

Datamoon

Features of the Datamoon

- 20 beams
- Position Control of reflector dish
- 8 gobos (squares, tunnel, dots, star, triangle, segments, spiral, circle)
- 7 dichroic colours (magenta, yellow, cyan, pink, red, green and blue) and white
- Blackout/strobe shutter.
- 250W halogen lamp with dichroic reflector
- Lamp life economy switch
- Adjustable Focus
- DMX control
- 0-10V Analogue control
- Analogue control of operating modes
- Stand-alone operation using internal microphone

IMPORTANT

Installer and Users please note:

These instructions should be read carefully and left with the user of the product for future reference.

Installation

Fix the Datamoon with the hanging bracket provided. To conform to Health & Safety Regulations, a safety chain must also be employed.

The Datamoon must be installed by a competent electrician in accordance with the current IEE wiring regulations.

Connect the Datamoon to the mains supply with the lead provided. The wires are colour-coded as follows:

- Brown = Live (phase)
- Blue = Neutral
- Green/Yellow = Earth
- The Datamoon must be earthed for safe and reliable operation.

The supply must be fitted with an isolating switch, or plug and socket, and protected by fuse or circuit breaker rated at between 6A and 16A. If the Datamoon circuit is connected via an MCB then it is recommended that a time-delay MCB is used (Type 3 or Type C to BS3871). This will reduce the possibility of "nuisance tripping" due to the large inrush current of the halogen lamp.

In order to reduce the risk of fire, the Datamoon should be installed more than 0.8 metres from any object that it is illuminating.

It is also possible to connect the Datamoon to a switching pack such as the NJD SP10000 but this is not recommended. If connecting via a power pack, the outputs of the power pack should be de-rated by 50% from its "resistive load" capacity to allow for the large inrush current of the halogen lamp. The Datamoon should not be connected to a dimming pack or light dimmer. The Datamoon is an inductive load.

Adjust the hanging bracket until the light beams are in the best position. The Datamoon may be moved whilst it is operating provided that it is done carefully, the lamp is most vulnerable mechanical

damage immediately after it has been switched off, before it has fully cooled. It is recommended that the Datamoon is allowed to cool for 5 minutes after switching off before moving.

Lamp Brightness/Extended Life Switch

The high brightness/extended life switch is provided to select high brightness or extended lamp life, or to allow for lower or higher mains voltages (A higher mains voltage substantially reduces lamp life). The switch is positioned next to the incoming mains cable. If operating on a 220V supply, select high brightness, otherwise, select whichever mode is appropriate. In the centres of towns the mains voltage can be appreciably higher than 240V during the evenings, so the extended life setting may be advisable.

Changing the lamp.

Disconnect from the mains supply. Remove the lamp cover on top of the unit and remove the lamp from the lampholder. Disconnect the lamp connector. Replace with a new lamp, type A1/259, being careful not to touch the glass envelope of the lamp. Hold the lamp only by the edge of the reflector. Replace the cover and tighten the fixing knob.

Changing the fuse.

Occasionally, when the lamp fails the fuse may also blow. If this occurs, replace with a new fuse type 20mm x 5mm 3.15 Amp antisurge, high breaking capacity. This type of fuse has a ceramic case. Do not replace with any other type or value of fuse. If the new fuse blows consult a dealer. The fuse is located next to the incoming mains cable.

Focusing.

To focus slacken the two focusing controls on the top of the unit, move forwards or backwards as required, and re-tighten the screw when the best image is obtained.

Cleaning.

The Datamoon should be cleaned periodically as the light output will become less intense as smoke fluid residues build up on the mirror assembly and the lens. Also, remove any dust build up in the fan using a brush - a blocked fan can lead to overheating and reduced lamp life.

Disconnect from the mains supply and remove the cover. Clean the lens and the mirror using a soft lint-free cloth and methylated spirit, isopropyl alcohol or hi-fi cleaning fluid. Also, make sure that the fan is not becoming obstructed.

Setting up.

The Datamoon may be operated in one of four different Modes.

1) Independent (internal microphone) see page 5

The Datamoon will move to each bass beat, going through a sequence of patterns at random, including clockwise, anticlockwise and flash to sound. These can be selected using the analogue inputs or DIL switches.

2) Synchronized (internal microphone) see page 6

The Datamoon will perform the above patterns either synchronized together, (or with the movement mirrored in order that two rows of Datamoons can be set up opposed to each other, and will continue to move in synchrony).

3) Externally controlled from any DMX controller such as Merlin, IQ-MX80, IQ-MX60 or IQ-MX40. see page 7

The Datamoon may be controlled from the Merlin, or any of the NJD IQ-MX range of controllers, or any lighting desk with DMX or 0-10V analogue outputs.

