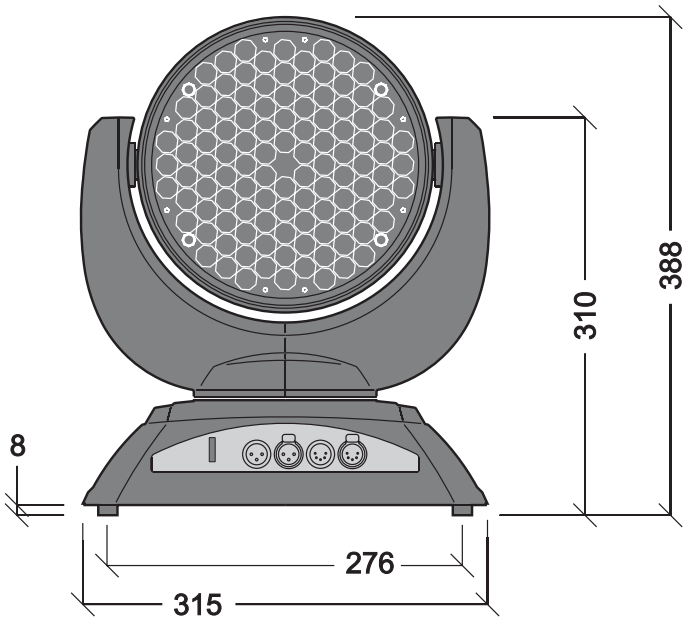
MAC 301 Wash™

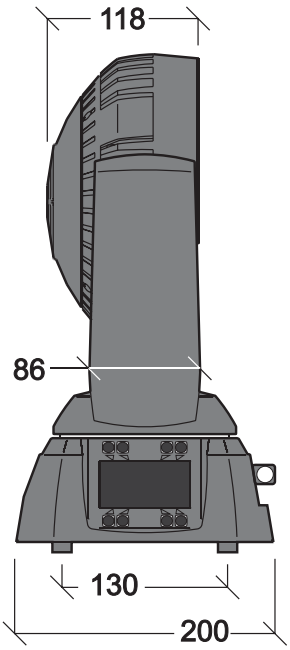
user manual

Martin®

Dimensions

All dimensions are in millimeters





P/N 35000228, Rev. A

Safety Information

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

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

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

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

WARNING!
Fire hazard.

WARNING!
LED light emission. Risk of eye injury.

WARNING!
Burn hazard. Hot surface. Do not touch.

WARNING!
Wear protective eyewear.

WARNING!
Refer to user manual.

Warning! Class 2M LED product. Do not look into the beam at a distance of less than 0.5 meters (20 inches) from the front surface of the product. Do not view the light output with optical instruments or any device that may concentrate the beam.

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

This product presents risks of severe injury or death due to fire and burn hazards, electric shock and falls.

Read this manual before installing, powering or servicing the fixture, follow the safety precautions listed below and observe all warnings in this manual and printed on the fixture. If you have questions about how to operate the fixture safely, please contact your Martin dealer or call the Martin 24-hour service hotline at +45 70 200 201.

PROTECTION FROM ELECTRIC SHOCK

- Disconnect the fixture from AC power before removing or installing any cover or part – including fuses – and when not in use.
- Always ground (earth) the fixture electrically.
- Use only a source of AC power that complies with local building and electrical codes and has both overload and ground-fault (earth-fault) protection.
- Before using the fixture, check that all power distribution equipment and cables are in perfect condition and rated for the current requirements of all connected devices.
- Isolate the fixture from power immediately if the power plug or any seal, cover, cable, or other component is damaged, defective, deformed, wet or showing signs of overheating. Do not reapply power until repairs have been completed.
- Do not expose the fixture to rain or moisture.
- Refer any service operation not described in this manual to a qualified technician.
- Socket outlets used to supply MAC 301 Wash panels with power or external power switches must be located near the panels and easily accessible so that the panels can easily be disconnected from power.

PROTECTION FROM BURNS AND FIRE

- Do not operate the fixture if the ambient temperature (Ta) exceeds 40° C (104° F).
- The exterior of the fixture becomes hot during use. Avoid contact by persons and materials. Allow the fixture to cool for at least 10 minutes before handling.
- Keep all combustible materials (e.g. fabric, wood, paper) at least 100 mm (4 ins.) away from the head.
- Keep flammable materials well away from the fixture.
- Ensure that there is free and unobstructed airflow around the fixture.
- Do not illuminate surfaces within 250 mm (10 ins.) of the fixture.
- Do not attempt to bypass thermostatic switches or fuses. Replace defective fuses with ones of the specified type and rating.
- Do not stick filters, masks or other materials onto any optical component.
- Do not modify the fixture in any way not described in this manual
- Install only genuine Martin parts.

PROTECTION FROM INJURY

- Do not look continuously at LEDs from a distance of less than 0.5 meters (20 inches) from the front surface of the fixture without protective eyewear such as shade 4-5 welding goggles. At less than this distance, the LED emission can cause eye injury or irritation. At distances of 0.5 meters (20 inches) and above, light output is harmless to the naked eye provided that the eye's natural aversion response is not overcome.
- Do not look at LEDs with magnifiers, telescopes, binoculars or similar optical instruments that may concentrate the light output.

- Ensure that persons are not looking at the LEDs from within 0.5 meters (20 inches) when the product lights up suddenly. This can happen when power is applied, when the product receives a DMX signal, when a stand-alone program suddenly increases light output intensity or when SERVICE menu items are selected.
- Install as described in this manual 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 of all the fixtures it secures. The safety cable must comply with EN 60598-2-17 Section 17.6.6 and be capable of bearing a static suspended load ten times the weight of the fixture.
- If suspending from a rigging structure, attach the fixture with two evenly spaced clamps. Do not use only one clamp.
- Ensure that any supporting structure and/or hardware used can hold at least 10 times the weight of all the devices they support.
- Allow enough clearance around the head to ensure that it cannot collide with an object or another fixture when it moves.
- Check that all external covers and rigging hardware are securely fastened.
- Block access below the work area and work from a stable platform whenever installing, servicing or moving the fixture.
- Do not operate the fixture with missing or damaged covers, shields or any optical component.

