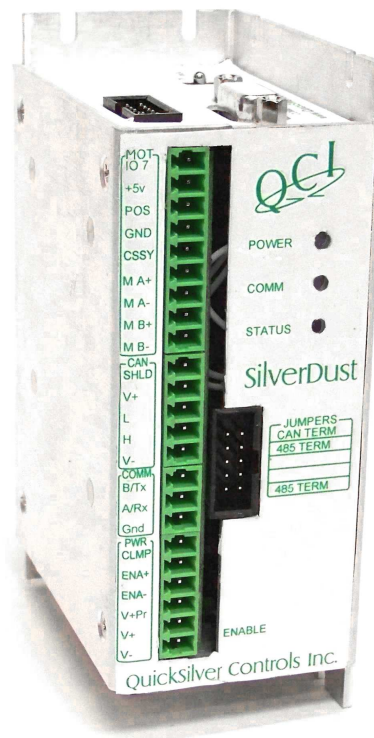


SilverDust D2-IGH Datasheet

Servo controller/drivers for DC Motors and Linear Actuators with Analog or Encoder feedback. Also may be used with 2 phase motors requiring filtered motor drive signals. These SilverDust controllers share a compact DIN mount designed to save cabinet space. They are great for multi-axis systems.

QCI-D2-IGH

7 LVTTL I/O and CANopen®, Filtered motor signals, Analog or Encoder feedback.



QCI-D2-IGH

System Overview

Point-to-Point Moves

- Relative or Absolute
- Velocity or Time Based
- S-Curve

Advanced Motion Profile Moves

- Profile Move Commands
- Register Based
 - Position/Accel/Decel/Vel
 - Modify On-the-Fly

Multi-Axis Linear Interpolation

- XYZ Coords Contained in Text File
- CANopen® used for local bus
- 1000+ Points Stored In NV Memory

Built-In Voltage Clamp

- Regenerative Braking Resistor

Input/Output

- Dedicated Position Feedback Analog input with 3rd order Analog filtering and Analog Derivative
- 7 TTL Digital I/O
 - Use for QCI-BO-B52 24V I/O
- 4 Analog Inputs (Joystick)
- Analog Output Option
- Programmable Limit Switch (PLS)
- Secondary Encoder In

Program and Data Storage

- 32K Non-Volatile Memory:
- 2000-3000 Program Lines
- User Data Examples
 - CAM Tables
 - Motion Profiles
 - Lookup Tables

Electronic Slip Clutch/Brake

- Variable Torque
- Wind/Unwind Applications

Anti-Hunt™ (available with stepper motors)

- Optionally use Open Loop While Holding
- No Servo Dither While At Rest

Electronic Gearing/Camming

- Follow Encoder (A/B Quadrature) or Step and Direction
- Dynamic Gear Ratios
 - Integer Ratios
32767:1 to 1:32767
 - Decimal Ratios to 7 Places
- Electronic Cam
 - Import Tables From Text File
 - Over 2500 Points
 - Multiple Tables

Communications

- RS-485/RS-232 @ 230K Baud
- ASCII,Binary,Modbus®,DMX512
- CANopen®
- Host Control While Servo in Motion

Programming Language

- Easy, Menu Driven Interface
- Command Parameter Prompts
- No Syntax Errors
- User Namable I/O and Registers

Advance PVIA™ Servo Loop

- 100:1 Inertial Mismatch
- Direct Drive Oversized Inertial Loads
 - Flywheels/Belt Drives
 - Typically Without Gearheads
- More Stable Than PID

Digital 4 Quadrant Vector Drive

- DSP Driven for Reduced Noise

Multi-Task/Multi-Thread

Compatible with DC motors, linear actuators

Electrical Specifications

Input Power

Voltage

+12 VDC to +48 VDC, regulated. The controller must be initialized for the actual operating voltage using Initialization Wizard.

Over-Voltage Protection

Voltages exceeding +55 VDC will permanently damage the controller/driver electronics. All controllers include an onboard clamp circuit and braking resistor to dissipate excess current developed during re-generative braking (stopping).

Reverse Polarity Protection

Reverse polarity protection is provided. Note, however, if the power supply is not floating, connecting the V+ input to Ground will cause this potential to be present at the communications and I/O lines, which may damage these lines or that to which they are connected.