4) Analogue control from a 0-10V output controller (Touch panel, or AR1 remote controller) see page 10.

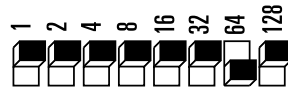
0-10V can be used to directly control the colour and movement, or to select the sound animated patterns.

Independent mode.

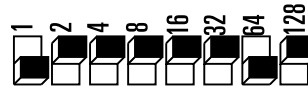
If the Datamoon is to be operated in the “independent” mode, then proceed as follows:

1) To allow the Datamoon to select an operating mode at random (i.e. change colour to sound, rotate to sound etc.) set all the DMX address switches to OFF.

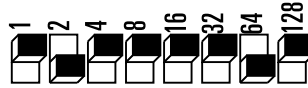
2) If you wish to select the operating mode turn switch “64” ON, then turn the following switches on to decide which operating mode you would like



To select change colour to sound, turn switch “1” ON.



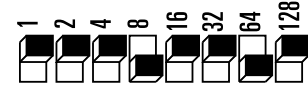
To select twist-to-sound clockwise, turn switch “2” ON.



To select twist-to-sound random, turn switch “4” ON.



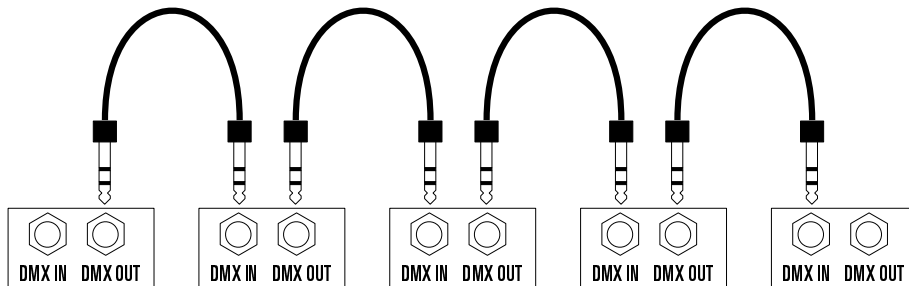
To select flash to sound, turn switch “8” ON.



If more than one of the switches is turned on, then the Datamoon will sequence through the selected operating modes in turn. Switches “16”, “32” and “128” must be turned OFF.

Synchronized operation without a controller

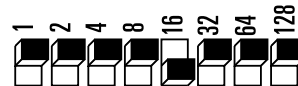
To synchronize Datamoons without a controller, connect a DMX lead from the DMXout jack on the first Datamoon to DMXin on the second, from DMXout on the second Datamoon to DMXin on the third, and so on.



DMX line termination is performed automatically by the Datamoon. DMX leads must never be joined (apart from end-to-end) or split. Using a 2-to-1 splitter or similar will prevent the system working.

To obtain the the correct movement the switches on the back of each Datamoon must be adjusted to tell it which channel it is set to. The switches are labelled 128, 64, 32, 16, 8, 4, 2 and 1. These set the DMX address.

The "16" switch reverses the movement of the beams in order to allow two rows of Datamoons to be installed facing each other.



Setting the DIL switches.

The Datamoon at the start of the chain (the one with no plug in its DMXin socket) acts as master, the others act as slaves, controlled by the master. Set the DIL switches on the master as described above in "independent operation".

Set the DIL switches on the slaves as follows:

Either: If it is intended that all the Datamoons should operate identically, set all the DIL switches OFF on the slaves.

To reverse the movement of any of the units, turn switch 16 ON

Or: To obtain four channel colour changing sequences, set the DIL

switches as shown in the table below: (Datamoons 5 to 8 repeat the actions of numbers 1 to 4)

Datamoon.	Switches ON (other switches OFF)
2 or 6	4
3 or 7	8
5	all switches OFF
4 or 8	8, 4
2 or 6 (movement reversed)	16,4
3 or 7 (movement reversed)	16,8
4 or 8 (movement reversed)	16, 8, 4
5 (movement reversed)	16

Reversing the movement is useful if two or more datamoons are facing each other. Reversing the direction of rotation makes the beams from both units move the same way in the air.

DMX operation

Background information

The DMX system is a high-speed digital data system, which can transmit all the information required for light dimmers, multi-motor lighting effects etc. down a single cable. It was invented in 1986 by the United States Institute of Theater Technicians for the control of dimming theatre lighting, and has since been adapted for the control of intelligent lighting.

