# VDO Dotron™
## User Manual
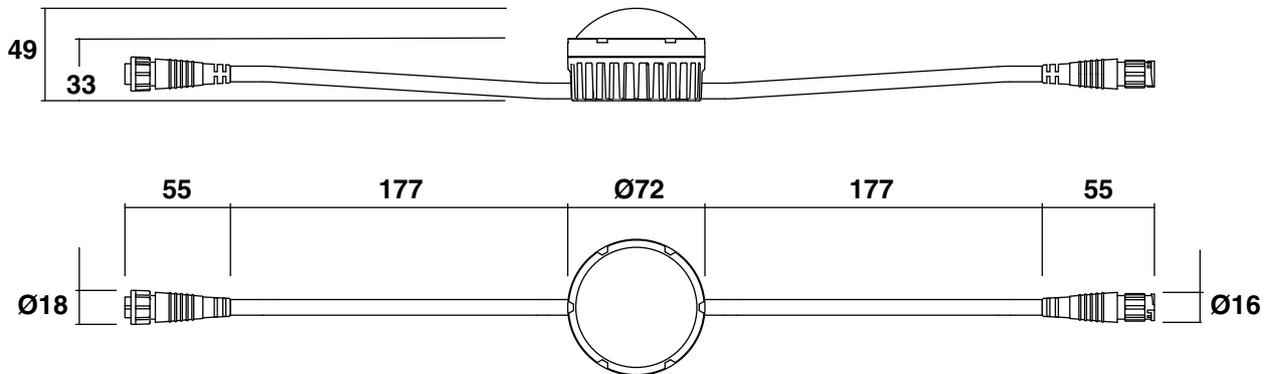
**Martin**®
by HARMAN

# Dimensions

**VDO Dotron, no diffuser / flat diffuser**

34

| 55 | 177 | Ø72 | 177 | 55 |

Ø18

Ø16
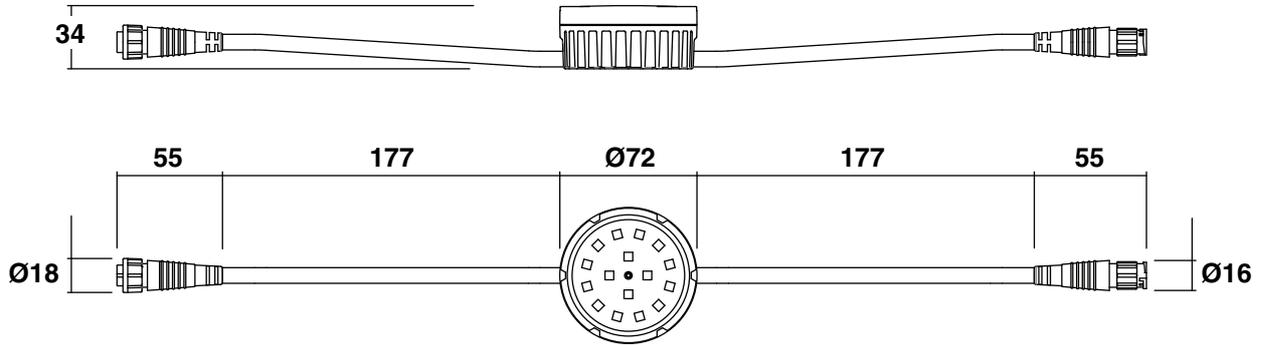
**VDO Dotron, diffuser dome front**

49

33

| 55 | 177 | Ø72 | 177 | 55 |

Ø18

Ø16

**VDO Dotron, directional lens array front**

42

| 55 | 177 | Ø72 | 177 | 55 |

Ø18

Ø16
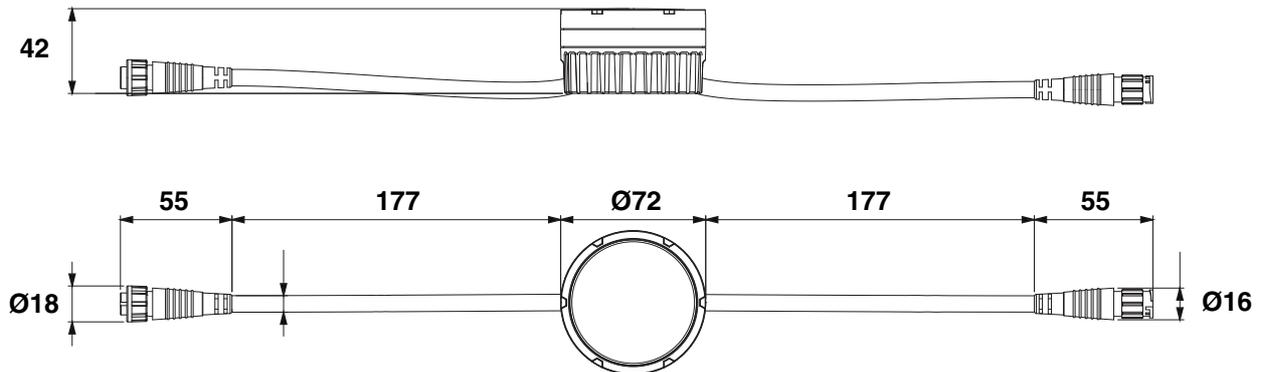
*Direct dot-to-dot connection allows up to 0.5 m (19.6 in.) pixel pitch*

*All dimensions are in millimeters*

**VDO Dotron Flange Bracket**

Ø4.5

Ø6.5  Ø15

54 | 45

26

86

100

3

**VDO Dotron Half-coupler Rigging Clamp**

91

30

92

67

Tube external Ø 48-51

61

60

**VDO Dotron to VDO Sceptron End Coupler**

61

143

13
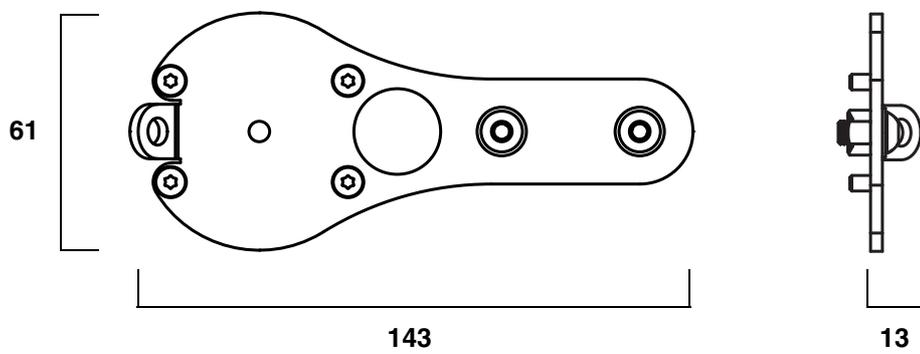
*All dimensions are in millimeters*

**VDO Sceptron to VDO Dotron Pivot Coupler**



*All dimensions are in millimeters*

# 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!** Burn hazard. Hot surface with risk of burns. | **Warning!** Refer to user manual. |
|---|---|---|---|---|

**Warning!**

- **Check the VDO Dotron Product Support / Tech Docs page on the Martin® website at www.martin.com and make the sure that you have the latest user documentation for the product. Martin user manual revisions are identified at the bottom of page 2.**

- **Read the latest revision of the user manual before installing, operating or servicing the Martin VDO Dotron.**

- **Follow the safety precautions given in this user manual and in the manuals of all the devices you connect to the product. Observe all warnings given in manuals and printed on devices. Make sure that everyone who is involved in working on or using the product has read and understood these safety precautions and warnings.**
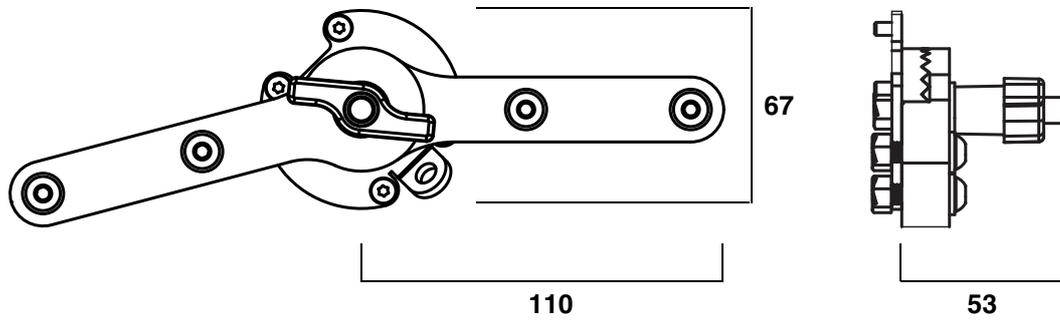
- **Install, connect, operate and service devices only as described in this user manual and in connected devices' user documentation and only in accordance with local laws and regulations. All Martin user documentation is supplied with devices and available for download from www.martin.com.**

- **This product 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.**

- **This product does not have user-serviceable parts. LEDs are not replaceable. Refer any operation not described in this manual to Martin Global Service or a Martin authorized service agent.**

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 documentation of all the devices that you intend to connect to the VDO Dotron, 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 so that power to the installation can 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 if it shows signs of overheating.
- Do not immerse the VDO Dotron in water. Do not allow water to collect around the VDO Dotron or connectors.
- If you supply a chain of VDO Dotron dots 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 7.5 A, install an inline fuseholder with a 7.5 A fuse on the circuit that you connect to that DC output.
- Do not allow the total number of dots in a linked chain of VDO Dotron dots to exceed the safe limits given in the tables in the following section of this manual.