Contents

Fixture overview

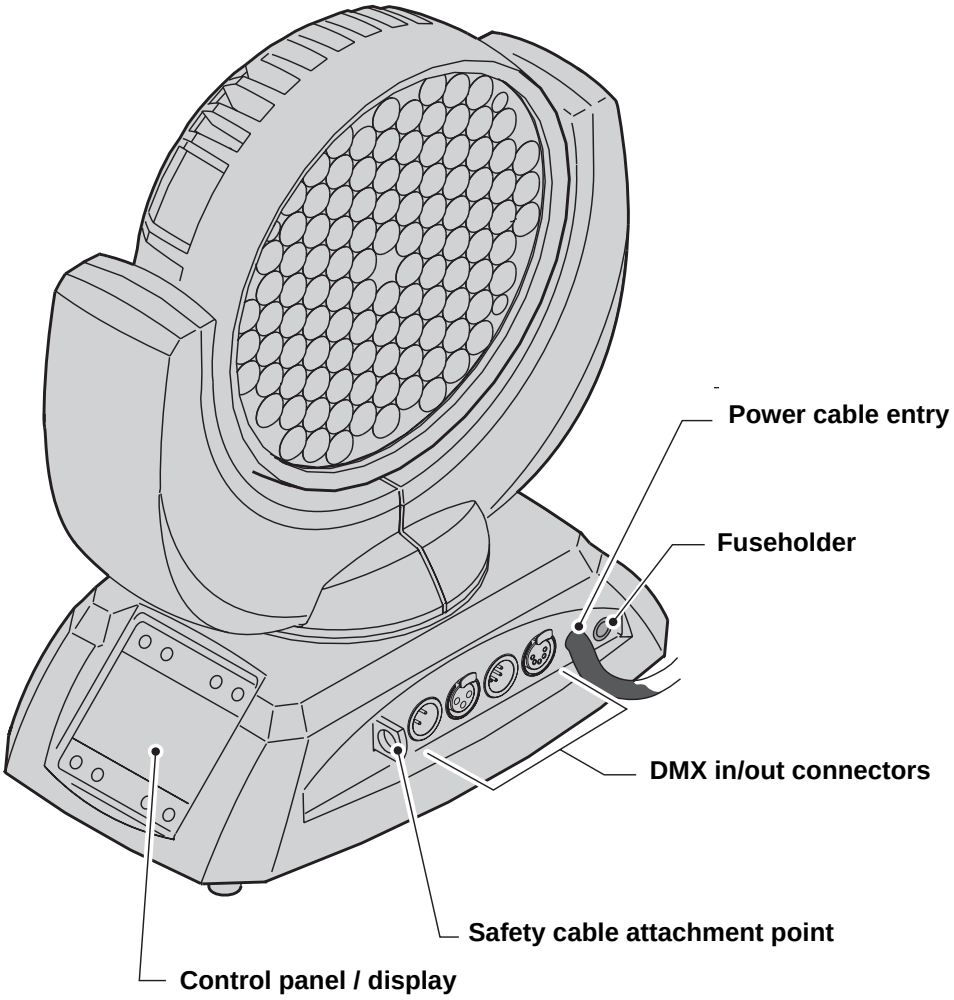


Figure 1: Connections panel overview

Introduction

Thank you for selecting the MAC 301 Wash™, an intelligent lighting fixture from Martin Professional™. This LED-based moving-head washlight features:

- Luxeon Rebel high-power emitters
- DMX control and stand-alone operation with scenes programmed on fixture or captured via DMX
- Onboard control panel and backlit LCD graphic display
- RGB color mixing with CTC
- ‘Color wheel’ color-snap feature
- Smooth electronic dimming
- Electronic strobe with pulse effects
- Motorized zoom, 13° - 36°
- 430° pan and 300° tilt ranges
- Two 8-bit and two 16-bit DMX control modes

For the latest firmware updates, documentation, and other information about this and all Martin Professional products, please visit the Martin website at http://www.martin.com

Comments or suggestions regarding this document may be e-mailed to service@martin.dk or posted to:

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

Warning! Read “Safety Information” on page 3 before installing, powering, operating or servicing the MAC 301 Wash.

Unpacking

The following items are included with the MAC 301 Wash:

- Two clamp attachment brackets with quarter-turn fasteners
- This user manual

Using for the first time

Before applying power to the fixture:

- Check the Martin Professional website at www.martin.com for the most recent user documentation and technical information about the MAC 301 Wash. Martin user manual revisions are identified by the revision letter at the bottom of page 2.
- Carefully review “Safety Information” on page 3.
- Check that the fixture’s power voltage and frequency ranges match the local AC mains power source.
- If drawing power from a socket, install a suitable power plug on the power cable as described in “Power plug” on page 8.

AC power

Warning! Read "Safety Information" starting on page 3 before connecting the MAC 301 Wash to AC mains power.

For protection from electric shock, the MAC 301 Wash must be grounded (earthed). The power distribution circuit must be equipped with a fuse or circuit breaker and ground-fault (earth-fault) protection.

The MAC 301 Wash does not have a power on/off switch. Socket outlets or external power switches used to supply the MAC 301 Wash with power must be located near the fixture and easily accessible so that the panels can easily be disconnected from power.

Important! Do not use an external dimming system to supply power to the MAC 301 Wash, as this may cause damage to the fixture that is not covered by the product warranty.

The MAC 301 Wash can be hard-wired to a building electrical installation if you want to install it permanently, or a power plug can be installed on the power cable in the case of temporary installation.

Main fuse

Warning! Replace fuses with ones of the same type and rating only.

MAC 301 Wash EU models for 200-240 VAC power are protected by a 4 amp slow-blow main fuse. MAC 301 Wash US models for 100-130 VAC power are protected by a 6.3 amp slow-blow main fuse. The main fuse is located in a fuseholder on the connections panel next to the power cable entry. See "Fuse replacement" on page 18 for details of accessing and changing fuses.