Input Current

7 Amps maximum for any input voltage, 6A RMS maximum, +12 VDC to +48 VDC.

Output Power

Output/Driver Current per output

Amps Per Output: 3.5 Continuous/ 5.5A Peak with adequate heat dissipation (heat sink). Outputs may be paralleled in DC-Motor/Actuator mode. A passive filter is incorporated into the driver path to filter the chopper drive.

Maximum Output Power

300 Watts continuous power with adequate heat dissipation.

Encoder Interface

From Motor Encoder: Quadrature (Differential)

Analog Position Feedback

A dedicated analog input is provided via the motor connector. This Analog input is mapped to provide feedback between 0 to 5v, with a local 0 and 5v source. (Contact factory for other input ranges). The analog feedback has a 3rd order analog anti-aliasing filter as well as an analog differentiator to maximize usable dynamic range.

Inputs & Outputs

Standard I/O

7 I/O (1-7)

Digital Inputs

0 to +3.3 VDC. LVTTTL level compatible.

Effective internal 200K ohm impedance to +3.3 V.

Note: IO7 is also available on the Motor Connector.

Digital Output Voltage

0 / +3.3 VDC.

Digital Output Current

Sinking or Sourcing

I/O 1, 4, 5, 7 outputs 4 mA MAX

I/O 2 and 3 outputs 2 mA MAX

I/O 6 outputs 8 mA MAX

I/O Over-Voltage Protection

An over-voltage limiter protects each standard I/O line up to 30 volts. Applying voltages greater than 30 volts will permanently damage the I/O.

Analog Inputs

0 to +3.3 VDC input signal range.

10 bit ADC resolution (single).

11 bit ADC resolution (differential).

Analog inputs 1 to 4 are mapped to share digital I/O lines 4 to 7.

Each input has an effective internal 200K ohm impedance to +3.3 VDC.

Analog signals are read every servo cycle (120 μ sec.) and the converted analog data is processed through a 5 ms filter (nominal – filter may be adjusted) to reduce noise & transients.

Analog Output

Available on I/O 2, but requires Basic Breakout w/ Analog Output (QCI-BO-B1A). See technical document QCI-TD048.

Driver Enable Inputs

10-48 Volts optically isolated differential inputs. This provides a hardware driver enable/lockout. Motor operation will not be possible if not enabled.

Communications

Hardware Interfaces

RS-232, RS-232 multi-drop, RS-485 multi-drop (software selectable).

Protocols

8-bit ASCII, 9-bit binary, Modbus® RTU, DMX-512 (hardware option).

Hardware Configuration Settings

Available Baud Rates: 2400, 4800, 9600, 19.2k, 28.8k, 57.6k, 115.2k or 230.4k

Data Bits: 8

Stop Bits: 1.5 or 2

Parity Bit: None (optionally configurable)

Controller Area Network (CAN)

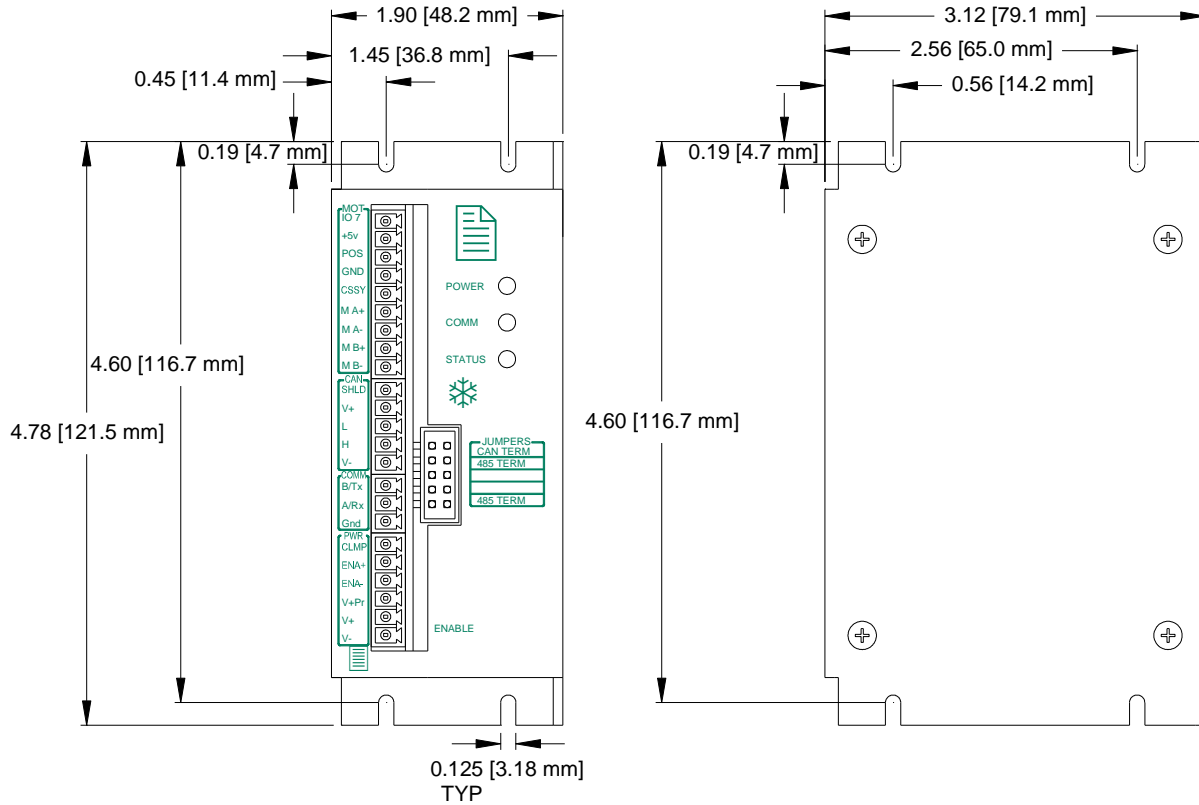
Software Required: Firmware Rev 40 (QuickControl Rev 4.64)

