Strand Lighting

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Operators Manual

Colour Call

Contents of this manual may be changed by Strand Lighting without notice.

Colour Call's design has been used in theatre, musicals, show and rock lighting worldwide. Our aim has been to manufacture a scroller silent enough for theatre, quick enough for shows and sturdy enough to tour.

- Colour Call is one of the fastest scrollers on the market with an operating speed of 11 colour frames in one second for the par size Colour Call CC1 and 11 frames in four seconds for CC2 the 2/5kw Colour call.

- Colour Call is also one of the slowest scrollers on the market with an operating speed as slow as your slowest cue.

- Colour Call is easy to zero set due to replacable rolls.

- Diagnostic indicators on the base of each unit indicate power, signal level and valid DMX signal.

- Automatic tensioning of gel string gives smooth operation.

- Colour call maintains position during power loss or loss of DMX data. There is no startup procedure at powering up.

- Colour Call can take anything between 2 and 16 colours.

- An extremely low power consumtion. Several scrollers can be fed from one power supply. Long control cables can be used.

- It can receive either DMX512 signals or analog 0 to 10 volts.

- A balanced analog input eliminates most earth problems.

- The par sized Colour Call CC1 has a accessory holder for Cadenza barndoors and is supplied with two addaptor plates as standard.

Controlling the Colour Call scrollers

The Colour Call scrollers are controlled with a DMX512 digital signal or a 0-10 volt analog signal. There are great advantages in using a digital system. The units can be linked and given address separately, making rigging easy. The speed of a unit is directly proportional to the speed of your control signal. The Analog and the Digital systems are treated separately in this manual.

Calibrating

Contrary to most other scrollers on the market the Colour Call scrollers will remain in position at loss of power. They will not require any form of start-up process*. This is due to the fact that they are run with a DC motor together with a direct drive position sensing. Another advantage of this construction is that you are able to position anywhere along the gel string, and at any speed.

*Note: Most other scrollers will "learn" the gel string at start-up by running through all colours and "remembering" the tabs. They will also "forget" the tabs at loss of power. This means that they will have to run through the gel string after a loss of power to function properly. This procedure can take up to 30 seconds. Colour Call will find it's position according to the control signal as soon as it's powered up.

Mounting on instruments

Power Data Daisy Chain Cable

There are different mounting plates for mounting the units to different lanterns. The maximum aperture of the PAR scroller is 192 mm. It can be mounted to work in any position.

Power supplies

There are Power Supplies for 12 or 24 units. The power is fed to the splitter box and distributed from there to each unit in the same cable as the control signal. The power supply can be fitted with a G clamp to be mounted in the truss. The power supply is a short circuit switched mode construction which allows mains to alter between 200/260 volts (230V setting) or 100/130 volts, (115v setting).

Splitterbox

The splitterboxes differ depending on if you are running an analog or a DMX system. The same power supply is used in both cases. Each type is described separately in this manual. General for all splitterboxes is an input for the control signal, another input for 24 volts from the power supply and several output connectors to the scrollers. The splitterboxes can be fitted with a G clamp to be mounted in the truss.

Gel rolls

The gel roll construction of the units consists of two spools, one with a gold knob and the other with a black knob. The spool with a gold knob has a built-in spring which takes care of tensioning the gels. You can easily prepare, mount and install gel rolls following the instructions in this manual. Changing gel rolls in a unit is done without need of any tools in a matter of minutes.

The units are factory trimmed for a working range of 11 colours, or a total filter length of 3080mm plus a leader and a tail of 320mm each. The standard number of colours is eleven because it gives one colour for each 10% control signal input to a unit. You are free to change the length of each colour within the total length of the colour string without need for readjusting the unit. If however you wish to change the total length of the colour string, you will have to re-trim the unit with the trimpot in the back of the unit. This is described later in this manual. A unit can be trimmed for 2-16 colours.

If the colour string is shorter than the trim range it will be ripped of the spool, and if it's too long you won't be able to reach the end colours.

Cooling

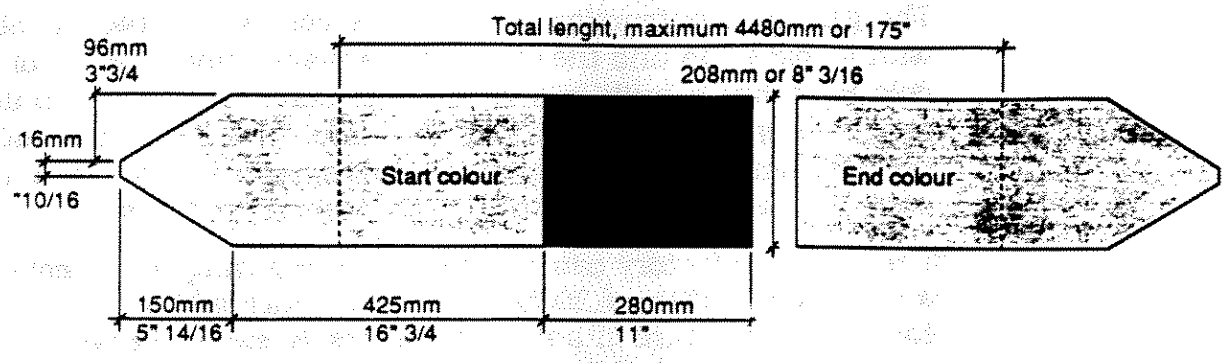
The unit has a two speed fan included to extend the life of the coloured gell. The low speed setting enables quiet operation whilst still cooling the gel sufficiently. The high speed setting provides extra cooling for saturated colours and further extends the life of all filter. The high speed operation should be used where silence is unimportant.

