1 Relay, 1 0-10 VDC Output

Features

Quality low power DMX receiver chip equal to 1/8 unit load on DMX line
ESD protection and "fail safe" features on DMX receiver chip
Allows DMX512 digital protocol to control 1 Relay and single 0-10Vdc output.
Jumper selectable 1 DMX channel or 2 consecutive channels
Quality Omron relay included on board.
Address all 512 channels.
Phoenix contact screw terminals

Input Signal:
Northlight RLY01 board accepts DMX512 protocol, current and legacy versions.
RLY01 will accept 0-10 VDC control voltage simultaneously with the DMX input, on a highest takes precedence basis.

Output:
Output is one 10 Amp 110 VAC relay.
1 0-10Vdc control signal

Address switch:
Mini DIP switches on the circuit board or panel mount.
Thumbwheel address switch also available.

Power requirements:
 15 to 24 volts DC @ 100 mA.
12 VAC @100 mA

LED Indicators:
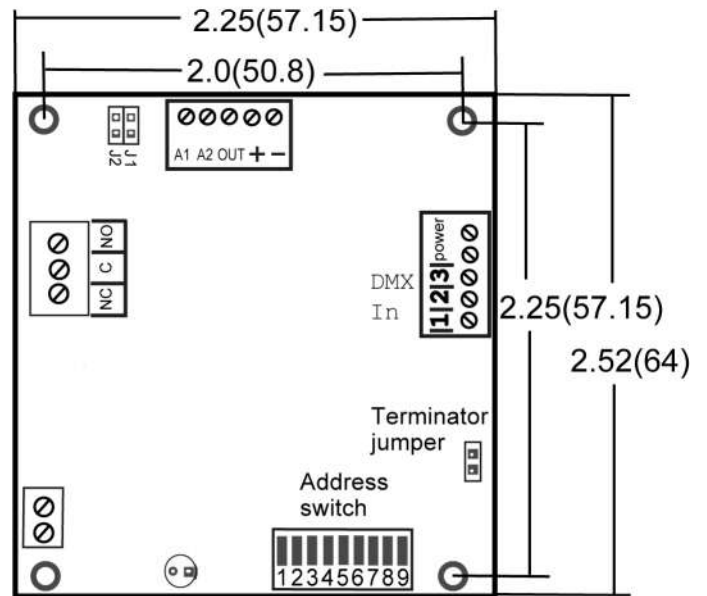Green DMX signal present LED.

Connections
Screw terminals are provided for all connections.

Physical Dimensions
Dimensions in
Inches(millimeter)

2.5(64)L X 2.25(57.15)W
+/-.20"

The **DMX input** pin numbers
correspond to the XLR pin
numbers.

The DMX gnd is signal ground
– not earth ground, do not
connect to earth ground.

Connections to the Relay board

Power Input
15 to 24 volts DC @ 100 mA.
12 VAC @ 100 mA

Ground
The signal ground connector is the common signal ground – not earth ground.

DMX512 In
The DMX input pin numbers correspond to the XLR pin numbers.

Pin 1 is signal ground, not earth ground
Pin 2 is DMX512 -
Pin 3 is DMX512 +

Setting the address for DMX512
Set the starting address to the first in a group of 2.
The address is entered on the DIP switches in standard binary code starting with 1.
See the chart of all 512, address switch positions at the back of this manual.

The **Push button** address switch is a snap fit for a panel up to .13" thick. The switch connects to board via 14 pin ribbon cable. The ribbon cable is installed with the ribbon going away from the board.
When using the Push button switch, set the starting address to the first in a group of 2. Start with address 1 up to 512.

Relays
The relay used are Single Pole Double Throw relay.
The screw terminals provide access to the common, normally open and normally closed terminals.

**Setting the start address with the DIP switch**

Set the starting address to the first in a group of 2.
The address is entered on the DIP switches in standard binary code starting with 1.

