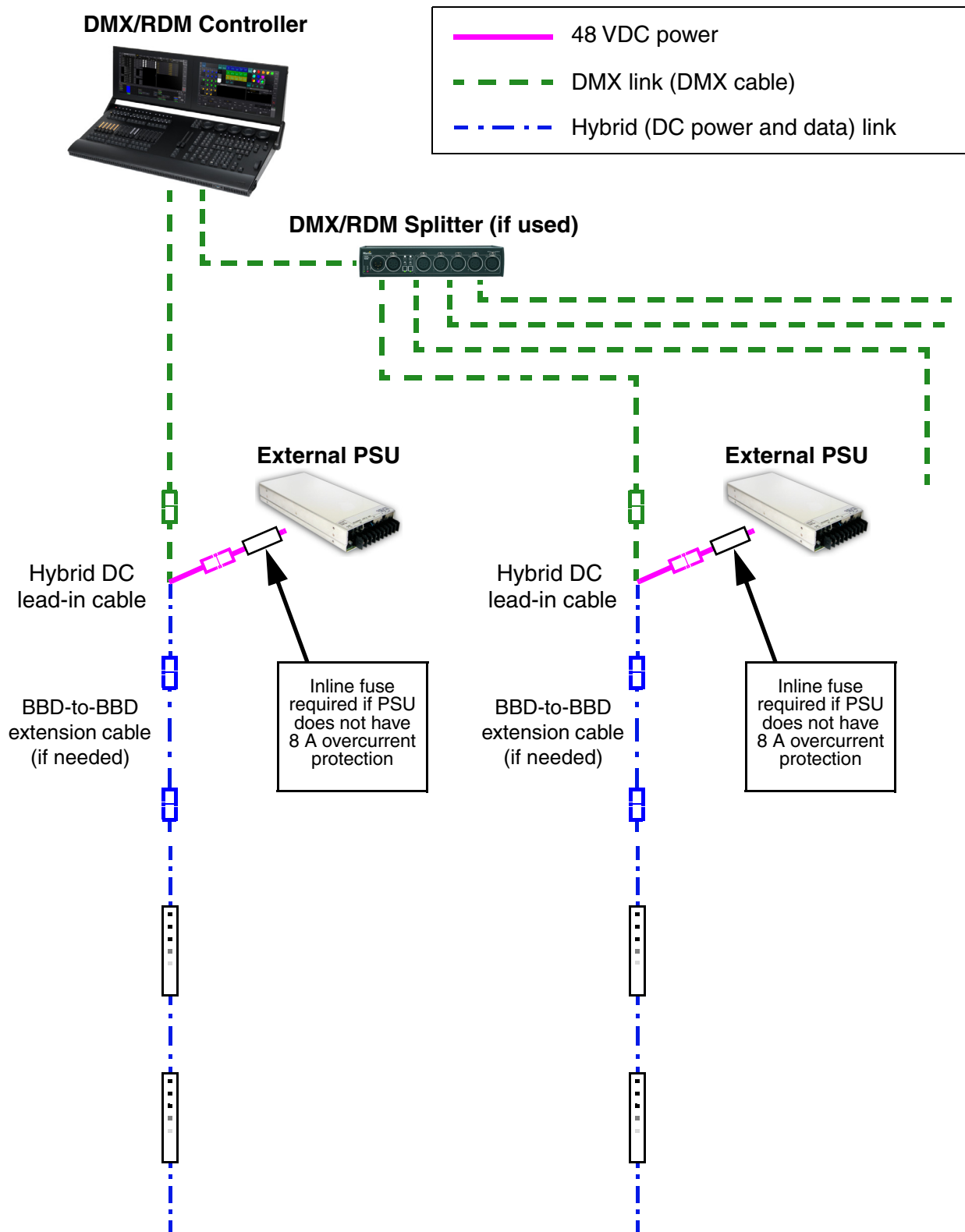
See "Safety limits for connecting devices" on page 5 before creating a chain. Do not exceed PSU output rating.

Figure 21: DMX-controlled system using a generic PSU

To create a DMX-controlled installation that draws DC power from a generic PSU:

1. See Figure 21 on page 29 for an overview of this type of installation.
2. Make sure that no devices in the installation can be connected to AC mains power until all installation work is complete.
3. Read "Safety information" starting on page 4 and "Precautions to avoid damage" on page 9.
4. Connect VDO Sceptron fixtures together in chains either directly using the fixtures' cable tails and BBD connectors or by adding Martin hybrid cables with BBD connectors (see "Accessories" on page 51).

   Warning! Do not exceed the maximum total length of fixtures and total length per chain given in "Safety limits for connecting devices" on page 5.

   Warning! Check the PSU's DC output power rating in watts and the power consumption figures in watts for VDO Sceptron fixtures given in Table 5 on page 7. Do not create a chain of VDO Sceptron fixtures that will exceed the power rating of the DC output on the PSU. Even if the PSU's DC output power rating would be high enough, do not create a chain of VDO Sceptrons that contains more than the maximum permitted number per chain given in Table 5 on page 7.
5. See Figure 22:
   - If the PSU does not have constant overcurrent protection that will limit current to 8 A on the DC output used, install an inline fuseholder with a 7.5 A or 8 A fuse on the white (+ve) power wire of a Martin Power and data adapter cable, XLR5 + power - BBD, 0.25 m (P/N 91616048). You can use a 30 amp automotive-type inline fuseholder with a 7.5 A blade fuse.
   - Connect the 5-pin male XLR connector on the power and data adapter cable to a DMX link that carries a DMX signal from an RDM-compliant DMX controller.
   - Connect the power wires on the power and data adapter cable to a DC output on the PSU. Connect the white wire to positive (+ve) and the black wire to negative (-ve).
   - Connect the female BBD connector on the adapter cable to the male BBD connector at the start of the chain of VDO Sceptron fixtures.

Power + Data Input Cable, XLR5 + Power to BBD, 0.25 m, P/N 91616048
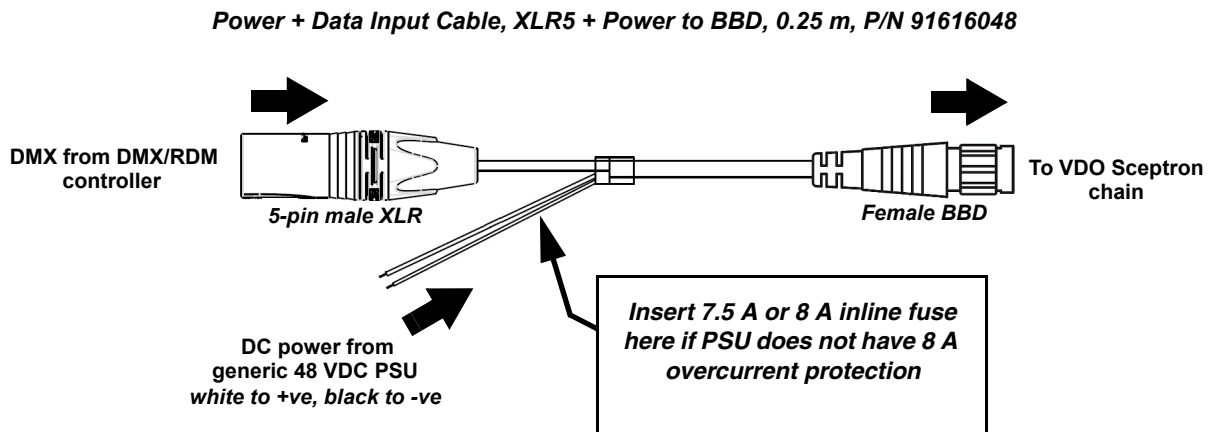
Figure 22: Generic PSU and DMX connections to a VDO Sceptron chain

6. Apply AC mains power to the external PSU.
7. Apply AC mains power to the DMX controller.

You can now configure the system. See "System setup" on page 31.