Rigging a Colour Call scroller system

The units are mounted on the lighting instruments of your choice. You can mount the splitterbox and the power unit in the truss with hook clamps. The power is fed into the splitterbox and distributed from there to each unit. The distribution system and the splitterbox depends on the type of control signal used DMX512 or analog (0-10V).

The cables used for distribution to the units are the of the same sort in both systems. Standard five pin XLR connectors are used. On the base of each unit there are three LED indicators*. The red LED indicates that power is on. The yellow LED shows the input signal to the unit. The green LED indicates that the incoming DMX data is correct. If the red LED is flashing it indicates auto motor shut off which is activated it the scroller for some reason cannot reach it's position.

Cutting and mounting a gel string



Step 1.
Use cutting templates provided by us or make your own as described above. Use a razor or a sharp knife to cut the filters.

Step 2.
Align filters correctly, no overlapping.

Step 3.
Tape only on one side. Cut ends of exessive joining tape.

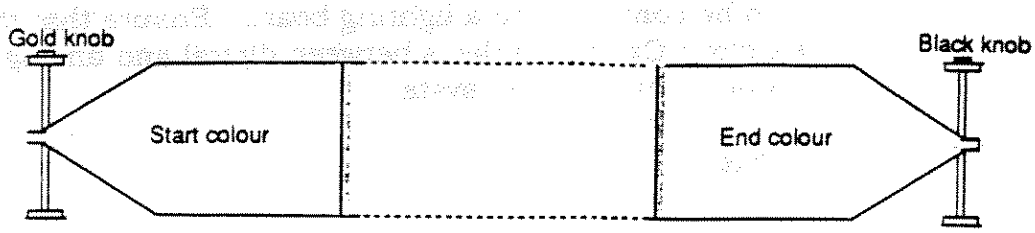
▲ Use only high temperature tape from Scotch 3M. Can be ordered from us as well.

A gel roll can have 2-16 colours and will always cons· of two leaders measuring as above and filters inbetween measuring 280 x 208. You can vary the amount of sizes of the gels but the maximum total length that a scroller can be trimmed for is 4480mm.

Hint 1: When preparing spare rolls take care to store rolls with the joining tape outwards and the end colour outward. It is then easier to mount the gel string on the spool with the black knob as described on the next page.

Hint 2: Dark coloured filters will react to heat and be deformed earlier than lighter coloured filters. This can affect the positioning of the other filters if the darker filters are placed as the last filters, thus being rolled up most of the time. Therefore it is a good idea to place darker filters closer to the start colour than to the end colour.

Mounting gels on rolls



Step 1.

Attach the start and end colours to the midpart of the rolls with the heat resistant tape (100mm). Make sure that the joining tape is on the outside of the gels when you wind up the roll as described in step 2.

Step 2.

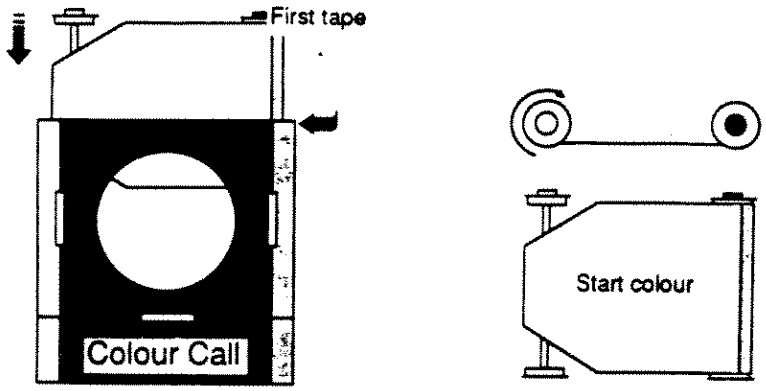
Make sure that the gel string is wound up counter clockwise on the roll with the black knob (seen from top). This makes it easier for you when you are mounting and synchronizing the roll in the scroller.

▲ Take care not to force the gold knob counter clockwise when tensioning the gel roll. If not you might break the tensioning spring.

Mounting gel rolls in scroller

To trim the zero position of the gel roll in the scroller, the scroller has to be connected to a lighting board. Ensure that the switch on the Colour Call that selects between digital and analog is correct position for the chosen system.

Step 1.



Make sure that the signal from the lightboard to the scroller is at zero level. The yellow LED indicating input to the scroller should be off.

Step 2.

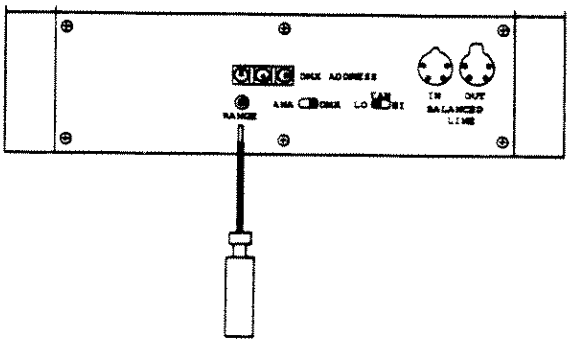
Make sure that the gel string is wound up on the spool with the black knob. The tape joint of the first filter should be aligned to the spool with the black knob as in the figure.

