Digital / Analog to DMX Transmitter

(Encoder)

Technical **T**

Version 1.0 -2012
WD1463-L

Overview

This board will take an incoming variable voltage of +0-5 VDC and convert this voltage value to a outgoing DMX value of 0-255 for 4 DMX channels.
The base address of the board determines what the DMX Channel output will be sent at. Any digital device (Switch, dry contact closure, Relay, RF remote) or Analog device (Potentiometer, variable Power Source, Sensor) can be connected to the board. The board can use it's own voltage reference source of 0-5 VDC at 20mAmp to source the analog or digital connected device, or an external variable power source of 0-5 VDC can be used directly into the analog inputs on the Digital / Analog to DMX Transmitter board. The board will transmit its own DMX along a single network, as a stand-alone system.

Digital / Analog Converter Board
Power Supply: 9 VDC @ 1.0 Amp
3" -1/4 W x 4-88" Lx 1-1/8" H

Setup

Four (4Ch) channel board that converts input voltage signals of 0-5V to DMX levels 0-255 out on 4 addressable DMX transmitted channels (1-112) . The card's DMX address sets where analog / digital input 1 goes. Input 2 goes to (address+1); input 3 goes to (address+2) and input 4 goes to (address+3). A stable voltage of 0-5 VDC at 20 mA is required to trigger board remotely or the on-board voltage reference source can be used directly through connected potentiometers, sensors, or digital devices.

Connection:
DMX Output: 5 Pin XLR Connectors (F - IN)
Power Input: +9VDC @ 1 Amp
Analog Inputs: 0-5V DC @ 20mA per channel via 2-way screw wire terminals

DMX512
No. of Channels: 1-112. The board base address may be set between 1 and 112 using the onboard DIP switches. (See address chart for dip switch settings)
Break: 88µs
Mark after Break: 8µs
Time between frames: 0s
Time between packets: 0s
Bit width: 4µs

Power Supply: Green Status LED
Power Supply: +9VDC @ 1 Amp via 2.1mm connector (center+) Power Input Jack

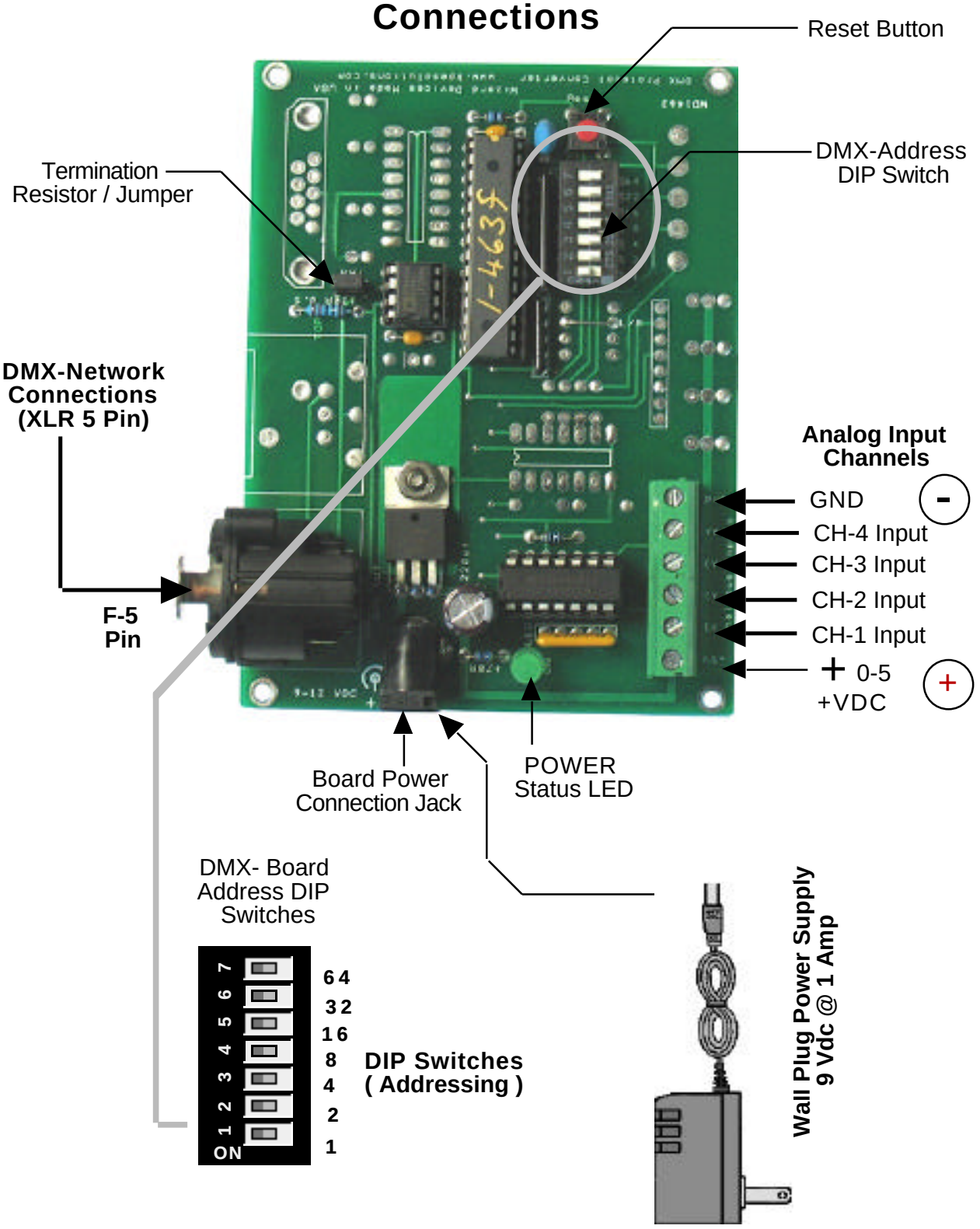
Settings - *(See Pages on Control / Addressing for more details)*
Set the start base address of the 4-Channel Digital /Analog Board as follows:
Select a valid DMX number for output channel-1 (address range 1 to 112). Look up the DMX switch settings for the selected value from the DMX addressing chart and then move the onboard DIP switches to the correct matching position (On / Off) for the selected DMX value.

Example: DIP switches 16 and 32 set to **ON** position, the start base address is now 48 for the board, (Add the value of the address DIP switches set to the **ON** position to calculate the start base address), this value is used to determine the starting address of output channel-1 for DMX control. The next DMX channel would be address 49 for output channel-2, and for channel-3 DMX address 50 for output channel-3, etc. Use this same process of adding the next channel to the next channel value until you have all 4 output channels address values identified.
A voltage control value of 0-5VDC will be used to control the output levels for each channel 1-4.
(Value 0= 0.0 Vdc, Value 255= 5.0 Vdc)

Digital / Analog to DMX Transmitter

Technical T

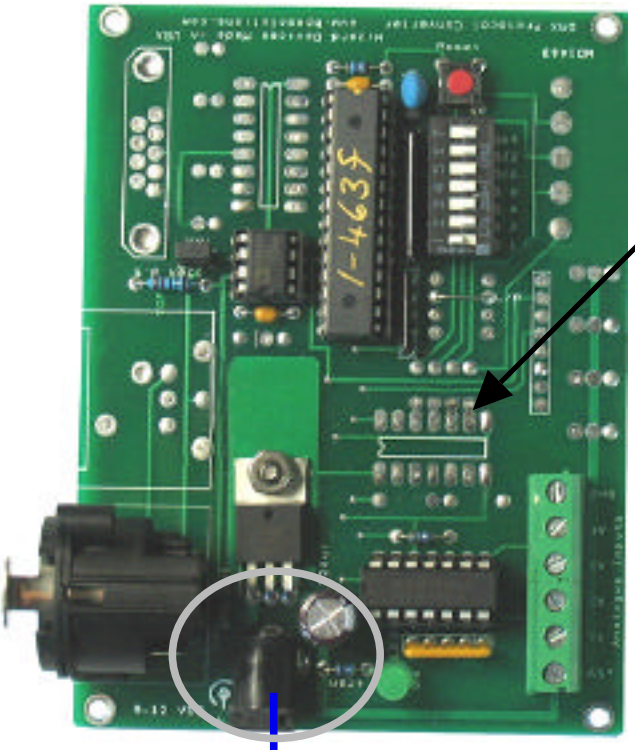
Connections



Digital / Analog to DMX Transmitter

Technical T

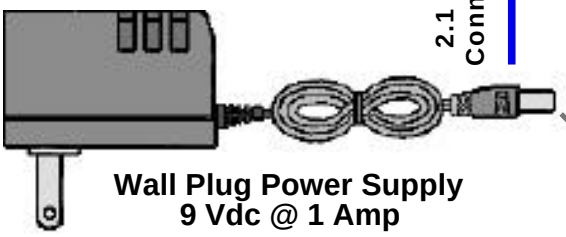
Power Connection



CIRCUIT FOR FUTURE UP-GRADE FEATURES (NOT USED)