System setup

⚠️ ***Warning! Read "Safety information" on page 4 and "Precautions to avoid damage" on page 9 before applying power to a VDO Sceptron installation.***

Pixels and segments

A pixel is the smallest RGB-controllable unit in a fixture's light output. A segment is a group of neighboring pixels that can be controlled as a unit.

Pixels and segments are numbered starting from the *female* connector end of fixtures: Pixel 1 and Segment 1 are closest to the female connector end.

Setting up for P3 display

A Martin P3™ system allows video to be displayed on an installation that consists of or includes VDO Sceptron devices. When a P3 controller is connected to the data link and the installation is powered on, you can set up all the devices on the link from the P3 controller. See the P3 controller user manual for details.

When you are controlling VDO Sceptrons from a P3 System Controller, you can still also control them (and even pixelmap them) using DMX or Art-Net by sending the DMX signal to the P3 System Controller. See "DMX via P3 System Controller" starting on page 45 for details.

Setting up for DMX control

The section below explains DMX control and the DMX modes available when connecting the VDO Sceptrons directly to a DMX controller (i.e. without routing the DMX signal via a P3 System Controller). More DMX modes are available if you use a P3 System Controller and send DMX or Art-Net input to the P3 System Controller. See "DMX via P3 System Controller" starting on page 45 for details.

A DMX system gives 0 - 100% variable intensity control. Varying the intensity of red, blue and green LEDs in RGB products gives RGB color mixing.

You can set up and control a VDO Sceptron installation over the data link using an RDM-compatible DMX controller.

DMX control channels

DMX controllers send control data to devices over DMX control channels in DMX universes. One DMX universe has 512 channels available. Multiple fixtures can share the same DMX channels if you want grouped control and identical fixture behavior.

A VDO Sceptron fixture can be controlled using four DMX modes (see under "DMX protocols" on page 40):
- In **RGB Mode**, each fixture uses three DMX channels.
- In **Basic Mode**, each fixture uses ten DMX channels.
- In **Segment Mode**, each fixture uses seven DMX channels plus three DMX channels per segment (there are two segments on 320 mm fixtures and five segments on 1000 mm fixtures)
- In **Pixel Mode**, each fixture uses seven DMX channels plus three DMX channels per pixel.

Type of VDO Sceptron fixture	DMX channels per fixture, RGB Mode	DMX channels per fixture, Basic Mode	DMX channels per fixture, Segment Mode	DMX channels per fixture, Pixel Mode
VDO Sceptron 10, 320 mm	3	10	13	103
VDO Sceptron 10, 1000 mm	3	10	22	307
VDO Sceptron 20, 320 mm	3	10	13	55
VDO Sceptron 20, 1000 mm	3	10	22	157
VDO Sceptron 40, 320 mm	3	10	13	31
VDO Sceptron 40, 1000 mm	3	10	22	82

Table 6: Number of DMX channels required per VDO Sceptron fixture

Different modes can be mixed freely in an installation. For example, some VDO Sceptron fixtures can be set to RGB Mode, some set to Basic Mode and others to Pixel Mode. All you need to do is set up fixtures, DMX addresses and DMX channel allocation correctly.

DMX addresses

To prepare an installation for DMX control, you set it up using an RDM-compliant DMX controller so that fixtures or pixels receive instructions from the controller on their own DMX channels. The DMX address (also known as the control address or start channel) is the first of these channels. A VDO Sceptron fixture or pixel uses more than one channel, so it uses the DMX address channel and the channels immediately above it. For example, one VDO Sceptron fixture set to RGB Mode and set to DMX address 1 will use DMX channels 1 - 3. Channel 4 will be available for use as a DMX address for the next device.

Setting up via RDM

Using an RDM-compliant DMX controller lets you communicate with the VDO Sceptron fixtures on the DMX data link via RDM. You can:

- Retrieve data
- Set the DMX addresses of the fixtures and set their DMX mode
- Apply various setup options.

Note that if you use a P3 System Controller there is no need to use RDM to configure VDO Sceptrons, because you can carry out all setup, patching and addressing using the P3 System Controller's *DMX & Motion* view.

Using the VDO Sceptron

> **Warning! Read "Safety information" on page 4 and "Precautions to avoid damage" on page 9 on before applying power to the VDO Sceptron.**
>
> Do not use the VDO Sceptron if the ambient temperature exceeds 55° C (131° F) or falls below -30° C (-22° F).
>
> Do not use the VDO Sceptron without an optical accessory installed on the front of the fixture (see "Installing and removing optical accessories" on page 20).

P3 display

The VDO Sceptron can display video from all common video sources. The video signal must be sent to a Martin P3™ controller and then distributed to fixtures. The P3 controller lets you map, configure and control an installation containing VDO Sceptron fixtures (and other Martin P3 video display products if you have them). See the P3 controller documentation for details.

DMX control

The VDO Sceptron features two DMX control options, each with its own DMX modes.

DMX sent directly to fixtures

A DMX signal can be sent directly to VDO Sceptron fixtures with no P3 System Controller used. In this case an RDM-compatible controller is required so that you can address and configure the fixtures. See the DMX/RDM controller documentation for details.

When sending DMX directly to fixtures, four DMX modes are available:
• **RGB Mode** uses three DMX channels and gives RGB color mixing of all the pixels on a fixture.
• **Basic Mode** uses ten DMX channels and gives RGB color mixing, strobe effects and pre-programmed FX (dynamic effects).
• **Segment Mode** uses the first seven DMX channels of Basic Mode plus three channels per segment for segment-level RGB color mixing, strobe effects and pre-programmed FX. 320 mm fixtures are divided into two segments, 1000 mm fixtures are divided into five segments.
• **Pixel Mode** uses the first seven DMX channels of Basic Mode plus three channels per pixel for pixel-level RGB color mixing, strobe effects and pre-programmed FX.

See "Direct DMX control" on page 40 for full details of DMX control in this type of installation.