## Safety limits for connecting devices

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

- **The maximum permitted total length of a chain of VDO Dotron dots is 50 m (164 ft.).** When you calculate the total length of the chain, include the cable tails on dots (2 x 25 cm or 2 x 10 ins. per dot) plus the lead-in cable (cable between the DC power source and the first VDO Dotron dot), plus all extension cable added between dots.
- The maximum number of VDO Dotron dots that you can connect in one chain depends on the type of device used as DC power source. Do not exceed the limits given in the following sections.

### Martin P3 PowerPort 1500 safety limits

If you supply VDO Dotron dots with DC power from a Martin P3 PowerPort 1500:

- Do not connect more than **one linked chain of VDO Dotron dots 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 dots to one P3 PowerPort 1500.
- Do not connect more than **60 VDO Dotron dots maximum per DC output** on the P3 PowerPort 1500.

### Martin P3 PowerPort 1000 IP safety limits

If you supply VDO Dotron dots with DC power from a Martin P3 PowerPort 1000 IP:

- Do not connect more than **one linked chain of VDO Dotron dots to one DC output** on the P3 PowerPort 1000 IP. Since the P3 PowerPort 1000 IP has four DC outputs, you can connect a maximum of four chains of dots to one P3 PowerPort 1000 IP.
- Do not connect more than **40 VDO Dotron dots maximum per DC output** on the P3 PowerPort 1000.

### Martin DMX PowerPort 375 safety limits

If you supply VDO Dotron dots with DC power from a Martin DMX PowerPort 375:

- Do not connect more than **one linked chain of VDO Dotron dots** to the DMX PowerPort 375's hybrid DC power and data output.
- Do not connect more than **60 VDO Dotron dots maximum** to the DMX PowerPort 375's hybrid DC power and data output.

### *Martin IP66 PSU 240W safety limits*

If you supply VDO Dotron dots with DC power from a ***Martin IP66 PSU 240W** external power supply unit*:

- Do not connect more than **one linked chain of VDO Dotron dots to the DC power output** of the Martin IP66 PSU 240W.
- Do not connect more than **40 VDO Dotron dots maximum to the DC power output** of the Martin IP66 PSU 240W.

### *Generic 48 VDC external PSU safety limits*

If you supply a chain of VDO Dotron dots with DC power from a **48 VDC external PSU (power supply unit) that is not manufactured by Martin**, you must not exceed the **maximum power rating of the output from the PSU** or **40 VDO Dotron dots**, whichever limit you reach first**.** Follow these instructions:

- Allow a power consumption of **5 watts per dot**. Calculate the total power consumption in watts of the dots in each chain you plan to create. Do not create a chain that will exceed the **maximum power rating of the PSU output** used to supply that chain with power. Each time the total power consumption in watts for one chain reaches the PSU output's maximum power rating, you must create a new chain of dots that is connected to a new 48 VDC power output. For example, if the PSU output is rated 100 W, do not connect more than 20 VDO Dotron dots to that output.
- Even if the maximum power rating of the PSU output is higher than 195 W, do not connect more than **40 VDO Dotron dots maximum per DC output** of the 48 VDC external PSU.
- This means that, each time you reach (a) the maximum total length of 40 dots 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 dots that is connected to a new 48 VDC power output

## PROTECTION FROM BURNS AND FIRE

- The VDO Dotron is cooled by convection. Provide free airflow and a minimum clearance of 10 mm (0.4 in.) around the product.
- Do not operate the VDO Dotron if the ambient temperature (Ta) exceeds 55° C (131° F).
- The surface of the product can become hot when in use. Take precautions to avoid accidental skin contact.
- Do not modify the VDO Dotron 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 12 and respect the limits and instructions given in that chapter.
- 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 Dotron.
- Make sure that all items are securely installed, taking into consideration all possible environmental conditions including temperature variation and wind. Make sure that it is impossible for items to fall and cause injury or damage.
- Use grade 8.8 (or equivalent strength) fasteners that are suitable for their purpose and for the installation environment.
- Fasten VDO Dotron products to the supporting surface or structure with a minimum of two fasteners (screws, bolts, etc.) per product.
- Either use self-locking nuts or use lock washers with standard nuts on all machine screws and bolts.

# Introduction

Thank you for selecting a product from the Martin® VDO Dotron™ family. These compact LED-based display dots are designed to integrate into a Martin P3 video system, where they can display video from a variety of sources. Each dot forms one pixel in the video display. As well as video, the VDO Dotron can be controlled using a DMX lighting controller. Use of an RDM-compliant DMX controller also allows two-way communication and remote management of VDO Dotron dots from the controller if you are not using a P3 system controller to set up and manage dots.

The VDO Dotron has an array of LEDs in a circular cast aluminum housing with a front cover that screws onto the unit to give a rugged IP65-rated dot.

Dots are supplied with a Diffuser Dome mounted, but the domes can be removed and replaced by any of the other optical accessories that can be ordered from Martin: Flat, Flat Smoked, Dome, Dome smoked and Lens Array Narrow Fronts (see "Accessories" on page 39). For instructions for installing optical accessories, see "Service and maintenance" on page 30.

A hybrid (combined power and data) cabling system allows VDO Dotron dots to be daisy-chained for easy setup and minimal cabling.

The VDO Dotron system offers the following features:
- IP65-rated dots and connectors
- Fast, flexible mounting options
- Range of optical accessories that can be installed in seconds without tools
- Built-in FX with individual pixel control
- High-quality 16-bit per color 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 controller from the Martin P3 system controller range
- Single hybrid cable carrying both power and data
- External power and data processor from the Martin P3 PowerPort range and simple cabling system
- Black anodized finish

For detailed dimensions drawings in various file formats of all the products in the VDO Dotron family, please see the VDO Dotron Tech Docs / 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. Before you install or use the VDO Dotron, please check www.martin.com and make sure that you have the latest user documentation for this product. Martin user documentation revisions are identified at the bottom of page 2.

# Precautions to avoid damage

**Important!** To obtain the best performance from the VDO Dotron and avoid causing damage that is not covered by the product warranty, make sure that everyone who is involved in installing, working on or using the VDO Dotron has read and understood the following information.

## Cleaning

Excessive dirt buildup causes overheating and may lead to damage that is not covered by the product warranty. Clean the product at regular intervals (see "Installing optical accessories" on page 30).

## Operating temperature precautions

• Exposing the VDO Dotron to direct sunlight, or operating it in an ambient temperature that exceeds the specified maximum of 55° C (131° F) that applies while showing average video content, may reduce the lifetime of the product.

• When using a Martin P3 System Controller, a Thermal Throttling feature is available. This feature gradually dims all the dots in the installation if one or more dots approaches maximum operating temperature. If you do not activate Thermal Throttling, the VDO Dotron's internal thermal protection will shut down the dot if the dot exceeds maximum operating temperature. The dot will light again when its temperature has fallen to a safe level. To avoid blackouts due to thermal shutdowns, we therefore recommend that you activate Thermal Throttling.

• When using DMX control, VDO Dotron dots automatically begin to reduce their light output when the ambient temperature reaches 45° C in order to control their internal temperature. Output is reduced gradually as the ambient temperature rises above 45° C. Dots will still light at the maximum ambient temperature of 55° C, but output will be considerably reduced. This feature avoids blackouts due to protective thermal shutdowns.

