PWM MOTOR CONTROL DATA SHEET

Description:

The PWM Motor Control operates the motor in an open loop voltage mode. The control performs 4-quadrant commutation when a PWM input signal is used. The control is compatible with 20 to 36Vdc power supplies. Open loop speed control is accomplished by the user supplying a logic level PWM input. For cost sensitive applications requiring minimal speed feedback a tachometer output can be accessed.

Environment:

The NT Dynamo uses a TENV (totally enclosed non-ventilated) non-gasket construction. Installation and operating conditions should not exceed the recommended values for humidity and temperature. Contact the Hurst engineering department regarding any special installation issues you may have regarding vapors, oils or dust.

Storage Temp.: 32-158°F (0-70°C)   **Humidity: 90% Max. Non-condensing**   **Operating Temp.: 32-104°F (0-40°C)**
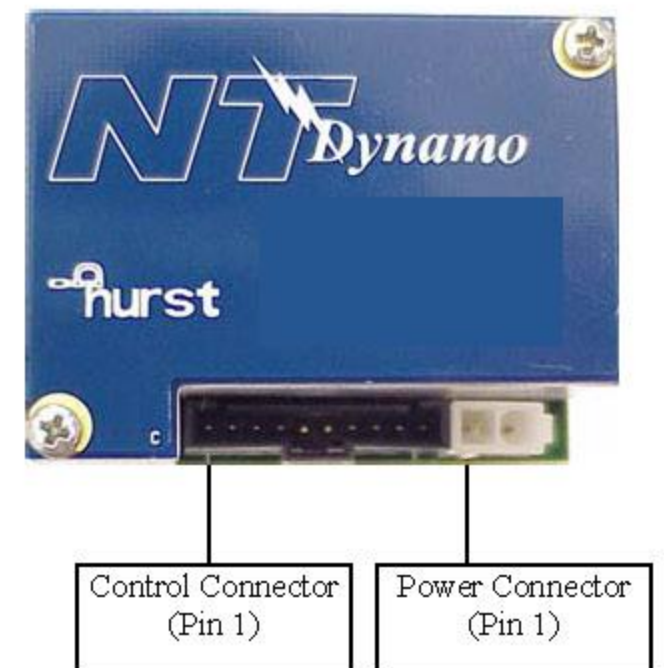
Power:

DC power must be connected to the 2-pin connector on control board. Observe the correct polarity when making this connection. Filter capacitors are supplied internal to the NT Dynamo for increased reliability under typical power conditions. Excessive amounts of voltage ripple can cause shortened product life. Control circuit commons are common to the negative terminal of the power connector. Use isolated input signals as required to avoid ground loop issues.

Minimum DC Voltage: 20Vdc   **Maximum DC Voltage: 36Vdc**
Minimum Logic Voltage: 4.75 Vdc   **Maximum Logic Voltage: 5.25 Vdc**
                                        Maximum Logic Current: 50 mA

Connector	Pin #	Function	Mating Connector	Mating Terminal	Recommended Wire Size	Cable Length
Power	1	V_s	Molex 39-01-2020	Molex 39-00-0039	22 AWG	30 ft. Max[1]
	2	$V_{s(RTN)}$				
Control	1	Tach Signal	Molex 50-57-9410	Molex 16-02-0103	22 AWG	30 ft. Max[1]
	2	N/A				
	3	N/A				
	4	Encoder B				
	5	Encoder A				
	6	N/A				
	7	PWM Input				
	8	Run/Stop				
	9	$+5V_{(RTN)}$				
	10	$+5V_s$				

Control Connector (Pin 1)   Power Connector (Pin 1)

Notes
1) Longer cable runs may require a larger wire size to maintain the correct input voltage level and a signal amplifier / conditioner to avoid erroneous signal values. For cable runs longer than 3 ft, shielded wire is recommended.

Inputs:

Logic Input (+5V$_s$)

A +5Vdc signal must be supplied to the Logic Circuitry. See Connection Chart and 'Power' section for more details.

Run/Stop

The Run/Stop pin is used to enable the drive. A low level signal on the Run/Stop pin causes the drive to start. A high level signal on the Run/Stop pin causes the drive to stop controlling the motor, thus allowing the motor to coast to a stop. This line has an internal 1.5KΩ pull up to 5Vdc. The minimum high level is +3.0Vdc. The maximum low level is +2.0Vdc. The 1.5KΩ pull up requires the pin to be driven by a circuit capable of sinking at least 3.5mA.

