

SC2SSI, analog to SSI interpolator

DS, Absolute Position, Rotary Electric Encoder™

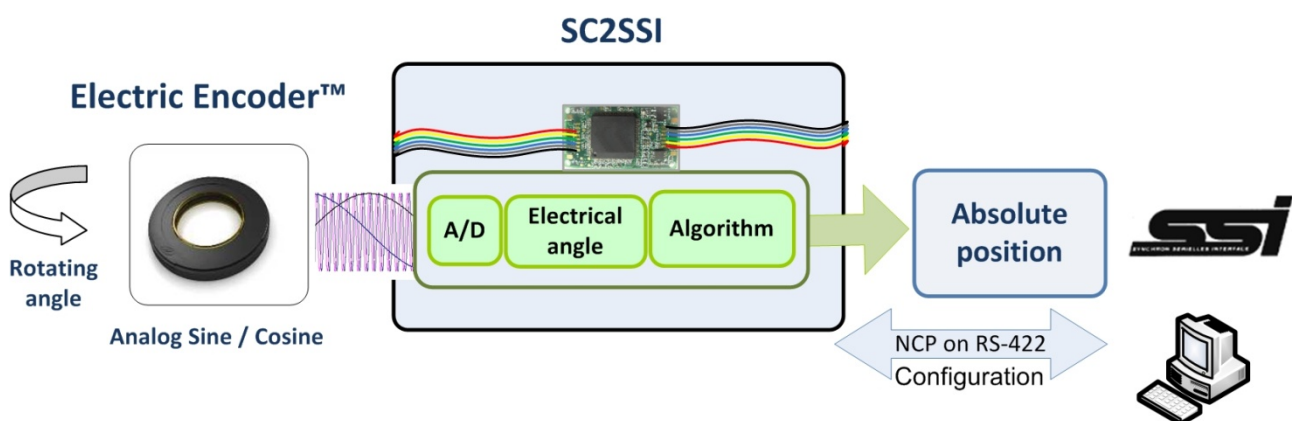


The **Analog to SSI Interpolator (SC2SSI)** provides Synchronous Serial Interface for the Electric Encoder™. The interpolator provides post processing functionality to the analog signal of the electric Encoder™ (Electric Angle) to mechanical absolute position.

- Real time servo feedback
- Continues output
- Setup and Configuration on RS-422
- On line monitoring
- Fully programmable

Electrical	
Supply voltage	+4.6 to +5.5 V
Current consumption	< 200 mA
Interconnection	25 cm Teflon-coated, loose AWG-32 wires
Environment	
Operating temperature range	-20 +80 °C
Relative Humidity	<98 % non condensate
protection	IP 40
Mechanical	
Dimensions	35 x 20 x 5 mm

The interpolator acts as intelligent converter of the analog Electric Encoder™ signals to Digital SSI format, the converter performs the post processing N/M algorithms and translates the electrical angle to mechanical angle – absolute angular or absolute linear position. The final performance in terms of accuracy and resolution are according to the original characteristics of the encoder and the interpolator setup.

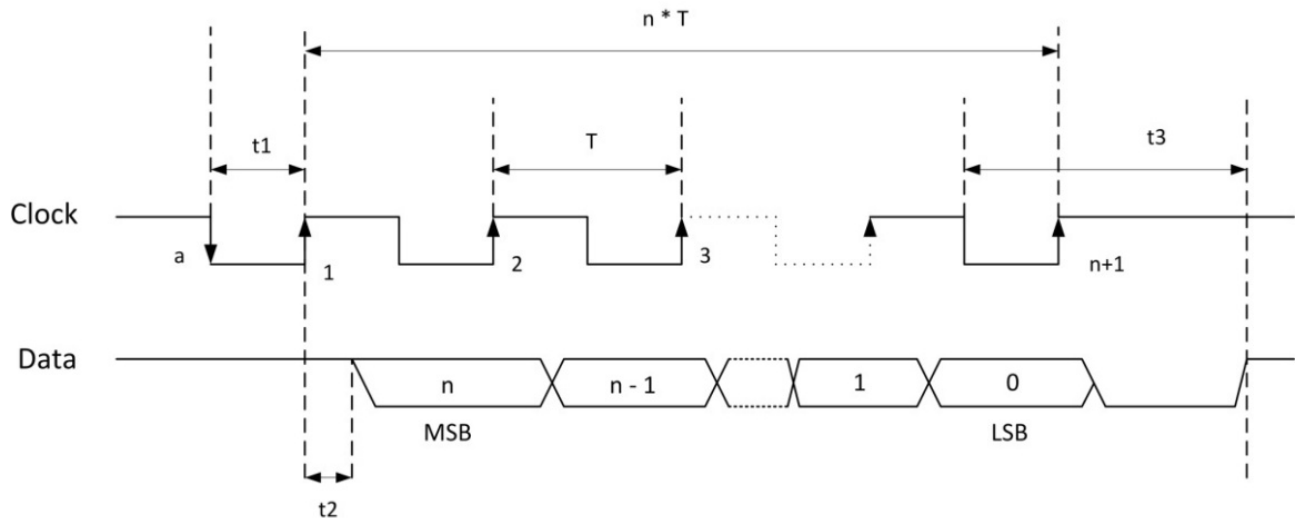


Synchronous Serial Interface (SSI) allows for serial transmission of absolute position data from the encoder based on a timed clock pulse train from the controller. Connection between the controller and encoder is based on two signal lines, clock and data, which are usually differential for increased noise immunity. For each sequential clock pulse of the controller, the encoder transmits one data bit from shift registers on the encoder. Figure 1 shows a typical SSI timing diagram, which shows the sequential clock pulse train from the controller and the corresponding data bits.