Power voltage

Warning! Check that the voltage range specified on the fixture's serial number label matches the local AC mains power voltage before applying power to the fixture.

- MAC 301 Wash EU models are factory-configured to accept AC mains power at 200-240 V, 50/60 Hz.
- MAC 301 Wash US models are factory-configured to accept AC mains power at 100-130 V, 50/60 Hz.

Do not apply AC mains power to the fixture at any other voltage than that specified on the fixture's serial number label.

Power plug

If you decide to install a power plug that is suitable for your AC power outlets on the fixture's hard-wired power cable, install a grounding-type (earthed) plug that is correctly rated for the current and power requirements of the fixture. Follow the plug manufacturer's instructions. Table 1 shows some possible pin identification schemes; if pins are not clearly identified, or if you have any doubts about proper installation, consult a qualified electrician.

Wire Color	Pin	Symbol	Screw (US)
brown	live	L	yellow or brass
blue	neutral	N	silver
yellow/green	ground (earth)	⏚	green

Table 1: Power plug connections

Data link

A data link is required in order to control a MAC 301 Wash via DMX.

Important! ***Do not connect more than 1 data input and 1 data output on a fixture.***

The MAC 301 Wash has both 3-pin and 5-pin XLR connectors for DMX data input and output. The pin-out on all connectors is pin 1 = shield, pin 2 = cold (-), and pin 3 = hot (+).

Pins 4 and 5 in the 5-pin XLR connectors not used in the MAC 301 Wash but are available for possible additional data signal requirements. Standard pin-out is pin 4 = data 2 cold (-) and pin 5 = data 2 hot (+).

Sockets are wired in parallel: both inputs connect to both outputs. *To avoid damage to the fixture, never use more than one input and one output socket.*

Tips for reliable data transmission

- Use shielded twisted-pair cable designed for RS-485 devices: standard microphone cable cannot transmit control data reliably over long runs. 24 AWG cable is suitable for runs up to 300 meters (1000 ft). Heavier gauge cable and/or an amplifier is recommended for longer runs.
- Never use both a fixture's outputs to split the link. To split the link into branches, use a splitter such as the Martin 4-Channel Opto-Isolated RS-485 Splitter/Amplifier.
- Do not overload the link. Up to 32 devices may be connected on a serial link.
- Terminate the link by installing a termination plug in the output socket of the last fixture. The termination plug, which is a male XLR plug with a 120 Ohm, 0.25 Watt resistor soldered between pins 2 and 3, "soaks up" the control signal so it does not reflect and cause interference. If a splitter is used, terminate each branch of the link.

Male termination plug

P/N 91613017

Connecting the data link

1. Connect the DMX data output from the controller to the MAC 301 Wash's 3-pin or 5-pin input (male) socket.
2. Using the sockets that match your data cable, connect the output of the fixture closest to the controller to the input of the next fixture.
3. Insert a male 120 Ohm XLR termination plug in the 3-pin or 5-pin output of the last fixture on the link.

Physical installation

The MAC 301 Wash can be placed on a horizontal surface such as a stage or clamped to a truss in any orientation using the quarter-turn clamp brackets supplied with the fixture.

Warning! Attach an approved safety cable to the attachment point on the connections panel (see "Fixture overview" on page 6).

Check that all surfaces to be illuminated are minimum 250 mm (10 ins.) from the fixture, that combustible materials (wood, fabric, paper, etc.) are minimum 100 mm (4 ins.) from the head, that there is free airflow around the fixture and that there are no flammable materials nearby.

Make sure that it is impossible for the moving head to collide with another fixture or other object.

Placing the fixture on a flat surface

The MAC 301 Wash can be placed on a stage or other level, flat surface. Check that the surface can support at least 10 times the weight of all fixtures and equipment to be installed on it.

Warning! The supporting surface must be hard and flat or air vents in the base may be blocked, which will cause overheating. Secure the fixture against falling. Attach a securely anchored safety cable to the safety cable attachment point (see "Fixture overview" on page 6) if the fixture is to be placed above ground level in any location where it may fall and cause injury or damage.

Mounting the fixture on a truss

The MAC 301 Wash can be clamped to a truss or similar rigging structure in any orientation. Clamp brackets can be attached to the base of the fixture using quarter-turn quick connectors.

Warning! Use two clamps to rig the fixture. Lock each clamp bracket by turning both 1/4-turn fasteners fully clockwise.

To clamp a MAC 301 Wash to a truss:

1. Check that the rigging structure can support at least 10 times the weight of all fixtures and equipment to be installed on it.
2. Obtain two rigging clamps and check that they are undamaged and can bear at least 10 times the weight of the fixture. Bolt the clamps securely to the supplied clamp brackets with a minimum grade 8.8 M12 bolt and lock nut.
3. See Figure 2. Align each of the two clamp brackets with two mounting points in the base. Insert the quarter-turn fasteners into the base and turn all levers a full 90° clockwise to lock.
4. Block access under the work area. Working from a stable platform, hang the fixture on the truss with the arrow on the base towards the area to be illuminated. Tighten the rigging clamps.

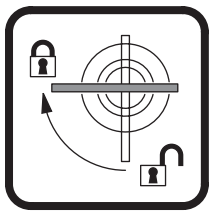


Figure 2: Quarter-turn fasteners

5. Secure the fixture against clamp or bracket failure with a secondary attachment such as a safety cable that can bear at least 10 times the weight of the fixture using the attachment point on the connections panel (see "Fixture overview" on page 6). This attachment point is designed to accept a carabiner clamp. Do not use any other part of the fixture as a safety cable attachment point.
6. Check that the head will not collide with other fixtures or objects.

