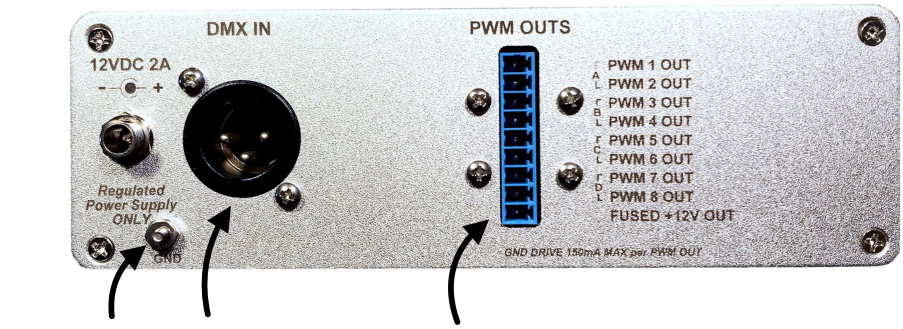
DPM8 User Guide
DMX to PWM Controller Driver
SR 1.xx

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GND CONNECTION

DMX INPUT *(3 or 5 Pin)*

PIN OUT:
- **A** [Pin 1 - PWM OUT 1, Pin 2 - PWM OUT 2
- **B** [Pin 3 - PWM OUT 3, Pin 4 - PWM OUT 4
- **C** [Pin 5 - PWM OUT 5, Pin 6 - PWM OUT 6
- **D** [Pin 7 - PWM OUT 7, Pin 8 - PWM OUT 8
- Pin 9 - FUSED 12V OUT

The DPM8 is a DMX to 8 channel PWM (Pulse Width Modulation) controller driver with a wide range of tunable frequencies that can be user set. This DPM8 will allow up to 4 different frequencies to be tuned (2 independent outputs per frequency). The low speed frequency range is from 123hz - 31.25Khz and the high speed frequency range is from 980hz - 250Khz. There are 8 independent outputs that will vary the duty cycle in respect to the assigned DMX channel level. Optionally there are 4 pairs (A, B, C, D) of frequency settings that can be user set. PWM outputs 1 & 2 (pair A), can be set to any frequency within the set low/high range, PWM outputs 3 & 4 (pair B) and another frequency, etc. *Note: The low/high frequency range setting is set for all 4 pairs and the unit will only operate in either low or high ranges. Once powered with a frequency range set all programmed frequencies will be in either the low or high ranges.*

Each PWM output is a ground drive output that allows multiple control voltages to be used. Each PWM output can drive up to 150mA at 12VDC (30VDC Max). Designed to control SSR (Solid State Relays) that could then directly power high power LED engines or fixtures, or any PWM circuits that uses a PWM control input (pending ground drive capability).

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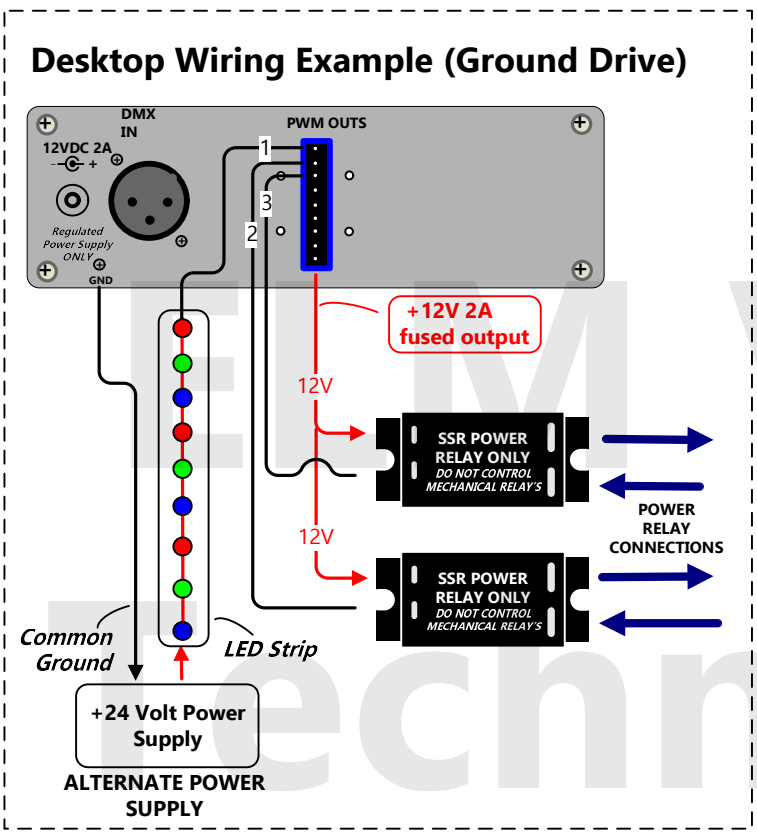
Connections