## Sealing unused connectors with blanking caps

Blanking caps for female BBD connectors can be ordered separately in sets of 10 (see "Connectors" on page 40). Install blanking caps on all unused female BBD connectors to seal them against water and dirt, otherwise short-circuits and damage may occur.

# VDO Dotron overview
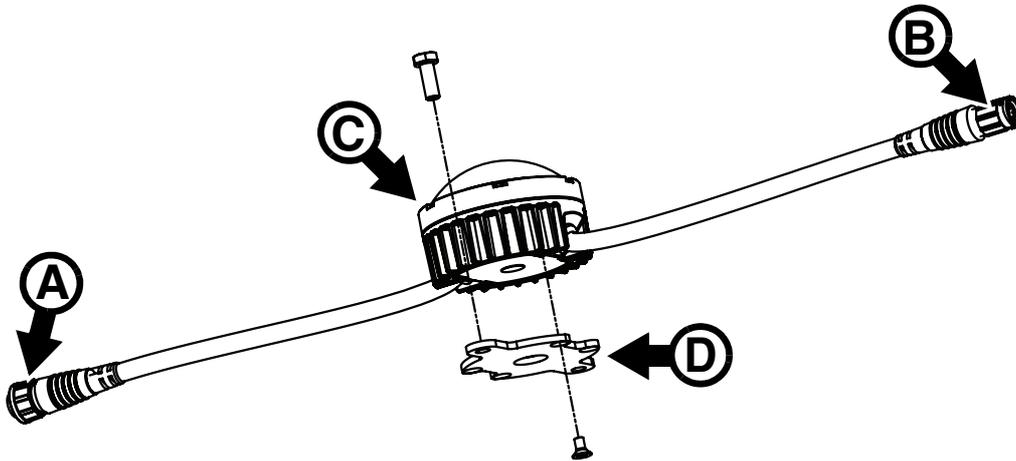


A - DC power + data male BBD-type input connector

B - DC power + data female BBD-type output (thru) connector

C - Dot

D - Flange Bracket (optional accessory)

**Figure 1: Overview**

# Physical installation

**Warning! Read "Safety information" on page 6 before installing the VDO Dotron and read all of this 'Physical installation' chapter before starting work.**

You can install VDO Dotron dots on a surface or structure using one of four methods:

- You can mount dots on VDO Dotron Flange Brackets and then fasten the Flange Brackets to the surface or structure.
- You can mount dots on VDO Dotron Half-Coupler Rigging Clamps and then fasten them to a rigging truss.
- You can mount dots on VDO Sceptron/Fatron End Couplers and fasten them to the end of VDO Sceptron or VDO Fatron creative video dots from Martin.
- You can mount dots on VDO Sceptron/Fatron Pivot Couplers and fasten them between the ends of VDO Sceptron or VDO Fatron creative video fixtures from Martin. The pivot couplers let you quickly lock the VDO Sceptron or VDO Fatron fixtures at an angle.

The VDO Dotron can be installed in any orientation.

Allow free airflow around dots and at least 10 mm (0.4 in.) of clearance around the front surface.

The VDO Dotron is designed to withstand water projections such as rainfall and low-pressure water jets and can be installed outdoors, but do not submerge it and do not install it in a location where water can build up around the dot or under the base of the dot. If necessary, provide drainage at the installation location.

## Avoiding damage

Avoid causing damage that is not covered by the product warranty by following these instructions carefully.

### Keeping connections dry

Moisture on connectors can cause short circuits and damage to products. Check that all connectors are perfectly dry before you connect them. Do not install the VDO Dotron during wet weather conditions or if condensation is visible on any surfaces.

### Avoiding shocks and stress

Do not expose the VDO Dotron to physical shocks (by dropping onto a hard surface, for example).

Do not apply pressure to or otherwise stress diffusers or lenses.

Do not stress cables (by bending them sharply, for example). Protect cables from sharp edges.

# Mounting on a surface

## Mounting on a surface using Flange Brackets

The Flange Bracket available from Martin as an optional accessory for the VDO Dotron (see "Accessories" on page 39) is a mounting plate that is recommended for installing dots on a flat surface.

All fasteners must be suitable for the application and environment. Steel fasteners must be grade 8.8 strength minimum. Stainless steel fasteners must be grade 304 (A2) or better. In marine environments, stainless steel fasteners must be grade 316 (A4) or better.
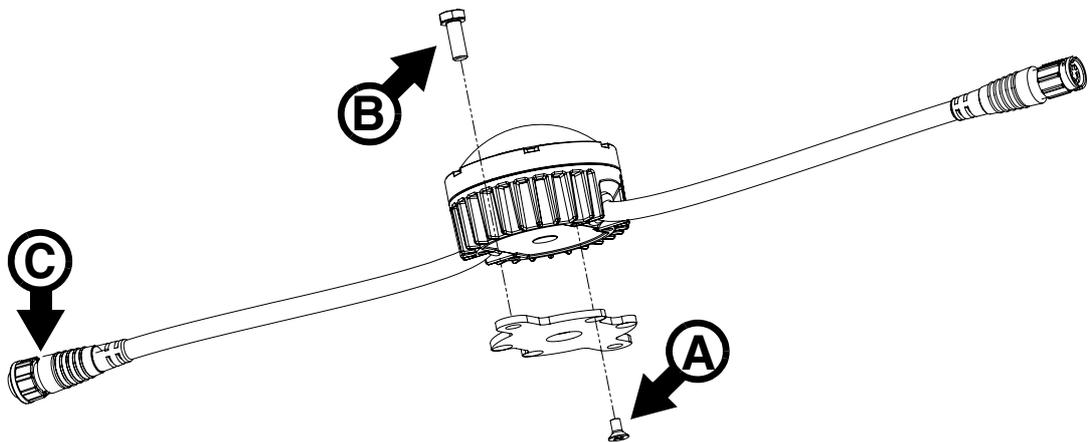


**Figure 2: Installing using a Flange Bracket**

To install an VDO Dotron using a Flange Bracket:

1. See Figure 2. Fasten the Flange Bracket to the base of the dot using the supplied M4 x 8 mm countersunk Torx screws **A** supplied with the Flange Bracket. Use a torque driver to tighten the screws to a torque of 2.5 Nm.

2. For each dot, obtain two grade 8.8 (or equivalent strength) M6 (or quarter-inch) fasteners (screws, screwbolts, etc.) **B** and screw plugs. You can use M6 machine screws and self-locking nuts if you have access to the back of the installation surface. Check that fasteners are suitable for the application and have appropriate corrosion resistance.

3. With reference to the dimensions drawings at the beginning of this manual, prepare two holes with centers 86 mm (3.4 in.) apart in the installation surface to accept two fasteners **B** passed through the holes in the Flange Bracket. Use screw plugs if necessary to ensure a secure installation.

4. Fasten the VDO Dotron and Flange Bracket assembly securely to the surface using two fasteners **B** per Flange Bracket.

5. Connect the dot's input connector **C** to the output connector of the previous device on the link, either directly or via a patch cable. Make sure that all connectors are correctly fastened together with locking rings twisted to ensure a seal.

6. Check that the dot is held securely before you leave it.

### Installing directly on a surface

It is also possible to install the VDO Dotron directly on a flat surface if you have access to the back of the surface.

To install an VDO Dotron on a surface:

1. See Figure 3 (dimensions are in millimeters). Pre-drill the surface with four holes to accept mounting screws.

2. Obtain four grade 8.8 (or equivalent strength) M4 x 8 mm machine screws or bolts for fastening into the back of the dot.

3. Apply a small amount of Loctite to the threads of the screws or bolts, then pass them through the surface and fasten them into the back of the dot. Use a torque driver to tighten to a torque of 2.5 Nm.

4. Connect the dot's input connector to the output connector of the previous device on the link, either directly or via a patch cable. Make sure that all connectors are correctly fastened together with locking rings twisted to ensure a seal.