Setup

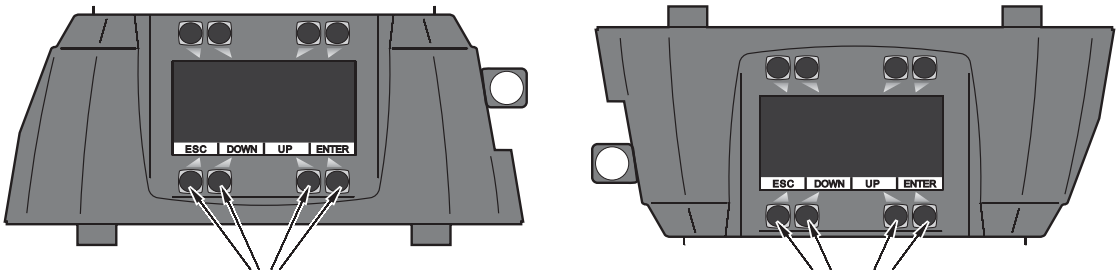
Warning! Read “Safety Information” on page 3 before installing, powering, operating or servicing the MAC 301 Wash.

Control panel and menu navigation

The onboard control panel and backlit graphic display are used to set the MAC 301 Wash’s DMX address, program stand-alone operation, configure individual fixture settings (personality), read out data and execute service utilities. See “Onboard control menus” on page 21 for a complete list of menus and commands.

Using the control buttons

- To enter a menu, select a function or apply a selection, press ENTER.
- Press UP and DOWN to scroll within a menu or adjust values.
- To escape a function or move back one level in the menu structure, press ESC.
- See Figure 3. There are two sets of control buttons. If the fixture is rotated through 180°, press once on any control button in the set that are now below the display. The display will rotate through 180° so that it is correctly orientated.



Control buttons, standing installation

Control buttons, hanging installation

Figure 3: Control buttons

Display panel functions

The DMX address is shown in the display panel when the MAC 301 Wash is powered on and has reset.

The display panel backlighting indicates fixture status as follows:

- The display dims to zero during resets.
- The display flashes slowly if the fixture is not receiving a valid DMX signal.
- The display flashes quickly if an error has been detected and stored in the ERROR LIST menu.
- The display dims to zero 30 seconds after the fixture begins receiving a valid DMX signal.

DMX address setting

The DMX address, also known as the start channel, is the first channel used to receive instructions from the controller. For independent control, each fixture must be assigned its own control channels. Two MAC 301 Wash fixtures may share the same address, however, if identical behavior is desired. Address sharing can be useful for diagnostic purposes and symmetric control, particularly when combined with the inverse pan and tilt options.

The DMX address is configured using the DMX ADDRESS menu in the control panel.

DMX modes

The MAC 301 Wash provides standard or compressed 8-bit or 16-bit DMX control modes. These four modes can be selected in the PERSONALITY menu. Depending on the selected DMX mode, the MAC 301 Wash requires 12, 15, 16 or 19 DMX channels. See “DMX protocol” on page 19 for details of DMX commands available in the different modes.

Tailoring performance

Movement

The MAC 301 Wash provides several options for optimizing movement for different applications.

- RESOLUTION in the PAN/TILT menu sets pan and tilt to 16-bit or 8-bit control resolution during stand-alone programming. The default setting is 16-bit. If this fine resolution is not required, you can set to 8-bit resolution for quicker scrolling through pan/tilt values.
- The PAN INVERS and TILT INVERS commands invert the direction of pan and tilt and the PAN/TILT SWAP command sets pan commands to tilt and vice versa. These settings are useful for symmetrical effects with multiple fixtures.
- SHORTEST DIST. sets effects to always take the shortest route from one scene to another and can normally be left at the default setting ON.

Other performance settings

- CAMERA MODE is designed to offer flicker-free illumination in TV studios. 50 HZ is best suited to PAL and SECAM systems and 60 HZ to NTSC systems.
- COOLING MODE gives you a choice of three settings. The default setting STANDARD should suit all situations. For quietest possible operation, SILENT reduces fan operation to a minimum. This mode can be used in well-ventilated areas, particularly if the ambient temperature is low or if light output is reduced or only required occasionally. HI POWER maximizes cooling for intensive use in warm areas at the expense of increased fan noise. Whatever mode is selected, a thermal cutout shuts down power to the LEDs if the fixture temperature exceeds safe limits. If this occurs during operation in SILENT mode, you may find it necessary to switch to STANDARD mode.

Effects

This section describes the effects provided in the MAC 301 Wash. The effects are available in both DMX control and stand-alone operation.

Pan and tilt

The MAC 301 Wash's moving head can be panned through 430° and tilted through 300°.

White balance

White balance for the white output in the color wheel effect can be adjusted electronically.

Shutter effect

The electronic 'shutter' effect provides instant open and blackout, variable speed regular and random strobe and opening/closing pulse effects.

Dimming

Overall intensity can be adjusted using 0 - 100% electronic dimming.

Zoom

The motorized zoom varies the beam angle continuously from 13° through to 36°.

RGB color mixing

8-bit RGB color mixing is available in all DMX modes, with 16-bit fine RGB control available in both standard and compressed 16-bit modes.

CTC

Color temperature can be varied with 0% - 100% effect.

Color wheel effect

The electronic 'color wheel' effect gives the convenience and feel of a color wheel in a discharge or incandescent lamp-based fixture. The color wheel effect in the MAC 301 Wash lets you fade or snap between the following full colors:

- White
- Red
- Yellow
- Magenta
- Green
- Amber
- Blue
- Cyan

You can also scroll continuously forwards or backwards through these colors at variable speed.

Pan, tilt and effects movement speed and blackout

The speed of pan/tilt movement and effects changes can be adjusted.

The fixture can also be set to go to a blackout during pan/tilt movement or color changes, with adjustable blackout fade out/fade in times from 5 seconds to a fast snap.

DMX operation

Warning! Read “Safety Information” on page 3 before installing, powering, operating or servicing the MAC 301 Wash.

This section describes only DMX control features that require particular explanation. See “DMX protocol” on page 19 for a full list of the DMX channels and values required to control the different effects. See “Effects” on page 13 for a full description of the fixture’s effects.