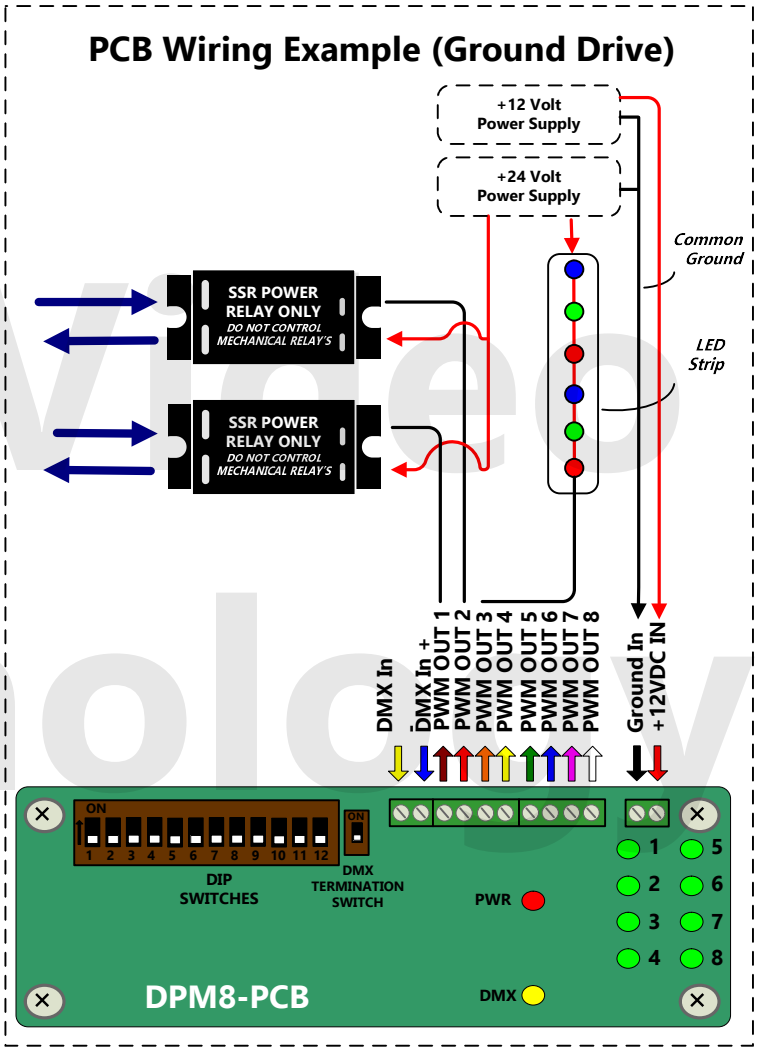
12VDC POWER INPUT Insert the power supply connector and screw the locking barrel to secure

GROUND CONNECTION If an external power supply is used to provide power to connected relay's or equipment, this connection can be used to connect to the power supply grounds.