DMX/Art-Net/sACN sent to P3 System Controller and then relayed to fixtures

A DMX, Art-Net or sACN signal can be sent to a P3 System Controller or the P3-PC application and then sent to VDO Sceptron fixtures. In this case the P3 System Controller takes care of all configuration and addressing of the fixtures. RDM is not required.

When sending DMX to fixtures via a P3 controller, five DMX modes are available:
• In **P3 Intensity Mode** the fixture displays video and DMX only controls the intensity of the video shown on the fixture
• In **P3 RGB Mode** the fixture displays video and DMX only controls the color of the video shown on the fixture.
• In **P3 Basic Mode** the fixture shows video and DMX only controls the intensity and the color of the video shown on the fixture.
• In **P3 Hybrid Mode** when the P3 Switch channel is set to above 50% the fixture shows video and channels 4-6 control the color of the video shown on the fixture. When the P3 Switch channel is set to below 50% the fixture is purely DMX-controlled, and channels 4 and above control the color of the segments of the fixture. The number of RGB segments per fixture can be set on the P3 System Controller, where the fixture can be divided into 1, 2, 4, 5, 8, 10, 16, 20, 25, 32, 50 or 100 segments.
• In **P3 PixelMap Mode** the fixture is always purely DMX-controlled (it never shows video). Channels 1 and above control the color of the segments of the fixture. The number of RGB segments per fixture can be

set on the P3 System Controller, where the fixture can be divided into 1, 2, 4, 5, 8, 10, 16, 20, 25, 32, 50 or 100 segments.

See "DMX via P3 System Controller" starting on page 45 for full details of DMX control in this type of installation.

Magnetic 'control button'

A magnetic sensor is embedded inside the VDO Sceptron behind the label on the back of the fixture (see **C** in Figure 1 on page 10). The sensor acts as a control button. To activate the sensor, swipe a magnet past it.

We recommend that you use the Martin VDO Sceptron Test and Accessory Tool (see "Accessories" on page 51), which contains a magnet.

Activating the magnetic sensor lets you display the product's status, test the LEDs and reset the VDO Sceptron.

Figure 23: VDO Sceptron Test and Accessory Tool

Status display

To display a VDO Sceptron fixture's status, swipe the magnet over the sensor once. The first four and last two LEDs on the fixture will give one of the indications listed in the tables below for a few seconds.

Color	Output	Indication	Action required
Blue	Constant	Busy (e.g. booting up or writing to flash memory).	Wait a moment for normal operation to be resumed.
Red	Constant	Error. The VDO Sceptron has encountered a fatal error and can not run.	Perform a factory reboot, followed by a firmware upload.
Red	Flashing	No control source detected.	Connect a P3 system controller or DMX source to the network.
Green	Flashing	Ready. VDO Sceptron connected to P3 controller but not mapped onto the canvas.	Set up the P3 controller to use the VDO Sceptron.
Green	Constant	Running normally in P3 mode.	None.
Cyan	Flashing	Ready. VDO Sceptron in DMX mode but not receiving valid DMX data.	Send DMX data (if flashing cyan continues although you are sending data, check that DMX controller is connected correctly and configured with VDO Sceptron's DMX address).
Cyan	Constant	Running normally in DMX mode.	None.

Table 7: Status information

Testing, rebooting and returning to defaults

The tables below list the functions of the magnetic 'control button' on each VDO Sceptron fixture.

Test patterns are stored in onboard memory. This lets you test the LEDs without an external controller, but test patterns can also be called up on P3 system controllers, the P3 PowerPort 1500 and the P3 PowerPort 1000 IP.

Action	Function
Quick swipe	The first swipe displays status as shown in Table 7 for a few seconds. The next swipes display the following test patterns on the LEDs (each swipe scrolls to the next pattern): - Calibrated white - Full red - Full green - Full blue - Scrolling gradient - Dimmed (20% uncalibrated white)
Hold magnet over 'button' until LEDs 1-4 light blue	Reboot the VDO Sceptron.
Hold magnet over 'button' until LEDs 1-4 light white	Return the VDO Sceptron to its default factory firmware.

Table 8: Magnetic 'control button' functions

Flightcase system

The flightcases and flightcase extenders available from Martin for the VDO Sceptron simplify transport and storage. We strongly recommend their use to protect fixtures and accessories. See "Ordering Information" on page 52).
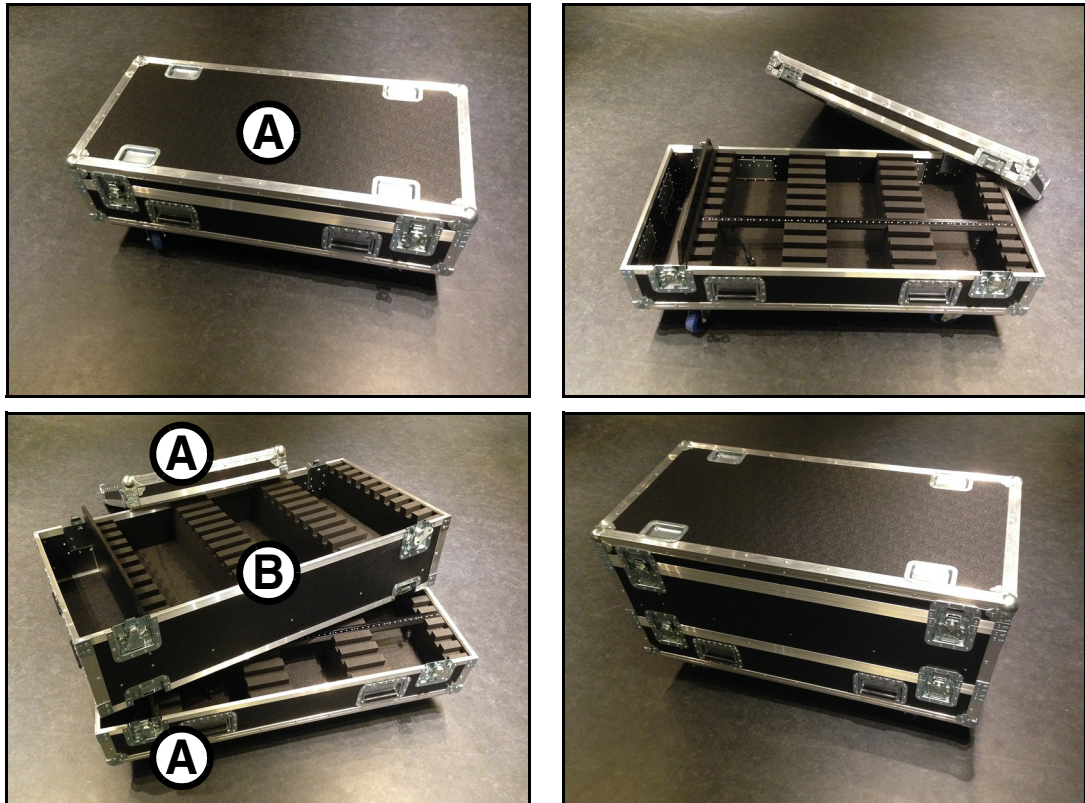
Figure 24: Flightcase system

Warning! Do not add more than three (3) extenders to one basic flightcase.