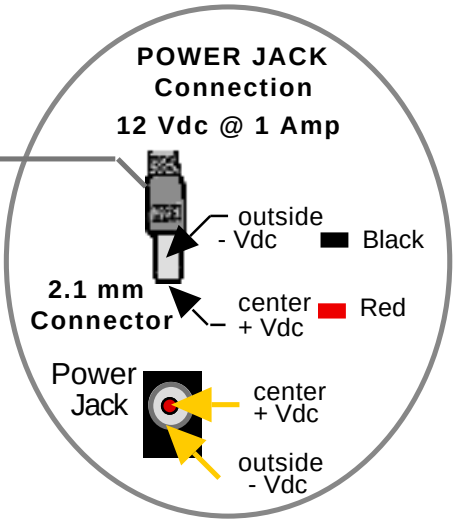
2.1 mm Connector

Power Jack



Wall Plug Power Supply
9 Vdc @ 1 Amp

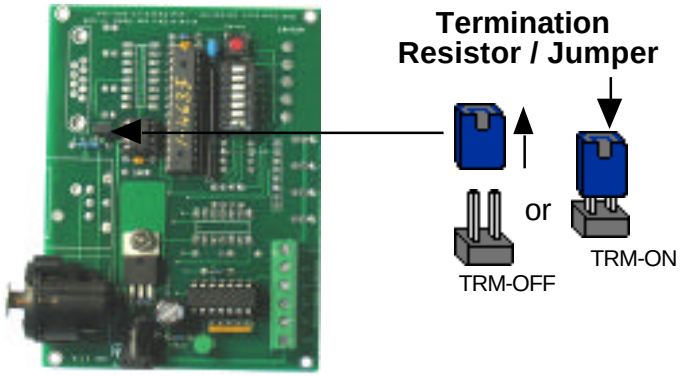
POWER JACK Connection
12 Vdc @ 1 Amp



Network Terminator

Network Termination Jumper

Termination Resistor / Jumper

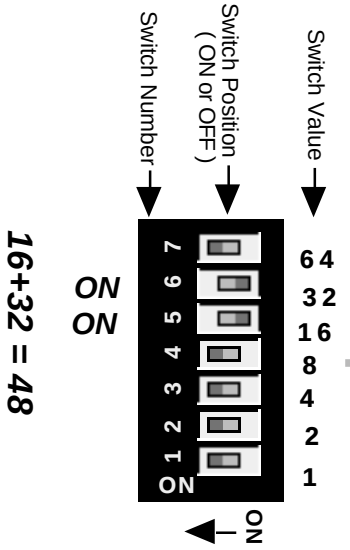


Digital / Analog to DMX Transmitter

Technical T

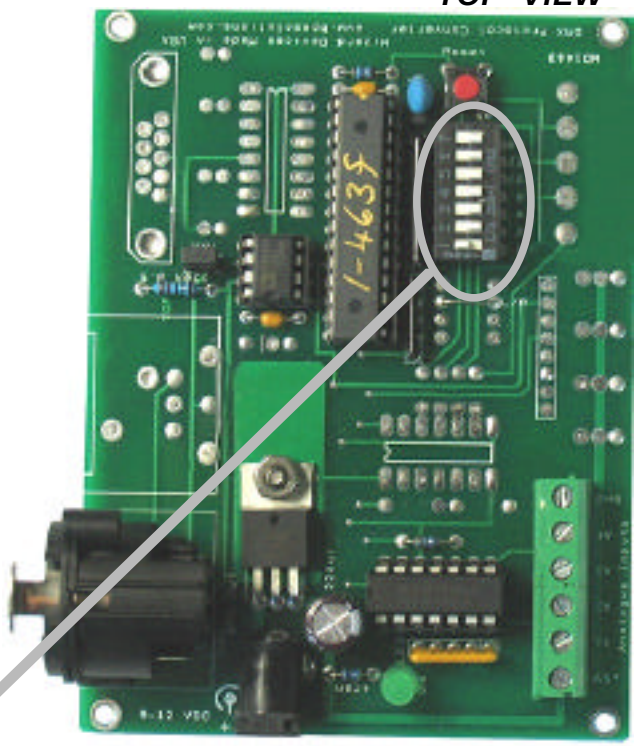
Board Address DMX - Values

Base address selectable between 1 and 112



DIP Switches (Addressing)

TOP VIEW



Example

CH3 = 51
CH3 = 50
CH2 = 49
CH1 = 48

DMX Value 0-255 = 0-100%
DMX Value 0-255 = 0.0Vdc to 5.0Vdc

Setting the base address of Output DMX Channels.
Add the value of the address DIP switches set to the **ON** position to calculate the base address.
Example(**CH**): DIP switches 5 and 6 set to **ON** position, the base address is now 48, (16+32) this setting is used to determine the starting address output of Ch1, the next channel would be address 49 for Ch2, and the next 50 for Ch3, and 51 for Ch4 output

Example **Output CH 1-4**

DIp Switch 5 and 6 ON = **Base Address 48**

Channel- 1 Output (Base Address starting at 48)
Channel- 2 Output (Base Address starting at 49)
Channel- 3 Output (Base Address starting at 50)
Channel- 4 Output (Base Address starting at 51)

