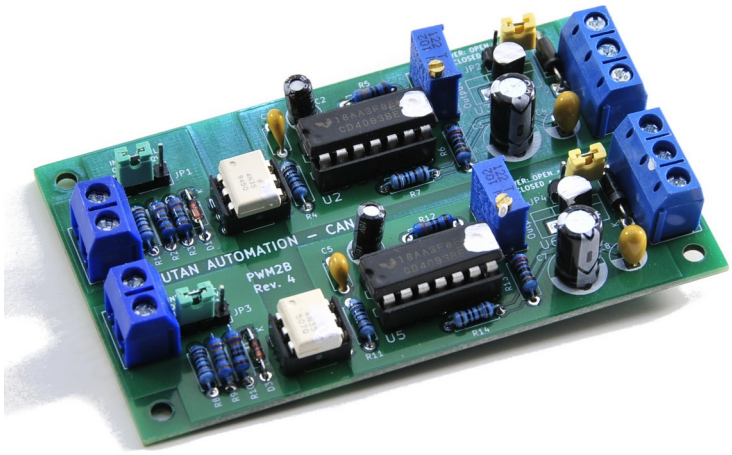
PWM2B – Isolated Dual channel PWM to Analog Converter



DESCRIPTION

This board contains two identical and independent PWM to analog converters. Each channel provides a linear output proportional to the duty cycle of the input signal.
Its intended application is to interface micro-controllers with PWM outputs to industrial devices that require linear analog signals, such as Variable Frequency Drives (VFD), direct flame burners, etc.

FEATURES

- Adjustable output level
- Optical isolation
- Independent channels
- Through hole components
- Socket mounted ICs
- Sturdy construction
- Fits in standard DIN rail enclosure (not supplied)

SPECIFICATIONS

- Number of channels: 2
- PWM input level: 3.3, 5, 12V Selectable
- Max frequency:
- Input current: 5mA @ 5V
- Output: Adjustable 0 to 5..12V or equal to Power Supply
- Linearity: 2% FSD
- Isolation: Min. 500 Vac
- Power: Nominal 24 Vdc (Acceptable range 17 to 30Vdc) See NOTE below.
- Dimensions: 3.400 x 1.950 in. (87 x 50 mm) 1.22 oz (0.025 Kg)

UTILIZATION

SELECT INPUT LEVEL

Use jumper JP1 (JP3) to select the desired input level. Leave the jumper open for 12V.

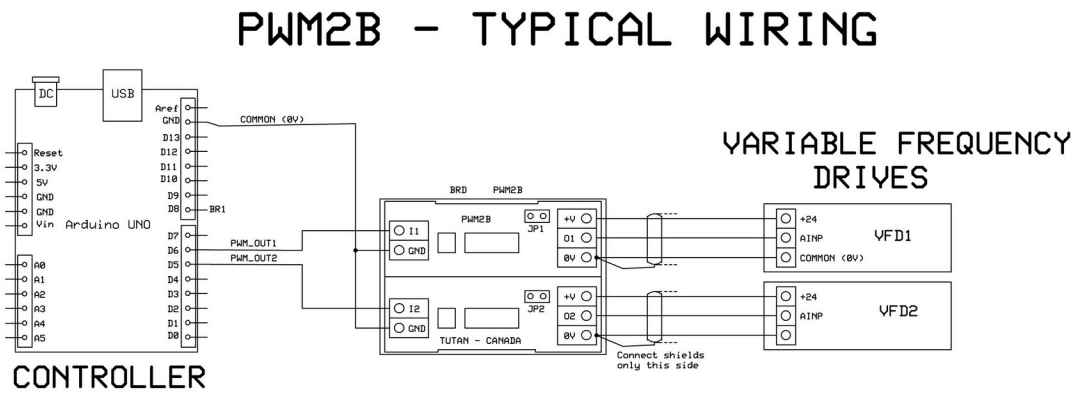
SELECT OPERATION MODE

Determine the mode of operation most suitable for your application: FIXED or ADJUSTABLE output MODE.

FIXED MODE:
Jumper JP2 (JP4) must be CLOSED. Power supply must be in the range 6 to 15Vdc (higher voltages will damage the CD4093 chip in the board).
The output level will be from 0V to the actual power supply voltage used.
This mode is used when the target device provides a “wetting” voltage that also corresponds with the Full Scale Input required. Most VFD provide this voltage.
WARNING: Maximum voltage in this mode is 15Vdc.

ADJUSTABLE MODE:
Jumper JP2 (JP4) must be OPEN. The output level will be from 0V to the value adjusted with the trim-pot RV1 (RV2), in the range 5 to 12V. The boards are factory adjusted to 10Vdc output.