Step 3.

Fit the roll with the black knob into the scroller and make sure it has locked around the socket pin inside the scroller. Then turn the gold knob clockwise to tension the gel string. If your gel string has other than 11 colours, or your lightboard doesn't give exact values you now will have to calibrate your scroller.

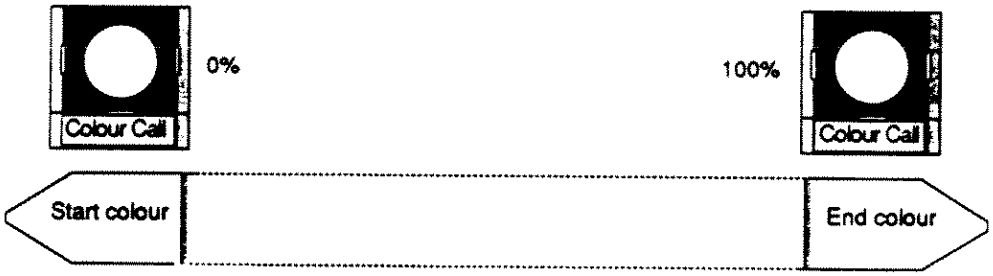
Calibrating gel rolls

The scrollers are factory calibrated for a gel string of 11 colours. If your gel string has other than 11 colours, or your lightboard doesn't give exact values you now will have to calibrate your scroller.



Step 1.

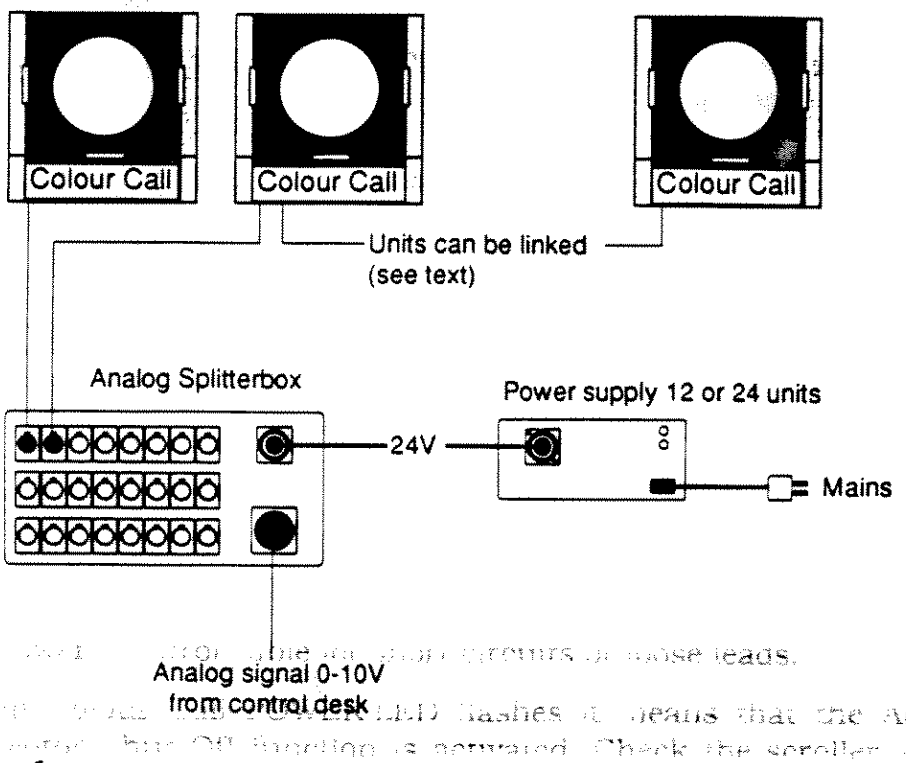
Use a small screwdriver at the trimpot "range"on the back of the scroller and turn this pot fully counter clockwise before power on. This pot can change the trimming range between 2 and 16 colours, therefore you might have perform up to 15 turns to set it fully to it's end position.



Step 2.

Set the lightboard to 100%. Use the trim pot to trim the end colour. Your scroller is trimmed when 100% on the lightboard corresponds to the end colour. Repeat this trimming procedure for each unit. Trimming clockwise will prolong the trimming range and vice versa.