8- and 16-bit Standard and Compressed DMX control modes

The MAC 301 Wash has four DMX operating modes:

- **Standard 8-bit** uses 16 DMX channels
- **Compressed 8-bit** uses 12 DMX channels
- **Standard 16-bit** uses 19 DMX channels
- **Compressed 16-bit** uses 15 DMX channels

In Compressed modes, the color wheel, pan/tilt speed, effect speed and movement blackout channels are not available. This means that color can be changed using the RGB channels only.

The 16-bit modes include the same control options as 8-bit modes but fine control of RGB is added on 3 extra channels.

Where fine control is available, the main control channel sets the first 8 bits (the most significant byte or MSB), and the fine channel sets the second 8 bits (the least significant byte or LSB) of the 16-bit control byte. In other words, the fine channel works within the position set by the main channel.

Stand-alone operation

Warning! Read "Safety Information" on page 3 before installing, powering, operating or servicing the MAC 301 Wash.

This section describes how to program and run stand-alone light shows on the MAC 301 Wash without a DMX controller. See "Onboard control menus" on page 21 for a full list of stand-alone commands. See "Effects" on page 13 for a full description of the MAC 301 Wash's effects.

In stand-alone operation, the MAC 301 Wash can play up to 28 pre-programmed scenes continuously in a loop.

About scenes

A stand-alone light show consists of a sequence of steps (also called scenes). Each step is a particular lighting effect with predetermined effects (color, intensity, pan, tilt, etc.) and duration.

See Figure 4. Each step has a dynamic part called the FADE TIME – during which effects move to the step's programmed positions, and a static part – the wait – where effects do not change. The total of the fade and wait times (i.e the time before the fixture moves to the next step in the sequence) is called the NEXT TIME.

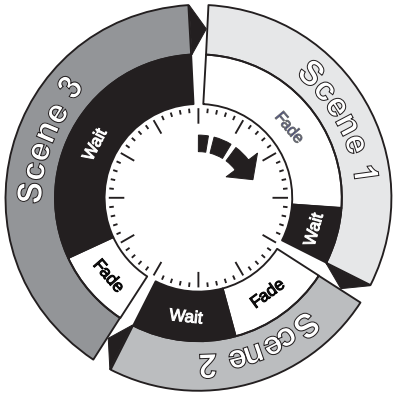


Figure 4: Scene timing

Programming stand-alone operation

Programming stand-alone operation via the control panel

The stand-alone programming commands available are given under "Onboard control menus" on page 21. Note the following points:

- To add a step to a sequence, navigate to the step before the one you want to add, then apply the INSERT command. The new step will be added after the current step, and the effects in the current step will be automatically copied to the new step.
- To clear the effects in a step, navigate to that step, and apply the RESET STEP command. All values in that step will be reset to zero.
- To delete a step from a sequence, navigate to that step, then apply the DELETE command.
- To clear an entire stand-alone sequence from memory and reset the stand-alone program to one step with all values set to zero, navigate to and apply the CLEAR ALL command.
- To speed up the stand-alone program by a factor of ten, select 1/10 SEC in the TIMEBASE menu.

Programming stand-alone scenes via DMX

You can program the effects in each step by capturing the DMX values the fixture is receiving. To do this:

1. Send the DMX values you want to capture.
2. Navigate to and apply the CAPT DMX command. The MAC 301 Wash will display CAPTURE DMX 01/01. Press ENTER to confirm and the fixture will display START CAPTURE.
3. Continue creating steps using the INSERT command in the control panel, and adjust the DMX values you send to the fixture and use CAPT DMX each time you want to apply those values to a new step.
4. Reset and delete steps using the control panel commands.

Running a stand-alone program

Select RUN in the STANDALONE menu to execute the programmed sequence in a repeating loop.

Service and maintenance

Warning! Read “Safety Information” on page 3 before servicing the MAC 301 Wash.

Warning! Disconnect the fixture from AC mains power and allow to cool for at least 10 minutes before handling. Do not view the light output from less than 0.5 meters (20 inches) without shade 4-5 welding goggles. Be prepared for the fixture to light suddenly if connected to power.

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

Important! Excessive dust, smoke fluid, and particle buildup degrades performance, causes overheating and will damage the fixture. Damage caused by inadequate cleaning or maintenance is not covered by the product warranty.

The user will need to clean the MAC 301 Wash periodically, and it is also possible for the user to change the main fuse and update the firmware. All other service operations on the MAC 301 Wash 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.

It is Martin policy to apply the strictest possible calibration procedures and use the best quality materials available to ensure optimum performance and the longest possible component lifetimes. However, LEDs are subject to wear and tear over the life of the product, resulting in gradual changes in color and overall brightness over many thousands of hours of use. The extent of wear and tear depends heavily on operating conditions and environment, so it is impossible to specify precisely whether and to what extent LED performance will be affected. However, you may eventually need to ask Martin Professional to replace LEDs if their characteristics are affected by wear and tear after an extended period of use and if you require fixtures to perform within very precise optical and color parameters.

Cleaning

Cleaning schedules for lighting fixtures vary greatly depending on the operating environment. It is therefore impossible to specify precise cleaning intervals for the MAC 301 Wash. 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 at outdoor events, for example).

If one or more of these factors is present, inspect fixtures within their first 100 hours of operation to see whether cleaning is necessary. Check again at frequent intervals. This procedure will allow you to assess cleaning requirements in your particular situation. If in doubt, consult your Martin dealer about a suitable maintenance schedule.

Use gentle pressure only when cleaning, and work in a clean, well-lit area. Do not use any product that contains solvents or abrasives, as these can cause surface damage.

Warning! Disconnect from power and allow to cool before cleaning.

To clean the fixture:

1. Disconnect the fixture from power and allow it to cool for at least 10 minutes.
2. Vacuum or gently blow away dust and loose particles from the outside of the fixture and the air vents at the back and sides of the head and in the base with low-pressure compressed air.
3. Clean the front glass by wiping gently with a soft, clean lint-free cloth moistened with a weak detergent solution. Do not rub the surface hard: lift particles off with a soft repeated press. Dry with a soft, clean,

lint-free cloth or low-pressure compressed air. Remove stuck particles with an unscented tissue or cotton swab moistened with glass cleaner or distilled water.

