

## Basic Breakout With Analog Out - QCI-BO-B1A

QCI-BO-B1A



## Product Overview

All SilverDust controller/drivers can generate a pulse width modulated (PWM) output on I/O #2 using the PWM Output (PWO) command. The B1A breakout translates the PWM output into an analog output using an active filter. The resolution of the analog output is 10-bit. Actual accuracy is dependent upon system wiring and load impedance.

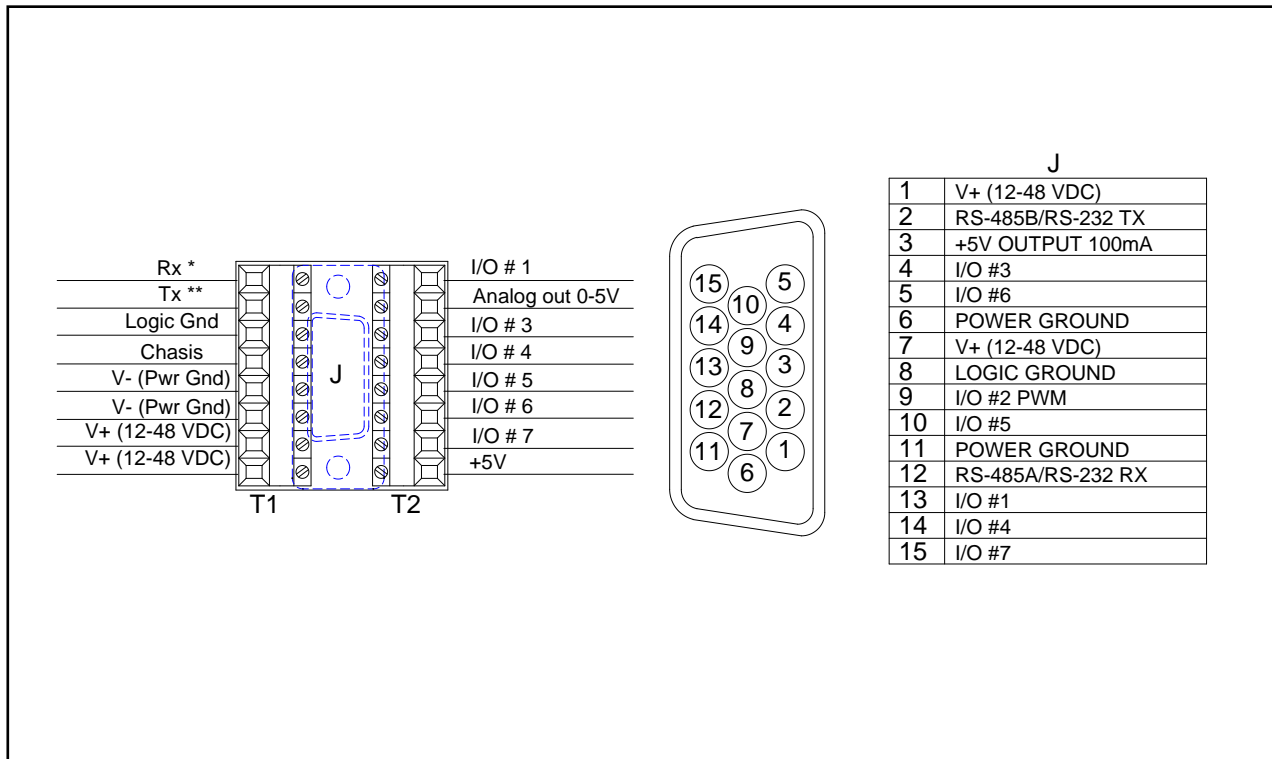
The breakout connects directly to the SMI port on SilverDust controller/drivers, and breaks out power, communication and I/O. The B1A does not work with the SilverNugget controller/drivers.

The provided screws lock the breakout to the SMI port (DB15HD connector). There are two, 8 position, terminal blocks that breakout all 15 pins.

Besides the special circuitry on I/O #2, the QCI-BO-B1A is the same as the Basic Breakout QCI-BO-B1. See Technical Document QCI-TD036 for details.

Terminal Connector Wire Range: 16-28 AWG

## Pin-Out Descriptions



- \* RS-485 A
- \*\* RS-485 B

Note: The onboard copper weight and trace width will only allow power daisy chain up to three units.

## How to Use

Configure the PWO command to get duty cycle from lower or upper word of any register. As this word ranges from -32768 to 32767, the PWM output (I/O #2) duty cycle ranges from 0 to 100% at 3.3V. The B1A filters this PWM output and amplifies it to 0-5V.

Note: PWO "Mode" parameter may have the following values:  
 Disable, High Word, Low Word

Use the following equation to determine the Register Value (R) for the desired B1A output voltage (Vo):

$$R = [(Vo - 2.5) / 2.5] * 32767$$

### Example 1:

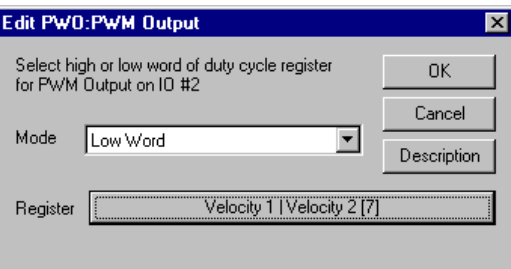
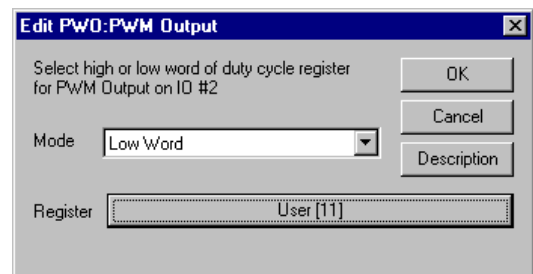
Desired analog output is 1.75 volts.

- 1) Configure PWO to get duty cycle from lower word of User Register 11.
- 2) Set Register 11 according to the following equation:

$$R = [(Vo - 2.5) / 2.5] * 32767$$

$$R = [(1.75 - 2.5) / 2.5] * 32767$$

$$R = -9830.1 \approx -9830$$



### Example 2:

Output Analog Actual Velocity

All SilverLode servo systems store velocity in Register 7 [Velocity 1|Velocity 2]. Velocity 1 is the actual velocity filtered once. Velocity 2 is the actual velocity filtered twice. The above example uses Velocity 2. Velocity 2 is a signed 16-bit number where -32768 is -4000 RPM and +32767 is +4000 RPM. At zero speed, the output voltage will be 2.5 volts.

### Example 3:

Using Analog Output for Torque

All SilverLode servo systems store torque in Register 9 [Control|Torque]. The lower word is the actual output torque on the motor shaft. Torque values of -30000 is -150% torque and +30000 is +150% torque. The minus and plus represents clockwise and counter clockwise torque. A value of 0 is zero torque.

