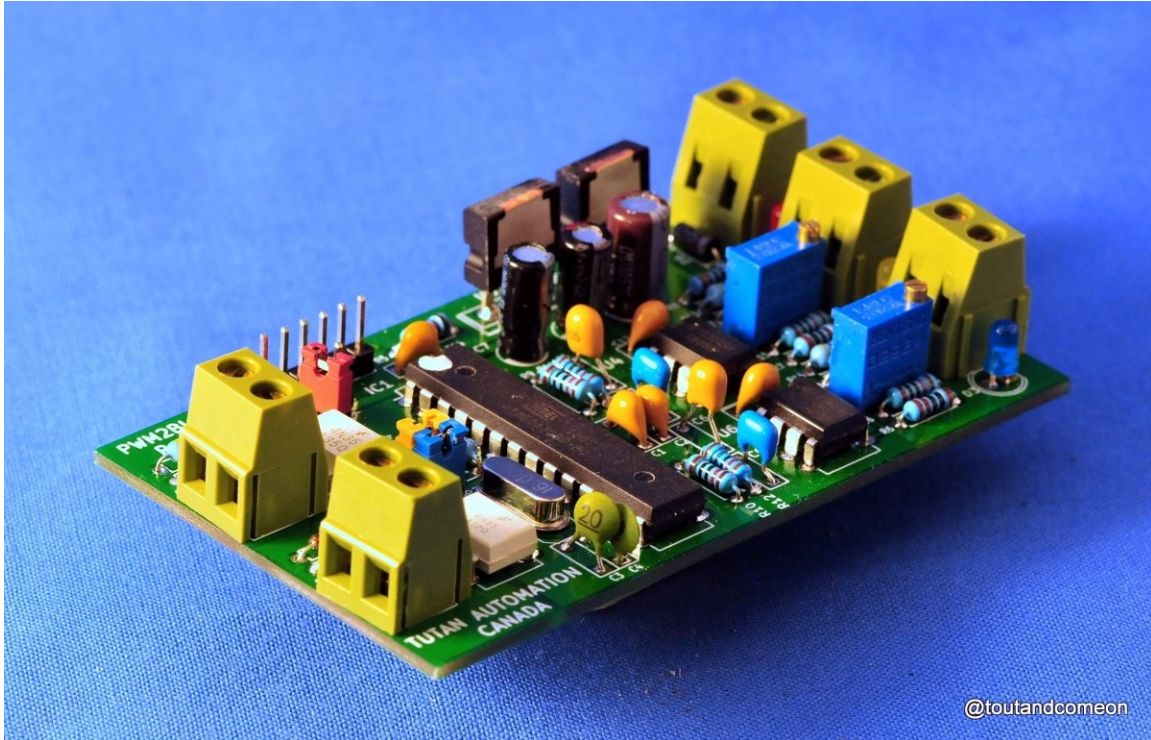# PWM2LS – 2 CHANNEL LOW SPEED PWM TO ANALOG CONVERTER

This board houses two low speed PWM to 0-10V analogue converters with optical input isolation and common output ground. It is suitable to interface devices with low frequency PWM (TTL level) outputs, such as flow meters, anemometers, etc, to standard variable frequency drives (VFD) or similar devices that require analogue input set-points to control an operational parameter (i.e. speed, torque, etc.).

SPECIFICATIONS

- Number of channels: 2
- PWM input: TTL Level (5V)
- Frequency range: 10 to 100 Hz
- Output voltage: Adjustable 0 to 5..12 V (max. 5mA)
- Linearity: 1% FSD
- Isolation: Minimum 500 Vac
- Power: Nominal 24Vdc +/-20%
- Dimensions: 3.40 x 1.95 in (86.4 x 49.6 mm)
- Weight: 1.40 oz (0.04Kg)

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ENCLOSURE

The board is available bare or mounted in a commercial DIN rail enclosure for easy integration with other industrial grade devices inside a control cabinet.

OPERATION PRINCIPLE

The PWM input signals are connected via opto-couplers to a microprocessor where the duty cycle of each input is measured and converted to a high speed PWM signal that is averaged with a two pole filter and buffered with an OP-amp with variable gain.