4. Check that the fixture is dry before reapplying power.

Control menu service utilities

Fixture reset

The RESET FIXTURE command resets the fixture and can be used as a first remedy if an error occurs.

Error logging

The ERROR LIST command displays a list of any errors detected. An isolated error can simply be a harmless incident that is almost unavoidable in any complex combination of high-tech software and hardware, but if repeated errors occur, the MAC 301 Wash may require new firmware, service or repair. Contact your Martin supplier for advice

Error types are counted, and the error list can be cleared.

Functions test

The FUNCTIONS TEST feature provides a general test of all effects, allowing testing without a controller.

Pan/tilt reinitialization

The INIT PAN TILT feature reinitializes pan and tilt relative to their end stops. Use it if pan and tilt appear to have lost calibration.

White balance adjustment

The white balance in all MAC 301 Wash fixtures is calibrated relative to a reference source before fixtures leave the factory. However, it is possible to fine-tune the white output in the color wheel effect using the FINE ADJUST menu.

Warning! ***The MAC 301 Wash lights up immediately the FINE ADJUST menu is activated.***

The SKAL RED, SKAL GREEN and SKAL BLUE items let you adjust the intensity of red, green and blue pixels as a percentage in the white light mix. Keep at least one value at 100% for maximum intensity. Overall intensity can be adjusted from 0% to 100% using SKAL ALL.

Zoom adjustment

The zoom effect in all MAC 301 Wash fixtures is also calibrated at the factory, but it is possible to fine-tune the zoom using the ZOOM OFS command.

Software upload

The RECEIVESOFT command prepares the fixture for a fixture software (also called firmware) upload.

Software updates are available from the Martin website and can be installed with a special MAC 301 upload device that can upload software to one fixture at a time.

The following are required in order to install software:

- The latest version of the MAC 301 Wash software, available for download free of charge from the Product Support Area of the Martin website at http://www.martin.com
- A PC running Windows 98/2000/XP
- A special MAC 301 Software Uploader interface device and 5-pin DMX cable (supplied with device).

See the MAC 301 Software Uploader device user documentation for full details of the upload process.

Fixture readouts

DMX input signal

The DMX TEST menu lets you view the DMX values received on each channel. If the fixture does not behave as expected, reading the DMX values can help you troubleshoot the problem.

Fixture status

The MAC 301 Wash gives fixture status readouts in the INFO menu:

- Current software/firmware version information is available.
- The non-resettable TOT OPERATE TIME counter displays total hours of use since the fixture was manufactured.
- Temperature readouts from the display panel and power supply unit in the base as well as the driver and LED PCB in the head are available. In each case, you can view the current temperature and the maximum temperature reached since the readout was last reset. The maximum temperatures can be reset individually.

Lubrication

In general, the MAC 301 Wash does not require lubrication. However, depending on use conditions, the moving parts in the head and zoom mechanisms may eventually require reapplication of lubricant. Excessive noise during pan/tilt and zoom movement is a sign that lubrication may be required. This operation can be carried out by a Martin service partner if necessary.

Fuse replacement

Warning! Disconnect from power before replacing a fuse. Replace fuses with ones of the same type and rating only. Never bypass or bridge a fuse.

The MAC 301 Wash is protected by a main fuse located in a fuseholder next to the power cable entry (see “Fixture overview” on page 6). US models require a 6.3 amp slow-blow fuse and EU models require a 4 amp slow-blow fuse.

To replace fuses:

1. Isolate the fixture from power.
2. Use a flathead screwdriver to open the fuseholder and remove the fuse for testing or replacement.
3. Replace defective fuses with ones of the same type and rating only. Replacement fuses are available from Martin.
4. Reinstall the fuseholder before reapplying power.

If a fuse blows repeatedly, disconnect the fixture from power immediately and consult your Martin supplier.