See Figure 24. The flightcase system consists of the flightcase base unit **A** and the flightcase extender **B**. The extender adds a level to the base unit. If you combine 1 base unit with 2 extenders, for example, you obtain a total of 3 levels in one high flightcase.

• You can add maximum 3 extenders to 1 flightcase, giving a maximum height of 4 levels.

• Each level of the flightcase can contain ten 1000mm fixtures or thirty 320 mm fixtures. You can mix the two different fixture sizes.

• The lids of flightcase base units and the bottoms of extenders have foam strips that keep fixtures in their slots. These foam strips are fastened in place with Velcro. The strips can be rotated and must be fastened correctly depending on which diffusers are installed on the fixtures packed below the strips:

- When packing fixtures with Tube Diffusers installed, fasten the *wide* sides of the foam strips to the lid or the bottom of the extender. This effectively makes the foam layer thinner, giving room for the Tube Diffusers while still holding fixtures securely.

- When packing fixtures with either no diffusers or with other types of diffuser installed, fasten the *narrow* sides of the foam strips to the lid or the bottom of the extender. This effectively makes the foam layer thicker so that it holds fixtures securely.

Service and maintenance

Warning! Read "Safety information" on page 4 and "Precautions to avoid damage" on page 9 before carrying out service on the VDO Sceptron.

Warning! Isolate the installation from AC mains power before servicing.

Warning! Refer any service operation not described in this manual to a qualified service technician.

Important! Excessive dirt buildup causes overheating and may damage the product. Damage caused by inadequate cleaning is not covered by the product warranty.

The user will need to clean the VDO Sceptron periodically. All other service operations on the VDO Sceptron must be carried out by Martin Professional™ or its approved service agents.

Installation, on-site service and maintenance can be provided worldwide by the Martin Professional Global Service organization and its approved agents, giving owners access to Martin's expertise and product knowledge in a partnership that will ensure the highest level of performance throughout the product's lifetime. Please contact your Martin supplier for details.

Cleaning

Cleaning schedules vary greatly depending on the operating environment. It is therefore impossible to specify precise cleaning intervals for the VDO Sceptron. In extreme cases, the product may require cleaning after surprisingly few hours of operation. Environmental factors that may result in a need for frequent cleaning include:

- Use of smoke or fog machines.
- High airflow rates (near air conditioning vents, for example).
- Presence of cigarette smoke.
- Airborne dust (from stage effects, building structures and fittings or the natural environment in outdoor locations, for example).

If one or more of these factors is present, inspect products soon after installing them 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.

To clean the product, use low-pressure compressed air to gently remove dust and loose particles from the front and back of the product. Wipe clean with a soft cloth dampened in a detergent solution. Do not use solvents or abrasives.

LED performance

Martin use the best components available, but the characteristics of all LEDs change gradually over many thousands of hours of use. Not all colors change at the same rate, and rates of change vary depending on factors such as temperature and how intensively a particular color is used. Because of the changes, overall light output and the exact hues obtained from specific color mixes in all LED-based products can be expected to shift slightly over time.

To help you obtain consistent output despite these changes, Martin P3 software from version 4.1.0 contains the P3 Fixture Adjuster tool. This feature lets you compensate for changes in LED characteristics and restore initial output and color authenticity levels. Please contact Martin for more details.

Installing new software

It may be necessary to upload new software (i.e. device firmware) to the VDO Sceptron if it appears to have a software-related fault or if you want to update to a newer software version.

Software for Martin products is available from the Martin website. The VDO Sceptron software can be installed from the P3 System Controller over the P3 data link. You will need a Martin P3 PowerPort 1500 or a Martin P3 PowerPort 1000 IP for this. See the P3 System Controller user manual for software installation instructions.

Troubleshooting

Problem	Probable cause(s)	Remedy
Control is lost and activating magnetic 'control button' causes VDO Sceptron to show constant or flashing red status indication.	Error has occurred.	Check that system is correctly connected, set up and running. Hold magnet over 'control button' until LEDs 1 - 4 turn blue, then move magnet away, to reboot VDO Sceptron. Restart P3 or DMX controller.
Product seems completely dead.	Product has gone into thermal protection shutdown.	Check product temperature readouts on P3 system controller. Reduce ambient temperature by providing ventilation or fan cooling, for example.
	No DC power to product.	Check 48 VDC power supply and cables
	Internal fault.	Disconnect from power. Do not attempt repairs yourself. Contact Martin Service or an authorized Martin service partner for assistance.
VDO Sceptron does not display as intended.	Bad 48 VDC power transmission.	Inspect connections and cables. Correct poor connections. Repair or replace damaged cables.
	Bad data transmission.	Inspect connections and cables. Correct poor connections. Repair or replace damaged cables.
	Incorrect mapping or addressing of products.	Check product address and controller settings.
	Product in installation is defective and is disturbing data transmission.	Substitute known good products one at a time until normal operation is regained. Have faulty product serviced by Martin Service.

Table 9: Troubleshooting

DMX protocols

Direct DMX control

The following DMX Modes are available when sending a DMX signal directly to fixtures.

RGB Mode

Channel	DMX Value	Function
1	0 - 255	**Red** 0 → 100%
2	0 - 255	**Green** 0 → 100%
3	0 - 255	**Blue** 0 → 100%

Table 10: DMX Protocol, RGB Mode

Basic Mode

Channel	DMX Value	Function
1	0 - 65535	**Dimmer fade (MSB)** 8-bit coarse control, closed 0% → open 100%
2		**Dimmer fade (LSB)** 16-bit fine adjustment, closed → open
3	0 - 49 50 - 200 201 - 210 211 - 255	**Strobe** No strobe Strobe, slow → fast No strobe Random strobe, slow → fast
4	0 - 255	**Strobe duration** 0 → 1 second
5	0 1 - 255	**FX selection** No FX: output controlled on RGB channels FX selection (see "Segment control in P3 PixelMap Mode" on page 48)
6	0 - 126 127 - 128 129 - 255	**FX speed / modifier (depending on effect)** Fast → slow Stop Slow → fast
7	0 1 2 3 - 34 35 36 37 - 100 101 - 120 121 - 140 141 - 255	**FX synchronization** No sync Fixture offset 10° Fixture offset 10° ... Fixture offset 350° Synchronized *No function* Random start Random duration *No function*
8	0 - 255	**Red** 0 → 100%
9	0 - 255	**Green** 0 → 100%
10	0 - 255	**Blue** 0 → 100%