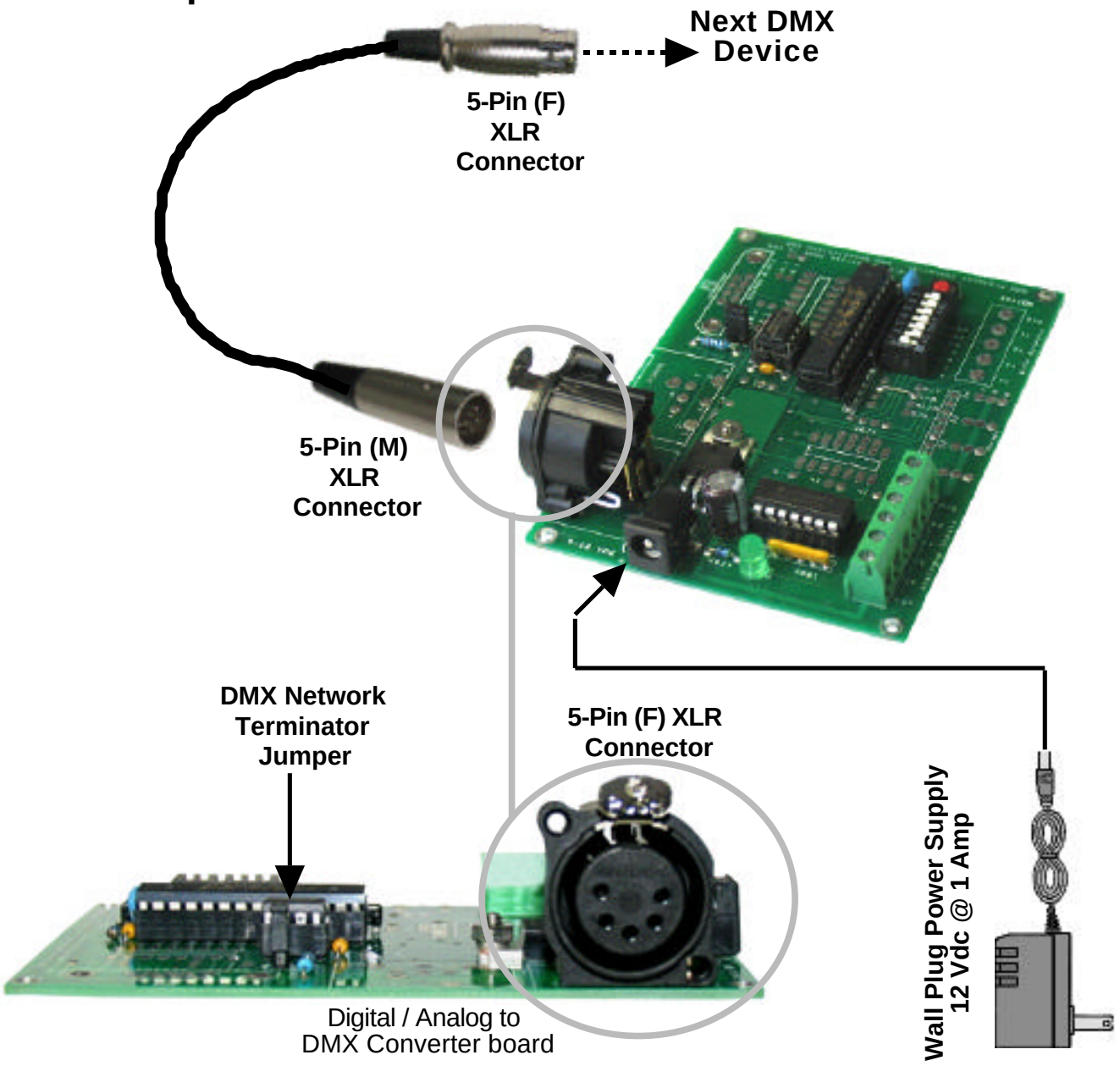
Digital / Analog to DMX Transmitter Function
The board will take an incoming variable voltage of +0-5 VDC and convert this voltage value to a outgoing DMX value of 0-255.on 4 DMX channels.
The base address of the board determines what the DMX Channel Value output will be sent at.
Any digital device (Switch, dry contact closure, Relay) or Analog device (Potentiometer, variable Power Source, Sensor) can be connected to the board. The board can use it's own voltage reference source of 0-5 VDC at 20mAmp to source the analog or digital connected device, or an external variable power source of 0-5 VDC can be used directly into the analog inputs on the Digital / Analog to DMX Transmitter board.

Digital / Analog to DMX Transmitter

Technical T

Overview

DMX Network Setup - 5 Pin



Note:
The Digital / Analog to DMX Converter board can be a stand-alone board with it's own DMX network and DMX devices / boards connected. If this board is to be used on a DMX network with a Control Console unit or with DMX Control Software and not as a stand-alone DMX network connected to a standard DMX network, then a DMX Merger Board is required to connect the Digital / Analog to DMX Converter and a DMX network and devices.