5. Check that the dot is held securely before you leave it.

**Ø 4.5**

**45**

**26**
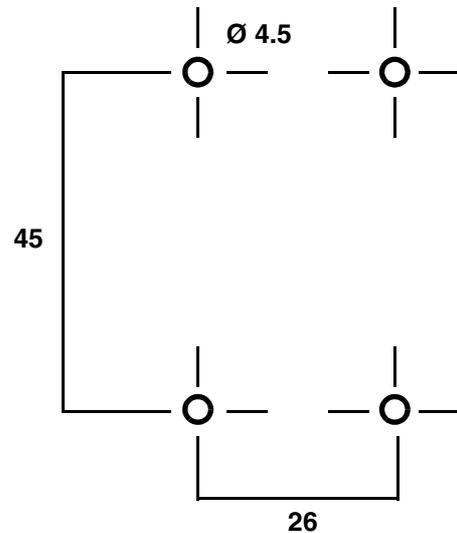
**Figure 3: Dimensions for pre-drilling holes**

## Mounting on a rigging truss

You can mount VDO Dotron dots on a rigging truss or similar bar with a diameter of 48 - 51 mm using the VDO Dotron Half-coupler Rigging Clamp available from Martin (see "Accessories" on page 39).

To mount a VDO Dotron on a rigging truss:

1. See Figure 5. Pass four grade 8.8 (or equivalent strength) non-countersunk M4 x 8 mm machine screws or bolts through the four holes **A** in a Dotron Half-Coupler Clamp and fasten the screws or bolts into the back of the dot. Use a torque driver to tighten to a torque of 2.5 Nm.

2. Loosen handle **B**, open the clamp and pass it around the chord of a rigging truss. Close the clamp and fasten handle **B**. Make sure that handle B is tight, but do not use tools: fasten by hand only.

3. Attach a safety cable or similar secondary attachment to attachment point **C** and to a secure anchoring point so that the safety cable will catch the VDO Dotron if the primary attachments fail.

4. Connect the dot's input connector to the output connector of the previous device on the link, either directly or via a patch cable. Make sure that all connectors are correctly fastened together with locking rings twisted to ensure a seal.

5. Check that the dot is held securely before you leave it.

*VDO Dotron Half-coupler Rigging Clamp, P/N 91611802*
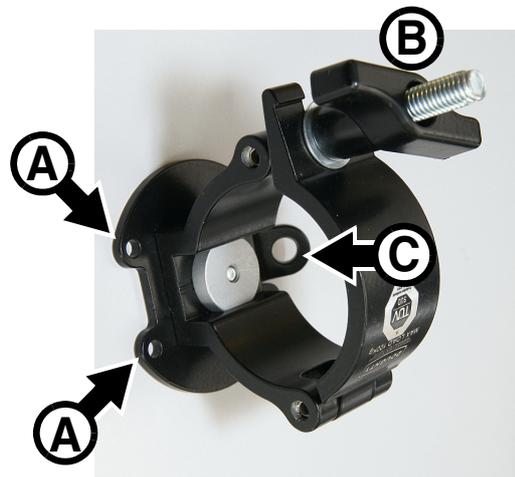
**Figure 4: VDO Dotron Half-coupler Clamp**

# Installing with other Martin creative video products

VDO Dotron dots can be fastened to other Martin creative video products using coupler brackets available from Martin (see "Accessories" on page 39).

## Fastening to the end of a VDO Sceptron or VDO Fatron

To fasten a VDO Dotron to the end of a VDO Sceptron or VDO Fatron fixture:

1. See Figure 5. Pass four grade 8.8 (or equivalent strength) M4 x 8 mm countersunk screws through the four holes **A** in a Dotron to Sceptron End Coupler and fasten them into the back of the Dotron dot. Use a torque driver to tighten to 2.5 Nm.
2. Slide the two nuts **B** into the channel in the back of a Martin Sceptron or Fatron fixture and tighten the two Allen bolts **C** into the nuts **B** to fasten the coupler to the fixture.
3. Attach a safety cable or similar secondary attachment to attachment point **D** and to a secure anchoring point so that the safety cable will catch the VDO Dotron dot if the primary attachments fail.

*VDO Dotron to Sceptron End Coupler, P/N 91616071*



**Figure 5: VDO Dotron to Sceptron End Coupler**

4. Connect the dot's input connector to the output connector of the previous device on the link, either directly or inserting a relay cable. Make sure that all connectors are correctly fastened together with locking rings twisted to ensure a seal.
5. Check that the dot is held securely before you leave it.

## Fastening between two VDO Sceptron or VDO Fatron fixtures

To fasten a VDO Dotron between the ends of two VDO Sceptron or VDO Fatron fixtures:

1. See Figure 6. Pass four grade 8.8 (or equivalent strength) M4 x 8 mm countersunk screws through the four holes **A** in a Dotron-to-Sceptron Pivot Coupler and fasten them into the back of the Dotron dot. Use a torque driver to tighten to 2.5 Nm.
2. Slide the nuts **B** into the channel in the back of a Martin Sceptron or Fatron fixture and tighten the two Allen bolts **C** into the nuts **B** to fasten the coupler to the fixture.
3. Attach a safety cable or similar secondary attachment to attachment point **C** and to a secure anchoring point so that the safety cable will catch the VDO Dotron dot if the primary attachments fail.

*VDO Dotron to Sceptron Pivot Coupler, P/N 91611793*
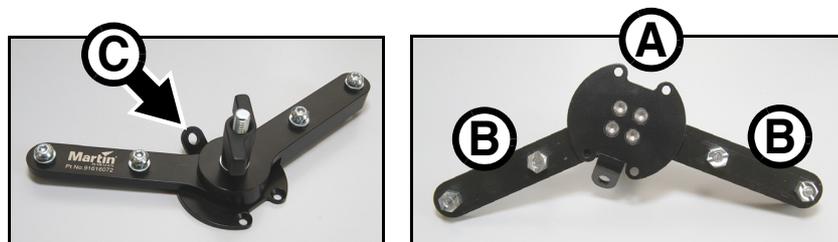


**Figure 6: VDO Dotron to Sceptron Pivot Coupler**

4. Connect the dot's input connector to the output connector of the previous device on the link, either directly or inserting a relay cable. Make sure that all connectors are correctly fastened together with locking rings twisted to ensure a seal.
5. Check that the dot is held securely before you leave it.

# System installation

⚠️ *Warning! Read "Safety information" on page 6 and "Precautions to avoid damage" on page 10 carefully before installing an VDO Dotron system.*

*Warning! Connect the VDO Dotron 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 7 and in the manuals of the other devices in the system.*

*Important! If using DMX, make sure that the DMX console and DC power source are at the same earth (ground) potential, or the data signal may become saturated.*

The VDO Dotron 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 an VDO Dotron installation to display P3 video data or DMX-controlled lighting effects.

Even when VDO Dotron dots 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 36 for details.

## Installing a P3 system

See Figure 8 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 Dotron dots, see the overview in Figure 8 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 6 and "Precautions to avoid damage" on page 10.
3. Connect VDO Dotron dots together in chains either directly using the dots' cable tails and BBD connectors or by adding Martin hybrid cables with BBD connectors (see "Cables" on page 40).
   **Warning!** Do not exceed the maximum number of dots per chain given in "Safety limits for connecting devices" on page 7.
4. Install a blanking cap (see "Connectors" on page 40) on the output connector of the last dot on each chain to protect from water, dirt etc.
5. Connect each chain of VDO Dotron dots 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 7). Alternatively, connect each chain of VDO Dotron dots to one of the 4 outputs on a P3 PowerPort 1000 IP.

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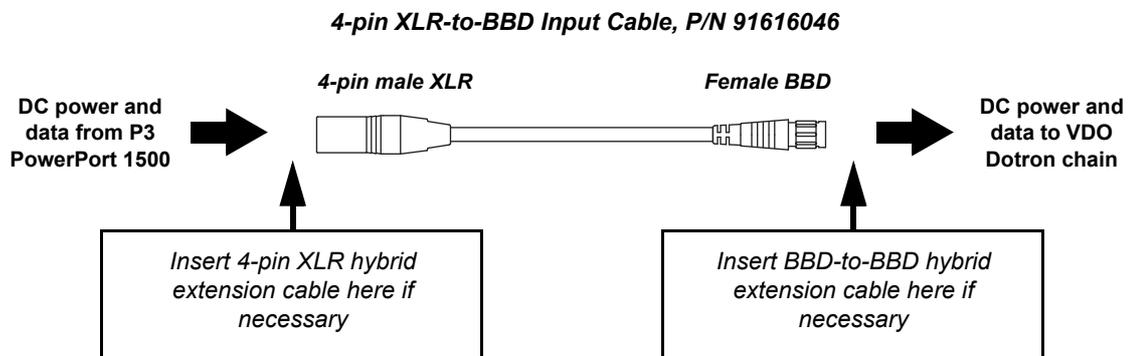


**Figure 7: Power and P3 video data input**

6. If necessary, add a BBD-to-BBD extension cable between the first dot and the P3 PowerPort. Suitable extension cables are available from Martin in various lengths. See "Cables" on page 40.
7. Create a P3 video data link from a Martin P3 system controller such as the P3-50, 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.  It is possible to connect P3 PowerPort devices in daisy-chains in a P3 network, but if you are using multiple P3 PowerPorts in a fixed installation we recommend that you distribute the P3 signal by connecting an unmanaged Gigabit Ethernet switch to the P3 System Controller and then connecting each P3 PowerPort directly to the switch. This eliminates the risk of one P3 PowerPort signal failing and causing loss of signal to the P3 PowerPorts daisy-chained behind it.