See CANopen® User Manual for hardware and software details.

CANopen® and CiA® are registered community trade marks of CAN in Automation e.V.

Mechanical Specification

QCI-D2-IGH



Environmental Specifications

Operational Temperature

-10 C to +80 C

Storage Temperature

- 40 C to +85 C

Humidity

Continuous specification is 95% RH non-condensing.

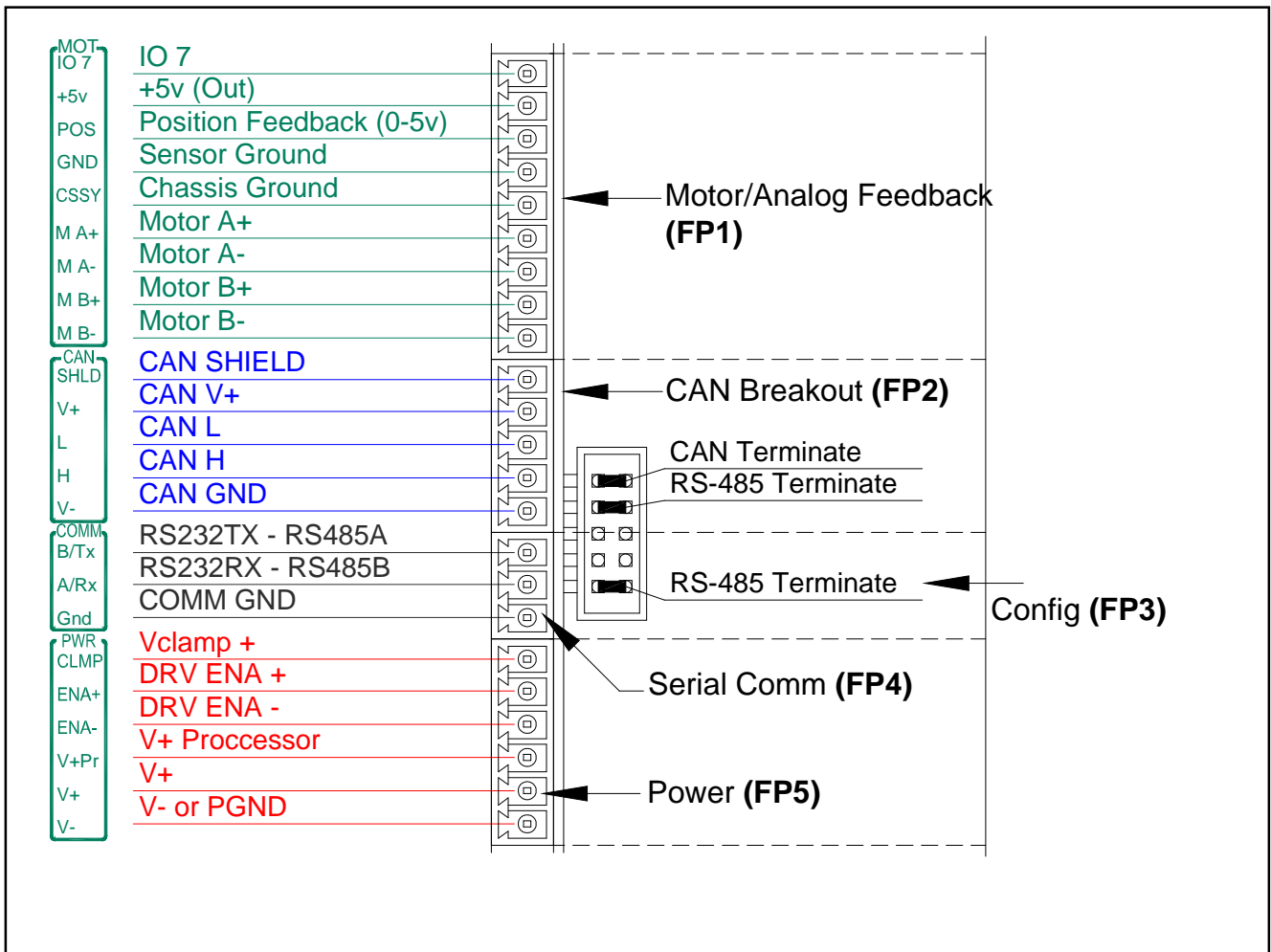
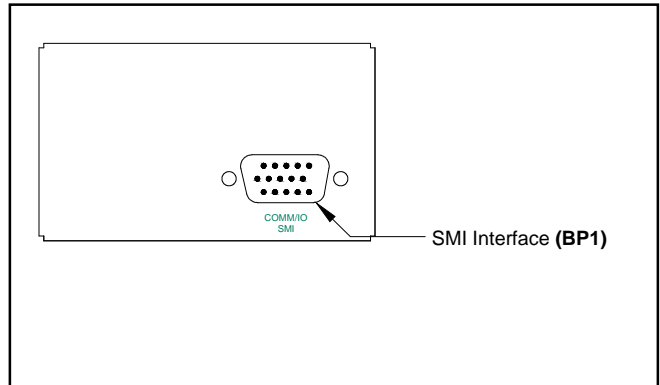