Digital / Analog to DMX Transmitter

Technical T

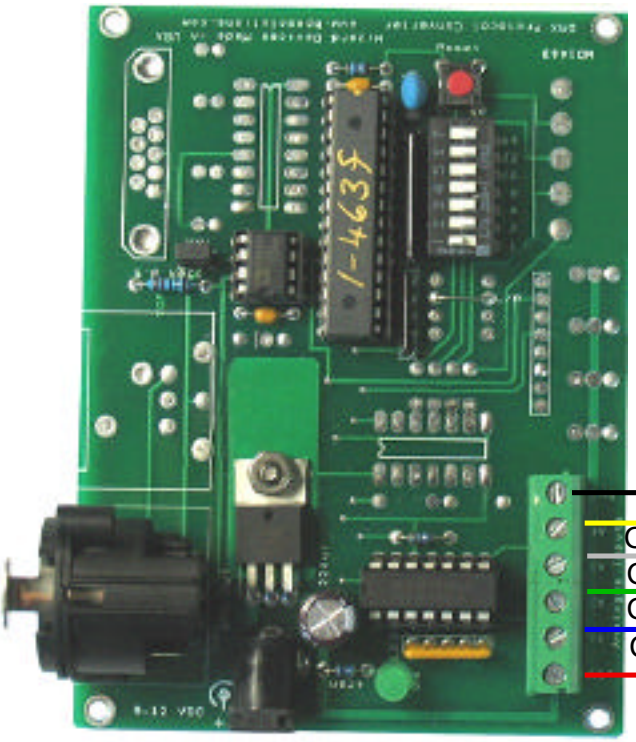
Overview

Channel Input Connection

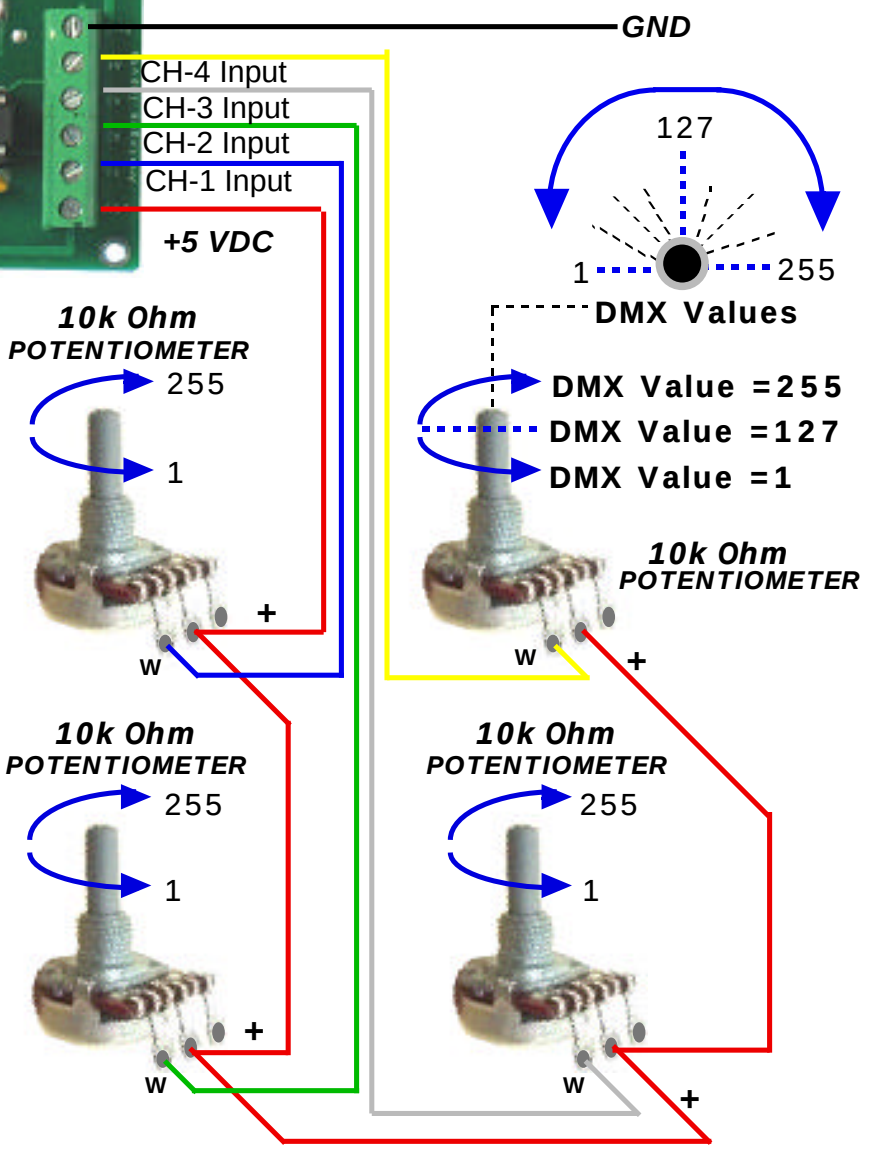
Internal Voltage Reference

Potentiometers

DMX Value = 1 to 255



Wall Plug Power Supply
9 Vdc @ 1 Amp



Digital / Analog to DMX Transmitter

Technical T

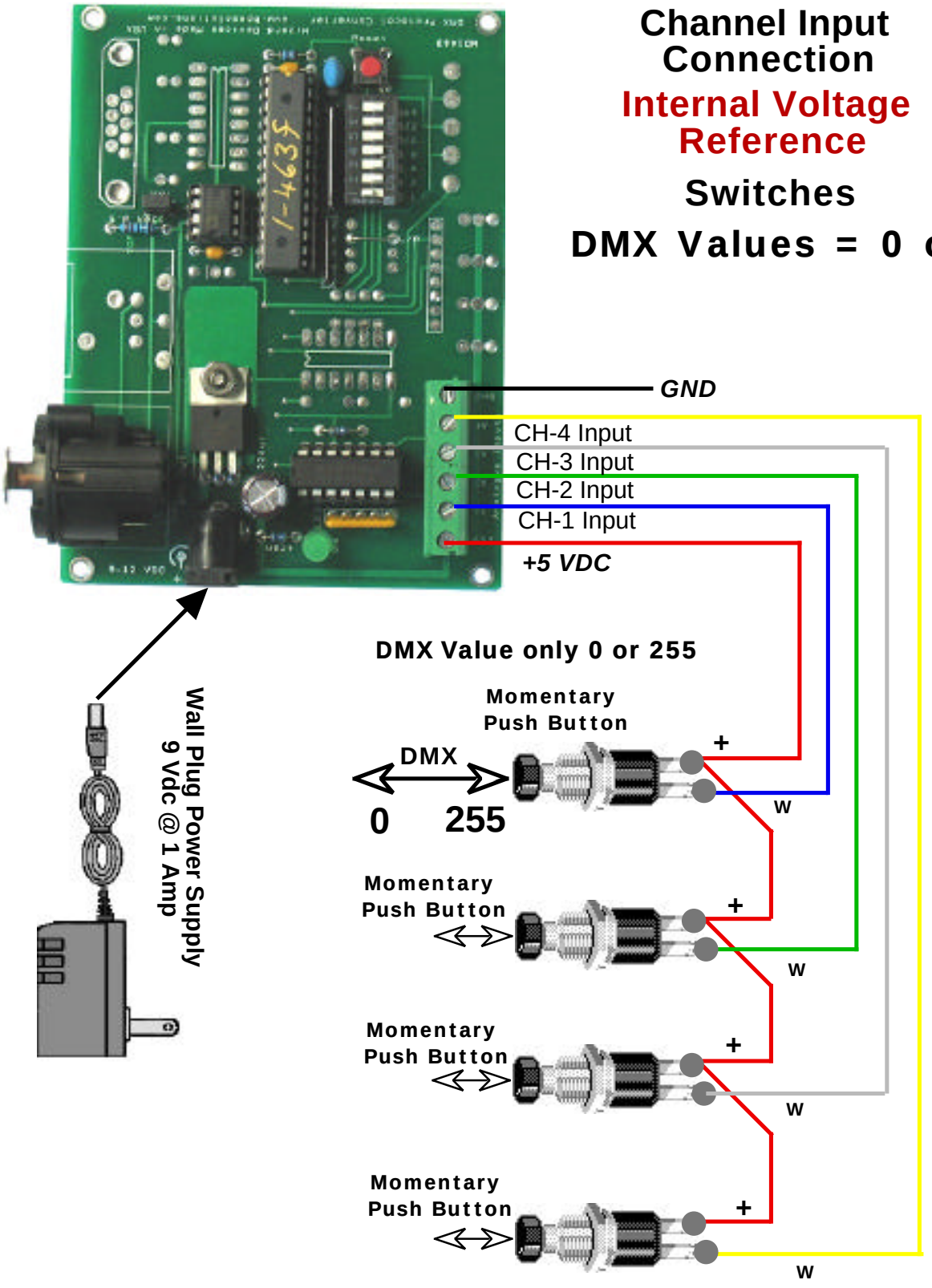
Overview

Channel Input Connection

Internal Voltage Reference

Switches

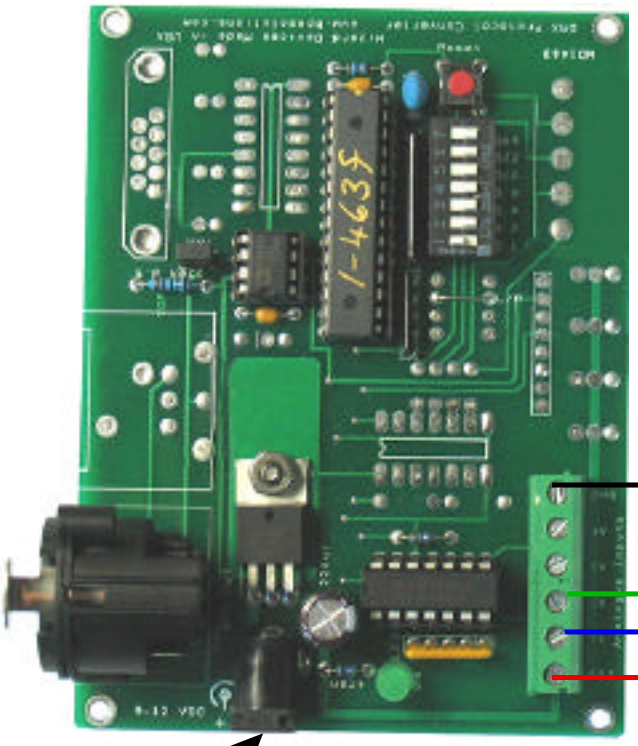
DMX Values = 0 or 255



Digital / Analog to DMX Transmitter

Technical T

Overview



Channel Input Connection

Internal Voltage Reference

Switches / Potentiometers

DMX Values = 0-255

GND

CH-4 Input
CH-3 Input
CH-2 Input
CH-1 Input

+5 VDC

Wall Plug Power Supply
9 Vdc @ 1 Amp

DMX Value only 0 or 255

Momentary Push Button

DMX

0 255

\+

W

Potentiometer Sets DMX Value 1 to 255
Potentiometer value sent to channel 2 on switch activation (1-255)