9.  Connect the P3 PowerPort 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 25.
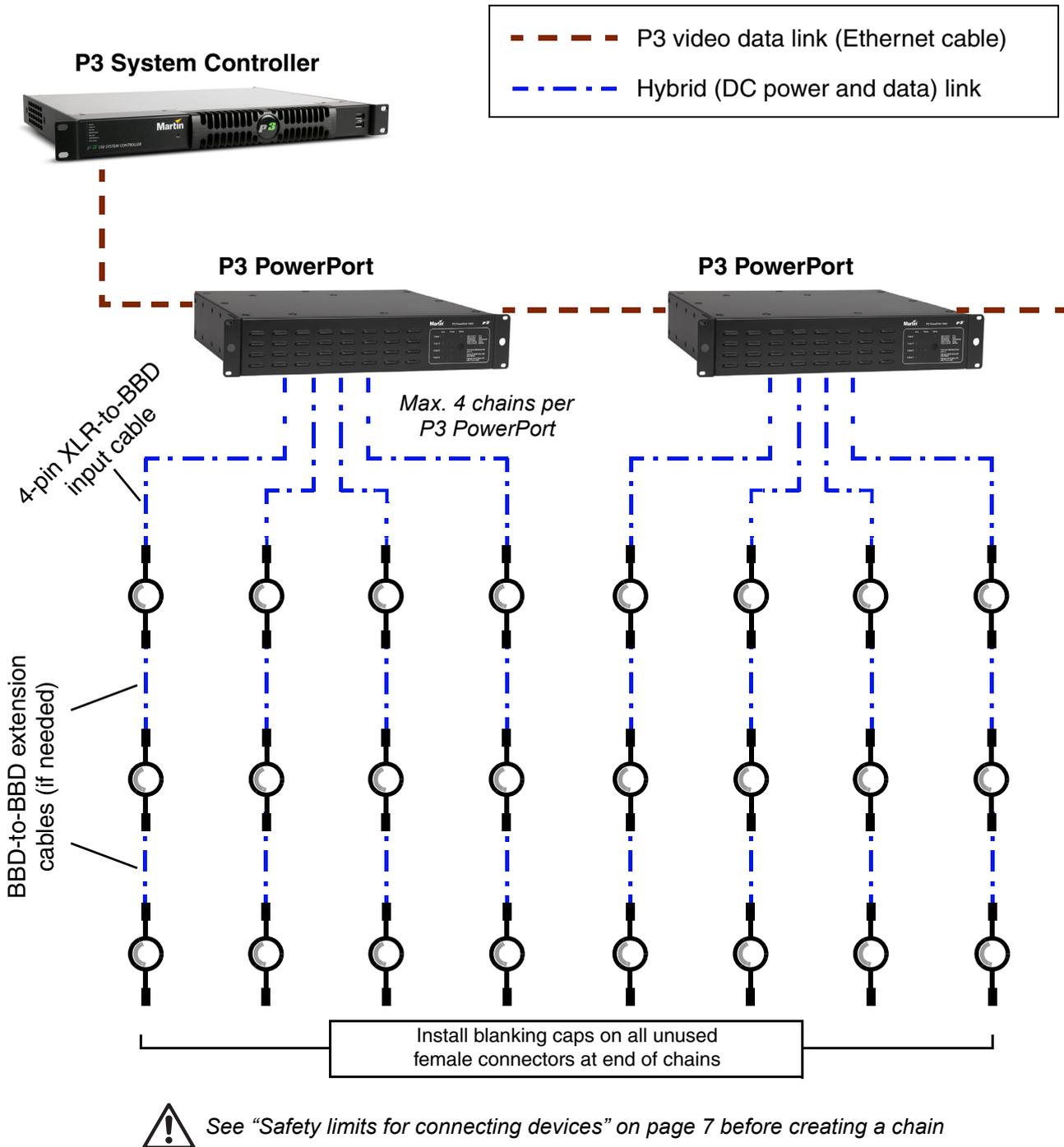


**Figure 8: P3 system layout**

# Installing a DMX-controlled system

You can send DMX control data to VDO Dotron dots 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 Dotron dots. If you intend to do this, see "Installing a P3 system" on page 16 for cabling instructions and see "DMX via P3 System Controller" on page 36 for the available DMX modes.
- You can send a DMX control signal directly to VDO Dotron dots. If you intend to do this, follow the cabling instructions in the section below and see "Direct DMX control" on page 33 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 Dotron dots.

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 Dotron dots that you can control on one DMX link is limited by the number of DMX channels the dots 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 dots and cable (see "Safety limits for connecting devices" on page 7) 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 Dotron dots, connect a DMX Lead-out Cable (see "Cables" on page 40) to the output connector of the last dot 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 Dotron 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 19.
- If you are using a Martin IP66 PSU 240W, see "Installing a DMX system using the Martin IP66 PSU 240W" on page 21.
- If you are using a generic 48 VDC PSU, see "Installing a DMX system using a generic external 48 VDC PSU" on page 23.

# 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)

BBD-to-BBD
extension cable
(if needed)

BBD-to-BBD
extension cable
(if needed)

BBD-to-BBD
extension cable
(if needed)

BBD-to-BBD
extension cable
(if needed)

Install blanking caps on all unused
female connectors at end of chains

⚠ *See "Safety limits for connecting devices" on page 7 before creating a chain*

**Figure 9: 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 9 on page 19 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 6 and "Precautions to avoid damage" on page 10.

4. Connect VDO Dotron dots together in chains either directly using the dots' cable tails and BBD connectors or by adding Martin hybrid cables with BBD connectors (see "Power + data extension cables" on page 40).

   **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 7.

5. Install a blanking cap (see "Connectors" on page 40) on the output connector of the last dot on each chain to protect from water, dirt etc. There is no need to install DMX termination plugs, as dots have integral DMX termination.

6. See Figure 10. 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*     *Female BBD*     **To VDO Dotron chain**
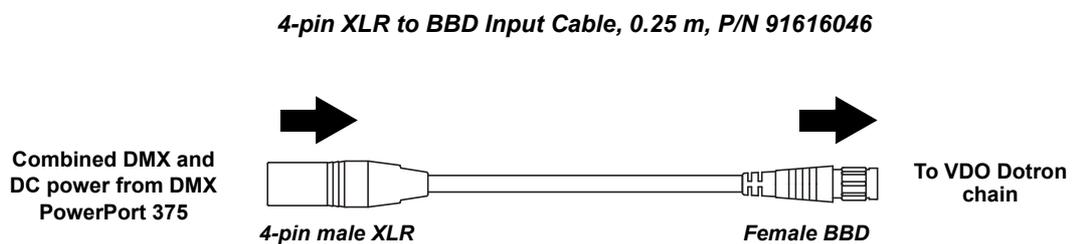
**Figure 10: Martin PowerPort 375 connection to a VDO Dotron chain**

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 dots (or other 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 25.

# Installing a DMX system using the Martin IP66 PSU 240W

**DMX/RDM Controller**

| | |
|---|---|
| ——— | 48 VDC power |
| – – – | DMX link (DMX cable) |
| –·–·– | Hybrid (DC power and data) link |

**DMX/RDM Splitter (if used)**

**Martin IP66 PSU 240W**    **Martin IP66 PSU 240W**

Hybrid
lead-in cable,
Martin IP66 PSU
240W

Hybrid
lead-in cable,
Martin IP66 PSU
240W

BBD-to-BBD
extension cable
(if needed)

BBD-to-BBD
extension cable
(if needed)

BBD-to-BBD
extension cable
(if needed)

BBD-to-BBD
extension cable
(if needed)

BBD-to-BBD
extension cable
(if needed)

BBD-to-BBD
extension cable
(if needed)

Install blanking caps on all unused
female connectors at end of chains

⚠ *See "Safety limits for connecting devices" on page 7 before creating a chain*

**Figure 11: 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 11 on page 21 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 6 and "Precautions to avoid damage" on page 10.