Analog system



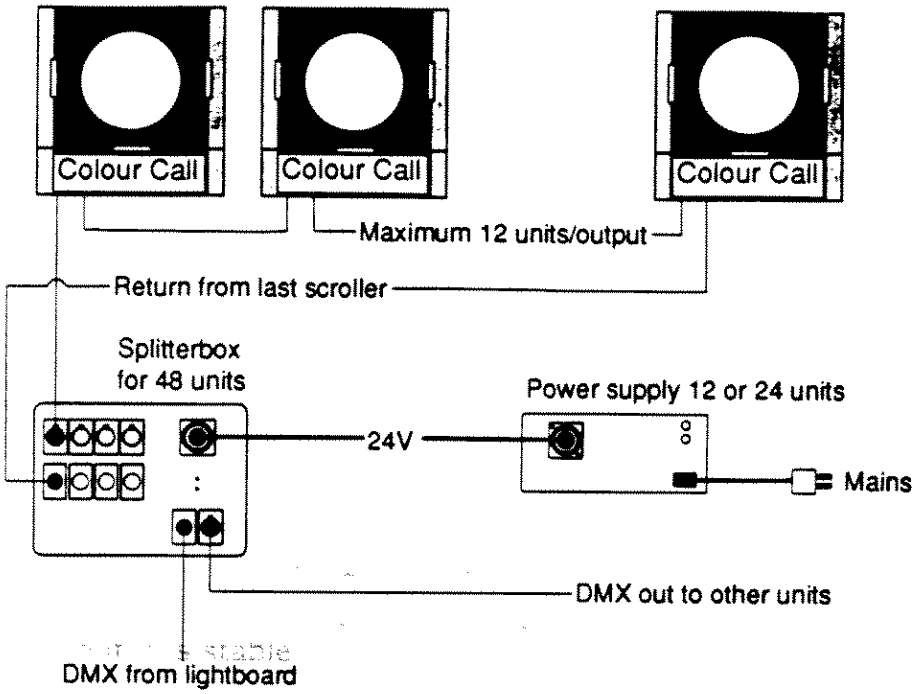
General

In an analog system 0-10V standard output signal from any type of lightboard is fed into the splitterbox together with the 24V DC from the power supply unit. The power/control signal is distributed from the splitterbox to a maximum of 12 or 24 individual scrollers. Up to 6 scrollers can be linked to the same output if cable lenghts do not exceed 10 meters, but you can never exceed the capacity of the power supply unit. To power more than 24 units from one splitterbox you will have to use the option of connecting two 24 unit power supplies in parallel.

▲ As any analogically controlled moving unit, the Colour Call analog system requires a stable analog control signal. Any variations in the signal will be noticed more or less in the positioning of the scroller.

Hint: If your analog control signal is passing any other equipment connected to mains (dimmers for example), make sure that the same mains earth is used also for this equipment. If possible check that your scroller system is "floating" against the mains earth before you power up for the first time. This is done with an ohm meter measuring between the signal ground and the mains ground. The should be no connection between these two whatsoever, which is indicated by infinity ohm's on the ohm meter.

DMX system



General

The DMX signal from a lightboard is fed into the splitterbox together with the 24V DC from the power supply unit. The power/control signal link is distributed from the splitterbox in 4 parallel outputs. Each output can support up to 12 individual scrollers. This makes a possible total of 48 scrollers/splitterbox. Make sure that you connect the return cable from the last unit to the splitterbox to ensure reliable functioning. Each scroller is given an address with the switches at the back of the scroller.To power more than 24 units from one splitterbox you will have to use the option of connecting two 24 unit power supplies in parallel.

Return connection

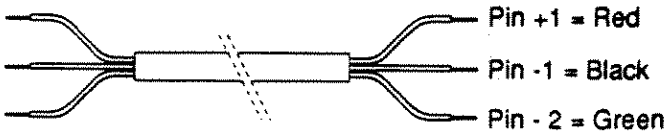
The return connection from the last scroller back to the splitterbox ensures reliable DMX transmission system functioning even if one signal cable is faulty. You can replace the return cable with a terminator plug in the last scroller, providing the speed of the last scroller isn't affected by not having a return cable. Terminator: 100 ohm resistor between pin 2 & 3.

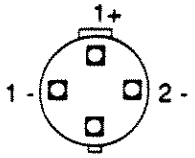
Analog desk - DMX system

If you want to run the scrollers in DMX mode from a control desk with an analog output you will need an Analog to Digital converter. DMX gives easy patching of channels to the scrollers

Cable lengths

Use ordinary 3 core rubber mains cable.





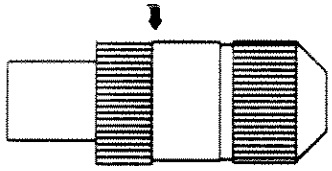
Lead area	Cable lengths	Voltage drop at full load*
1.5 mm2/xxAWG 16	5 meters/15 feet 15 meters/45 feet	1V 4V
2.5 mm2/xxAWG 12	8 meters/24 feet 25 meters/75 feet	1V 4V
4.0 mm2/xxAWG 10	12 meters/36feet 40 meters/120feet	1V 4V
6.0 mm2/xxAWG 8	18 meters/55feet 60 meters/180feet	1V 4V

*Voltage drop does not affect positioning, just the maximum speed.

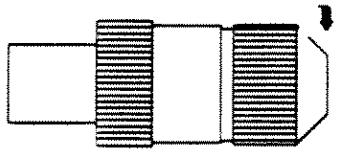
Neutrik NL4 24V Connector

This is how you connect the Neutrik 24V connector:

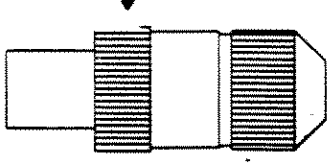
Step 1.
Turn the locking ring fully counter clockwise.



Step 2.
Hold rear end and insert, then turn clockwise until it "snaps" in.



Step 3.
Secure the connector by turning the locking ring fully clockwise.