DMX INPUT XLR (3 or 5 pin) connector standard DMX protocol. The input is self terminated.

FOR GROUND DRIVE PWM OUTS Connect the PWM Outs as shown for ground drive units. For the enclosed unit w/ a +12V output, the output is internally fused with a 2A fuse and can be used to provide +V for SSR (Solid State Relay's), or mechanical relay's, or LED's directly insuring that the maximum current is not exceeded.





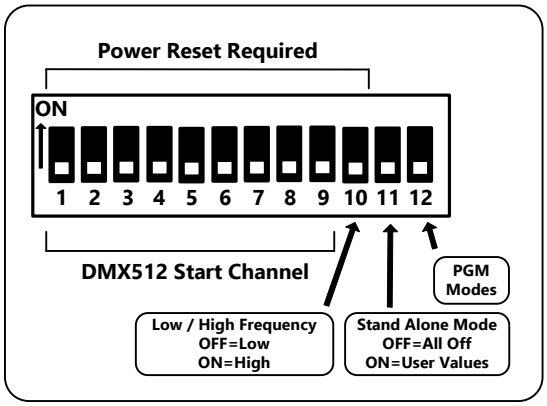
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Operation

DIP SWITCHES – It is recommended to have a DMX Start Channel value of 503 or less to have channels assigned to 8 PWM outputs and 2 for frequency programming and setup. See the Frequency *Setup Procedures for more information.*
NOTE – A RESET/REPOWER IS REQUIRED FOR DMX START CHANNEL and LOW / HIGH SPEED FREQUENCY SETTINGS



DIP SWITCHES 1-9 - DMX START CHANNEL: [POWER RESET REQUIRED] sets the DMX512 start channel *(see the DMX512 Channel Assignment Document).* PWM output 1 will be the DMX assigned start channel and the 2nd PWM output is controlled by the assigned DMX start channel +1 (consecutively) and so on.

Dip Switch's 1-6 are also used to program the frequency settings. *See the Frequency Setup Procedure*

DIP SWITCH 10 - FREQUENCY RANGE: [POWER RESET REQUIRED] sets the low or high frequency ranges for all outputs. OFF (down position) = low frequency range. ON = high frequency range.

DIP SWITCH 11 – STAND ALONE (No DMX): OFF (down position) = With no DMX signal the all PWM outputs will turn off. ON (up position) = With no DMX signal the PWM outputs will be the user preset (8 independent) values. *See the Stand Alone programming setup instructions*

DIP SWITCH 12 – ENTER PROGRAM SETUP MODES: OFF = normal operation. If the DPM8 is powered and DIP 12 is turned on the stand alone values can be programmed *(see the stand alone programming setup instructions).* When powering up the DPM8 and DIP 12 is ON then the frequency settings can be programmed, modified and stored. *See the Frequency Setup Procedure instructions*

STANDALONE MODE - The Stand Alone Mode is activated when there is no valid DMX present indicated by the status indicator off. The PWM duty cycle values are all off if the Stand Alone Dip Switch is in the OFF position. The user set PWM duty cycle values are applied when the Stand Alone Dip Switch is in the ON position. Take care to setup the values and place the dip switch in the desired position. Test the unit to insure the desired results.

LED INDICATOR – The Power LED will illuminate indicating power is applied. The Status LED will indicate the status and modes of the DPM8.