DMX protocol

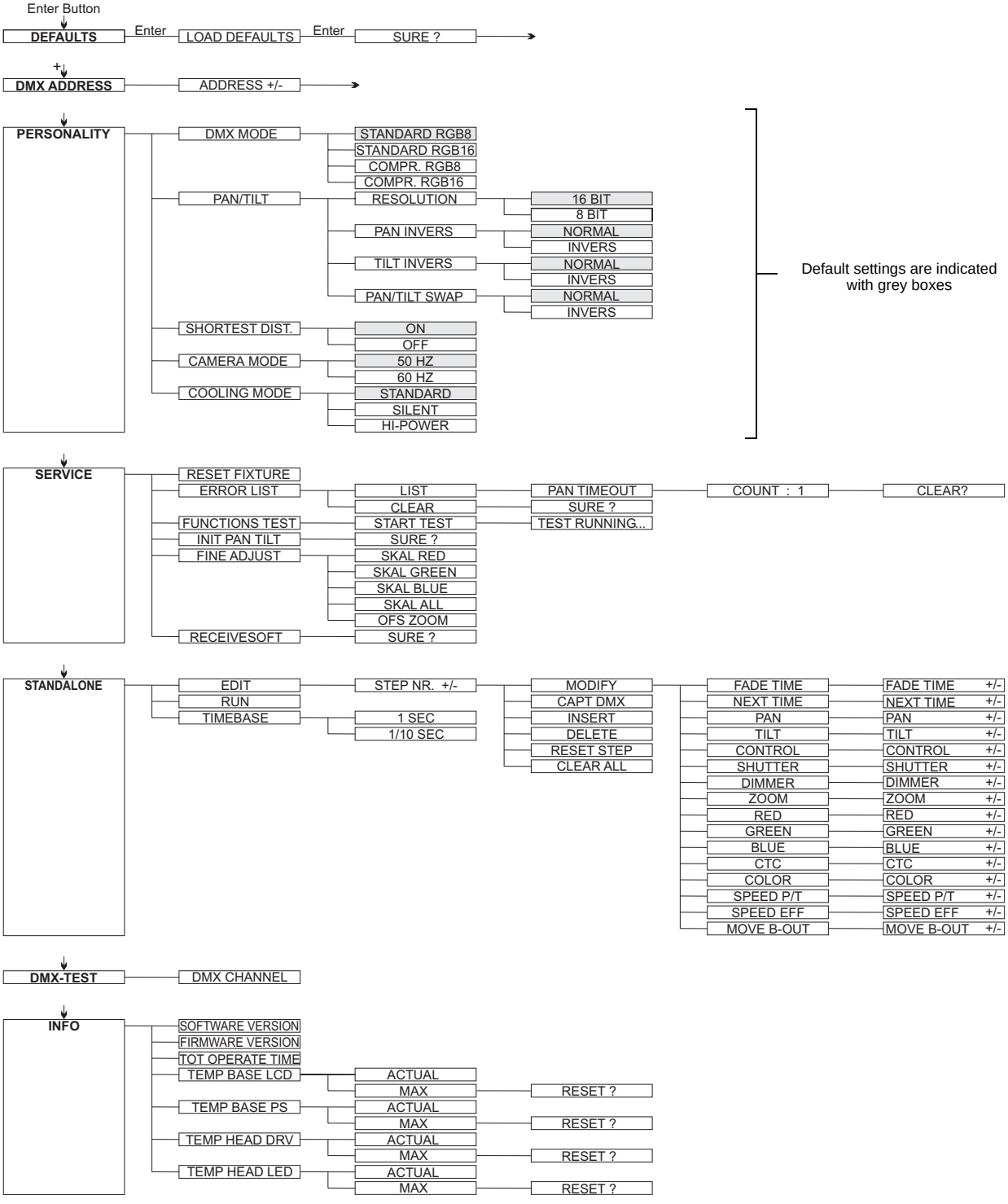
Std. 8-bit	Std. 16-bit	Comp. 8-bit	Comp. 16-bit	DMX Value	Percent	Function
1	**1**	**1**	**1**	0 - 255	0 - 100	**Pan** Pan 0 - 430°
2	**2**	**2**	**2**	0 - 255	0 - 100	**Pan fine** Pan fine (Least Significant Byte)
3	**3**	**3**	**3**	0 - 255	0 - 100	**Tilt** Tilt 0 - 300°
4	**4**	**4**	**4**	0 - 255	0 - 100	**Tilt fine** Tilt fine (Least Significant Byte)
5	**5**	**5**	**5**	0 - 7 8 - 15 16 - 239 240 - 247 248 - 255	0 - 3 3 - 6 6 - 94 94 - 97 97 - 100	**General control** Full LED output power White balance (if color wheel effect active) Safe Reset (after 1 second delay) Safe
6	**6**	**6**	**6**	0 - 15 16 - 95 96 - 110 111 112 - 125 126 127 128 - 142 143 144 - 158 159 160 - 174 175 176 - 190 191 192 - 206 207 208 - 222 223 224 - 238 239 240 - 254 255	0 - 6 6 - 37 38 - 43 43 44 - 49 49 47 47 - 56 56 56 - 62 62 63 - 68 69 69 - 74 75 75 - 81 81 82 - 87 87 88 - 93 94 94 - 100 100	**Electronic shutter effect** Shutter closed Shutter open Strobe effect >10 Hz (fast → slow) Shutter open Dimmer fade time adjustment, slow → fast Shutter open Shutter closed Strobe effect <10 Hz (fast → slow) Shutter open Closing pulse (0.6 → 4.8 seconds) Shutter closed Shutter fade to 0% (0.6 → 4.8 seconds) Shutter open Shutter fade to 100% (0.6 → 4.8 seconds) Shutter closed Random shutter 100% (0.6 → 4.8 seconds) Shutter open Random shutter 0% (0.6 → 4.8 seconds) Shutter closed Random shutter fade to 0% (0.6 → 4.8 seconds) Shutter open Random shutter fade to 100% (0.6 → 4.8 seconds) Shutter open
7	**7**	**7**	**7**	0 - 255	0 - 100	**Dimmer** Dimmer 0 → 100%
8	**8**	**8**	**8**	0 - 255	0 - 100	**Zoom** Zoom 16 → 36°
9	**9**	**9**	**9**	0 - 255	0 - 100	**Red** Red 0 → 100%
	10		**10**	0 - 255	0 - 100	**Red fine** Red fine (LSB)
10	**11**	**10**	**11**	0 - 255	0 - 100	**Green** Green 0 → 100%
	12		**12**	0 - 255	0 - 100	**Green fine** Green fine (LSB)
11	**13**	**11**	**13**	0 - 255	0 - 100	**Blue** Blue 0 → 100%
	14		**14**	0 - 255	0 - 100	**Blue fine** Blue fine (LSB)
12	**15**	**12**	**15**	0 - 255	0 - 100	**CTC** CTC 0 → 100%

Table 2: DMX Protocol

Std. 8-bit	Std. 16-bit	Comp. 8-bit	Comp. 16-bit	DMX Value	Percent	Function
						Color wheel effect
				0 - 1	0	Inactive: color mixing with RGB control
				2 - 3	1	White
				4 - 7	2	White → Red
				8 - 11	3 - 4	Red
				12 - 15	5 - 6	Red → Yellow
				16 - 19	6 - 7	Yellow
				20 - 23	8 - 9	Yellow → Magenta
				24 - 27	9 - 10	Magenta
				28 - 31	11 - 12	Magenta → Green
				32 - 35	13 - 14	Green
13	**16**			36 - 39	14 - 15	Green → Amber
				40 - 43	16 - 17	Amber
				44 - 47	17 - 18	Amber → Blue
				48 - 51	19 - 20	Blue
				52 - 55	20 - 21	Blue → Cyan
				56 - 59	22 - 23	Cyan
				60 - 63	24 - 25	Cyan → White
				64 - 191	25 - 75	Continuous color wheel positioning
						Color wheel rotation effect
				192 - 222	75 - 87	Clockwise, fast → slow
				223 - 224	87 - 88	Color wheel stop
				225 - 255	88 - 100	Counter-clockwise, slow → fast
						Pan/tilt speed
14	**17**			0 - 3	0 - 1	Moves in real time
				4 - 255	2 - 100	Delayed movement, fast → slow
						Effects speed
15	**18**			0 - 3	0 - 1	Move in real time
				4 - 255	2 - 100	Delayed movement, fast → slow
						Movement blackout
				0 - 95	0 - 37	No function
				96 - 127	38 - 50	Blackout during pan/tilt movement
				128 - 159	50 - 62	Blackout during color changes
16	**19**			160 - 223	63 - 87	No function
				224 - 255	88 - 100	Blackout during pan/tilt movement and color changes
						Fade-out/fade-in times for blackouts is adjustable, slow (5 secs.) → snap