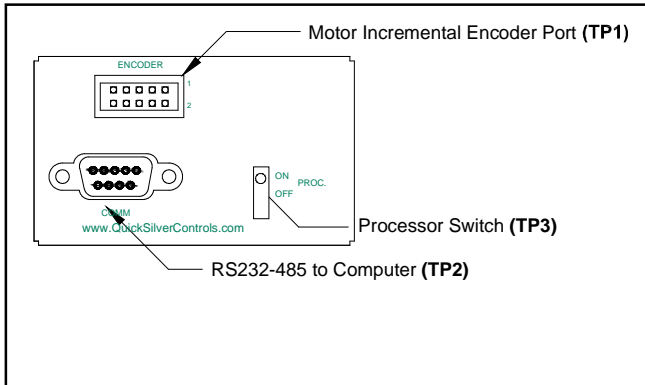
Shock

Limitation is approximately 50g/11ms.

IP Rating

IP20 with cables attached.

Connector Data



Front Panel (FP)

- (FP1) I/O Interface Breakout
- (FP2) CAN Interface Breakout
- (FP3) Termination Interface
- (FP4) Communication Interface Breakout
- (FP5) Power Interface Breakout

Top Panel (TP)

- (TP1) RS-232-485 to Computer
- (TP2) Differential encoder (when not using analog feedback)
- (TP3) Power Switch