STATUS LED: ON: indicates DMX data is being received.
OFF: indicates no DMX data is being received and the unit is in Stand Alone Mode
SLOW BLINK:
DMX receive error – [overrun error] (reset clears)
Pre Program/Setup Mode, waiting on user to apply settings
MEDIUM BLINK: Programming/setup mode
RAPID BLINK: Programming/setup mode can't be entered, check settings
PULSE: Programming/setup complete – Reset DIP Switches if needed and RESET POWER

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Programming & Setup

STAND ALONE PROGRAMMING SETUP PROCEDURE

- *To ABORT any changes from storing turn off the power and reset the dips switches as desired*
- *If the Status LED has a rapid blink this indicates either No DMX present, the Start Channel is above 505, or dip 11 or 12 are not in the respective position or order of switching*

To store the 8 desired stand alone PWM values:

- Connect a valid DMX signal – Status LED on solid
- Set the respective DMX levels to the desired stand alone values
- Turn on Dip 11
- Turn on Dip 12 – Status LED medium blink
- Toggle Dip 11 - OFF and then ON – Status LED pulses (waiting)
- Turn of Dip 12 – The new values are stored in permanent memory – Status LED blinks twice to confirm

PWM DUTY CYCLE / FREQUENCY SETTINGS

The DPM8 has four PWM frequency groups: A, B, C and D. Outputs 1A and 2A share the same frequency, outputs 3B and 4B share the same frequency, and so on.

The FREQUENCY RANGE DIP switch selects either the Low or High frequency range when the DPM8 is powered on. All four groups operate within the selected range; Low- and High-range frequencies cannot be used at the same time.
- Low range: approximately 123 Hz to 31.25 kHz
- High range: approximately 980 Hz to 250 kHz

The PWM frequency can be changed to suit the application. For example, when controlling LEDs used for film or television, adjusting the PWM frequency may reduce visible pulsing or strobing. Common choices are 900 Hz and 1800 Hz, which are included as presets.

For LEDs or other circuits that do not require a specific PWM frequency, approximately 150–400 Hz is recommended for a squarer PWM waveform.

The DPM8 PWM outputs may produce a small ripple at the beginning and end of the duty cycle. Most electronic circuits, including solid-state relays, will not be affected.

If the DPM8 is used to control LED fixtures for film or television and the frame rate shows a pulsing or strobing effect on the LEDs, then the DPM8 PWM frequencies can be adjusted to possibly eliminate that effect. Standard television frame rates are 30FPS or 60FPS and a 30x multiple of the frame rates, 30x30 is 900hz and 30x60 is 1800hz. Both frequencies can be programmed. If the DPM8 is used to control LED's or other circuits that require a PWM source and the frequency isn't important then a 150 to 400hz frequency is suggested offering a squarer PWM waveform.

NOTE: DO NOT CONTROL MECHANICAL RELAYS WITH PWM.

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Programming & Setup

PWM DUTY CYCLE / FREQUENCY PROGRAMMING

Each of the four PWM groups can store one frequency for the Low range and one frequency for the High range. The range is selected when the DPM8 is powered on.

The easiest method is to select one of the three frequency presets shown in Table FPP-1.

For a precise frequency not provided by a preset, select VARIABLE mode by setting DIP switches 5 and 6 to OFF. During VARIABLE programming, the DPM8 uses ten consecutive DMX control channels:
- The first eight DMX channels control PWM outputs 1–8.
- The ninth DMX channel provides the coarse frequency adjustment.
- The tenth DMX channel provides the fine frequency adjustment.

Use the coarse DMX control to approach the desired frequency, then use the fine DMX control for final adjustment. An oscilloscope or frequency meter is required to accurately set a specific frequency.

The potentiometer and physical DIP switches 8 and 9 are not used for coarse or fine frequency adjustment. After programming mode is exited, DIP switches 1–9 resume their normal DMX start-channel functions.

Approximate coarse-control calculations:

Low range:
100 - ((31,372 ÷ desired frequency) ÷ 2.55) = coarse control %

High range:
100 - ((250,000 ÷ desired frequency) ÷ 2.55) = coarse control %

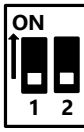
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Programming & Setup

Table FPP-1



Dip 1 ON = PWM A 1/2
Dip 2 ON = PWM B 3/4
Dip 3 ON = PWM C 5/6
Dip 4 ON = PWM D 7/8

Set duty cycles for each PWM output in respect to the DMX channel(s). Select one or more PWM groups at a time. For each PWM group any frequency within the selected low or high range can be set & viewed. Repower to abort, toggle dip switch 12 to store.