Each switch on the DIP switch, numbered 1-9, has a decimal equivalent.
To calculate the address on the DIP switch, just add up the decimal equivalents of the switches used.
For example, to set the DMX output address to 8, set switch 4 to ON. Switch 4 is equal to 8.
To set the DMX output address to 131 set switches 8, 2 and 1 to ON. Switch 8 = 128, add switch 2 = 130, then add switch 1 = address 131.

decimal equivalent	switch
1	1
2	2
4	3
8	4
16	5
32	6
64	7
128	8
255	9

Start Address DIP switch
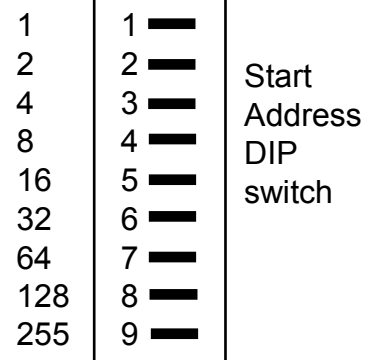
Using the configuration jumpers

There are 2 configuration jumpers on the board.

J1 – Determines the output in the event of DMX signal loss.

Open(no jumper) - When the DMX signal is lost, the relays will open.

Closed(jumper in place) – When the DMX signal is lost the relays will hold the last valid data.

J2 – Determines whether the relay and 0-10 VDC output are controlled by a single DMX channel or 2 consecutive DMX channels.

Open(no jumper) – This is the default setting.
The relay is controlled by the single DMX channel selected by the address switch. The relay will switch at DMX level 75%.
The 0-10 VDC out is controlled by the next DMX channel.

Closed(jumper in place) – For use with Fluorescent lamp and LED dimmers.
The relay and 0-10 V output are controlled by a single channel.
In addition the relay will switch at DMX level of 8%.

Toggle switch and Analog Inputs

The analog input and DMX are used on a highest takes precedence basis.
If the analog input is over 7.5 volts, the relay will activate.
DMX input is not required to use the relay or 0-10VDC output.

External 0-10VDC
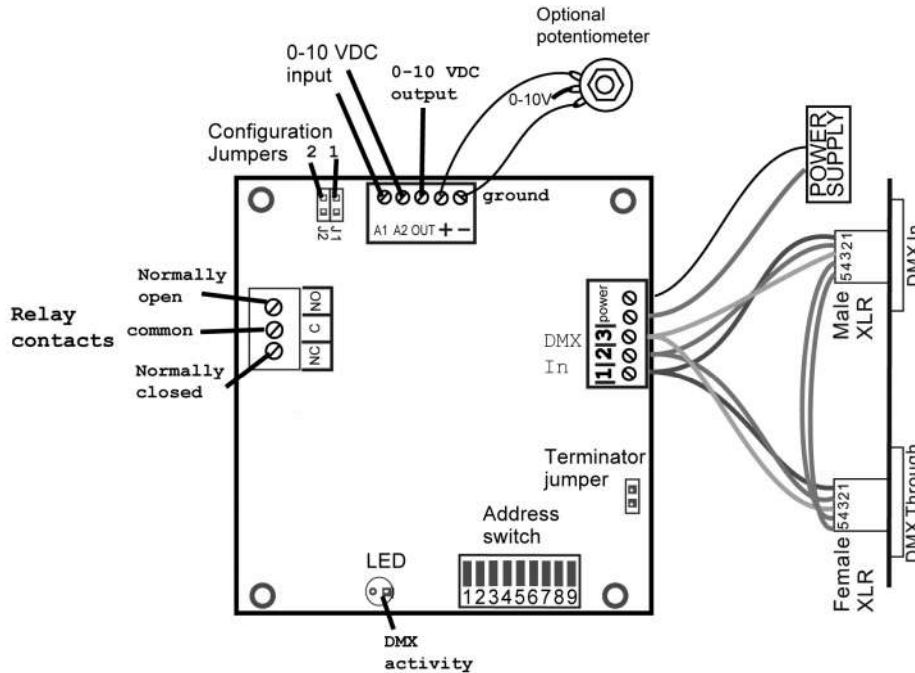The analog input use the screw terminals, it must not connect to any other terminal.

A standard analog voltage spanning 0 - 10 VDC @5mA can be used to control the relay and 0-10 V output.
This should be a smooth DC voltage with no noise or ripple.