255

1

DMX Value 1 to 255

10k Ohm POTENTIOMETER

W

\+

\+

Momentary Push Button

\+

Potentiometer Value Set

Digital / Analog to DMX Transmitter

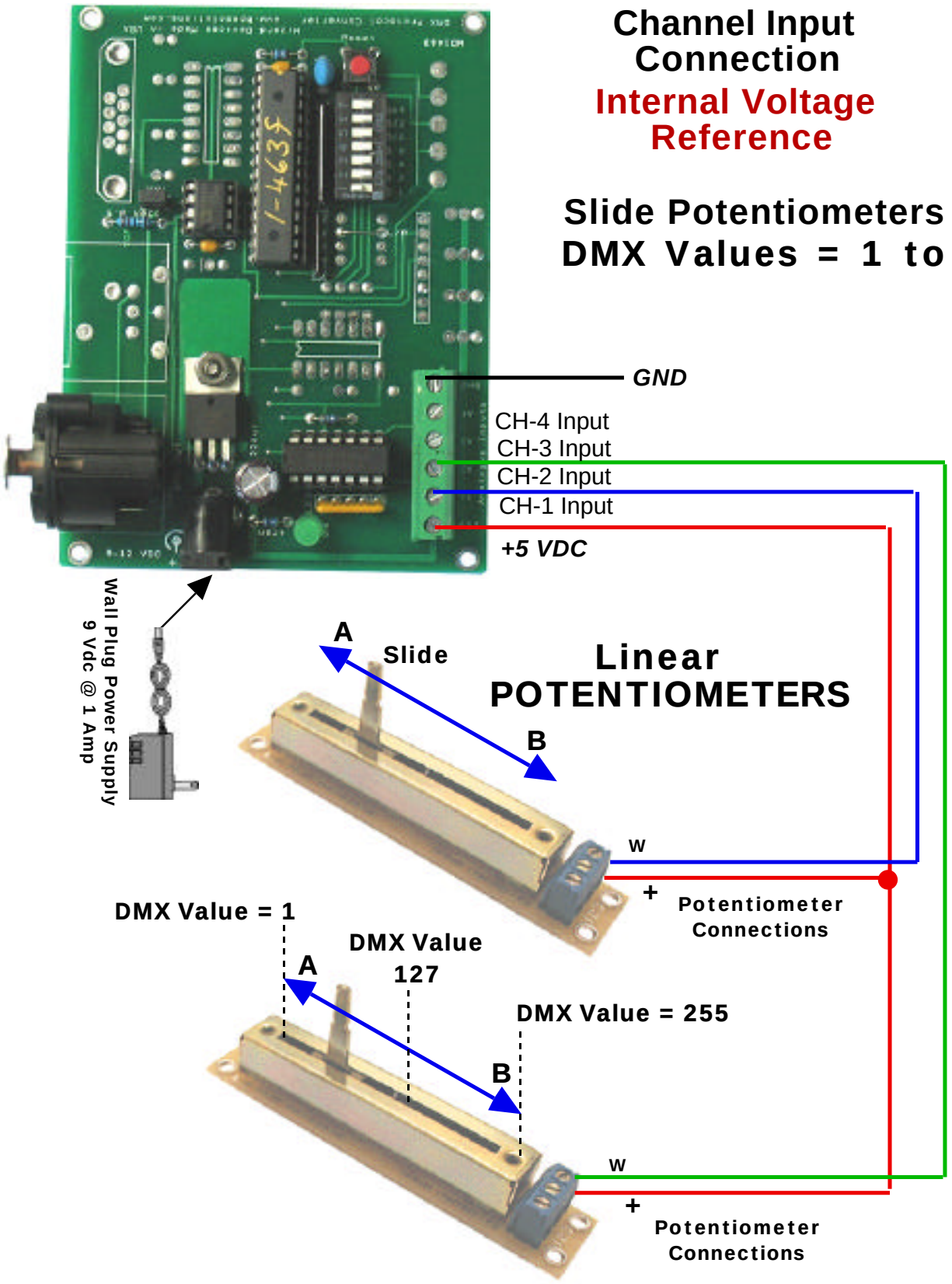
Technical T

Overview

Channel Input Connection

Internal Voltage Reference

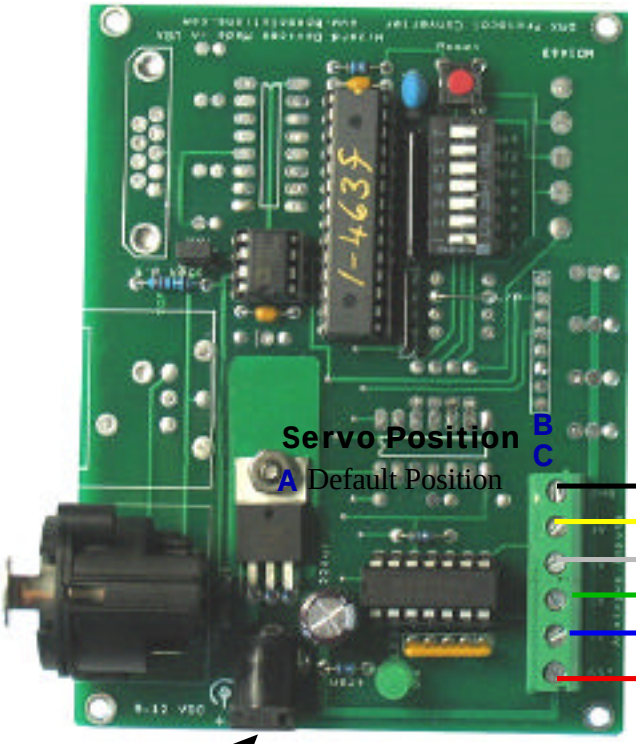
Slide Potentiometers
DMX Values = 1 to 255



Digital / Analog to DMX Transmitter

Technical T

Overview



Channel Input Connection

Internal Voltage Reference

Joystick Control

(10K Ohm Potentiometers)