Power supply for 12 or 24 units

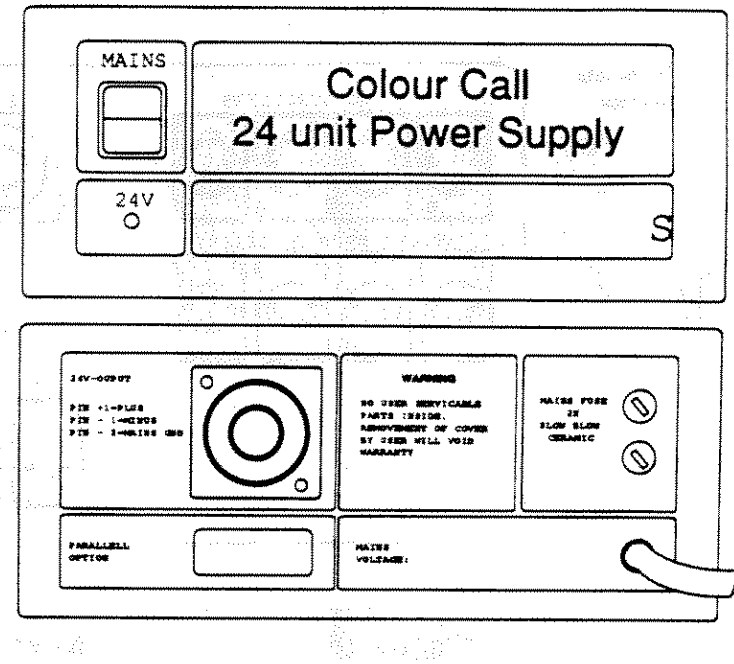
The power supplies come in two sizes; for 12 or for 24 units. They can be fitted with a G-clamp to be mounted in the truss.

PSU 24 units

Heigth:	85mm/3,5"
Width:	215mm/8,25"
Depth:	330mm/13"
Weight:	3,8kg/8,5lbs
Fuse:	5AT 6,3x32mm
Current:	230V: 2,5 amp
	115V: 4,4 amp

PSU 12 units

Heigth:	85mm/3,5"
Width:	215mm/8,25"
Depth:	330mm/13"
Weight:	3.2kg/7lbs
Fuse:	4AT 6,3x32mm
Current:	230V: 1,6 amp
	115V: 2,7 amp



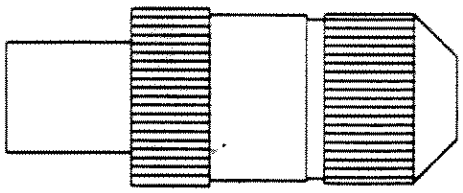
Caution: The PSU **must** be connected to a mains outlet with mains earth. Do **not** connect to a dimmer circuit.

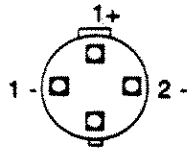
Power

The Power supply is a light weight switched mode construction allowing mains to alter between 230 volts +/- 15%, **or** 115 volts +/- 15% depending on the factory setup.

Parallel option

Two power supplies can be connected in parallel via the "parallel option" connector. This enables you to connect the maximum amount of scrollers possible to a DMX splitterbox and power them on a single line. The option connector should **not** be used for other purposes.