Table 11: DMX Protocol, Basic Mode

Segment Mode

Channel	DMX Value	Function
1	0 - 65535	**Dimmer fade (MSB)** 8-bit coarse control, closed 0% → open 100%
2		**Dimmer fade (LSB)** 16-bit fine adjustment, closed → open
3	0 - 49 50 - 200 201 - 210 211 - 255	**Strobe** No strobe Strobe, slow → fast No strobe Random strobe, slow → fast
4	0 - 255	**Strobe duration** 0 → 1 second
5	0 1 - 255	**FX selection** No FX: output controlled on RGB channels FX selection (see "Segment control in P3 PixelMap Mode" on page 48)
6	0 - 126 127 - 128 129 - 255	**FX speed / modifier (depending on effect)** Fast → slow Stop Slow → fast
7	0 1 2 3 - 34 35 36 37 - 100 101 - 120 121 - 140 141 - 255	**FX synchronization** No sync Fixture offset 10° Fixture offset 10° ... Fixture offset 350° Synchronized *No function* Random start Random duration *No function*
Segment RGB control		
8	0 - 255	**Segment 1 Red** 0 → 100%
9	0 - 255	**Segment 1 Green** 0 → 100%
10	0 - 255	**Segment 1 Blue** 0 → 100%
11	0 - 255	**Segment 2 Red** 0 → 100%
12	0 - 255	**Segment 2 Green** 0 → 100%
13	0 - 255	**Segment 2 Blue** 0 → 100%
Etc...	...	*See details below*

Table 12: DMX Protocol, Segment Mode

Channels used by different fixtures in Segment Mode

In Segment Mode, the following channels are used for RGB control of segments:
- 320 mm fixtures (two 160 mm segments) = channels 8 - 13
- 1000 mm fixtures (five 200 mm segments) = channels 8 - 22

Pixel Mode

Channel	DMX Value	Function
1	0 - 65535	**Dimmer fade (MSB)** 8-bit coarse control, closed 0% → open 100%
2		**Dimmer fade (LSB)** 16-bit fine adjustment, closed → open
3	0 - 49 50 - 200 201 - 210 211 - 255	**Strobe** No strobe Strobe, slow → fast No strobe Random strobe, slow → fast
4	0 - 255	**Strobe duration** 0 → 1 second
5	0 1 - 255	**FX selection** No FX: output controlled on RGB channels FX selection (see "Segment control in P3 PixelMap Mode" on page 48)
6	0 - 126 127 - 128 129 - 255	**FX speed / modifier (depending on effect)** Fast → slow Stop Slow → fast
7	0 1 2 3 - 34 35 36 37 - 100 101 - 120 121 - 140 141 - 255	**FX synchronization** No sync Fixture offset 10° Fixture offset 10° ... Fixture offset 350° Synchronized *No function* Random start Random duration *No function*
Individual pixel control	
8	0 - 255	**Pixel 1 Red** 0 → 100%
9	0 - 255	**Pixel 1 Green** 0 → 100%
10	0 - 255	**Pixel 1 Blue** 0 → 100%
11	0 - 255	**Pixel 2 Red** 0 → 100%
12	0 - 255	**Pixel 2 Green** 0 → 100%
13	0 - 255	**Pixel 2 Blue** 0 → 100%
Etc...	...	*See details below*

Table 13: DMX Protocol, Pixel Mode

Channels used by different fixtures in Pixel Mode

In Pixel Mode, the following channels are used for RGB control of individual pixels:

- Sceptron 10, 320 mm = channels 8 - 103
- Sceptron 10, 1000 mm = channels 8 - 307
- Sceptron 20, 320 mm = channels 8 - 55
- Sceptron 20, 1000 mm = channels 8 - 157
- Sceptron 40, 320 mm = channels 8 - 31
- Sceptron 40, 1000 mm = channels 8 - 82

Pre-programmed FX

The range of FX listed in this table is available when controlling the fixture directly by DMX (no P3 System Controller used). To use the pre-programmed FX:

• Select the FX in this table on channel 5 in Basic Mode or Pixel Mode.

• Set FX modification (in most cases this adjusts FX speed) on channel 6.

• Synchronize and set offsets between fixtures on channel 7.

Channel	DMX Value	Function
	0	No FX
		Intensity FX
	1	Wave
	2	Step
	3	Pulse
	4	Blackout strobe
	5	2x strobe
	6	3x strobe
	7	4x strobe
	8	Up, down flash
	9	Up, flash, down, flash
	10	Random levels
	11	Pixel killer
	12	Noise overlay
	13 - 19	*No function*
	20	Movie flicker
	21	Electric arc
	22	Atomic lightning
	23	Thunderstorm
	24 - 50	*No function*
		Color FX
5	51	Rainbow wave
	52	Rainbow step
	53	Rainbow pulse
	54	RGB wave
	55	RGB step
	56	RGB pulse
	57	CMY wave
	58	CMY step
	59	CMY pulse
	60	Random mix wave
	61	Random mix step
	62	Random mix pulse
	63 - 68	*No function*
	69	Solid
	70	Spectrum shifter
	71	RGB to white wave
	72	RGB to white step
	73	RGB to white pulse
	74	RGB to white strobe
	75	Normal to white wave
	76	Normal to white step
	77	Normal to white pulse
	78	Normal to white strobe
	79 -100	*No function*

Table 14: Pre-programmed FX

Channel	DMX Value	Function
5 (continued)		***Special FX***
	101	Police chase
	102	Nightrider
	103	Stars
	104	Fiberoptic white
	105	Fiberoptic mix
	106	Plasma
	107	Starfield
	108	Colorwave
	109	Noise
	110	Snowflakes
	111	Rain
	112-255	*No function*

Table 14: Pre-programmed FX

DMX via P3 System Controller

The following DMX Modes are available when sending a DMX signal to a P3 System Controller which then relays the signal to fixtures.

P3 Intensity Mode

In P3 Intensity Mode:
- The fixture displays video
- DMX only adjusts the intensity of the video.

Channel	DMX Value	Function
1	0 - 255	**Intensity** 0 → 100%

Table 15: DMX Protocol, P3 Intensity Mode

P3 RGB Mode

In P3 RGB Mode:
- The fixture displays video
- DMX only adjusts the color of the video.

Channel	DMX Value	Function
1	0 - 255	**Red** 0 → 100%
2	0 - 255	**Green** 0 → 100%
3	0 - 255	**Blue** 0 → 100%

Table 16: DMX Protocol, P3 RGB Mode

P3 Basic Mode

In P3 Basic Mode:
- The fixture displays video
- DMX only adjusts the intensity and color of the video.

Channel	DMX Value	Function
1	0 - 65535	**Intensity (MSB)** 8-bit coarse control, closed 0% → open 100%
2		**Intensity (LSB)** 16-bit fine adjustment, closed → open
3	0 - 255	**Red** 0 → 100%
4	0 - 255	**Green** 0 → 100%
5	0 - 255	**Blue** 0 → 100%

Table 17: DMX Protocol, P3 Basic Mode

P3 Hybrid Mode

In P3 Hybrid Mode:

- When the P3 Switch channel (channel 3) is set to above 50% the fixture displays video, and channels 4-6 adjust the color of the video on the fixture.
- When the P3 Switch channel (channel 3) is set to below 50% the fixture is controlled by DMX only, and channels from 4 to the last channel control the color of the segments of the fixture. The number of channels used for RGB control of segments starting at channel 4 depends on the number of segments per fixture.
- The number of RGB segments per fixture can be set on the P3 System Controller.