The Datamoon outputs a DMX signal when operating from its own microphone, which can be used to synchronize other Datamoons. Up to 32 units that can be connected to the DMX signal, but it is not recommended that the total cable length should exceed 250m.

Each unit connected to the DMX signal is given an address, and it compares this to the data being sent on the DMX cable, so it can determine which data is addressed to it. It then uses this data to move a motor or set a brightness level as required by the controller.

As the DMX system can transmit as much information as 512 analogue control wires down a single cable, it has to transmit very quickly, in fact, at a frequency 12 times higher than the highest audio frequency. Anyone who has used long leads for audio will realize that it is difficult to do without losing the higher frequencies. To make the DMX system work at such high frequencies, it requires special circuitry and special cable. Cable can be designed to pass high frequencies with no loss if it has the correct resistance connected at each end, this resistance is called the characteristic impedance of the cable. DMX cable has a characteristic impedance of 120Ω . All NJD DMX products fitted with $\frac{1}{4}$ " jacks are designed to ensure that the resistors are connected automatically. Without them, the signal reflects off the end of the cable and interferes with the new data coming the other way. If the cable is not correct, the system will not work. Most good quality low-capacitance screened twisted pair cables will work, but twin individually screened will not. Also, if the cable is split or joined other than end-to-end, the system will stop working.

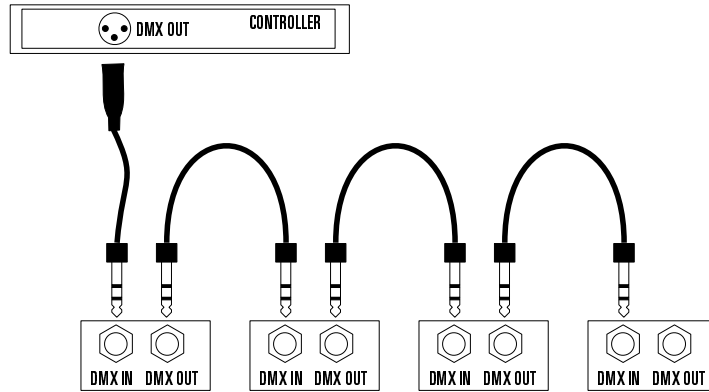
If making your own leads, it is important to use good quality connectors and make sure that the soldering is of a high standard.

Using the Datamoon with NJD's dedicated DMX controllers (IQ-MX range, and CX256)

To connect to a controller: Connect a DMX lead from the **DMXout** from the controller to **DMXin** on the first Datamoon. Connect a DMX lead from the **DMXout** jack on the first Datamoon to **DMXin** on the second. Connect from **DMXout** on the second Datamoon to **DMXin** on the third, and so on.

DMX line termination is performed automatically by the Datamoon. DMX leads must never be joined (apart from end-to-end) or split. Using a 2-to-1 splitter or similar will prevent the system working.

Refer to the User Guide accompanying your controller for information on how to set the switches.



Connecting to Merlin or any Lighting control desk with DMX output.

The DMX system has 512 addresses, each address can be the brightness of a single dimmer, or a position on a motor. The Datamoon controls 2 motors and the lamp: it requires four DMX addresses, only three of which are used, in order to maintain compatibility with the IQ range. The Datamoon can be programmed to any address from 1 to 256, so there can be up to 64 channels of Datamoons on a controller. Any number of Datamoons can be assigned to each channel or address. If two Datamoons are assigned to the same address then they will perform identically.

Each Datamoon occupies four DMX channels. The DMX address of the first channel can be set to any start address by using the switches on the back of the Datamoon .

The switches are labelled 128, 64, 32, 16, 8, 4, 2 and 1.

Add up the numbers of the switches that are ON and then add 1. This number is called the **start address**.

The dish-motor appears at the start address, start address plus 1 is not used, the colour/gobo is at the start address plus 2, and blackout at start address plus 3. (i.e. If switches 32 and 8 are ON, then start address is $32+8+1 = 41$, the dish-motor is on channel 41 and the colour/gobo on channel 43, channel 44 controls the blackout.)

The DMX dimmer levels control the movement as follows:

dish-motor: increasing data gives clockwise rotation of the beams.

The dish will take the shortest route to the new position, so that continuous rotation can be achieved. i.e. from 255 to 0 will be one small step clockwise, not almost a full circle anticlockwise.


DMX level	colour/gobo
224 - 255	white circle
192 - 223	blue spiral
160 - 191	red segments
128 - 159	green triangle
96 - 127	pink star
64 - 95	cyan dots
32 - 63	yellow tunnel
0 - 31	magenta squares

The fourth channel controls the blackout as follows:

0	lamp off
1 - 223	normal operation
224 - 255	blackout shutter

Direct Analogue control (0-10V)

The dish rotation and dimmer may be controlled directly using analogue channels 1 and 3 and 4. The microphone circuitry is disabled.