PWM Input

The PWM signal should be a fixed frequency, variable input where the duty cycle percentage represents the voltage applied to the motor. The PWM signal should be an active high PWM signal at 15 Hz to 25 kHz. A 0% duty cycle input indicates maximum command in the counterclockwise direction when viewing the motor from the lead end. A 50% duty cycle input indicates minimum command. A 100% duty cycle input indicates maximum command in the clockwise direction when viewing the motor from the lead end.
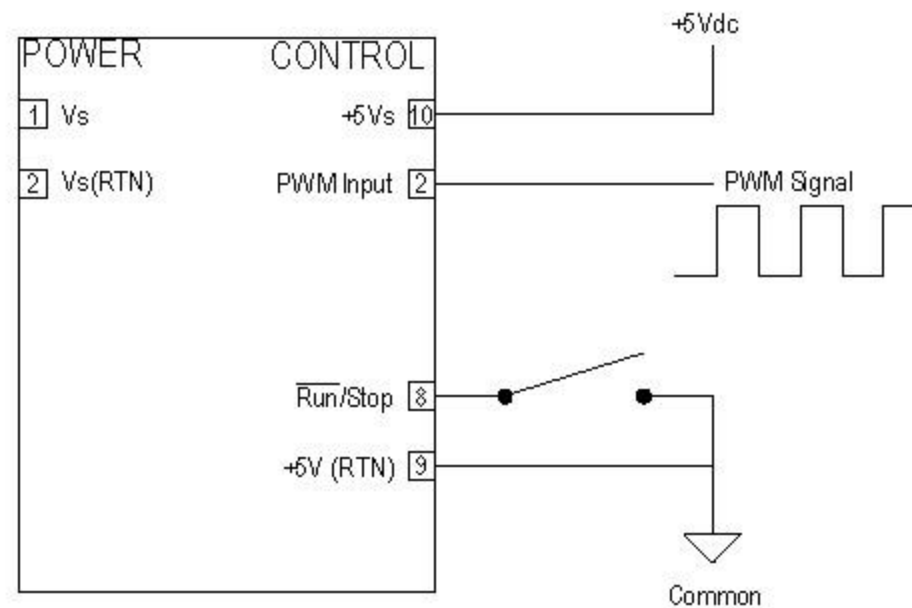
Figure 1 (Typical Connections)

Outputs:

Tachometer signal

Tachometer signal output is supplied by an open collector output with a 1KΩ resistor in series. On the standard 10 pole motor, the output is 30 pulses per revolution. Output for 8 pole motors (special order) is 24 pulses per revolution. The signal pulses low for 300ns minimum, 600ns typical.

**Max. Voltage: 14Vdc**   **Max. Current 1.5mA**

Encoder Output

The drive may contain an optional shaft mounted optical encoder. The encoder outputs two channel quadrature signals from which direction and speed can be determined. The signals are available to the user to close a speed loop external to the PWM Motor Control.

Encoder Type	Incremental	
Output Format	Two Channel Quadrature	(Velocity (rpm) X N)/60 N= Number of Counts per Revolution
Output Type	Square Wave	
Frequency Response	20 kHz	
Pull Up Resistor for Encoder Output	1K - 2.2K ohm	

CCW Direction viewed from Lead End
Figure 2
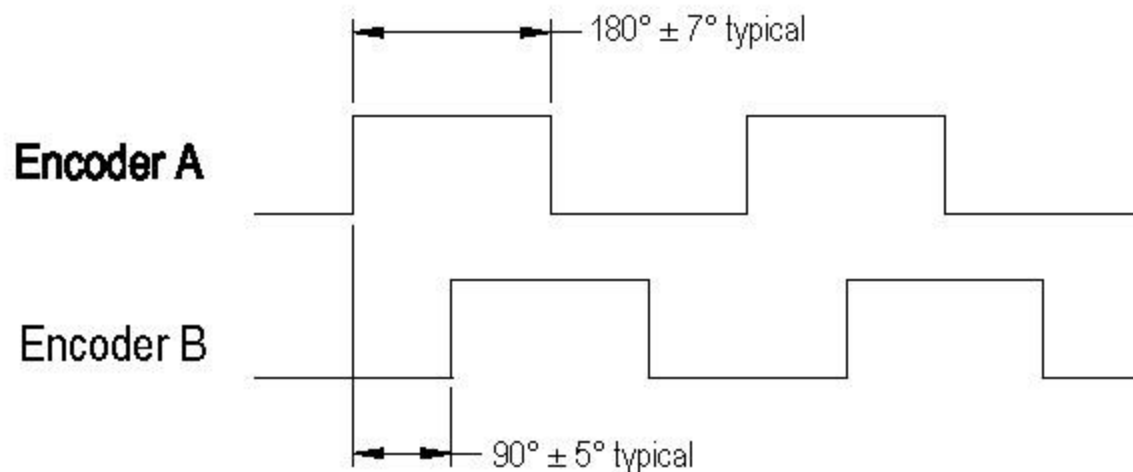
For More Information Visit The Website www.hurst-motors.com or
Contact Hurst Engineering at 812-385-2564