DMX Values = 1 to 255

DMX R/C Servo Application

Servo Position

A Default Position

B

C

GND

CH-4 Input

CH-3 Input

CH-2 Input

CH-1 Input

+5 VDC

Wall Plug Power Supply
9 Vdc @ 1 Amp

J2 Ch1

J1 Ch2

Mini Joystick Modules

\+ w + w

Joystick 1-2

(J1) DMX Value 1-255

(J2) DMX Value 1-255

J4 Ch3

J3 Ch4

Mini Joystick Modules

\+ w + w

Joystick 3-4

(J3) DMX Value 1-255

(J4) DMX Value 1-255

Technical T

Overview

Digital / Analog to DMX Transmitter

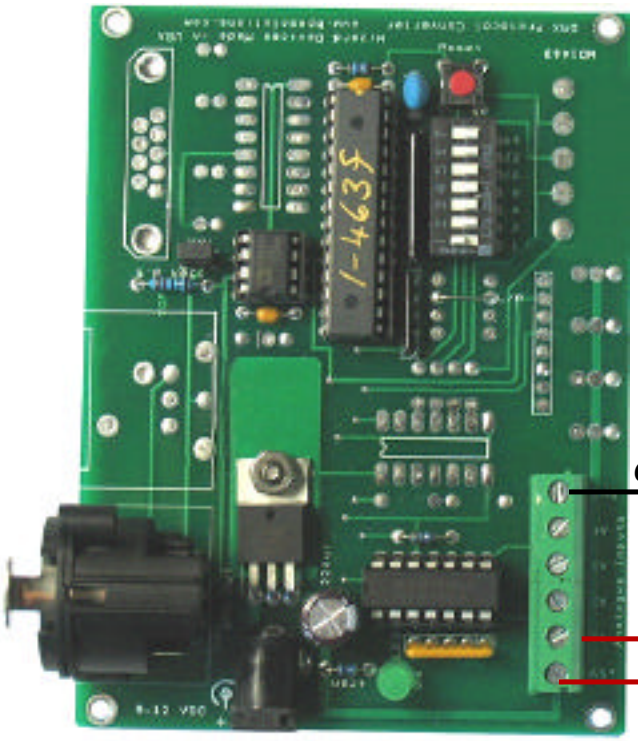
Channel Input Connection

External Voltage Reference

DMX Values = 0 to 255

+5 VDC Supply

Variable Voltage 0-5Vdc



GND

CH-4 Input
CH-3 Input
CH-2 Input
CH-1 Input

X

+5 VDC
Not Used

PLC, RF, MICROPROCESSOR

External Remote Control Input SET

Variable 0-5 +VDC Power Supply

20 mAmp

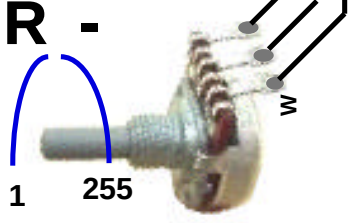
Variable 0-5 +VDC

Output

GND

- OR -

Wall Plug Power Supply 9 Vdc @ 1 Amp



Potentimeter Set

4.0 VDC

+ ◯ -

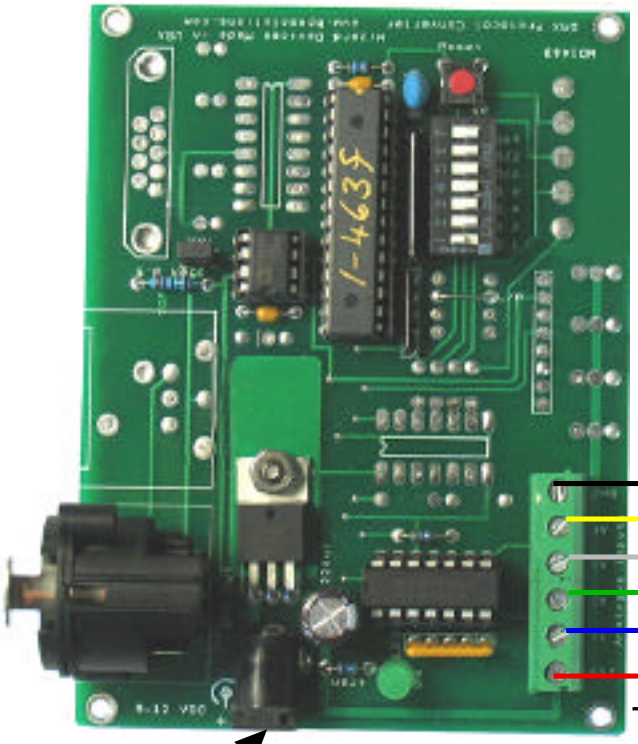
Digital Set

- OR -

Digital / Analog to DMX Transmitter

Technical T

Overview



Channel Input Connection

Internal Voltage Reference

RF Remote Switches

DMX Values = 0 or 255

GND

CH-4 Input

CH-3 Input

CH-2 Input

CH-1 Input

+5 VDC

RF 8-Ch SS Relay Board

Ribbon Connector

Wall Plug Power Supply 9 Vdc @ 1 Amp

+

W

W

W

W

Location B

RF Receiver and Transmitter

RF 8-Ch Receiver

Wall Plug Power Supply 9 Vdc @ 1 Amp

RF 8-Ch Transmitter

Location A

Switch Activated DMX Relays

Event: 4-Remote Switches to Activate DMX Relays 1-4

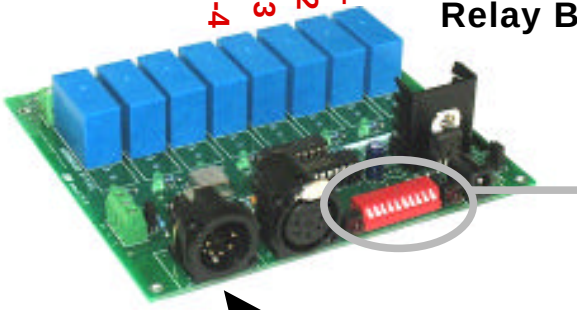
When Push Buttons 1 - 4 connected to the Digital / Analog to DMX Transmitter board is activated ON or OFF the corresponding Relay on the DMX Relay board at DMX base address 8 (starting Relay-1) will turn ON/OFF.

EXAMPLE- Relay Board:
DMX to start at Address 8

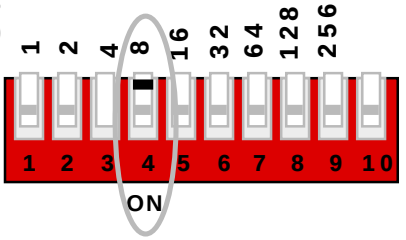
Relay 1= Address 8
Relay 2= Address 9
Relay 3= Address 10
Relay 4= Address 11

(11) Relay -4 (10) Relay -3 (9) Relay -2 (8) Relay -1 DMX Address

DMX - 8 Ch Relay Board



DIP Switches (Addressing)



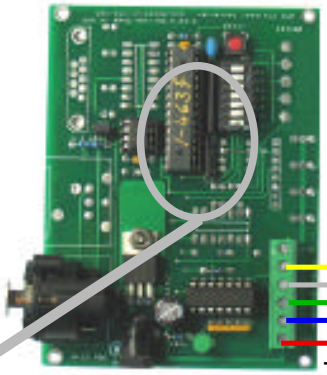
DMX Relay Board Base Address is set to 8

5-Pin (F) XLR Connector

DMX - XLR Cable

5-Pin (M) XLR Connector

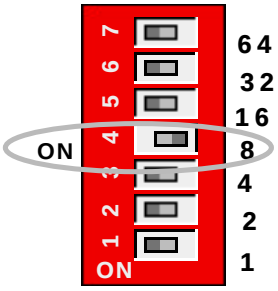
Digital / Analog to DMX Transmitter Board



See document on switch setup for more details

CH-4 Input
CH-3 Input
CH-2 Input
CH-1 Input
+5 VDC

Address = 1 to 112



DIP Switches (Addressing)

Momentary Push Buttons

Relay OFF ⟷ **Relay ON**

0 255

DMX

Momentary Push Buttons
Relay -1
Relay -2
Relay -3
Relay -4

DMX - 8 Ch Relay Board
DMX Value - 255 Relay ON
DMX Value - 0 Relay OFF

Digital / Analog DMX Transmitter Board Base Address is set to 8

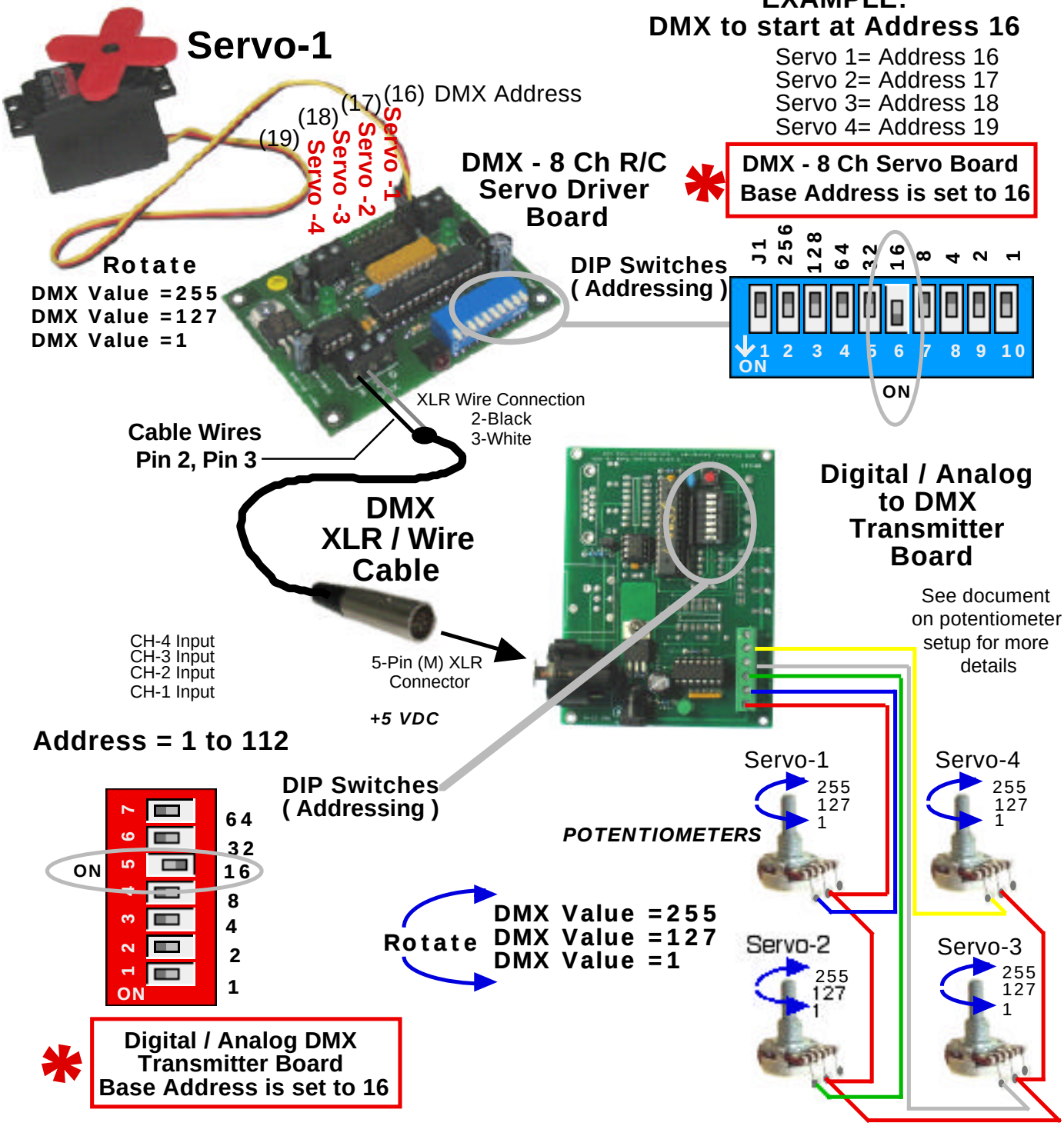
4- R/C Servomotor Control

Event: 4- R/C servos will move individually to various positions, under manual user DMX control.

When potentiometers 1 - 4 connected to the Digital / Analog to DMX Transmitter board are rotated by the user, the corresponding servomotor on the DMX Servo board at DMX base address 16 (starting Servo-1) will activate and the selected servos 1-4 will move to it's various positions as instructed by the user rotated potentiometers positions.

