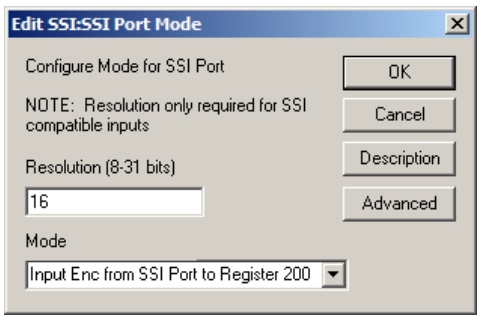
SSI Port Interface

The SSI port interface connects to third party devices that support both SSI and SPI functions. The SSI port is available as an option on selected SilverDust controllers. A common use for the SSI port is an absolute encoder. The absolute encoder allows the SilverDust controller to cycle power and still be able to maintain the encoder position. An incremental encoder can not retain position when the power is cycled on the controller. The incoming SSI encoder signal can be either a single ended and differential signals. The port may also be used to output an internal single ended or differential quadrature encoder signals to other devices.

SSI Command
The SSI Port Mode command configures the Synchronous Serial Interface (SSI) Port of the SilverDust Controller. The SSI Port Mode command has five modes associated with the command.



Input Diff Enc A,B,Z from SSI Port (Mode 0)
The mode 0(default mode) inputs Differential A, B, Z from the SSI port. The differential A.B,Z signals are used with the SEE command. Please refer to command reference manual for more information regarding the SEE command.

Output Int Enc to SSI Port (Mode 1)
Mode 1 outputs quadrature signals A, B and Z of the internal encoder to the SSI port. The output signal can be configured for single ended or differential quadrature signals.

Input Enc from SSI Port to Register 253 (Mode 2)
Mode 2 inputs the SSI encoder from SSI Port to Register 253. Register 200 is not effected with this command allowing step/direction or quadrature signal to be read for electronic gearing.

Input Enc from SSI Port to Dual Loop (Mode 3)
Mode 3 configures the port as a dual loop control when the DLC command is called. Please refer to command reference manual for more information regarding the DLC command.

Input Enc from SSI Port to Register 200 (Mode 4)
Mode 4 inputs the SSI encoder to register 200 and register 253 for electronic gearing or electronic camming.

The SSI command resolution value of the encoder can range from 8-bit to 31-bit. The default setting is binary but if the SSI encoder is set as gray code, the gray code option can be selected under the advance option.

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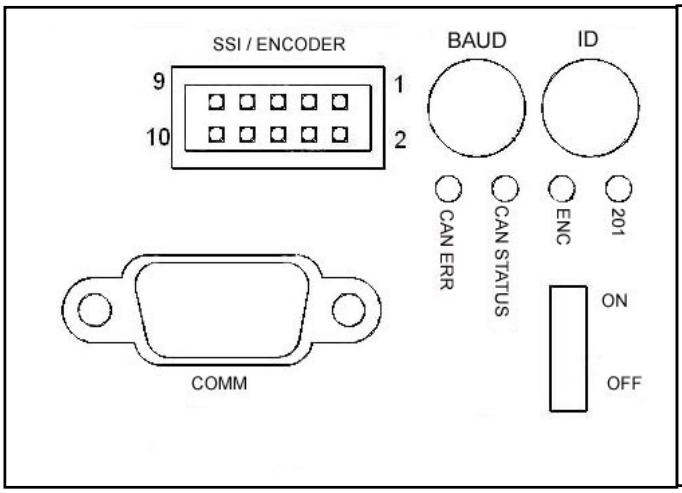
SSI Port Hardware

The 10-pin port requires a crimp style Molex connector to the SSI encoder. The pins can also be soldered or wired wrapped to the SSI encoder. The SSI clock and data signals are required of the SSI encoder. A 5-volt source and ground connection is supplied to power up the SSI encoder.

(TP1) Serial **P**eripheral **I**nterface **/ S**ynchronous **S**erial **I**nterface Port (**SPI/SSI** Port) – Optional



SPI	SSI
1 A_MOSI -	1 NA
2 A_MOSI +	2 NA
3 B_SCLK -	3 SCLK +
4 B_SCLK +	4 SCLK -
5 GND	5 GND
6 +5v	6 +5v
7 Z_CS -	7 NA
8 Z_CS+	8 NA
9 MISO -	9 Data -
10 MISO +	10 Data +

QCI-AN061_SSI_PortInterface.qcp

The following application describes a SSI encoder used for electronic gearing. The SSI mode command reads the 16-bit SSI encoder and stores the encoder values into register 200. The Select External Encoder (SEE) command causes the servo to electronically gear to the contents of register 200. Note, the Encoder Style parameter is ignored when using the SSI command in conjunction with the SEE command.

The RSD causes the servo to follow the incoming encoder signals at the ratio specified by register 11. For more information regarding electronic gearing please see application note QCI-AN019.

Line# Oper	Label	Command
1:REM		The SSI mode is set to a 16-bit encoder resolution and the encoder position stored to register 200
2:SSI		Input Enc from SSI Port to Register 200 16 Bits
3:REM		Configure the for an External Encoder input source. NOTE: Encoder style is ignored since the SSI command has already setup reg 200 to received the SSI encoder signals.
4:SEE		Select External Encoder: Index Source I/O #6 Encoder Style: A/B Quad on I/O #4 & 5
5:REM		Start follow the incoming encoder signals.
6:WRP		Write 1024 to "User[11]" Register
7:RSD		Registered Step and Direction: Scale Factor = "User[11]" Register