Channel	DMX Value	Function
1	0 - 65535	**Intensity (MSB)** 8-bit coarse control, closed 0% → open 100%
2		**Intensity (LSB)** 16-bit fine adjustment, closed → open
3	0 - 127 128 - 255	**P3 Switch** DMX Mode Video Mode
Segment control		
4	0 - 255	**Segment 1 Red** 0 → 100%
5	0 - 255	**Segment 1 Green** 0 → 100%
6	0 - 255	**Segment 1 Blue** 0 → 100%
7	0 - 255	**Segment 2 Red** 0 → 100%
8	0 - 255	**Segment 2 Green** 0 → 100%
9	0 - 255	**Segment 2 Blue** 0 → 100%
Etc...	...	*See details below*

Table 18: DMX Protocol, P3 Hybrid Mode

Segment control in P3 Hybrid Mode

In P3 Hybrid Mode, fixtures can be set to use the following numbers of segments and DMX channels:

VDO Sceptron 10, 320mm

- 1 segment – 6 DMX channels
- 2 segments – 9 DMX channels
- 4 segments – 15 DMX channels
- 8 segments – 27 DMX channels
- 16 segments – 51 DMX channels
- 32 segments (individual pixels) – 99 DMX channels

VDO Sceptron 10, 1000mm

- 1 segment – 6 DMX channels
- 2 segments – 9 DMX channels
- 4 segments – 15 DMX channels
- 5 segments – 18 DMX channels
- 10 segments – 33 DMX channels
- 20 segments – 63 DMX channels
- 25 segments – 78 DMX channels
- 50 segments – 153 DMX channels
- 100 segments (individual pixels) – 303 DMX channels

VDO Sceptron 20, 320mm

- 1 segment – 6 DMX channels
- 2 segments – 9 DMX channels
- 4 segments – 15 DMX channels
- 8 segments – 27 DMX channels
- 16 segments (individual pixels) – 51 DMX channels

VDO Sceptron 20, 1000mm

- 1 segment – 6 DMX channels
- 2 segments – 9 DMX channels
- 5 segments – 18 DMX channels
- 10 segments – 33 DMX channels
- 25 segments – 78 DMX channels
- 50 segments (individual pixels) – 153 DMX channels

VDO Sceptron 40, 320mm

- 1 segment – 6 DMX channels
- 2 segments – 9 DMX channels
- 4 segments – 15 DMX channels
- 8 segments (individual pixels) – 27 DMX channels

VDO Sceptron 40, 1000mm

- 1 segment – 6 DMX channels
- 5 segments – 18 DMX channels
- 25 segments (individual pixels) – 78 DMX channels

P3 PixelMap Mode

In P3 PixelMap Mode:
- The fixture is controlled by DMX only (it never shows video), and channels from 1 to the last channel control the color of the segments of the fixture. The number of channels used for RGB control of segments starting at channel 4 depends on the number of segments per fixture.
- The number of RGB segments per fixture can be set on the P3 System Controller.

Channel	DMX Value	Function
1	0 - 255	**Segment 1 Red** 0 → 100%
2	0 - 255	**Segment 1 Green** 0 → 100%
3	0 - 255	**Segment 1 Blue** 0 → 100%
4	0 - 255	**Segment 2 Red** 0 → 100%
5	0 - 255	**Segment 2 Green** 0 → 100%
6	0 - 255	**Segment 2 Blue** 0 → 100%
Etc...	...	*See details on next page*

Table 19: DMX Protocol, P3 PixelMap Mode

Segment control in P3 PixelMap Mode

In P3 PixelMap Mode, fixtures can be set to use the following numbers of segments and DMX channels:

VDO Sceptron 10, 320mm

- 1 segment – 3 DMX channels
- 2 segments – 6 DMX channels
- 4 segments – 12 DMX channels
- 8 segments – 24 DMX channels
- 16 segments – 48 DMX channels
- 32 segments (individual pixels) – 96 DMX channels

VDO Sceptron 10, 1000mm

- 1 segment – 3 DMX channels
- 2 segments – 6 DMX channels
- 4 segments – 12 DMX channels
- 5 segments – 15 DMX channels
- 10 segments – 30 DMX channels
- 20 segments – 60 DMX channels
- 25 segments – 75 DMX channels
- 50 segments – 150 DMX channels
- 100 segments (individual pixels) – 300 DMX channels

VDO Sceptron 20, 320mm

- 1 segment – 3 DMX channels
- 2 segments – 6 DMX channels
- 4 segments – 12 DMX channels
- 8 segments – 24 DMX channels
- 16 segments (individual pixels) – 48 DMX channels

VDO Sceptron 20, 1000mm

- 1 segment – 3 DMX channels
- 2 segments – 6 DMX channels
- 5 segments – 15 DMX channels
- 10 segments – 30 DMX channels
- 25 segments – 75 DMX channels
- 50 segments (individual pixels) – 150 DMX channels

VDO Sceptron 40, 320mm

- 1 segment – 3 DMX channels
- 2 segments – 6 DMX channels
- 4 segments – 12 DMX channels
- 8 segments (individual pixels) – 24 DMX channels

VDO Sceptron 40, 1000mm

- 1 segment – 3 DMX channels
- 5 segments – 15 DMX channels
- 25 segments (individual pixels) – 75 DMX channels

Specifications

Physical

Length . . . . Available in 320 mm (12.6 in.) and 1000 mm (39.4 in.) versions
Width . . . . .27 mm (1.07 in.)
Height . . . . .28 mm (1.10 in.)
Weight . . . . 1.2 kg / m (0.81 lbs. per foot)

Control and Programming

Control options. . . . . Martin P3™ System Controller (via Martin P3 PowerPort) or DMX
Protocol detection . . . . .Automatic
Control modes, direct DMX control . . . . RGB, Basic, Segment and Pixel
Control modes, DMX via P3. . . . . .P3 Intensity, P3 RGB, P3 Basic, P3 Hybrid and P3 PixelMap
Setting and addressing . . . . P3 System controller or RDM-compliant controller
Control resolution. . . . . 16-bit (P3) or 8-bit (DMX) control of each color
Color and intensity calibration . . . . .Pixel-level
DMX compliance . . . . USITT DMX512-A
RDM compliance . . . . ANSI/ESTA E1.20
Firmware update . . . . Via Martin P3 System controller

DMX channels, direct DMX control

VDO Sceptron 10. . . . . 3/10/13/22/103/307
VDO Sceptron 20. . . . . 3/10/13/22/55/157
VDO Sceptron 40. . . . . 3/1013/22//31/82

