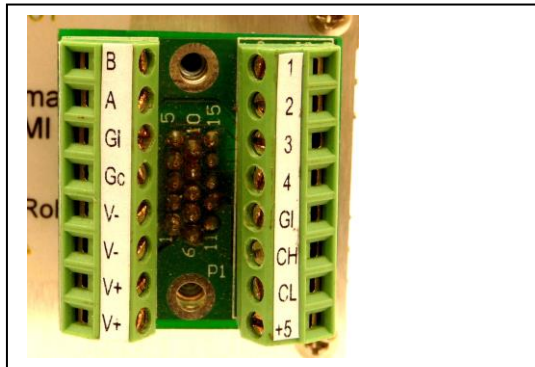# SilverSterling Basic Breakout – QCI-BO-S1 & QCI-BO-S1A

QCI-BO-S1

QCI-S2-IG with QCI-BO-S1

Product Overview

The Basic Breakouts connect directly to the SilverSterling's 15-pin interface port (SIP), which breakout power, RS-485 communication, CAN and 4 I/O.

The QCI-BO-S1A adds an active filter that translates a controller's 0 to 3.3v PWM output on I/O #2 into a 0-5v analog output. Besides the special circuitry on I/O #2, the QCI-BO-S1A is the same as the QCI-BO-S1. Refer to the last page of this document for examples of how to use the QCI-BO-S1A analog output feature.

The provided screws lock the breakouts to the DB15HD connector. There are two, 8 position terminal blocks that breakout all 15 pins. Terminal Connector Wire Range: 16-28 AWG
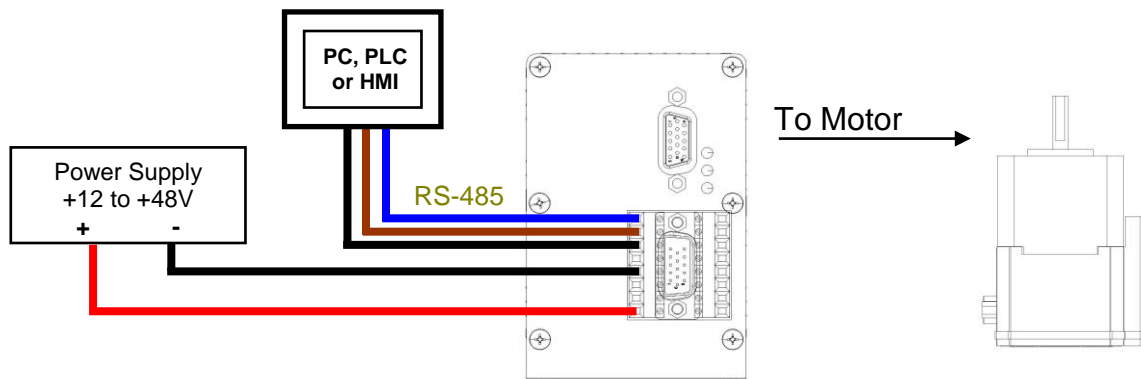
Pin-out Descriptions

QCI-BO-S1
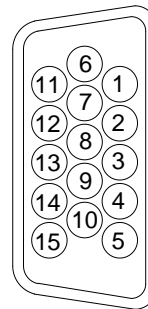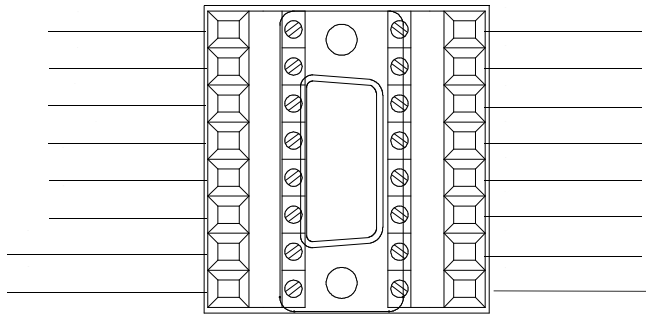
1	V+ (12-48 VDC)
2	RS-485A
3	+5V OUTPUT 100mA
4	I/O #3
5	CAN_H
6	POWER GROUND
7	V+ (12-48 VDC)
8	LOGIC GROUND
9	I/O #2
10	LOGIC GND (CAN GND)
11	POWER GROUND
12	RS-485B
13	I/O #1
14	I/O #4
15	CAN_L

How to Use
Single axis configuration:

PC, PLC or HMI

To Motor

Power Supply
+12 to +48V
+   -

RS-485

Note: It is **NOT** recommended to daisy chain power supply for more than 2 units due to current limitation on the breakout board.

How to Use QCI-BO-S1A

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 QCI-BO-S1A 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):

$$R = [(Vo - 2.5)/2.5]*32767$$
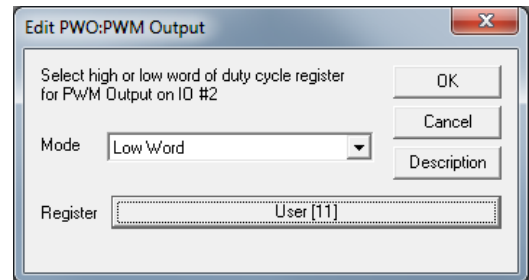
Example 1:
Desired analog output is 1.75 volts.
1) Configure PWO to get duty cycle from lower word of User Register 11.

2) Set Register 11 according to the following equation:
$$Reg\ 11 = [(Vo - 2.5)/2.5]*32767$$
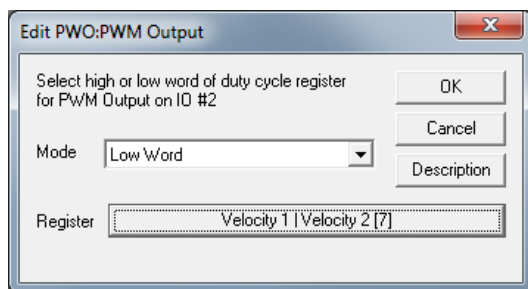$$Reg\ 11 = [(1.75 - 2.5)/2.5]*32767$$
$$Reg\ 11 = -9830.1 \approx -9830$$

Edit PWO:PWM Output

Select high or low word of duty cycle register for PWM Output on IO #2

OK | Cancel | Description

Mode   Low Word

Register   User [11]

Example 2:
Output Analog Actual Velocity

Edit PWO:PWM Output

Select high or low word of duty cycle register for PWM Output on IO #2

OK | Cancel | Description

Mode   Low Word

Register   Velocity 1 | Velocity 2 [7]

All SilverLode servo systems store velocity in Register 7 [Velocity 1|Velocity 2]. Velocity 1, (High Word) is the actual velocity filtered once. Velocity 2 (Low Word) is the actual velocity filtered twice. Example 2 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.

Edit PWO:PWM Output

Select high or low word of duty cycle register for PWM Output on IO #2

OK | Cancel | Description

Mode   Low Word

Register   Control | Torque [9]