Terminal A1 is the 0-10VDC input for the relay.
Terminal A2 is the 0-10VDC input for the 0-10VDC output.

Typical hook up

Termination

A common problem with DMX systems is improper termination.
Terminators are an impedance matching circuit required to damp signals that "reflect " from the end of an improperly terminated cable, causing signal degradation under certain conditions.

A simple terminator consists of a 120 Ohm resistor connected across pins 2-3 of the DMX signal
  The RLYLV01 provides an on board terminator using standard square pin connectors on .10" centers.
  A toggle switch can be placed across the terminals for convenient front panel terminator selection.
The termination resistor should only be in when the decoder is the last device on the DMX link.
It is possible to "over terminate". In other words make sure there is only 1 terminator on the end of the DMX line. Some devices have internal terminators, double check the settings.

There is no specific orientation of the connector on the PC board.
  The latest version of the DMX512 specifies that the terminator switch should be labeled "In" and "Out".

Trouble shooting

Basically the board is plug and play. When all connections are properly made, the relays will respond to the DMX signal and analog switches.

Signal Ground/common: On the board, there is NO connection between chassis/earth ground and Signal/common ground. Do not install one.
On the DMX data cable, there is NO connection between the shield/XLR shell earth ground and the signal/common ground. Do not connect these together.

DMX512 address.
Be sure the address is set to a valid address. The Relay start address should not be higher than the highest address received.

Misc:
Good solid connections are a must. The mini screw terminals provide good connections. However the screws can be stripped by over tightening.

DMX512 signal wires should be twisted together all the way to the connector.

Check the input signal integrity. There should be signal present on both Data lines for DMX512. Reverse the connections.

It is recommended that a separate power supply be used to power the Relay board. Occasionally unexpected problems can occur if power is "borrowed" from an existing source.
Small wall wart transformers with DC voltage outputs work well for this application.

XLR Connectors
DMX512 protocol specifies that 5 pin XLR connectors be used. Female on the transmitter and male on the receiver.
When a 3 pin XLR is used it is wired the same as the first 3 pins on the 5 pin XLR.

PIN	WIRE	SIGNAL
1	signal	ground/return
2	signal	data compliment (-)
3	signal	data true (+)
4	signal	spare data compliment (-)
5	signal	spare data true (+)

Conductors 2/3 and 4/5 should be twisted together.

Warranty and Disclaimer

Warranty

 Northlight Systems warrants this product against defects in materials and workmanship for a period of 1 year.

Returns Policy
 If there is a defect, we will repair or replace the product at out discretion.

We offer a full refund on the purchase price if returned in original, unused and "like new", condition in less than 30 days.
 Return the product with a description of the problem. Free repairs are for defective parts or workmanship only.
 Repairs due to improper hookup, over voltage, short circuits, physical damage etc., will be charged to the customer.