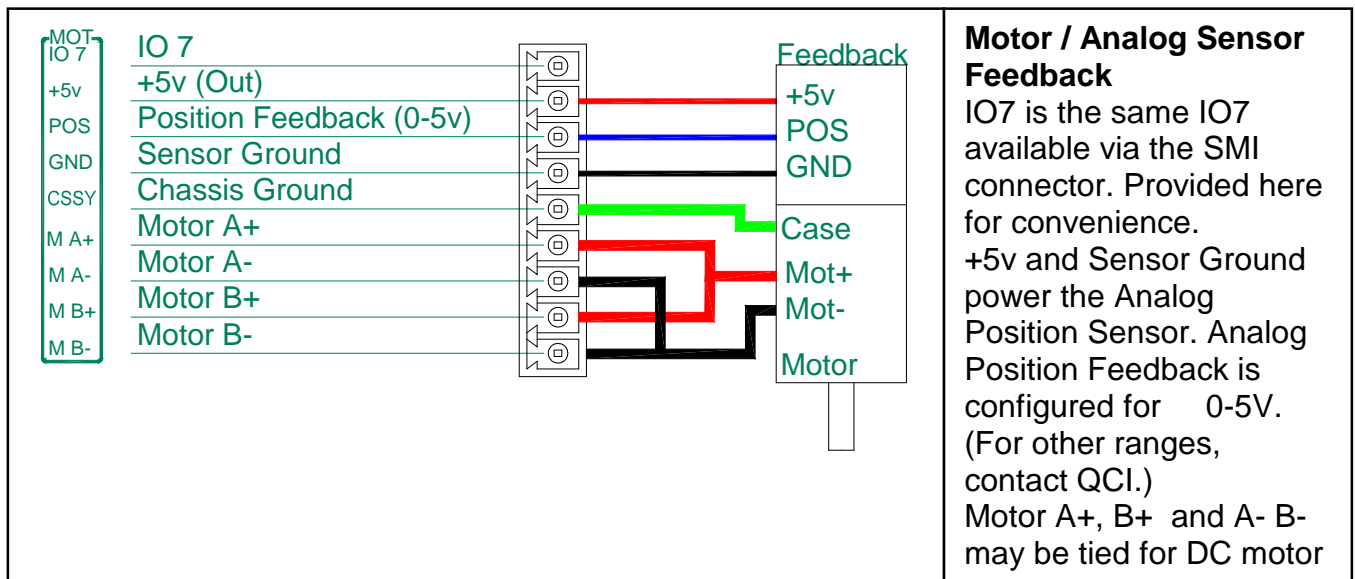
ee

Bottom Panel (BP)

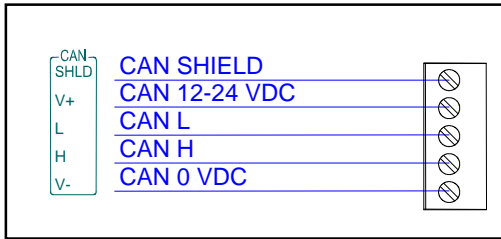
- (BP1) SMI Interface

Front Panel (FP)

(FP1) Motor / Analog Sensor Feedback



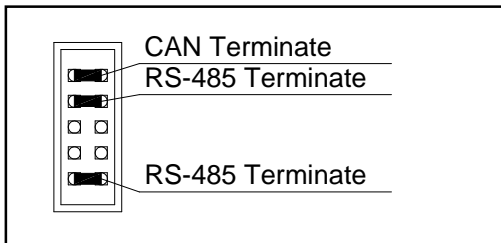
(FP2) CAN Interface Breakout



Controller Area Network (CAN)

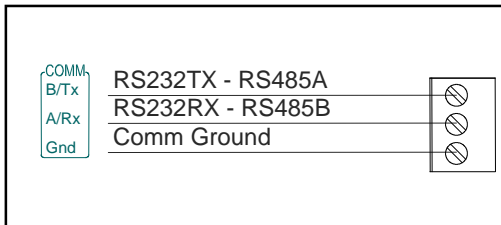
This high-speed up to 1-megabit/s bus allows for register and I/O sharing as well as interface to 3rd party CANopen devices (i.e. encoders, I/O modules,...). Note: CAN V+ and CAN SHIELD are not connected internally. They are provide to provide a tie point for those systems which do use them.

(FP3) Termination Interface



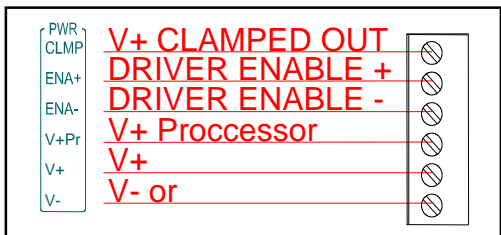
- CAN requires termination at both ends of the bus. Jumper “**CAN Terminate**” to terminate the bus.
- Jumper both “RS-485 Terminate” for RS-485 termination. This provides a biased termination for the bus.