EXAMPLE:
DMX to start at Address 16

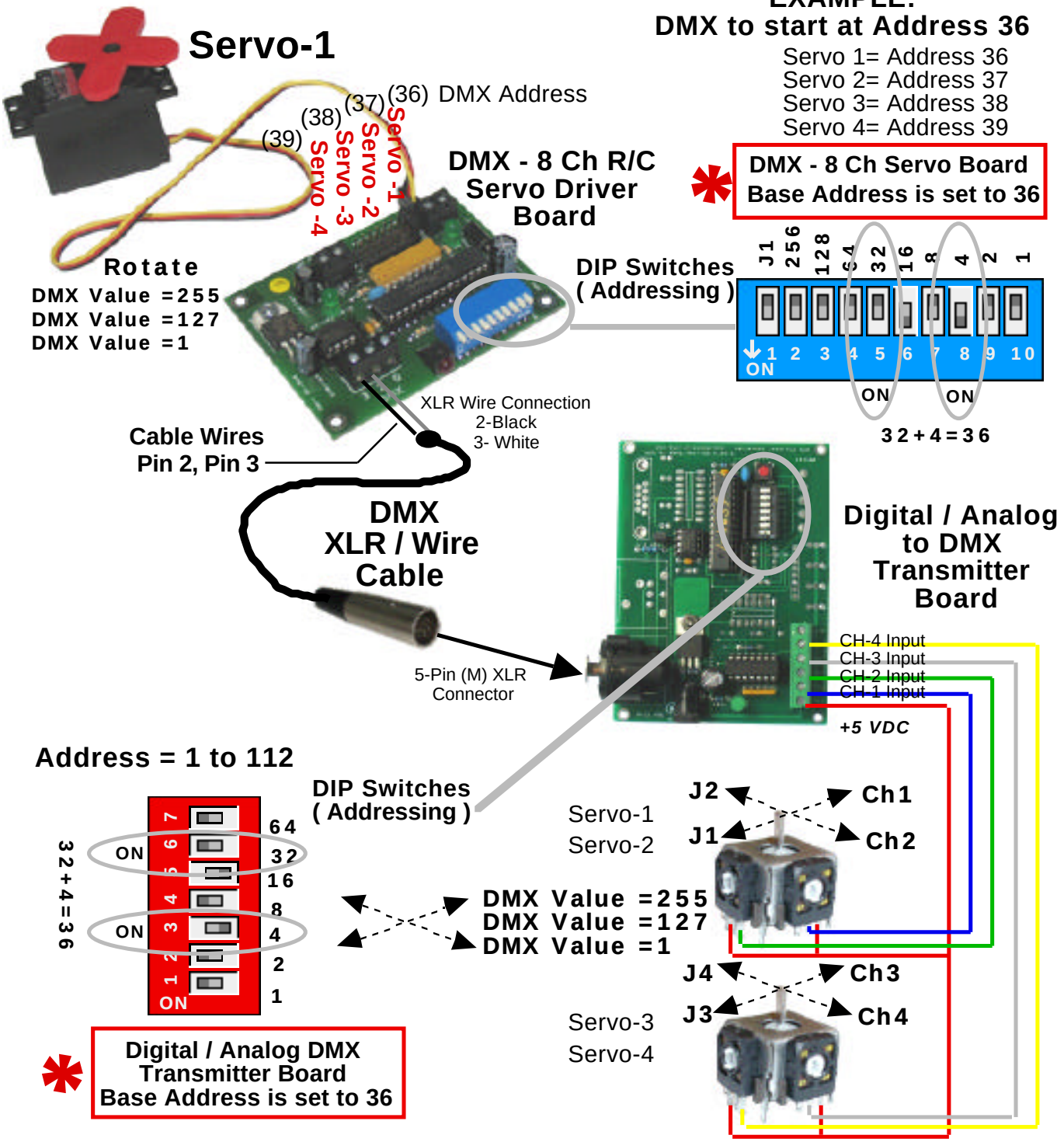
Servo 1= Address 16
Servo 2= Address 17
Servo 3= Address 18
Servo 4= Address 19



4- R/C Servomotor Control

Event: 4- R/C servos will move individually to various positions, using manual operated joystick modules

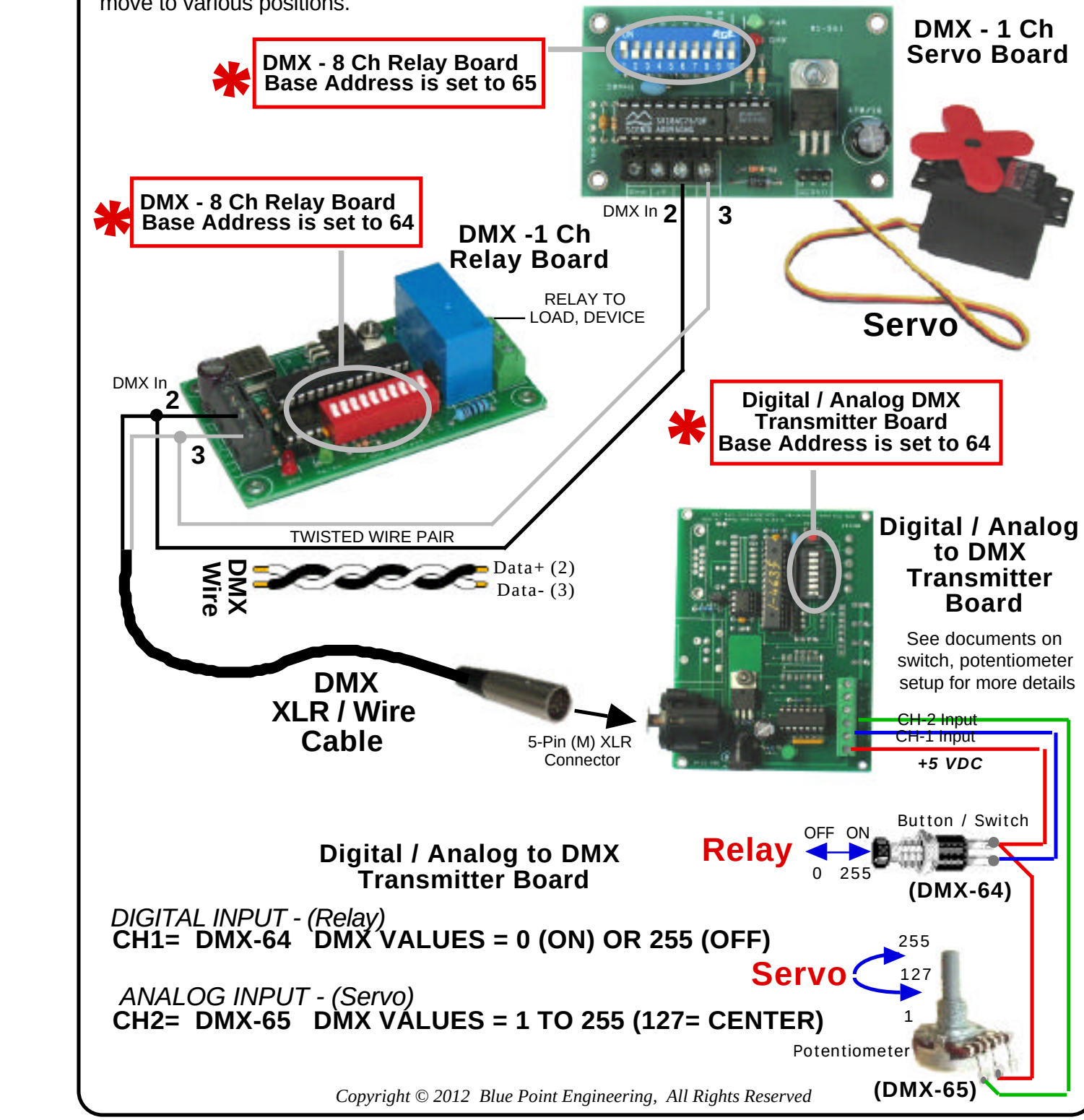
When joystick modules 1 - 4 connected to the Digital / Analog to DMX Transmitter board are moved by the user, the corresponding servomotor on the DMX Servo board at DMX base address 36 (starting Servo-1) will activate and the selected servos 1-4 will move to it's various positions as controlled by the user.