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Contact

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Address - switches	Address - switches	Address - switches	Address - switches
1 =1	64 = 7	127 = 1, 2, 3, 4, 5, 6, 7	190 = 2, 3, 4, 5, 6, 8
2 =2	65 = 1, 7	128 = 8	191 = 1, 2, 3, 4, 5, 6, 8
3 = 1, 2	66 = 2, 7	129 = 1, 8	192 = 7, 8
4 =3	67 = 1, 2, 7	130 = 2, 8	193 = 1, 7, 8,
5 = 1, 3	68 = 3, 7	131 = 1, 2, 8	194 = 2, 7, 8,
6 = 2, 3	69 = 1, 3, 7	132 = 3, 8	195 = 1, 2, 7, 8
7 = 1, 2, 3	70 = 2, 3, 7	133 = 1, 3, 8	196 = 3, 7, 8
8 = 4	71 = 1, 2, 3, 7	134 = 2, 3, 8	197 = 1, 3, 7, 8
9 = 1, 4	72 = 4, 7	135 = 1, 2, 3, 8	198 = 2, 3, 7, 8
10 = 2, 4	73 = 1, 4, 7	136 = 4, 8	199 = 1, 2, 3, 7, 8
11 = 1, 2, 4	74 = 2, 4, 7	137 = 1, 4, 8	200 = 4, 7, 8,
12 = 3, 4	75 = 1, 2, 4, 7	138 = 2, 4, 8	201 = 1, 4, 7, 8
13 = 1, 3, 4	76 = 3, 4, 7	139 = 1, 2, 4, 8	202 = 2, 4, 7, 8
14 = 2, 3, 4	77 = 1, 3, 4, 7	140 = 3, 4, 8	203 = 1, 2, 4, 7, 8
15 = 1, 2, 3, 4	78 = 2, 3, 4, 7	141 = 1, 3, 4, 8	204 = 3, 4, 7, 8
16 = 5	79 = 1, 3, 4, 7	142 = 2, 3, 4, 8	205 = 1, 3, 4, 7, 8
17 = 1, 5	80 = 5, 7	143 = 1, 2, 3, 4, 8	206 = 2, 3, 4, 7, 8
18 = 2, 5	81 = 1, 5, 7	144 = 5, 8	207 = 1, 2, 3, 4, 7, 8
19 = 1, 2, 5	82 = 2, 5, 7	145 = 1, 5, 8	208 = 5, 7, 8
20 = 3, 5	83 = 1, 2, 5, 7	146 = 2, 5, 8	209 = 1, 5, 7, 8
21 = 1, 3, 5	84 = 3, 5, 7	147 = 1, 2, 5, 8	210 = 2, 5, 7, 8
22 = 2, 3, 5	85 = 1, 3, 5, 7	148 = 3, 5, 8	211 = 1, 2, 5, 7, 8
23 = 1, 2, 3, 5	86 = 2, 3, 5, 7	149 = 1, 3, 5, 8	212 = 3, 5, 7, 8
24 = 4, 5	87 = 1, 2, 3, 5, 7	150 = 2, 3, 5, 8	213 = 1, 3, 5, 7, 8
25 = 1, 4, 5	88 = 4, 5, 7	151 = 1, 2, 3, 5, 8	214 = 2, 3, 5, 7, 8
26 = 2, 4, 5	89 = 1, 4, 5, 7	152 = 4, 5, 8	215 = 1, 2, 3, 5, 7, 8
27 = 1, 2, 4, 5	90 = 2, 4, 5, 7	153 = 1, 4, 5, 8	216 = 4, 5, 7, 8
28 = 3, 4, 5	91 = 1, 2, 4, 5, 7	154 = 2, 4, 5, 8	217 = 1, 4, 5, 7, 8
29 = 1, 3, 4, 5	92 = 3, 4, 5, 7	155 = 1, 2, 4, 5, 8	218 = 2, 4, 5, 7, 8
30 = 2, 3, 4, 5	93 = 1, 3, 4, 5, 7	156 = 3, 4, 5, 8	219 = 1, 2, 4, 5, 7, 8
31 = 1, 2, 3, 4, 5	94 = 2, 3, 4, 5, 7	157 = 1, 3, 4, 5, 8	220 = 3, 4, 5, 7, 8
32 = 6	95 = 1, 2, 3, 4, 5, 7	158 = 2, 3, 4, 5, 8	221 = 1, 3, 4, 5, 7, 8
33 = 1, 6	96 = 6, 7	159 = 1, 2, 3, 4, 5, 8	222 = 2, 3, 4, 5, 7, 8
34 = 2, 6	97 = 1, 6, 7	160 = 6, 8	223 = 1, 2, 3, 4, 5, 7, 8
35 = 1, 2, 6	98 = 2, 6, 7	161 = 1, 6, 8	224 = 6, 7, 8
36 = 3, 6	99 = 1, 2, 6, 7	162 = 2, 6, 8	225 = 1, 6, 7, 8