Set the DMX address switches with  switch 128 ON and all other switches OFF.

The 0-10V inputs control the Datamoon as follows:

Channel 1: (pin 3) rotates the dish,

Channel 3: (pin 4) controls the colours and gobos.

Channel 4: (pin 1) controls the blackout shutter and lamp.

The 0-10V dimmer levels control the movement as follows:

dish-motor: increasing voltage gives clockwise rotation of the beams.

The dish will take the shortest route to the new position, so that

continuous rotation can be achieved. i.e. from 10V to 0V will be one small step clockwise, not almost a full circle anticlockwise.

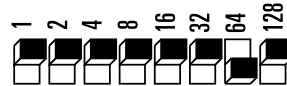
When using analogue control, units can be synchronized together using the DMX outputs - refer to the "Synchronized operation without a controller" section.

voltage	colour/gobo:
(8.75V - 10V)	white circle
(7.5V - 8.75V)	blue spiral
(6.25V - 7.5V)	red segments
(5V - 6.25V)	green triangle
(3.75V - 5V)	pink star
(2.5V - 3.75V)	cyan dots
(1.25V - 2.5V)	yellow tunnel
(0-1.25V)	magenta squares

Control from a low-voltage switch panel (such as Logic S12lv, Logic X12 or Logic T12) **or the AR1 remote control**

Set the DMX Address switches as follows:

Turn switch "64" on and all other switches OFF.



Connect the output from the controller to the 5-pin DIN socket.

Connect to channel 4 (pin 1) (or turn on switch #1 on the AR1) if you want to select twist and flash to sound.

Connect to channel 1 (pin 3) (or turn on switch #2 on the AR1) if you want to select change colour to sound.

Connect to channel 2 (pin 5) (or turn on switch #3 on the AR1) if you want to select twist clockwise to sound.

Connect to channel 3 (pin 4) (or turn on switch #4 on the AR1) if you want the Datamoon to select a mode at random.

Connect 0V from the controller to pin 2 of the DIN socket.

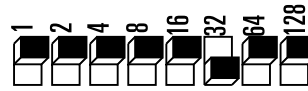
More than one channel can be connected to the touch panel, so that different pads may be used to select different effects. If more than

one input is enabled at once, the Datamoon will sequence through the selected modes in turn.

When all four channels are off (or all four switches off on the AR1) the lamp is turned off.

Voltage Control

The Datamoon may be controlled by a single analogue channel from a lighting desk such as the Stage 12, or from a Fade-4. Set the DMX address switches with switch 32 ON and all other switches OFF. Connect the 0-10V output to channel 1 (pin 3) of the Datamoon. The slider will then control the Datamoon as follows:



87.5% to 100% (8.75V - 10V) run through all modes

75% to 87.5% (7.5V - 8.75V) flash and rotate to sound random

62.5% to 75% (6.25V - 7.5V) flash to sound

50% to 62.5% (5V - 6.25V) rotate anticlockwise to sound

37.5% to 50% (3.75V - 5V) rotate clockwise to sound

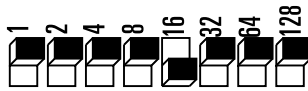
25% to 37.5% (2.5V - 3.75V) rotate random to sound

12.5% to 25% (1.25V - 2.5V) change colour to sound

0 - 12.5% (0-1.25V) OFF

Partial Analogue Control

In this mode, the beams will animate to sound but the colour is selected by the user, using a 0 - 10V control voltage on channel 3. Set switch 16 ON and all other switches off. Channels 3 and 4 are used, channel 3 sets the colour and channel 4 controls the lamp and blackout as in "direct analogue control"



When using any of the analogue control modes, Datamoons may be linked together by DMX so that all units synchronize. The analogue control inputs are connected to the first unit, and all subsequent units will be controlled from the analogue inputs to the first unit.

Fault Finding.

Stand-alone mode.

- *Does not start and go through set-up procedure.*

No mains supply - check mains lead

Fuse Blown - check fuse.

- *Lamp not lit*

Lamp failed - replace lamp.

In analogue control mode - make sure that the 4th channel is at the correct level.

- *No response to sound*

Jack plug in DMXin socket - remove jack for stand-alone operation.

Analogue mode selected - make sure DIL switches 16, 32, 64 and 128 are off.

- *Erratic response to sound*

Music not loud enough.