VARIABLE
Frequency setting using DMX coarse (9th) and DMX fine (10th) values



PRESETS
Low Freq 300hz
High Freq 50Khz



PRESETS
Low Freq 900hz
High Freq 100Khz



PRESETS
Low Freq 1800hz
High Freq 250Khz

FREQUENCY PROGRAMMING SETUP PROCEDURE:

- *While programming if the Status LED has a rapid blink this indicates either no DMX present, the Start Channel is above 503*
- *To ABORT any changes from storing turn off the power and reset the dips switches as desired*

To store any of the 4 PWM group frequency values:

- Unplug any PWM outputs that are sensitive to level and frequency adjustments
- Connect a valid DMX signal – Status LED on solid
- Turn off power, turn on dip 12, set DMX Start Channel to 503 or less
- Turn on power – [Waiting on user to preset dips switches 1-6] (all can be set to OFF) - LED BLINKS FAST
- Toggle Dip 12 off then on to enter programming setup mode, PWM outputs will be responsive to settings - Status LED medium blink
- Set dip switches according to table FPP-1 until any or all of the frequencies are as desired
- Turn on DIPs 1, 2, 3, and/or 4 respectively for the PWM(s) groups (A, B, C, and/or D) then to adjust:
  - For VARIABLE frequency adjustment: set DIP switches 5 and 6 to OFF. Use dip sw 9 for coarse adjustment and dip sw 10 for fine adjustment.
  - For PRESET frequency(s): dips 5 and 6 should be set per table FPP-1, Continue to repeat PWM group(s) selections and adjustments until any or all frequencies are set
- Once the PWMs are set as desired turn off DIP 12 to store settings - 2 confirm blinks
- Repower and test the new frequencies are as desired

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Specifications

DMX CONTROL WARNING: NEVER use DMX data devices where human safety must be maintained. NEVER use DMX data devices for pyrotechnics or similar controls.

MANUFACTURER: ELM Video Technology
NAME: DMX to PWM Controller and/or Driver
DESCRIPTION: The DPM8 converts DMX to variable duty cycle PWM (Pulse Width Modulation)
MPN: DPM8-DC3P
MODEL: DPM8
CHASSIS: Anodized Aluminum .093" thick RoHS compliant
PCB FUSE: SMT 1A
PWM OUT FUSE: Inline 2A (installed if unit has a 12V output)
POWER INPUT: +12VDC 80mA + sum of PWM outputs
PWM VOLT/AMP: **Ground Drive Unit** outputs a ground signal for the duration of the respective duty cycle at a max of 150mA. If an alternate external power supply max voltage 30VDC.
DATA TYPE: DMX 512 (250Khz)
DATA INPUT: 3 (or 5) pin male XLR
[Pin 1 Not connected, Pin 2 Data -, Pin 3 Data +]
DATA LOOP OUT: *(If equipped)* 3 (or 5) pin female XLR,
[Pin 1 Looped from pin 1 of input XLR, Pin 2 Data -, Pin 3 Data +]
CHASSIS GND: Input power connector negative shorts to chassis
RDM CAPABLE: No
DIMENSIONS: 3.7 x 6.7 x 2.1 inches
WEIGHT: 1.5 pounds
OPERATING TEMP: 32°F to 100°F
HUMIDITY: Non condensing
OUTPUT CONN.: 9 pin terminal block
POWER SUPPLY: +12VDC wall mount
- **Voltage Input:** 100 ~ 132 (or 240) VAC
- **Current Output:** 1A or 2A depending on unit/options
- **Polarization:** Positive Center
- **Output Conn.:** **12V unit** - Locking Barrel Plug, 2.1mm I.D. x 5.5mm O.D. x 9.5mm

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