WIRING



OUTPUT LEVEL ADJUST

Apply 5V to input (PWM=100%) and adjust trim-pot RV(n) to desired value.
Verify that the output is 0-10mV with the input open (PWM=0%).

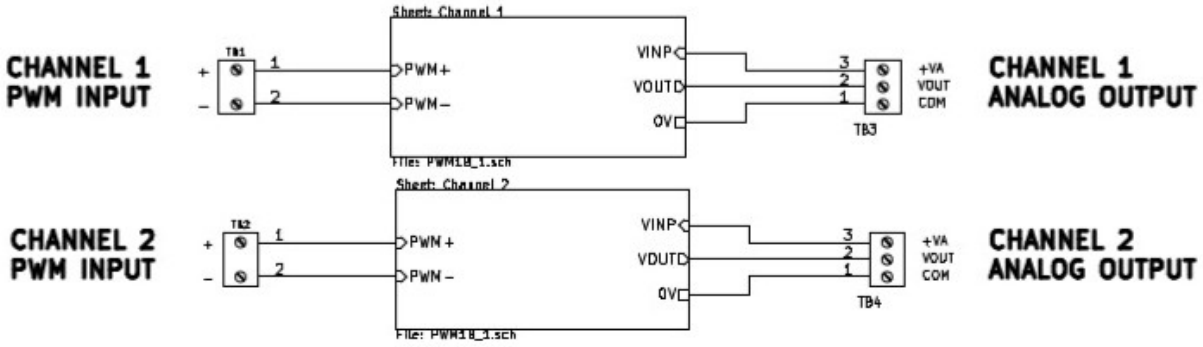
NOTE: It is recommended to adjust the output voltage with the board connected to the device in order to compensate for the voltage drop caused by the input resistance.

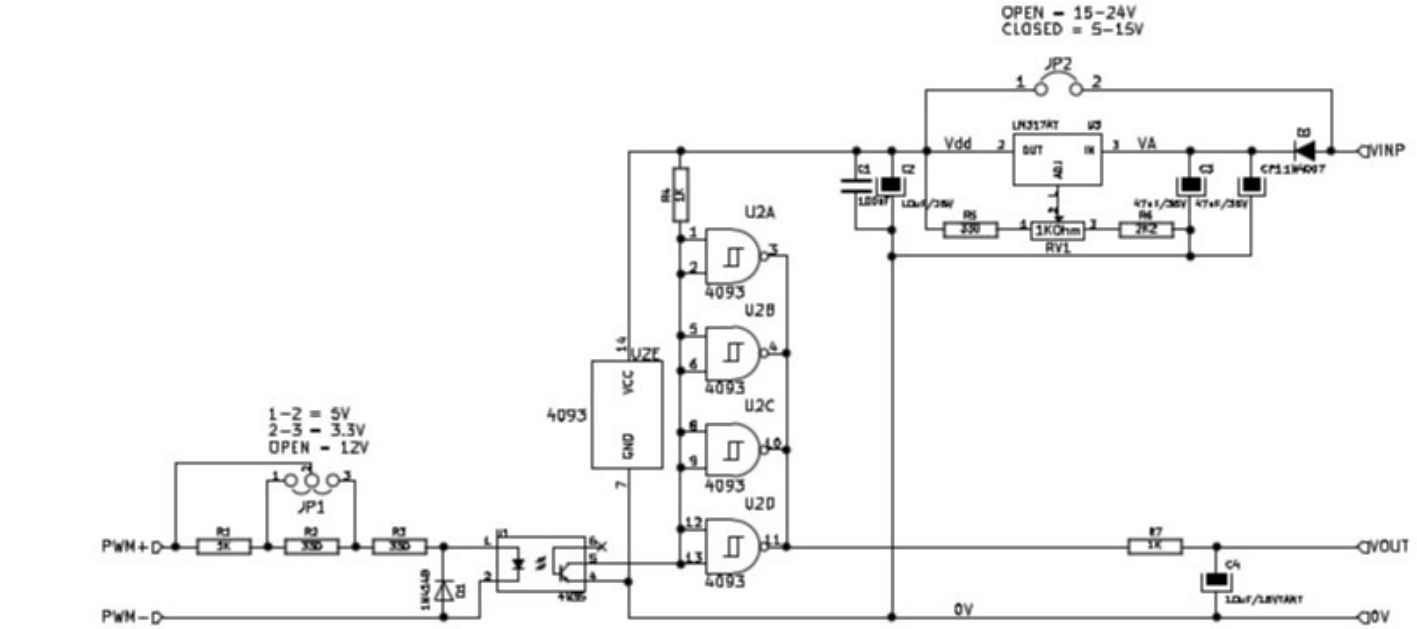
Open voltage calculation:

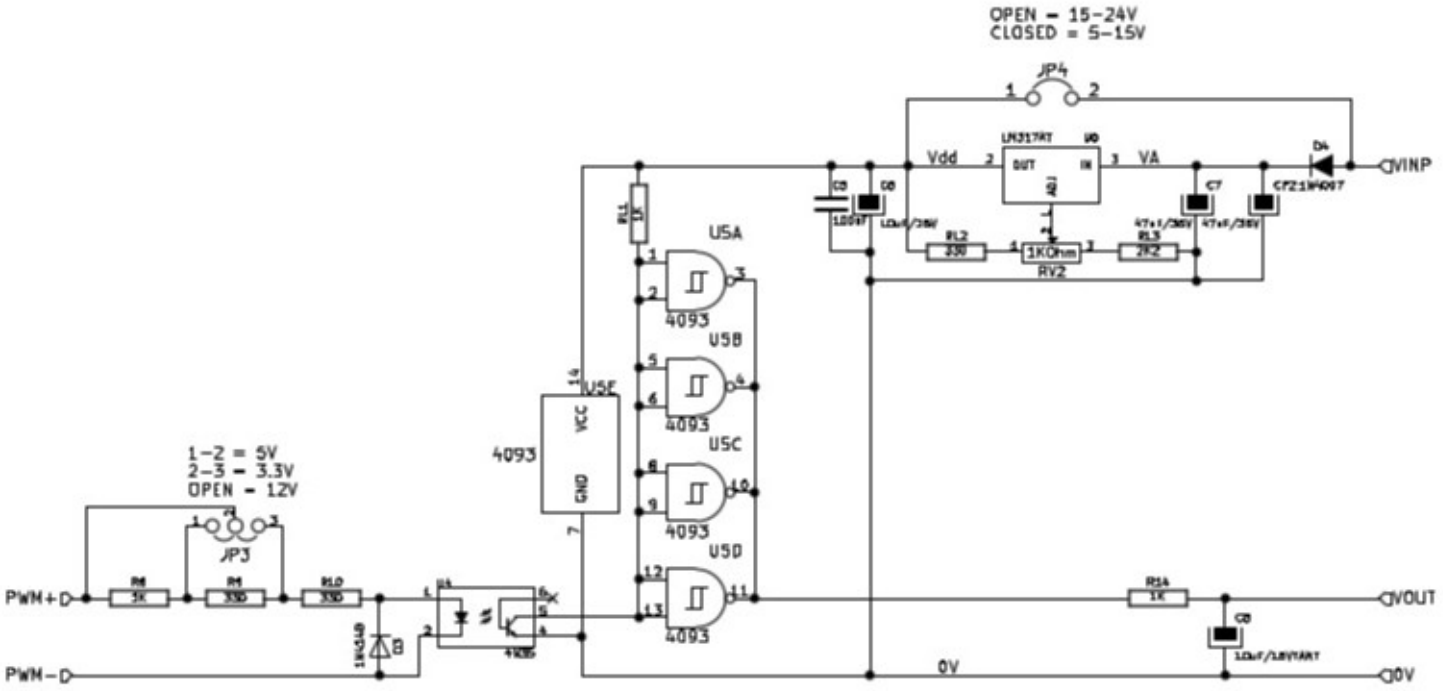
Vopen = Vinp (1 + 1K / Rinp)

PWM2B – BOM

Item	Qty	Reference(s)	Value
1	2	C1, C5	100nF
2	2	C2, C6	10uF/16V
3	2	C3, C7	47uF/35V
4	2	C4, C8	10uF/16VTANT
5	2	D1, D3	1N4148
6	2	D2, D4	1N4007
7	2	JP1, JP3	JUMPER
8	2	JP2, JP4	JUMPER
9	6	R1, R4, R7, R8, R11, R14	1K
10	6	R2, R3, R5, R9, R10, R12	330
11	2	R6, R13	2K2
12	2	RV1, RV2	1KOhm
13	2	TB1, TB2	CONN_2_V
14	2	TB3, TB4	CONN_3_V
15	2	U1, U4	4N35
16	2	U2, U5	4093
17	2	U3, U6	LM317AT
18	2	SK1, SK4	DIL6_300
19	2	SK2, SK5	DIL14_300
20	1	PCB	PWM2B-R4




OPEN = 15-24V
CLOSED = 5-15V
JP2
LM317KT
Vdd
VA
VINP
1KOhm
RV1
U2A
U2B
U2C
U2D
U2E
4093
VCC
GND
1-2 = 5V
2-3 = 3.3V
OPEN = 12V
JP1
PWM+
PWM-
VOUT
0V


OPEN = 15-24V
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JP4
LM317KT
Vdd
VA
VINP
1KOhm
RV2
U5A
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U5C
U5D
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4093
VCC
GND
1-2 = 5V
2-3 = 3.3V
OPEN = 12V
JP3
PWM+
PWM-
VOUT
0V