- *Light output dim.*

mirror and lens dirty - clean mirror and lens.

lamp misaligned in lampholder.

lamp blackened (about to fail)

Synchronized mode

• *Changes colour when it should move left-right, moves left-right when it should change colour*

Switch 1 or 2 ON, should be off

- *Movement erratic.*

Wrong type of cable - DO NOT use twin individually screened unterminated cable in DMXout jack of final lantern - do not connect to DMXout jack of final lantern.

- *No movement and lamp off*

DMX jack not in socket correctly. - check jack plugs DMX lead broken or incorrectly wired. - check leads

DMX controlled mode (see also synchronized mode)

- *No movement and lamp off*
DMX address set wrongly - check DIL switches, or see if lantern responds to a different address.
- *Lamp off but mirror can be seen moving inside unit*
4th DMX channel at wrong level - move to central position
Lamp failed - replace lamp

Standards

The Datamoon complies with the following British and European Standards:

- BS EN55015 - Electromagnetic Compatibility.
- EN60598 - Electrical Safety Standard for Luminaires.

Technical Specification.

Power supply:	230V AC 50Hz 1.3A 300VA
Fuse:	T3.15A (3.15 Amp anti-surge) 5x20mm HBC to IEC127 A HBC fuse has a ceramic case.
Switch-on Inrush:	4.2A (1000VA)
Inrush Duration:	100ms (5 mains cycles)
Lamp:	A1/259 (ELC) 24V 250W halogen with dichroic reflector
Colours:	7 (dichroic) + white
Gobos:	7
Beam intensity:	20,000 candela (high brightness) 15,500 candela (extended life)
Lamp life:	100 hours nominal @ 230V AC (high brightness) 300 hours nominal @ 230V AC (extended life)
<i>Note: Although Britain has had a 230V supply since January 1995, the voltage is usually nearer 240V</i>	
Lamp Life:	60 hours nominal @ 240V AC (high brightness) 180 hours nominal @ 240V AC (extended life)
Beam diameter:	63mm @ 1m
Beam angle:	3.6°

This is the diameter of each individual beam (circular gobo selected)

Pattern diameter: 660mm @ 1m

Pattern Angle: 37°

This is the overall diameter of all 20 beams

Motors: Unipolar Hybrid stepper: microstepping

Microstep size: 6'45"

DMX input/output: complies with
DMX512 (1990) 4µsec protocol

Connectors: ¼" jack
Data+: Tip
Data-: Ring
Earth: Sleeve

Analogue input voltage: 0-10V

Analogue input impedance: 44kΩ

Analogue connector: 5-pin DIN Type A (180°)

Channel 1: pin 3

Channel 2: pin 5

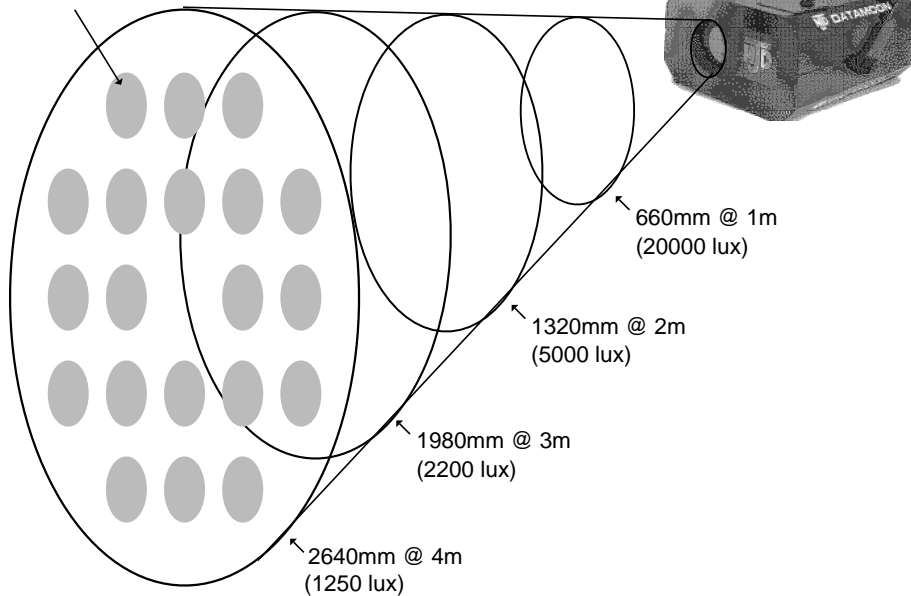
Channel 3: pin 4

Channel 4: pin 1

0V (ground): pin 2

Beam widths and brightness.

individual beam diameter
250mm @ 4m



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