(FP4) Communication Interface Breakout



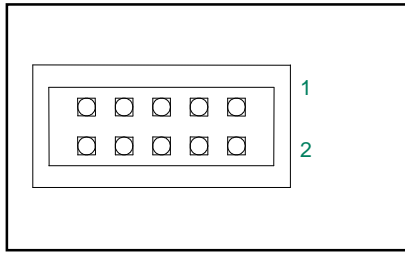
Standard RS-232/RS-485 connections broken out to terminals for easy wiring.

(FP5) Power Interface Breakout



The two main items are V+ & V-, normally from the main power supply. V+Pr is a separate power input to keep the processor alive for certain applications. ENA+ and ENA- are inputs to an optically isolated drive enable. If Driver Enable is not needed, jumper ENA+ to CLMP and ENA- to V-. CLMP is a fused 500 mA output. CLMP = V+ minus 0.3V.

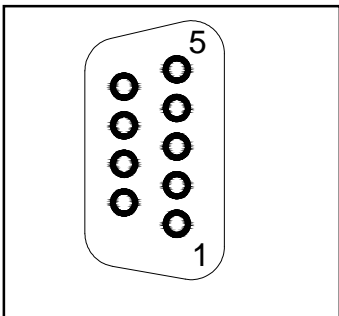
(TP1) Differential Encoder



Encoder Pinout:

- 1) Signal Ground
- 2) Signal Ground
- 3) Index -
- 4) Index +
- 5) A-
- 6) A+
- 7) +5v
- 8) +5v
- 9) B-
- 10) B+

(TP2) RS-232/RS-485 to Computer



Comm Pinout

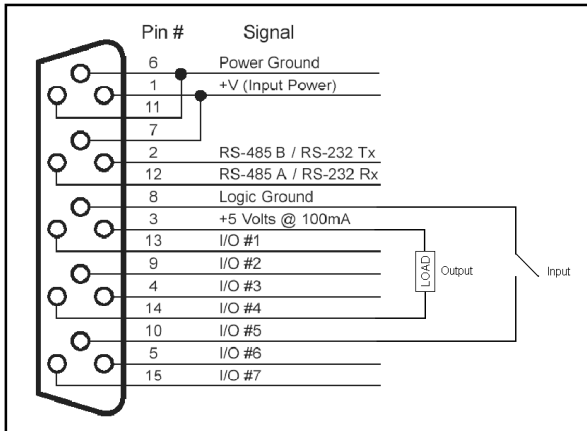
- 2 RS-232RX – RS-485A
- 3 RS-232TX – RS-485B
- 5 Communication Ground

All the rest are No Connect.

(TP3) Processor Switch

The Processor Switch turns on and off the power to the processor. The main power to the SilverDust should be OFF before connecting or disconnecting the system. The Processor Switch does **NOT** disconnect main power. It also does not turn off the power the 485-biased termination.

(BP1) SilverLode Multi-function Interface (SMI) Port



These signals provide power, communications and 3.3v IO signals (digital and analog).

NOTE: QCI has many modules capable of breaking out these signals. For example:

- Basic Breakouts (QCI-BO-B, QCI-BO-B1)
- Basic Breakout w/ Analog Out (QCI-BO-B1A)
- Breakout w/ 24V IO -5in 2out (QCI-BO-B52)
- 24V Optical I/O Module (QCI-OPTMC-24)*

*Requires QCI-EC-SMI cable

See technical documents on our website for details.

This port provides QuickSilver’s basic Power, Communication, standard I/O for easy connectivity in large systems. The SMI port is standard on all our controllers which helps make new products backward compatible with older ones. See above sections for details on these signals.