37 = 1, 3, 6	100 = 3, 6, 7	163 = 1, 2, 6, 8	226 = 2, 6, 7, 8
38 = 2, 3, 6	101 = 1, 3, 6, 7	164 = 3, 6, 8	227 = 1, 2, 6, 7, 8
39 = 1, 2, 3, 6	102 = 2, 3, 6, 7	165 = 1, 3, 6, 8	228 = 3, 6, 7, 8
40 = 4, 6	103 = 1, 2, 3, 6, 7	166 = 2, 3, 6, 8	229 = 1, 3, 6, 7, 8
41 = 1, 4, 6	104 = 4, 6, 7	167 = 1, 2, 3, 6, 8	230 = 2, 3, 6, 7, 8
42 = 2, 4, 6	105 = 1, 4, 6, 7	168 = 4, 6, 8	231 = 1, 2, 3, 6, 7, 8
43 = 1, 2, 4, 6	106 = 2, 4, 6, 7	169 = 1, 4, 6, 8	232 = 4, 6, 7, 8
44 = 3, 4, 6,	107 = 1, 2, 4, 6, 7	170 = 2, 4, 6, 8	233 = 1, 4, 6, 7, 8
45 = 1, 3, 4, 6	108 = 3, 4, 6, 7	171 = 1, 2, 4, 6, 8	234 = 2, 4, 6, 7, 8
46 = 2, 3, 4, 6	109 = 1, 3, 4, 6, 7	172 = 3, 4, 6, 8	235 = 1, 2, 4, 6, 7, 8
47 = 1, 2, 3, 4, 6	110 = 2, 3, 4, 6, 7	173 = 1, 3, 4, 6, 8	236 = 3, 4, 6, 7, 8
48 = 5, 6	111 = 1, 2, 3, 4, 6, 7	174 = 2, 3, 4, 6, 8	237 = 1, 3, 4, 6, 7, 8
49 = 1, 5, 6	112 = 5, 6, 7	175 = 1,2, 3, 4, 6, 8	238 = 2, 3, 4, 6, 7, 8
50 = 2, 5, 6	113 = 1, 5, 6, 7	176 = 5, 6, 8	239 = 1, 2, 3, 4, 6, 7, 8
51 = 1, 2, 5, 6	114 = 2, 5, 6, 7	177 = 1, 5, 6, 8	240 = 5, 6, 7, 8
52 = 3, 5, 6	115 = 1, 2, 5, 6, 7	178 = 2, 5, 6, 8	241 = 1, 5, 6, 7, 8
53 = 1, 3, 5, 6	116 = 3, 5, 6, 7	179 = 1, 2, 5, 6, 8	242 = 2, 5, 6, 7, 8
54 = 2, 3, 5, 6	117 = 1, 3, 5, 6, 7	180 = 3, 5, 6, 8	243 = 1, 2, 5, 6, 7, 8
55 = 1, 2, 3, 5, 6	118 = 2, 3, 5, 6, 7	181 = 1, 3, 5, 6, 8	244 = 3, 5, 6, 7, 8
56 = 4, 5, 6	119 = 1, 2, 3, 5, 6, 7	182 = 2, 3, 5, 6, 8	245 = 1, 3, 5, 6, 7, 8
57 = 1, 4, 5, 6	120 = 4, 5, 6, 7	183 = 1, 2, 3, 5, 6, 8	246 = 2, 3, 5, 6, 7, 8
58 = 2, 4, 5, 6	121 = 1, 4, 5, 6, 7	184 = 4, 5, 6, 8	247 = 1, 2, 3, 5, 6, 7, 8
59 = 1, 2, 4, 5, 6	122 = 2, 4, 5, 6, 7	185 = 1, 4, 5, 6, 8	248 = 4, 5, 6, 7, 8
60 = 3, 4, 5, 6	123 = 1, 2, 4, 5, 6, 7	186 = 2, 4, 5, 6, 8	249 = 1, 4, 5, 6, 7, 8
61 = 1, 3, 4, 5, 6	124 = 3, 4, 5, 6, 7	187 = 1, 2, 4, 5, 6, 8	250 = 2, 4, 5, 6, 7, 8
62 = 2, 3, 4, 5, 6	125 = 1, 3, 4, 5, 6, 7	188 = 3, 4, 5, 6, 8	251 = 1, 2, 4, 5, 6, 7, 8
63 = 1, 2, 3, 4, 5, 6	126 = 2, 3, 4, 5, 6, 7	189 = 1, 3, 4, 5, 6, 8	252 = 3, 4, 5, 6, 7, 8

Address - switches
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Address - switches
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Address - switches
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464 = 5, 7, 8, 9

Address - switches
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