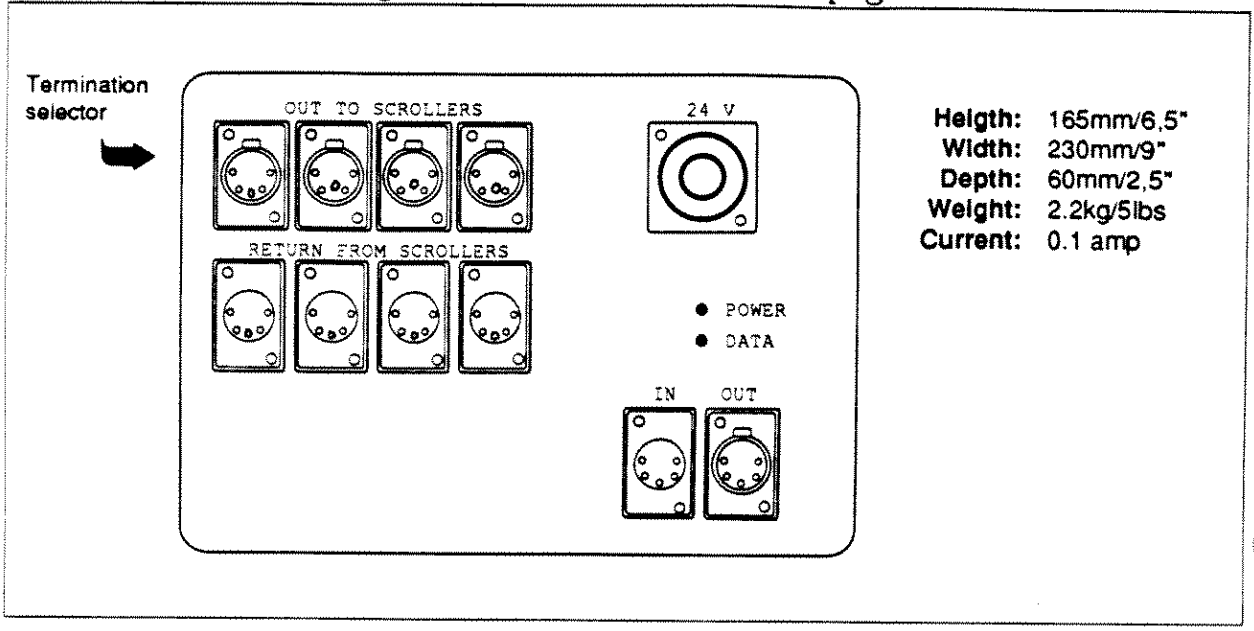
24V connector

Neutrik NL4 connector

Pin 1-: 24V -
Pin 1+: 24V +
Pin 2 -: Mains earth

DMX512 digital splitter box

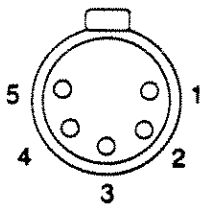
The DMX splitter box is fully buffered and re-amplifies the signal to each scroller daisy chain loop. Always connect a return cable from the last scroller from each output to the return sockets. This improves current feeding and DMX transmission, see page 10.



Heigth: 165mm/6,5"
Width: 230mm/9"
Depth: 60mm/2,5"
Weight: 2.2kg/5lbs
Current: 0.1 amp

DMX512 Connector

XLR-5p Female connector

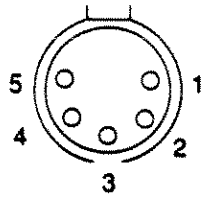


Pin 1: Screen
Pin 2: Data –
Pin 3: Data +

USITT-protocol from control desk.

Power/Data Daisy Chain Cable

XLR-5p Female connector

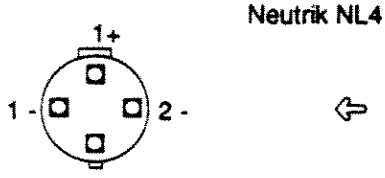


Pin 1: Screen
Pin 2: Data –
Pin 3: Data +
Pin.4: 0V (24V Return)
Pin 5: +24Volts DC

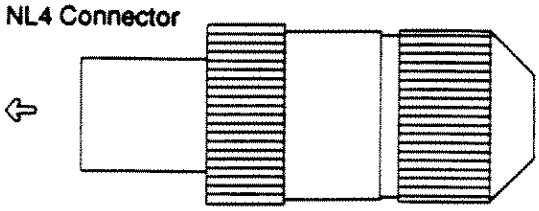
For Cable Specification see page 17

24V connector

Neutrik NL4 Connector



Pin 1-: 24V –
Pin 1+: 24V +
Pin 2 -: Mains earth (for DMX use)



1: Dismantle end part ⇨

⇦ 2: Push frontpart forward

Digital Splitterbox Termination selector

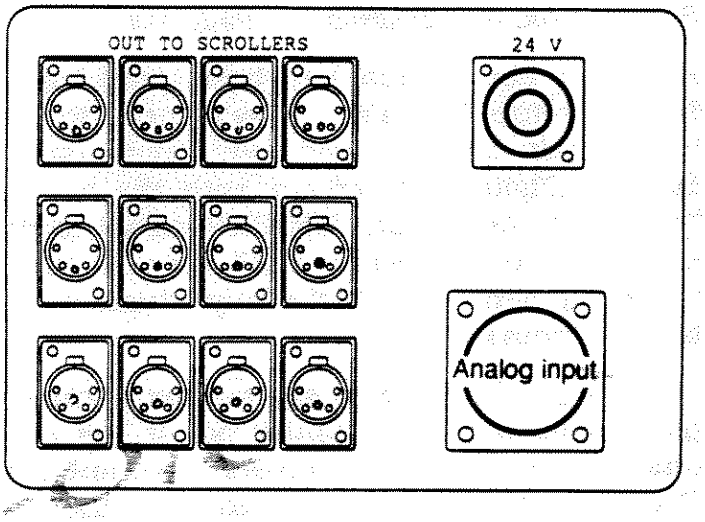
DXM512 is a USITT protocol based on a RS485 electrical specification. Like most digital signal transmission lines RS485 requires correct line termination for reliable operation. Therefore line terminators have been incorporated in the Digital Splitterbox. All the scroller daisy chain loops are automatically terminated when the return from the last scroller is connected into the Digital Splitter box, (see diagram on Page 10).

A termination switch has been provided so that when several Digital Splitter boxes are daisy cained together the last Splitter box in the chain can be terminated. Every instalation should only have the last Digital Splitter box with the termination selector in the "yes" position. If the DMX512 signal is daisy chained to other equipment that receives DMX then termination should occur in this equipment. This is the only situation where **no** Digital Splitter box is terminated.

The design of the digital splitter box ensures that in the event of a power failure on one splitter box it has no detrimental affect on other splitter boxes or dimmers down line of the failed splitter box. This is due to passive transmission on the control out line.

Analog splitterboxes 12 or 24

The analog splitterbox comes in two sizes: 12 channels and 24 channels. The amount of scrollers that can be linked to a box depends on the capacity of the power supply.