4. Connect VDO Dotron dots together in chains either directly using the BBD connectors on the dots' cable tails or by adding Martin hybrid BBD-to-BBD extension cables (see "Cables" on page 40).

   **Warning!** Do not exceed the maximum number of dots per chain given in "Martin IP66 PSU 240W safety limits" on page 8.

5. Install a blanking cap (see "Connectors" on page 40) on the output connector of the last dot on each chain to protect from water, dirt etc. There is no need to install DMX termination plugs, as dots have integral DMX termination.

6. See Figure 12. Connect a Martin 5-pin XLR and Martin IP66 PSU to 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 connector on the adapter cable to the DC output of a Martin IP66 PSU 240W external power supply unit.

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

*XLR5+Martin IP66 PSU-to-BBD Input Cable, 0.25 m, P/N 91616050*
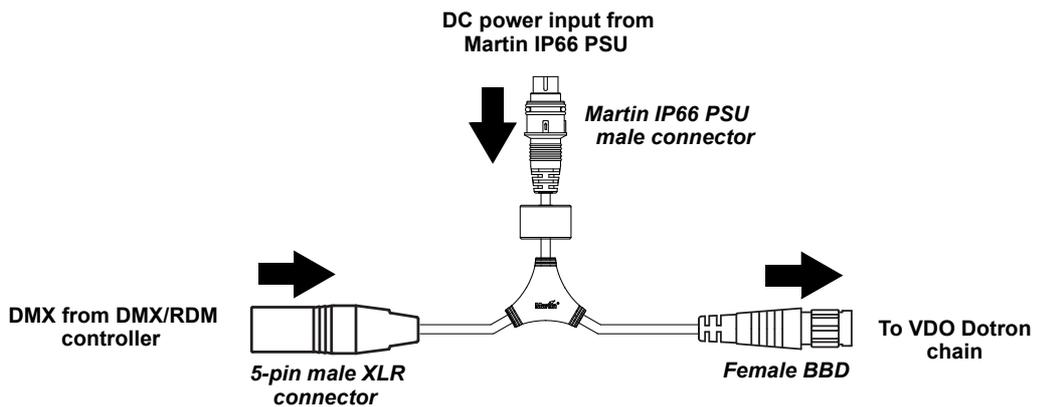


**Figure 12: Martin IP66 PSU and DMX connections to an VDO Dotron chain**

7. Install a mains power cable on the Martin IP66 Power Supply Unit 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 25.

**Installing a DMX system using a generic external 48 VDC PSU**

**DMX/RDM Controller**

| | |
|---|---|
| ▬▬▬▬▬ | 48 VDC power |
| ▬ ▬ ▬ ▬ | DMX link (DMX cable) |
| ▬ · ▬ · ▬ · | Hybrid (DC power and data) link |

**DMX/RDM Splitter (if used)**

**External PSU**

**External PSU**

Hybrid DC lead-in cable

Hybrid DC lead-in cable

Inline fuse required if PSU does not have 8 A overcurrent protection

Inline fuse required if PSU does not have 8 A overcurrent protection

BBD-to-BBD extension cable (if needed)

BBD-to-BBD extension cable (if needed)

BBD-to-BBD extension cable (if needed)

BBD-to-BBD extension cable (if needed)

BBD-to-BBD extension cable (if needed)

BBD-to-BBD extension cable (if needed)

Install blanking caps on all unused female connectors at end of chains

⚠ *See "Safety limits for connecting devices" on page 7 before creating a chain. Do not exceed PSU output rating.*

**Figure 13: DMX-controlled system using a generic PSU**

*Warning! If you decide to use any other external PSU than the Martin devices listed earlier in this section, you must verify that the combination of equipment used is compliant with all applicable safety and electromagnetic compatibility regulations.*

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

1.  See Figure 13 on page 23 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 6 and "Precautions to avoid damage" on page 10.
4.  Connect VDO Dotron dots together in chains either directly using the BBD connectors on the dots' cable tails or by adding Martin BBD-to-BBD hybrid extension cables (see "Cables" on page 40).

*Warning! Check the PSU's DC output power rating in watts and the power consumption figures in watts for VDO Dotron dots with reference to "Generic 48 VDC external PSU safety limits" on page 8. Do not create a chain of VDO Dotron dots that will exceed the power rating of the DC output on the PSU.*

5.  Install a blanking cap (see "Connectors" on page 40) on the output connector of the last dot on each chain to protect from water, dirt etc.
6.  See Figure 14:
    *   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 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 Dotron dots.

*Power + Data Input Cable, XLR5 + Power to BBD, 0.25 m, P/N 91616048*
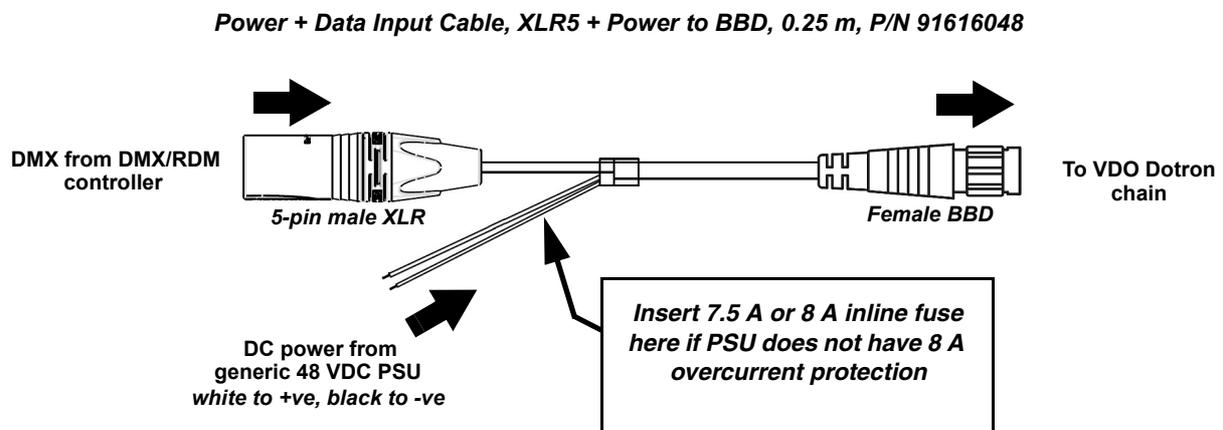


**Figure 14: Generic PSU and DMX connections to an VDO Dotron chain**

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

You can now configure the system. See "System setup"on page 25.

# System setup

> ⚠️ *Warning! Read "Safety information" on page 6 and "Precautions to avoid damage" on page 10 before applying power to an VDO Dotron installation.*

## Setting up for P3 display

A Martin P3 system allows video to be displayed on an installation that consists of or includes VDO Dotron dots. 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 Dotron dots 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" on page 36 for details.

## Setting up for DMX control

The section below explains DMX control and the DMX modes available when connecting the VDO Dotron dots 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" on page 36 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 an VDO Dotron 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 dots can share the same DMX channels if you want grouped control and identical dot behavior.

The VDO Dotron can be controlled using two DMX modes (see under "DMX protocols" on page 33):

- In **RGB Mode**, each dot uses three DMX channels.
- In **Basic Mode**, each dot uses ten DMX channels.

Different modes can be mixed freely in an installation. For example, some VDO Dotron dots can be set to RGB mode and others to Basic mode. All you need to do is set up dots, 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 dots 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. An VDO Dotron dot or pixel uses more than one channel, so it uses the DMX address channel and the channels immediately above it. For example, one VDO Dotron dot 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 Dotron dots on the DMX data link via RDM. You can retrieve data, set the DMX addresses of the dots and set their DMX mode, and you can apply various setup options.