INSTRUCTIONS

POWER SUPPLY
The board can be powered with any voltage between 17 and 30 Vdc (24Vdc nominal) and is protected against polarity inversion. If the output signals are adjusted to 5V maximum then the power can be as low as 10Vdc.
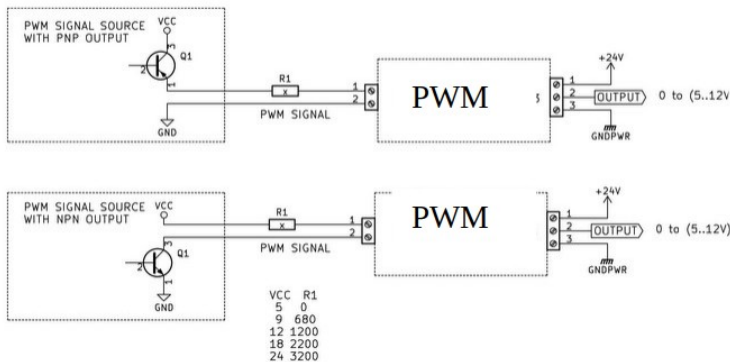
CHANNEL ENABLE
The operation of each channel is enabled by the jumpers JP1 (channel A) and JP2 (channel B) respectively.
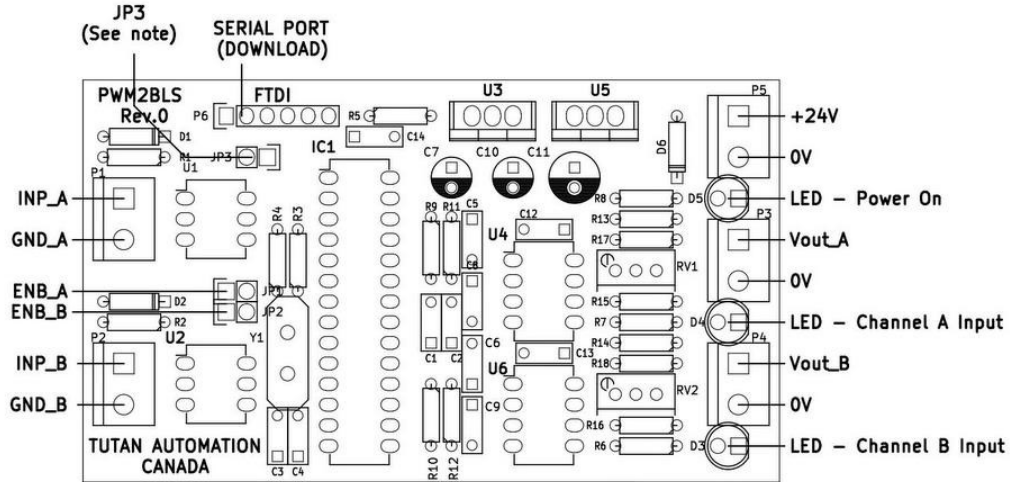
OUTPUT LEVEL ADJUST
Apply 5V to the input (PWM=100%) and adjust trimpot RV1 or RV2 to obtain the required output value (5 to 12Vdc). Leave the input open and verify that the output is 0-10mV.
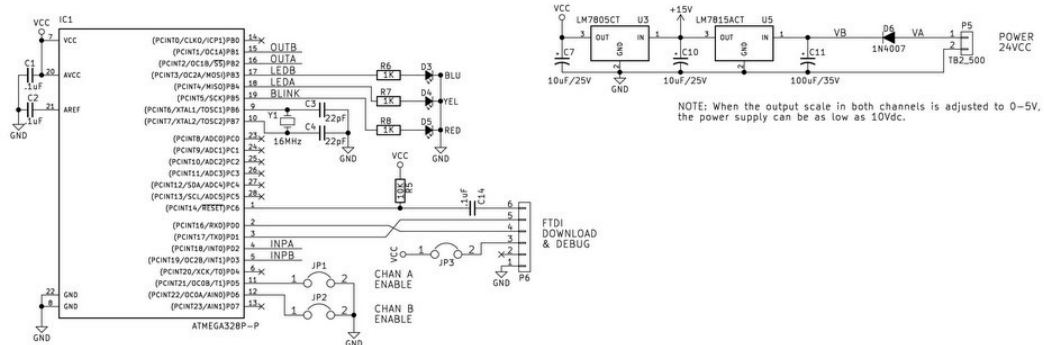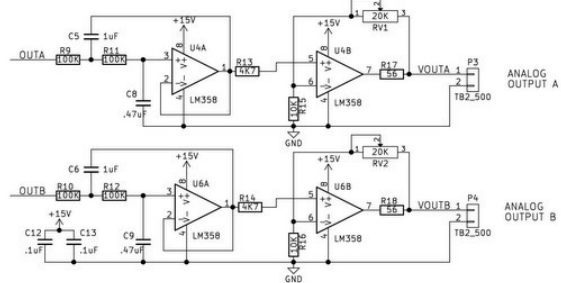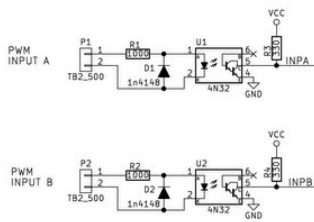

WIRING EXAMPLES — 5, 9, 12, 16 and 24V LOGIC

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PWM2LS – LOW SPEED PWM TO ANALOGUE CONVERTER

INPUTS: PWM 0 to 100% DC, TTL level, 10 to 100Hz
OUTPUTS: 0 to 10V
Inputs are isolated from each other and the output stage.
Outputs share a common ground.

NOTE: When the output scale in both channels is adjusted to 0–5V,
the power supply can be as low as 10Vdc.

PWM2LS - BOM

Pos	Quantity	Reference	Value	
1	2	C10 C7	10uF/25V	
2	1	C11	100uF/35V	
3	5	C1 C12 C13 C14 C2	.1uF	
4	2	C3 C4	22pF	
5	2	C5 C6	1uF	
6	2	C8 C9	.47uF	
7	2	D1 D2	1n4148	
8	1	D3	BLU	
9	1	D4	YEL	
10	1	D5	RED	
11	1	D6	1N4007	
12	1	IC1	ATMEGA328P-P	
13	3	JP1 JP2 JP3	JUMPER	
14	5	P1 P2 P3 P4 P5	TB2_500	
15	1	P6	CONN_01X06	
16	2	R1 R2	1000	
17	2	R13 R14	4K7	
18	3	R15 R16 R5	10K	
19	2	R17 R18	56	
20	2	R3 R4	330	
21	3	R6 R7 R8	1K	
22	4	R10 R11 R12 R9	100K	
23	2	RV1 RV2	20K	
24	2	U1 U2	4N32	
25	1	U3	LM7805CT	
26	1	U5	LM7815ACT	
27	2	U4 U6	LM358	
28	1	Y1	16MHz	
29	1	SK1	DIL28_300	
30	2	SK2 SK3	DIL06_300	
31	2	SK4 SK5	DIL08_300	
32	1	PCB1	PWM2LS	