12 ch

Heigth: 165mm/6,5"
Width: 230mm/9"
Depth: 60mm/2,5"
Weight: 2.2kg/5lbs
Current: 0.0 amp

24 ch

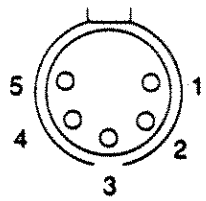
Heigth: 165mm/6,5"
Width: 340mm/13,5"
Depth: 60mm/2,5"
Weight: 3.3kg/7,25lbs
Current: 0.0 amp

Analog signal connector

The Analog splitter box has been fitted with a 25pin D type plug. This is particularly suited to M24 and Action de-multiplex boxes. However, it should be noted that only thoses de-multiplex boxes that have a positive output should be used.

Power/Data Daisy Chain Cable

XLR-5p Female connector

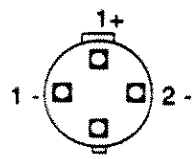


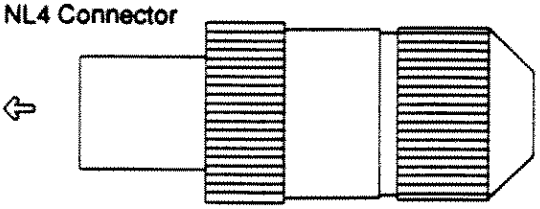
Pin 1: Screen
Pin 2: Analog 0 volts
Pin 3: Analog Control
Pin.4: 0V (24V Return)
Pin 5: +24Volts DC

For Calbie Specification see page 17

24V connector

Neutrik NL4 Connector





Pin 1-: 24V –
Pin 1+: 24V +
Pin 2 -: Mains earth

1: Dismantle end part ⇨

⇦ 2: Push frontpart forward

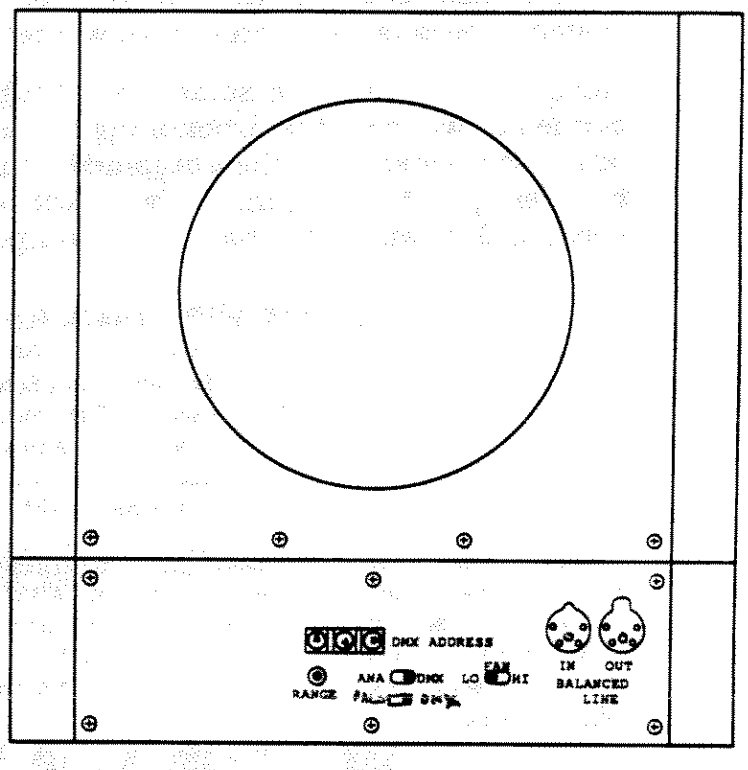
PAR scroller

The PAR Scroller can operate in analog or DMX mode. The LED's on the bottom of each unit will indicate power and running status according to the text screened as showed in the figure below.

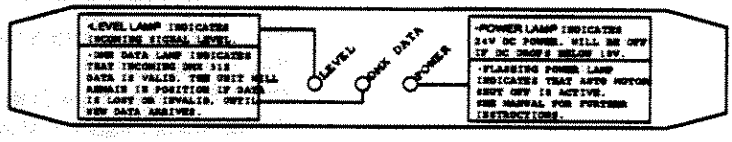
Height: 330mm/13"
Width: 300mm/12"
Depth: 65mm/2,5"
Weight: 2kg/4,5lbs
Current: 0.3 amp
Voltage: 24V DC
Colours: 2–16/280mm
Speed: 11 colours/1sec.
Control input: 0–10V
DMX512 if DMX card is fitted.

Front

Back



Bottom



DMX Address

Each unit in a DMX system has to be given an address. If several units have the same address they will respond simultaneously to incoming signals.

Analog or Digital selector

This switch decides if the scroller works in Analog or DMX mode.

Fan

This selector allows two fan speeds for optimum noise/cooling setting.

Range

This is where you trim the gel range for the unit. See calibrating on page 8.

General

It is essential that all customer made cables conform to our specifications.

•The gauge must be at least the rated one.

•Cables should be screened, and screen must NOT be connected to the case of the connectors. A screen touching the case of the connector is always hazardous to the function of both analog or digital scroller systems, because it creates an unwanted earthloop.

•Insulate each pin with some kind of tubing. Any shortcircuit within the connector will ruin the functioning of the system and might even destroy other components in the equipment. In a DMX system a short circuit between pin 5 and pins 2 or 3 will destroy the output line driver, because 24V will be fed back to the output of the linedriver circuit.