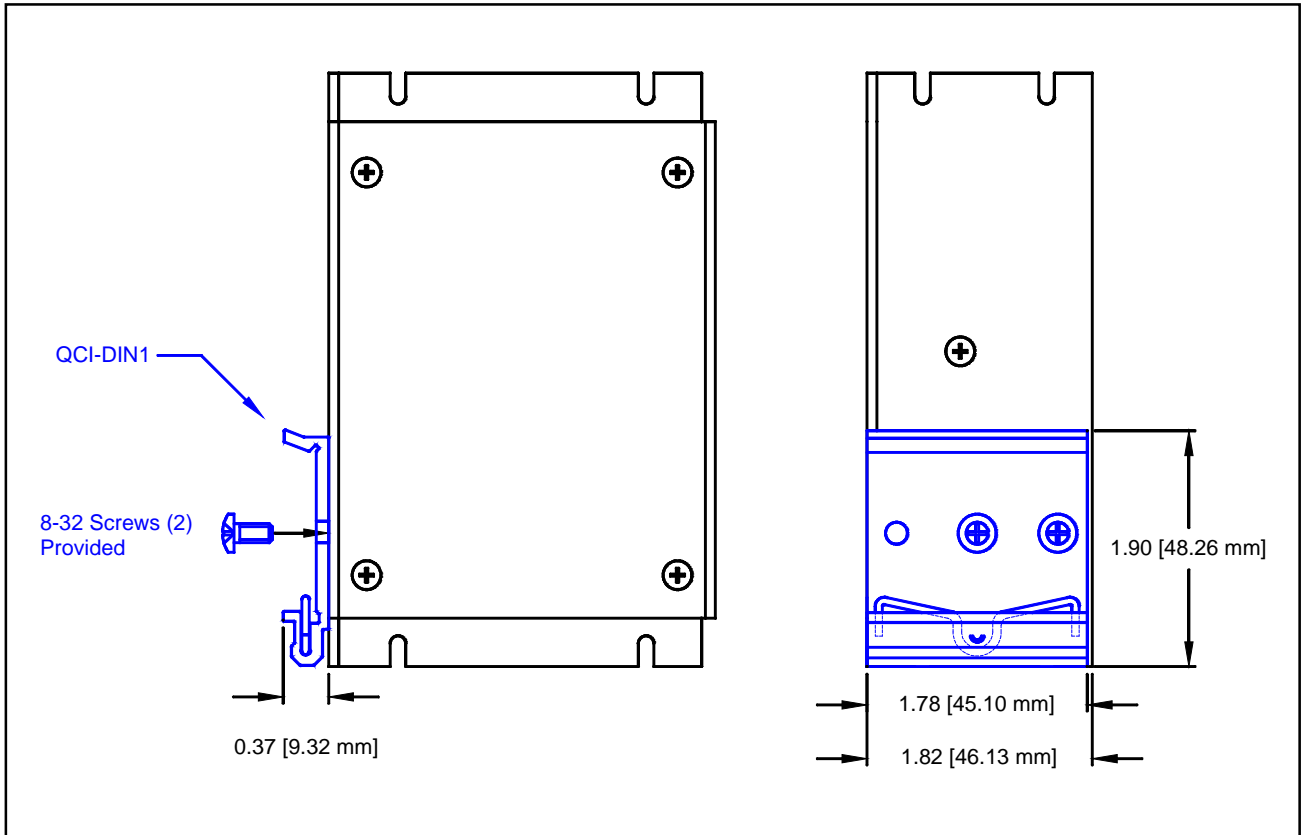
Power inputs are diode OR’ed into power inputs from the Power Interface Breakout. Apply power from either port is OK.

Note: Communication lines RS-485A / RS-232 RX, RS-485B / RS-232 TX, and LOGIC GROUND are all internally connected between the SMI port and the respective pins on the front side connector (FP4).

Din Rail Mount (Optional)

The DIN Rail Bracket (QCI-DIN) is an optional kit for din mountable applications. See below.

QCI-DIN1



Part Numbers

SilverDust™ IGH Controller/Driver		
DRIVER	CONTROLLER	OPTIONS
<p>QCI-D2 - 3.5 Amp</p> <ul style="list-style-type: none"> • 3.5 Amps per Phase Continuous* • 5.5 Amp Peak • Input Power: • 7A@12V-48V • 5A RMS 12V – 48V max <p>* Depending on heat sink (25C ambient).</p>	<p>IGH– SilverDust D2 IGM</p> <ul style="list-style-type: none"> • 7 TTL Inputs or Outputs (use QCI-BO-B52 for 24V I/O) • 4 Analog Inputs (Joystick) • Analog Output Option (use QCI-BO-B1A) • RS-232 or RS-485 • ASCII, Binary, Modbus® • CANopen® • Voltage Clamp And Resistor • Drive Enable • DB15HD (pin): SMI Port • Motor drive filter compatible with stepper or DC motor • Analog Position Feedback 	<p>Blank – Standard</p> <ul style="list-style-type: none"> • DIN compatible <p>D – DMX512</p> <p>For multiple options, list fields in alphabetical order</p>
To create a part number, choose one from each column above. For a SilverDust IGH		
QCI-D2	IGH	
This selection creates the part number: QCI-D2-IGH		

Contact Information

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