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

# RDM

Using an RDM-compliant DMX controller, you can communicate with the VDO Dotron dots on the DMX data link via RDM. You can:

• Retrieve data from dots

• Set the DMX addresses of the dots and set their DMX mode

• Reset dots

The VDO Dotron responds to the RDM parameter IDs listed in Table 1.

| RDM parameter IDs | GET allowed | SET allowed |
|---|:---:|:---:|
| Category – Network Management | | |
| DISC_UNIQUE_BRANCH | | |
| DISC_MUTE | | |
| DISC_UN_MUTE | | |
| Category - Product Information | | |
| DEVICE_INFO | ✓ | |
| DEVICE_MODEL_DESCRIPTION | ✓ | |
| MANUFACTURER_LABEL | ✓ | |
| DEVICE_LABEL | ✓ | ✓ |
| SOFTWARE_VERSION_LABEL | ✓ | |
| Category - DMX512 Setup | | |
| DMX_PERSONALITY | ✓ | ✓ |
| DMX_PERSONALITY_DESCRIPTION | ✓ | |
| DMX_START_ADDRESS | ✓ | ✓ |
| SLOT_DESCRIPTION | ✓ | |
| Category - Control | | |
| IDENTIFY_DEVICE | ✓ | ✓ |
| RESET_DEVICE | | ✓ |

**Table 1: RDM communication with the VDO Dotron**

# Using the VDO Dotron

⚠️ ***Warning! Read "Safety information" on page 6 and "Precautions to avoid damage" on page 10 on before applying power to the VDO Dotron.***

Do not use the VDO Dotron if the ambient temperature exceeds 55° C (131° F) or falls below -20° C (-4° F).

## Thermal regulation

The VDO Dotron dot has a protective thermal shutdown feature that blacks out the dot if it exceeds its permitted maximum operating temperature.

To avoid unexpected blackouts due to thermal shutdowns but also avoid overheating that may damage the product, the VDO Dotron offers various options for managing temperature:

- During P3 video operation, you can enable the thermal regulation feature available in the software of all Martin P3 system controllers. When this feature is active, VDO Dotron dots begin to reduce their light output when the ambient temperature reaches 45° C in order to control dot temperature. Output is reduced gradually as the ambient temperature rises above 45° C. Dots will still light at the maximum ambient temperature of 55° C, but output will be considerably reduced. This option avoids blackouts due to protective thermal shutdowns.
- During P3 video operation, you can disable the P3 controller thermal regulation feature. If you choose to do this, VDO Dotron dots will not reduce their light output when the ambient temperature reaches 45° C, but if you drive dots hard when the ambient temperature approaches or exceeds 55° C, dots may black out completely due to protective thermal shutdown.
- During DMX operation, the VDO Dotron dots begin to reduce their light output when the ambient temperature reaches 45° C in order to control dot temperature. Output is reduced gradually as the ambient temperature rises above 45° C. Dots will still light at the maximum ambient temperature of 55° C, but output will be considerably reduced. This option avoids blackouts due to protective thermal shutdowns.

## P3 display

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

## DMX control

The VDO Dotron can display effects controlled by DMX.

Two DMX control options, each with its own DMX modes, are available. The following sections describe these options.

### DMX sent directly to dots

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

When sending DMX directly to dots, two DMX modes are available:

- **RGB mode** uses three DMX channels and gives RGB color mixing of all the pixels on a dot.
- **Basic mode** uses ten DMX channels and gives RGB color mixing, strobe effects and pre-programmed dynamic effects.

See "Direct DMX control" on page 33 for full details of DMX control in this type of installation.

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

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 Dotron dots. In this case the P3 System Controller takes care of all configuration and addressing of the dots. RDM is not required.

When sending DMX to dots via a P3 controller, five DMX modes are available:

- In **P3 Intensity Mode** the dot displays video and DMX only controls the intensity of the video shown on the dot
- In **P3 RGB Mode** the dot displays video and DMX only controls the color of the video shown on the dot.
- In **P3 Basic Mode** the dot shows video and DMX only controls the intensity and the color of the video shown on the dot.
- In **P3 Hybrid Mode** when the P3 Switch channel is set to above 50% the dot shows video and channels 4-6 control the color of the video shown on the dot. When the P3 Switch channel is set to below 50% the dot is purely DMX-controlled, and channels 4 and above control the color of the dot.
- In **P3 PixelMap Mode** the dot is always purely DMX-controlled (it never shows video). Channels 1 and above control the color of the dot.

See "DMX via P3 System Controller" on page 36 for full details of DMX control in this type of installation.

# Magnetic 'control button'

A magnetic sensor is embedded inside the VDO Dotron behind the label on the back of the dot (see **C** in Figure 1 on page 11). The sensor acts as a control button. To activate the sensor, swipe a magnet past the side of the dot near where the input cable tail enters the dot.

You may find it convenient to use the Martin Test Tool (see "Accessories" on page 39), which contains a magnet.

Activating the magnetic sensor lets you display the product's status, test the LEDs and reset the VDO Dotron as explained in the following table.



**Figure 15: Test Tool with magnet**

### Status display

To display a VDO Dotron dot's status, swipe the magnet over the sensor once. The LEDs on the dot 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 Dotron has encountered a fatal error and can not run. | Perform a factory reboot, followed by a firmware upload if necessary. |
| Red | Flashing | No control source detected. | Connect a P3 system controller or DMX controller to the network. |
| Green | Flashing | Ready. VDO Dotron connected to P3 controller but not mapped onto the canvas. | Set up the P3 controller to use the VDO Dotron. |
| Green | Constant | Running normally in P3 mode. | None. |
| Cyan | Flashing | Ready. VDO Dotron in DMX mode but not receiving valid DMX data signal. | Send DMX data (if flashing cyan continues although you are sending data, check that DMX controller is connected and configured with dot's DMX address). |
| Cyan | Constant | Running normally in DMX mode. | None. |

**Table 2: Status information**

## Testing, rebooting and returning to defaults

The table below lists the functions of the magnetic 'control button' on each VDO Dotron dot.

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 2 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% raw white) |
| Hold magnet over 'button' until LEDs light blue | Reboot the VDO Dotron. |
| Hold magnet over 'button' until LEDs light white | Return the VDO Dotron to its default factory firmware. |

**Table 3: Magnetic 'control button' functions**

# Service and maintenance

*Warning! Read "Safety information" on page 6 and "Precautions to avoid damage" on page 10 before carrying out service on the VDO Dotron.*

*Warning! Lock out AC mains power to the installation 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 Dotron periodically. All other service operations on the VDO Dotron 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.

## Installing optical accessories

Installing one of the optical accessories available from Martin for the VDO Dotron takes a few seconds. No tools are required.

Install optical accessories in dry conditions only.

To install an optical accessory:
1. If dots have been in use, allow them to cool.
2. Unscrew the VDO Dotron's front cover and lift it off the dot.
3. Remove any existing accessory and install the new accessory. If installing a Lens Array accessory, see below.
4. Screw the front cover back onto the dot. Make sure that the cover is tight but do not use tools: use hand force only to tighten.

### Installing a Lens Array Front

To install an Lens Array accessory:
1. If dots have been in use, allow them to cool.
2. Unscrew the VDO Dotron dot's front cover **A** and lift it off the dot.
3. Remove any optical accessory that is already fitted over the LEDs.
4. See Figure 16. Note the position of the three locating posts in the Lens Array **C** and the three corresponding locating lugs in the top of the dot **B**. This will ensure that each lens in the array sits directly over an LED in the dot. Place the Lens Array onto the dot with its flat side facing upwards and rotate it so that each locating post in the Lens Array fits around a lug in the top of the dot.
5. Without disturbing the position of the Lens Array, screw the front cover back onto the dot. Make sure that the cover is tight but do not use tools: use hand force only to tighten.
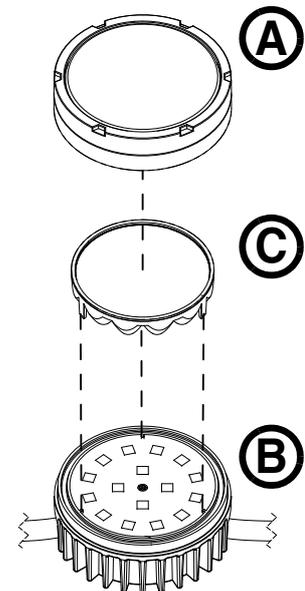


**Figure 16: Installing a Lens Array Front**

## Cleaning

Cleaning schedules vary depending on the operating environment. It is therefore impossible to specify precise cleaning intervals for the VDO Dotron. Environmental factors that may result in a need for frequent cleaning include airborne dust and pollution.

Inspect products frequently to see whether cleaning is necessary. If in doubt, consult your Martin dealer about a suitable maintenance schedule.