DMX channels, DMX via P3 System Controller

VDO Sceptron 10. . . . . Wide range of options from 1 to 303
VDO Sceptron 20. . . . . Wide range of options from 1 to 153
VDO Sceptron 40. . . . . Wide range of options from 1 to 78

Signal Protocol

P3 (via Martin P3 PowerPort) or DMX

Optics

Minimum LED lifetime . . . . 50 000 hours (to >70% luminous output)*

*Figure obtained under manufacturer's test conditions

Options

Open Front
Flat Diffuser
Smoked Flat Diffuser
Round Diffuser
Smoked Round Diffuser
Square Diffuser (fixtures are supplied with these installed)
Smoked Square Diffuser
Tube Diffuser
Smoked Tube Diffuser
NoBlend Diffuser, 10 mm
Smoked NoBlend Diffuser, 10 mm
NoBlend Diffuser, 20 mm
Smoked NoBlend Diffuser, 20 mm
NoBlend Diffuser, 40 mm
Smoked NoBlend Diffuser, 40 mm
Asymmetric (Wall-Washing) Lens
Lens Array Narrow, 20 mm
Lens Array Narrow, 40 mm

All optical accessory options are interchangeable and clip onto fixtures

Control/User Interface

Device status . . . . Multi-color visual indication
Device test and reset . . . . Magnetic pushbutton to call up local test patterns and reset device

Video Processing

Brightness control
Gamma correction and control
Color temperature control
Color space control
Calibration processing
Synchronization

Photometric Data

Color resolution . . . . .16 bits per color (48 bits per pixel)
Viewing angle. . . . . 120° x 120°

VDO Sceptron 10

Pixels per meter. 100
Pitch (pixel center-to-center) . . . . .10.00 mm
Luminous intensity, calibrated mode . . . . 250 cd per meter
Total output, calibrated mode. . . . . 750 lumens per meter
Total output, calibrated mode. . . . . 8333 nits (modules spaced 30 mm center-to-center)

VDO Sceptron 20

Pixels per meter. 50
Pitch (pixel center-to-center) . . . . .20.00 mm
Luminous intensity, calibrated mode . . . . 125 cd per meter
Total output, calibrated mode. . . . . 375 lumens per meter
Total output, calibrated mode. . . . . 4166 nits (modules spaced 30 mm center-to-center)

VDO Sceptron 40

Pixels per meter. 25
Pitch (pixel center-to-center) . . . . .40.00 mm
Luminous intensity, calibrated mode . . . . 62 cd per meter
Total output, calibrated mode. . . . . 187 lumens per meter
Total output, calibrated mode. . . . . 2083 nits (modules spaced 30 mm center-to-center)

Construction

Base. . . . . Extruded aluminum profile
Color . . . . .Matt black
Protection rating. IP65
RoHS compliant

Installation

Orientation . . . . .Any
Mounting . . . . .Channel for M6 captive nuts on back of profile.
Mounting options . . . . M6 bolts, optional sliding bracket (accepts M12 bolt)

Connections

Power and data input . . . . 6-pin custom (BBD-type) IP66-rated
Power and data thru. . . . . 6-pin custom (BBD type) IP66-rated
Hot-plugging compatible

Electrical

Nominal input voltage . . . . .48 VDC +/- 4%
Power supply options. Martin P3 PowerPort 1500, Martin P3 PowerPort 1000 IP,
Martin IP66 PSU 240W, Martin DMX PowerPort 375
or generic 48 VDC PSU

VDO Sceptron 10

Total power consumption . . . . .33 W per meter at full intensity, full white

VDO Sceptron 20

Total power consumption . . . . .17 W per meter at full intensity, full white

VDO Sceptron 40

Total power consumption . . . . 8.5 W per meter at full intensity, full white

Thermal

Cooling. . . . . Convection
Maximum ambient temperature (Ta max.) for typical video content. . . . . 55° C (131° F)
Minimum ambient temperature (Ta min.) . . . . -30° C (-22° F)

VDO Sceptron 10

Max. total heat dissipation, calculated, +/- 10%. . . . . 115 BTU/hr per meter

VDO Sceptron 20

Max. total heat dissipation, calculated, +/- 10%. . . . . 60 BTU/hr per meter

VDO Sceptron 40

Max. total heat dissipation, calculated, +/- 10%. . . . . 30 BTU/hr per meter

Approvals

CE ETL Intertek RCM	EU safety. .EN 60950-1, EN 60950-22, EN 62471
	EU EMC . . . . .EN 55024, EN 55032
	US safety. . . . . UL 60950-1, UL 60950-22
	US EMC . . . . .CFR Title 47 Part 15 Class A
	Canadian safety . . . . .CSA C22.2 No. 60950-1, No. 60950-22
	Canadian EMC . . . . ICES-003 Class A
	Australia/NZ . . . . .RCM

Accessories

Service

VDO Sceptron Accessory and Test Tool with magnetic swiper, set of 10 . . . . P/N 91610139
VDO Sceptron Diffuser Lens Removal Jaws . . . . P/N 91611836

Hardware

VDO Sceptron/Fatron Sliding Brackets, set of 10 . . . . P/N 91610123
VDO Sceptron/Fatron Linear (End-to-End) Coupler . . . . P/N 91611843
VDO Sceptron Linear (End-to-End) Couplers, set of 10 (not suitable for VDO Fatron) . . . . . P/N 91610124
VDO Sceptron/Fatron Spigot Adapter, 28 mm. . . . . P/N 91611791
VDO Sceptron/Fatron Floor stands, set of two . . . . P/N 91611792
VDO Sceptron/Fatron Low-profile Half Coupler Rigging Clamp, black . . . . P/N 91611790
Superlight Half-coupler Rigging Clamp, black . . . . P/N 91602018
VDO Sceptron Pivot Coupler . . . . P/N 91611793
VDO Sceptron Parallel Couplers 30/40/50 mm, set of 10 . . . . P/N 91610125
VDO Sceptron Parallel Couplers 60/70/80 mm, set of 10 . . . . P/N 91610138
Safety Cable, SWL 60 kg, BGV C1 / DGUV 17, black . . . . P/N 91604006
Safety Cable, SWL 60 kg, BGV C1 / DGUV 17, silver . . . . P/N 91604007