Table 2: DMX Protocol

Onboard control menus



Troubleshooting

Problem	Probable cause(s)	Remedy
Fixture is completely dead.	No power to fixture.	Check power and connections.
	Fuse blown.	Disconnect fixture from power. Check fuses and replace.
One or more fixtures resets correctly but responds erratically or not at all to the controller.	Fault on data link.	Inspect connections and cables. Correct poor connections. Repair or replace damaged cables.
	Data link not terminated.	Insert termination plug in output connector of the last fixture on the link.
	Incorrect fixture DMX addressing.	Check addressing on fixture and controller. Check fixture is set to correct DMX mode.
	One of the fixtures is defective and is disturbing data transmission on the link.	Unplug XLR in and out connectors and connect them directly together to bypass one fixture at a time until normal operation is regained. Have faulty fixture serviced by Martin service technician.
	XLR pin-out on fixtures does not match (pins 2 and 3 reversed).	Install a phase-reversing cable between the fixtures or swap pins 2 and 3 in the fixture that behaves erratically.
Light output cuts out intermittently.	Fixture is too hot.	Ensure free airflow around fixture. Clean fixture. Check that ambient temperature does not exceed max. permitted level. If problem persists, contact Martin for service.

Table 3: Troubleshooting

Specifications

Physical

Length . . . . . 200 mm (7.9 in.)
Width . . . . . 320 mm (12.6 in.)
Height . . . . . 370 mm (14.6 in.)
Weight . . . . . 8.9 kg (19.6 lbs.) excl. brackets

Dynamic Effects

Color mixing . . . . . RGB
Red . . . . . 0 - 100%
Green . . . . . 0 - 100%
Blue . . . . . 0 - 100%
Electronic 'color wheel' effect: . . . . . 7 colors plus white, color wheel rotation effect, snap, blackout or dimmer fade at color changes
Variable CTC
Electronic dimming . . . . . 0 - 100%
Zoom . . . . . 13 - 36°
Strobe effect . . . . . Electronic, with pulse and random effects
Pan . . . . . 430°
Tilt . . . . . 300°
Adjustable pan/tilt and effects speed

Optics

Light source . . . . . Luxeon Rebel high power emitters

Control and Programming

Control options. . . . . DMX, stand-alone
DMX channels 12/15/16/19
Setting and addressing . . . . . Control panel with backlit graphic display
Protocol . . . . . USITT DMX512/1990
Stand-alone memory . . . . . 28 scenes
Stand-alone programming . . . . . Control panel with backlit graphic display
Transceiver RS-485
Firmware update . . . . . Serial upload via DMX link

Construction

Color: . . . . . Black
Housing:. . . . . High-impact flame-retardant thermoplastic
Protection rating. . . . . IP 20

Installation

Mounting points . . . . . 2 pairs of 1/4-turn locks
Orientation . . . . . Any
Minimum distance to illuminated surfaces . . . . . 250 mm (9.8 in.)
Minimum distance to combustible materials . . . . 100 mm (3.9 in.) from head, no min. distance from base

Connections

AC power input: . . . . . 1.6 m cable tail
DMX data in/out: . . . . . 3-pin and 5-pin locking XLR

Electrical

AC power: . . . . . 100-130 V (US model), 200-240 V (EU model), 50/60 Hz
Maximum total power consumption: . . . . . 350 W
Power supply unit: . . . . . Electronic switch mode
Main fuse: . . . . . 6.3 AT (US model), 4 AT (EU model)

Thermal

Cooling: . . . . . Forced air (temperature-regulated, low noise, user-definable levels)
Maximum ambient temperature (Ta max.): . . . . . 40° C (104° F)
Minimum ambient temperature (Ta min.): . . . . . 5° C (41° F)
Total heat dissipation (calculated, +/- 10%): . . . . . 1200 BTU/hr.

Approvals

CE

See separate CE Declaration of Conformity
ETL approval pending

Included Items

Two Omega clamp attachment brackets with 1/4-turn fasteners
User manual: . . . . . P/N 35000228

Accessories

G-clamp . . . . . P/N 91602003
Half-coupler clamp . . . . . P/N 91602005
Quick trigger clamp . . . . . P/N 91602007
Safety wire, universal, 50 kg safe work load . . . . . P/N 91604003
DMX cable, STP, 1 pair + shield, IEC/UL-CL, 1 m . . . . . P/N 91611242
DMX cable, STP, 1 pair + shield, IEC/UL-CL, 2 m . . . . . P/N 91611243
DMX cable, STP, 1 pair + shield, IEC/UL-CL, 5 m . . . . . P/N 91611244
DMX cable, STP, 1 pair + shield, IEC/UL-CL, 10 m . . . . . P/N 91611245
DMX cable, STP, 1 pair + shield, IEC/UL-CL, 20 m . . . . . P/N 91611246

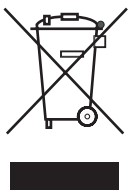
Spare parts

6.3 AT main fuse (US models): . . . . . P/N 05020020
4 AT main fuse (EU models):. . . . . P/N 05020014

Ordering Information

MAC 301 Wash™, US model (100-130 V, 50/60 Hz) . . . . . P/N 90218100
MAC 301 Wash™, EU model (200-240 V, 50/60 Hz) . . . . . P/N 90218100

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



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.

Notes

Notes

Martin®

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