Hardware Setup

Event:
Switch to Activate DMX 1-Ch Relay Board
Potentiometer to Activate DMX 1-Ch Servo to various positions

When Push Button 1 connected to the Digital / Analog to DMX Transmitter board is activated ON or OFF the Relay on the DMX Relay board at DMX base address 64 will turn ON/OFF. When the potentiometer 1 connected to the Digital / Analog to DMX Transmitter board is rotated by the user, the servomotor on the DMX Servo board at DMX base address 65 will activate and the servomotor will move to various positions.



DIGITAL INPUT - (Relay)
CH1= DMX-64 DMX VALUES = 0 (ON) OR 255 (OFF)

ANALOG INPUT - (Servo)
CH2= DMX-65 DMX VALUES = 1 TO 255 (127= CENTER)

DMX 512 Chart - US Standard

Technical **T**

Address Switch Setting

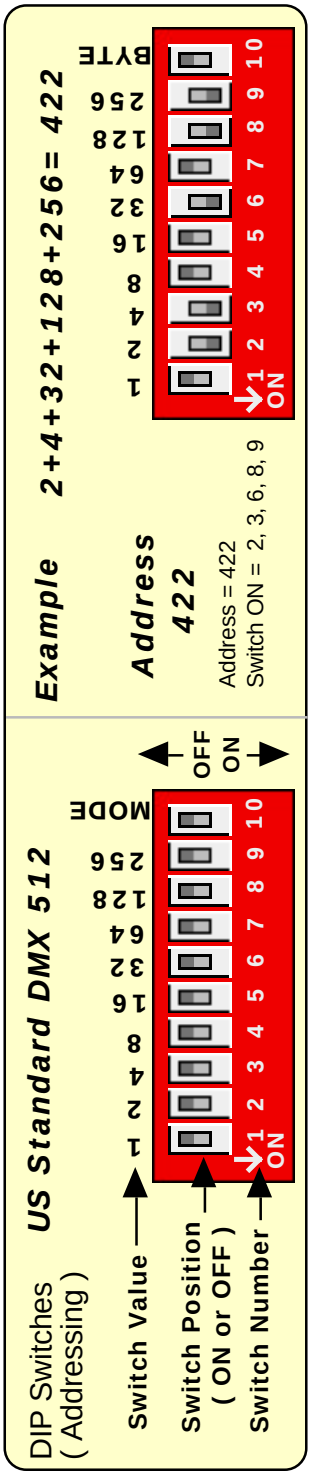
Chart A - US Standard DMX 512

DMX
Digital / Analog Converter

Ch -	Switches
1	1
2	2
3	1, 2
4	3
5	1, 3
6	2, 3
7	1, 2, 3
8	4
9	1, 4
10	2, 4
11	1, 2, 4
12	3, 4
13	1, 3, 4
14	2, 3, 4
15	1, 2, 3, 4
16	5
17	1, 5
18	2, 5
19	1, 2, 5
20	3, 5
21	1, 3, 5
22	2, 3, 5
23	1, 2, 3, 5
24	4, 5
25	1, 4, 5
26	2, 4, 5
27	1, 2, 4, 5
28	3, 4, 5
29	1, 3, 4, 5
30	2, 3, 4, 5
31	1, 2, 3, 4, 5
32	6
33	1, 6
34	2, 6
35	1, 2, 6
36	3, 6
37	1, 3, 6
38	2, 3, 6
39	1, 2, 3, 6
40	4, 6
41	1, 4, 6
42	2, 4, 6
43	1, 2, 4, 6
44	3, 4, 6,
45	1, 3, 4, 6
46	2, 3, 4, 6
47	1, 2, 3, 4, 6
48	5, 6
49	1, 5, 6
50	2, 5, 6
51	1, 2, 5, 6
52	3, 5, 6

Ch -	Switches
53	1, 3, 5, 6
54	2, 3, 5, 6
55	1, 2, 3, 5, 6
56	4, 5, 6
57	1, 4, 5, 6
58	2, 4, 5, 6
59	1, 2, 4, 5, 6
60	3, 4, 5, 6
61	1, 3, 4, 5, 6
62	2, 3, 4, 5, 6
63	1, 2, 3, 4, 5, 6
64	7
65	1, 7
66	2, 7
67	1, 2, 7
68	3, 7
69	1, 3, 7
70	2, 3, 7
71	1, 2, 3, 7
72	4, 7
73	1, 4, 7
74	2, 4, 7
75	1, 2, 4, 7
76	3, 4, 7
77	1, 3, 4, 7
78	2, 3, 4, 7
79	1, 3, 4, 7
80	5, 7
81	1, 5, 7
82	2, 5, 7
83	1, 2, 5, 7
84	3, 5, 7
85	1, 3, 5, 7
86	2, 3, 5, 7
87	1, 2, 3, 5, 7
88	4, 5, 7
89	1, 4, 5, 7
90	2, 4, 5, 7
91	1, 2, 4, 5, 7
92	3, 4, 5, 7
93	1, 3, 4, 5, 7
94	2, 3, 4, 5, 7
95	1, 2, 3, 4, 5, 7
96	6, 7
97	1, 6, 7
98	2, 6, 7
99	1, 2, 6, 7
100	3, 6, 7
101	1, 3, 6, 7
102	2, 3, 6, 7
103	1, 2, 3, 6, 7
104	4, 6, 7

Ch -	Switches
105	1, 4, 6, 7
106	2, 4, 6, 7
107	1, 2, 4, 6, 7
108	3, 4, 6, 7
109	1, 3, 4, 6, 7
110	2, 3, 4, 6, 7
111	1, 2, 3, 4, 6, 7
112	5, 6, 7



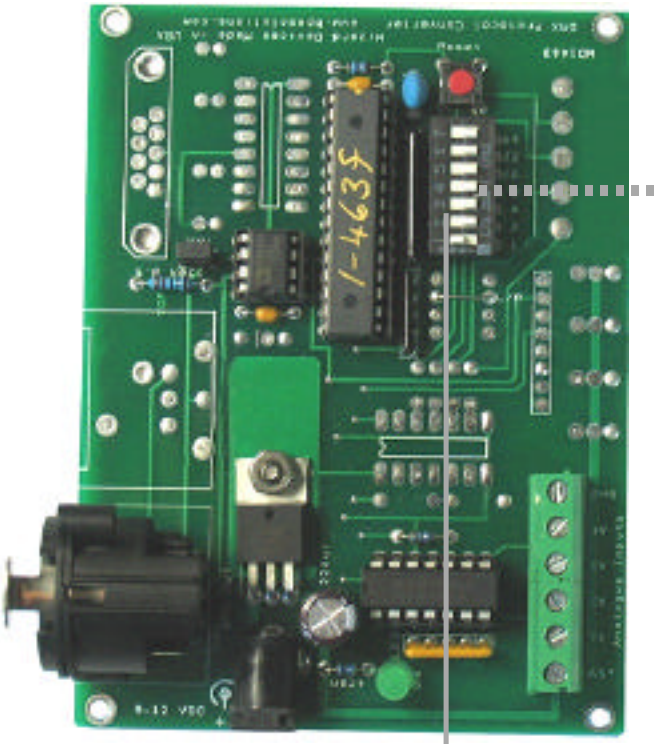
Digital / Analog to DMX Transmitter

Works Sheet W

Notes / Work Sheet:

DMX CONVERTER BOARD NO: _____

DMX CONVERTER Application: _____

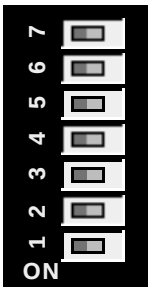


Addressing	*Application*
CH - 1	
CH - 2	
CH - 3	
CH - 4	

DIP Switch Numbers

Addressing

7 =
6 =
5 =
4 =
3 =
2 =
1 =



DIP Switches (Addressing)

Addressing

DMX Value	0 OFF	1 ON
SW-1		
SW-2		
SW-3		
SW-4		
SW-5		
SW-6		
SW-7		

Switch Positions (UP / Down)