Strand power/data daisy chain cable

XLR 5 pin connectors

Pin 1: Screen = Data Screen
Pin 2: Lead 1 = Data minus
Pin 3: Lead 2 = Data plus
Pin 4: Leads 3&4 = 0 Volts (24V return)
Pin 5: Leads 5&6 = +24Volts.

This cable was designed to give ultimate performance in a DMX system. The cable consists of two heavy gauge leads, 1,5mm2/AWG16 (approximately) for the power feed and a twisted screened pair of leads for the signal. The twisted pair has a double screen and meets the USITT and RS485 standards fully.
The actual screen is cut in both ends but the drain wire is connected to pin 1 at the female connector.

Alternative power/data daisy chain cable

XLR 5 pin connectors

Pin 1: Screen = Data Screen
Pin 2: Twisted Pair = Data minus
Pin 3: Twisted Pair= Data plus
Pin 4: Thick Lead = 0 Volts (24V return)
Pin 5: Thick Lead = +24Volts.

An alternative Colour Call Power/control cable can be made out of a screened three twisted pair cable cable. The gauge of each inner lead must be at least 0.5mm2/AWG20. The nominal impedance of the twisted pair used for data transmission must be 100 ohms. The cable should have at least a foil screen with drain wire.

Standard DMX line cable

XLR 5 pin connectors

Pin 1: Screen, both ends = Signal earth
Pin 2: Lead 1 of twisted pair = Data minus
Pin 3: Lead 2 of twisted pair = Data plus

The USITT standard specifies two different types of cables. These are Alpha 5271 and Belden 9841.

Safety in the system

We have incorporated several safety features in each Colour Call. The following can be good to know.

Internal fuse

An internal reversible fuse in each scroller will protect the rest of your system from breaking down in case of major problems in a singel unit.This fuse will automatically be reset at no overload.

Line input

The line input of the scrollers will withstand any voltage within +/- 24V relative to the earth (pin 1) without tearing of the gel string.

Feedback pot

The feedback pot inside each scroller has no end stops and will therefore not be broken by forcing past the zero or end position.

Motor

The motor is protected from overload and will not burn.

Auto Motor shut off circuit

The Auto Motor shut off circuit in each scroller will stop the Colour Call if for any reason the position cannot be reached within 4 seconds. This could be caused by a broken cable, locked rolls or other mechanical or electrical disturbance to the servo system. This ensures that a scroller never will run out of control.

DMX Card

The DMX card is equipped with a watchdog that will reset automatically at any signal disturbance.

Troubleshooting a system

Here are some hints on troubleshooting a Colour Call scroller system. Remember that the guarantee will be void if unauthorized personnel opens the housing of the equipment.

All systems:

Scrollers do not move at all

If motors receive less than 18V they will automatically be shut off.

- Check the 24V LED on the PSU (Power Supply Unit). If it is off the PSU is delivering less than 18V.
- The lamp in the PSU mains switch indicates that there is power to the PSU. Check fuses at PSU back.
- Check POWER LED on bottom of Colour Call units. It will not be lit if less than 18V reaches the unit.
- If PSU is okay and Colour Call POWER LED is off, check Power/Control cable for short circuits or loose leads.
- If Colour Call POWER LED flashes it means that the Auto Motor Shut Off function is activated. Check the scroller and gel roll.

Digital system:

Scrollers are juddering

A corrupt DMX signal can create a juddering effect in the scrollers.

- Make sure the return connection from the last scroller is connected.
- If several scrollers are linked to an output, try disconnecting one or two and see if the fault disappears.
- Disconnect any other DMX 512 receivers to see if fault disappears, making sure that only the last digital splitter box is terminate (Termination switched to YES).
- Protocol convertors when conected between a control desk and a digital scroller often create "bit jitter" within the DMX signal due to "noise" on the incoming signal. This jittering may result in a position variation from 13mm to half a colour in a scroller. Try a lighting board that outputs DMX512 to see if the problem disappears. If you are using a Strand Lighting desk enquire with a Strand Lighting representative about the possibility of converting the desk to DMX output. Avoid using a protocol converter.

Digital system:

Speed difference between first and last scrollers

•Ensure that the correct specification of Power/Data daisy chain cable is used between splitter box and the scrollers. If the conductor size is too small for the quantity of scrollers used, voltage will be droped along the line. Replace the cable with the correct cable obtained from Strand Lighting.

Scrollers stay in position but will not move

•Check DMX transmission cables and lighting board. If DMX data is faulty or missing the Colour Call will stay in it's position until new DMX data is received.

Analog system:

Scrollers are juddering, chasing or moving to sound.

•Check the analog control signal with an oscilloscope to see that it is stable.

•Check that analoge 0 volt signal is not connected to mains earth and or trussing. Do like this:

Disconnect the signal multicable at the controlling device (lighting board). Measure with an ohm meter between signal earth in the multicable and mains earth, trussing etc.

There should be no connection at all between signal earth and the rest of the equipment. If there is, check cables and connectors to see if screen is touching connectors or broken.

•Do not power two splitterboxes from one PSU. This will create earthloops that mostly cause problems.

Scroller goes to zero position

•If analog control signal is missing the scrollers will return to their zero position. There is no position memory in the analog mode.