Optical

VDO Sceptron Flat Diffuser, 320 mm . . . . P/N 91610111
VDO Sceptron Flat Diffuser, 1000 mm . . . . P/N 91610112
VDO Sceptron Flat Smoked Diffuser, 320 mm . . . . P/N 91610113
VDO Sceptron Flat Smoked Diffuser, 1000 mm . . . . P/N 91610114
VDO Sceptron Round Diffuser, 320 mm . . . . P/N 91610115
VDO Sceptron Round Diffuser, 1000 mm . . . . P/N 91610116
VDO Sceptron Round Smoked Diffuser, 320 mm . . . . P/N 91610117
VDO Sceptron Round Smoked Diffuser, 1000 mm . . . . P/N 91610118
VDO Sceptron Square Diffuser, 320 mm (installed on fixtures when supplied). . . . . P/N 91610119
VDO Sceptron Square Diffuser, 1000 mm (installed on fixtures when supplied). . . . . P/N 91610120
VDO Sceptron Square Smoked Diffuser, 320 mm. . . . . P/N 91610121
VDO Sceptron Square Smoked Diffuser, 1000 mm. . . . . P/N 91610122
VDO Sceptron Tube Diffuser, 320 mm. . . . . P/N 91611630
VDO Sceptron Tube Diffuser, 1000 mm. . . . . P/N 91611640
VDO Sceptron Tube Smoked Diffuser, 320 mm. . . . . P/N 91611650
VDO Sceptron Tube Smoked Diffuser, 1000 mm. . . . . P/N 91611660
VDO Sceptron 10 NoBlend Diffuser, 320 mm . . . . P/N 91610126
VDO Sceptron 10 NoBlend Diffuser, 1000 mm . . . . P/N 91610127

VDO Sceptron 10 NoBlend Smoked Diffuser, 320 mm . . . . P/N 91610128
VDO Sceptron 10 NoBlend Smoked Diffuser, 1000 mm . . . . P/N 91610129
VDO Sceptron 20 NoBlend Diffuser, 320 mm . . . . P/N 91610130
VDO Sceptron 20 NoBlend Diffuser, 1000 mm . . . . P/N 91610131
VDO Sceptron 20 NoBlend Smoked Diffuser, 320 mm . . . . P/N 91610132
VDO Sceptron 20 NoBlend Smoked Diffuser, 1000 mm . . . . P/N 91610133
VDO Sceptron 40 NoBlend Diffuser, 320 mm . . . . P/N 91610134
VDO Sceptron 40 NoBlend Diffuser, 1000 mm . . . . P/N 91610135
VDO Sceptron 40 NoBlend Smoked Diffuser, 320 mm . . . . P/N 91610136
VDO Sceptron 40 NoBlend Smoked Diffuser, 1000 mm . . . . P/N 91610137
VDO Sceptron Asymmetric Lens, 320 mm . . . . P/N 91611670
VDO Sceptron Asymmetric Lens, 1000 mm . . . . P/N 91611680
VDO Sceptron 20 Lens Array, Narrow, 320 mm . . . . P/N 91610140
VDO Sceptron 20 Lens Array, Narrow, 1000 mm . . . . P/N 91610141
VDO Sceptron 40 Lens Array, Narrow, 320 mm . . . . P/N 91610142
VDO Sceptron 40 Lens Array, Narrow, 1000 mm . . . . P/N 91610143

Combined DC power and data cables
Power + Data Input Cable, 4-pin male XLR (for P3 PowerPort or DMX PowerPort 375)
        to female BBD, 0.25 m (9.8 in.). . . . . P/N 91616046
Power + Data Input Cable, 5-pin male XLR (for DMX) + wire tails (for PSU)
        to female BBD, 0.25 m (9.8 in.). . . . . P/N 91616048
Power + Data Input Cable, 5-pin male XLR (for DMX) + 4-pin male XLR (for
        P3 PowerPort) to female BBD, 0.25m (9.8 in.) . . . . P/N 91616049
Power + Data Input Cable, 5-pin male XLR (for DMX) + male Martin IP66 PSU 240W
        to female BBD, 0.25 m (9.8 in.). . . . . P/N 91616050
Power + Data Output Cable, male BBD
        to 4-pin female XLR, 0.25m (9.8 in.) . . . . P/N 91616047
DMX Lead-out Cable, male BBD to 5-pin female XLR, 0.25 m (9.8 in.) . . . . P/N 91616051

BBD extension cables
Power + Data Extension Cable, Rental Type, BBD to BBD 1 m (3.3 ft.) . . . . P/N 91616041
Power + Data Extension Cable, Rental Type, BBD to BBD, 2.5 m (8.2 ft.). . . . . P/N 91616024
Power + Data Extension Cable, Rental Type, BBD to BBD, 5 m (16.4 ft.) . . . . P/N 91616042
Power + Data Extension Cable, Rental Type, BBD to BBD, 10 m (32.8 ft.) . . . . P/N 91616043
Power + Data Extension Cable, Rental Type, BBD to BBD, 25 m (82.1 ft.) . . . . P/N 91616044
Power + Data Cable, Rental Type, 100m (328 ft.) bulk without connectors . . . . P/N 91616045

Connectors
Power + Data Cable Connector, BBD, Male. . . . . P/N 91611750
Power + Data Cable Connector, BBD, Female . . . . P/N 91611751
Blanking Caps for unused female BBD connectors, set of 10 . . . . P/N 91616052

Related Items
Martin P3™ PowerPort 1500 . . . . P/N 90721040
Martin P3™ PowerPort 1000 IP, rental model . . . . P/N 90721070
Martin DMX PowerPort 375 . . . . P/N 90721094
Martin IP66 PSU 240W external power supply unit (was Tripix Power IP66). . . . . P/N 90760330
Martin P3-050™ System Controller. . . . . P/N 90721090
Martin P3-150™ System Controller. . . . . P/N 90721015
Martin P3-300™ System Controller. . . . . P/N 90721060
Martin P3-PC™ System Controller . . . . P/N 90721030

Ordering Information
Flightcase for VDO Sceptron™ (holds 10 x 1000mm or 30 x 320 mm fixtures) . . . . P/N 91515030
Flightcase Extender for VDO Sceptron™ (holds 10 x 1000mm or 30 x 320 mm fixtures). . . P/N 91515031

VDO Sceptron™ 10
VDO Sceptron™ 10, 320 mm, in cardboard box* . . . . P/N 90357650
VDO Sceptron™ 10, 1000 mm, in cardboard box* . . . . P/N 90357655

VDO Sceptron™ 20
VDO Sceptron™ 20, 320 mm, in cardboard box* . . . . P/N 90357660
VDO Sceptron™ 20 1000 mm, in cardboard box*. . . . . P/N 90357665

VDO Sceptron™ 40

VDO Sceptron™ 40, 320 mm, in cardboard box* . . . . P/N 90357670

VDO Sceptron™ 40, 1000 mm, in cardboard box* . . . . P/N 90357675

*Please order flightcases and flightcase extenders separately from fixtures.

Fixtures are supplied with Square Diffusers clipped into position on the front of the fixture.

Specifications subject to change without notice. For the latest product specifications, see www.martin.com

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FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Interference-Causing Equipment Regulations - *Règlement sur le Matériel Brouilleur du Canada*

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le Matériel Brouilleur du Canada.

EU EMC

Operation of this equipment in a residential environment could cause radio interference.

Not for use in a computer room as defined in the Standard for the Protection of Information Technology Equipment, ANSI/NFPA 75.

Ne peut être utilisé dans une salle d'ordinateurs telle que définie dans la norme ANSI/NFPA 75 'Standard for the Protection of Information Technology Equipment'.

Disposing of this product

Martin products are supplied in compliance with Directive 2012/19/EC of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), 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.