To clean the product, use warm water and a soft brush or a low-pressure or medium-pressure water jet. Use car shampoo to help remove dirt and grease. If possible, dry with a soft cloth to avoid streaking. Do not use a stiff brush or scouring pad. 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 Dotron 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 Dotron 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 Dotron to show constant or flashing red status indication. | Error has occurred. | Check that system is correctly connected, set up and running.<br>Hold magnet over 'control button' until LEDs 1 - 4 turn blue, then move magnet away, to reboot VDO Dotron.<br>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 Dotron does not display as intended. | Fault in 48 VDC power transmission. | Inspect connections and cables. Correct poor connections. Repair or replace damaged cables. |
| | Fault in data transmission. | Inspect connections and cables. Correct poor connections. Repair or replace damaged cables.<br>If using DMX, check that DMX console and DC power supply unit are at same earth (ground) potential. |
| | 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 4: Troubleshooting**

# DMX protocols

## Direct DMX control

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

### RGB Mode

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

**Table 5: DMX Protocol, RGB Mode**

### Basic Mode

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

**Table 6: DMX Protocol, Basic Mode**

# 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 | Random pixel buildup / breakdown |
| | 14 | In / out wave |
| | 15 | In / out step |
| | 16 | In / out pulse |
| | 17 - 19 | *No function* |
| | 20 | Movie flicker |
| | 21 | Electric arc |
| | 22 | Atomic lightning |
| | 23 | Thunderstorm |
| | 24 | Sonar (1 pixel) |
| | 25 | Sonar (2 pixels) |
| | 26 | Sonar (3 pixels) |
| | 27 | Sonar (6 pixels) |
| | 28 | Sonar (9 pixels) |
| **5** | 29 | Pie slice chase |
| | 30 | Random chase |
| | 31 | Water drop |
| | 32 - 50 | *No function* |
| | | *Color FX* |
| | 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 - 86 | *No function* |

**Table 7: Pre-programmed FX**

| Channel | DMX Value | Function |
| --- | --- | --- |
| | 87 | Normal to inverted color in / out wave |
| | 88 | Normal to inverted color in / out step |
| | 89 | Normal to inverted color in / out pulse |
| | 90 - 100 | *No function* |
| | | ***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 7: 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 dots.

### P3 Intensity Mode

In P3 Intensity Mode:
• The dot displays video
• DMX only adjusts the intensity of the video.

| Channel | DMX Value | Function |
|---------|-----------|----------|
| 1 | 0 - 255 | **Intensity**<br>0 → 100% |

**Table 8: DMX Protocol, P3 Intensity Mode**

### P3 RGB Mode

In P3 RGB Mode:
• The dot displays video
• DMX only adjusts the color of the video.

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

**Table 9: DMX Protocol, P3 RGB Mode**

### P3 Basic Mode

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

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

**Table 10: 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 dot displays video, and channels 4-6 adjust the color of the video on the dot.
- When the P3 Switch channel (channel 3) is set to below 50% the dot is controlled by DMX only, and channels from 4 to 6 control the color of the dot.

| Channel | DMX Value | Function |
|---|---|---|
| **1** | 0 - 65535 | **Intensity (MSB)**<br>8-bit coarse control, closed 0% → open 100% |
| **2** | | **Intensity (LSB)**<br>16-bit fine adjustment, closed → open |
| **3** | 0 - 127<br>128 - 255 | **P3 Switch**<br>DMX Mode<br>Video Mode |
| **RGB control** | | |
| **4** | 0 - 255 | **Red**<br>0 → 100% |
| **5** | 0 - 255 | **Green**<br>0 → 100% |
| **6** | 0 - 255 | **Blue**<br>0 → 100% |

**Table 11: DMX Protocol, P3 Hybrid Mode**

## P3 PixelMap Mode

In P3 PixelMap Mode, the dot is controlled by DMX only (it never shows video). Channels from 1 to 3 give RGB color mixing.

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

**Table 12: DMX Protocol, P3 PixelMap Mode**

# Specifications

**Physical**

Diameter . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .72 mm (2.9 in.)
Height . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 34 mm (1.4 in.) not including front
Weight . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 0.3 kg per meter (0.7 lbs. per ft.)

**Control and Programming**

Control options. . . . . . . . . . . . . . . . . . . . . . . Martin P3 System Controller (via Martin P3 PowerPort 1500 or
. . . . . . . . . . . . . . . . . . . . . . . . . . . .P3 PowerPort 1000 IP) and/or DMX/RDM
Protocol detection . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .Automatic
Control modes, direct DMX control . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . RGB, Basic
Control channels, direct DMX control . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3/10
Control modes, DMX via P3. . . . . . . . . . . . . . P3 Intensity, P3 RGB, P3 Basic, P3 Hybrid and P3 PixelMap
Control channels, DMX via P3. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .1/3/5/6/3
Setting and addressing . . . . . . . . . . . . . . . . . . .Martin P3 System controller or RDM-compliant controller
Control resolution. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 16-bit (P3) or 8-bit (DMX) control of each color
Calibration . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .Color and intensity for each Dot
DMX compliance . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . USITT DMX512-A
RDM compliance . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ANSI/ESTA E1.20
Firmware update . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Via Martin P3 System controller

**Control/User Interface**

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

**Optics**

Minimum LED lifetime . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 50 000 hours (to >70% luminous output)*
Color resolution . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .16 bits per color (48 bits per pixel)

*Options*
No Front
Flat Diffuser
Flat Smoked Diffuser
Dome Diffuser
Dome Smoked Diffuser
Lens Array Narrow

*Viewing angle*
No front . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 103° x 103° (FWHM)
Dome front. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 125° x 125° (FWHM)
Lens Array Narrow. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 22° x 22° (FWHM)

*Figure obtained under manufacturer's test conditions*

**Photometric Data**

*Total output*
No front . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 100 lumens
Dome front. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 62 lumens
Lens Array front . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 72 lumens

*For full photometric data, see the Martin website at www.martin.com*

**Video Processing**

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

### Signal Protocol

Martin P3 system (via Martin P3 PowerPort) or DMX/RDM

### Construction

Base. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Cast aluminum
Color . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Black
Protection rating. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . IP65
RoHS compliant

### Installation

Orientation . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .Any
Mounting options . . . . . . . . Direct surface mount, optional Martin Flange Bracket, Half-Coupler or Coupler

### 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

### Power Consumption

Typical total power consumption . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 5 W at full intensity, full white

*Allow for +/-10% variation in power consumption figures*

### Thermal

Cooling. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Convection
Maximum ambient temperature (Ta max.) for typical video content. . . . . . . . . . . . . . . . . . 55° C (131° F)
Minimum ambient temperature (Ta min.) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . -20° C (-4° F)
Max. total heat dissipation, calculated, +/- 10%. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 20 BTU/hr.

### Approvals

EU safety . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .EN 60950-1, EN 60950-22
EU EMC . . . EN 55024, EN 55032 (Class A), EN 61000-3-2, EN 61000-3-3
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

Magnetic Test Tool, set of 10 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91610139

*Mounting hardware*

VDO Dotron Flange Bracket, . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91611803
VDO Dotron Half-coupler Rigging Clamp . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91611802
VDO Dotron to Sceptron Pivot Coupler . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91616072
VDO Dotron to Sceptron End Coupler. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91616071
VDO Dotron MultiRig Bar, 1000 mm . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91616100
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 Accessories*

VDO Dotron Flat Diffuser. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91611804
VDO Dotron Flat Smoked Diffuser. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91611805
VDO Dotron Dome Diffuser . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91611806
VDO Dotron Dome Smoked Diffuser . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91611807
VDO Dotron Lens Array Narrow . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91611808

### Cables

#### Power + data input 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 Tripix type (for
Martin IP66 PSU 240W) to female BBD, 0.25 m (9.8 in.) . . . . . . P/N 91616050

#### Power + data extension cables

Power + Data Extension Cable, Rental Type, BBD to BBD, 1 m (3.4 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 Extension Cable, Rental Type,
100 m (328 ft.) bulk without connectors . . . . . . . . . . . . . . . . . . . P/N 91616045

#### Power + data lead-out cables

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

#### Connectors

Power + Data Cable Connector, BBD, Male. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91611750

Power + Data Cable Connector, BBD, Female . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91611751

Blanking Caps for sealing 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

VDO Dotron™ dot in cardboard box . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 90357690

Flightcase for 24 x VDO Dotron™ dots . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91515043

Flightcase Extender for 24 x VDO Dotron™ dots . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . P/N 91515044

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

**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**

Warning! Class A ITE product. 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.

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**Disposing of this product**

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

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

**Martin**
by HARMAN

www.martin.com