Functional – SSI	
Accuracy	By Encoder
Output signal latency	400 μ sec
Output code	binary
Serial output SSI	Diff. RS-422
Clock SSI	Diff. RS-422
Monoflop time	25 μ sec
Clock Frequency	500 kHz - 2.5 MHz
SSI data size	According to encoder resolution
Measurement range	full rotation
Maximum usable speed	By Encoder

Notes:**1. Netzer Communication Protocol:**

The **NCP** is a bidirectional serial protocol interface designed for easy access to the absolute position and setup parameters via RS-422.



n = total # of data bits, according to encoder resolution.

T = clock period (sec)

$1/T$ = clock frequency \sim 500 kHz to \sim 2.5 MHz.

t_1 = minimum time required for encoder to freeze data and prepare shift registers before receiving the first rising edge to prompt the MSB, ($t_1=T/2$ recommended)

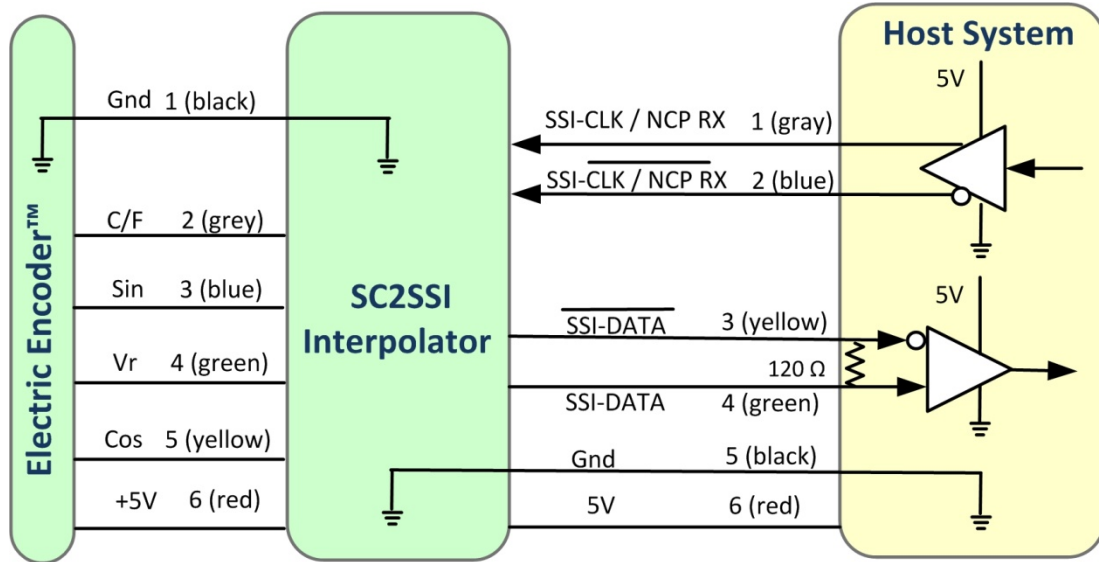
t_2 = data transmission delay (increases with cable length).

t_3 = (mono loop time) required delay to refresh position data between subsequent position reads.

Related Documents

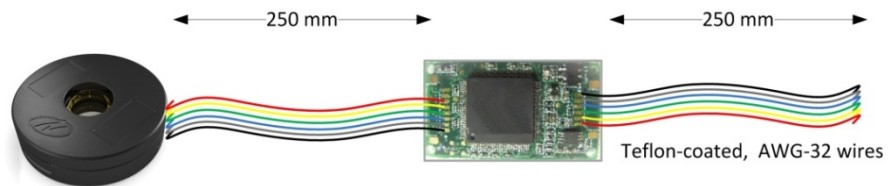
AN-05 - Accuracy, Resolution, and Repeatability.

Electric Encoder™ – SSI User Manual



Wires color coding (input)			
1	GND	Black	Ground
2	C/F	Gray	Coarse / Fine
3	Sine	Blue	Sine signal
4	Vr	Green	V reference
5	Cosine	Yellow	Cosine signal
6	+5V	Red	Power supply

Wires color coding (output)			
1	Clock +	Gray	SSI clock / NCP RX
2	Clock -	Blue	
3	Data -	Yellow	SSI Data / NCP TX
4	Data +	Green	
5	GND	Black	Ground
6	+5V	Red	Power supply



SC 2 SSI - 0 - 00

Sin / Cos interpolators
Interface SSI

Options
0 - Loose wires (standard)

Resolution CPR	
Binary	
A - 4,096	DS-25 ... DS-247
B - 8,192	DS-25 ... DS-247
C - 16,384	DS-25 ... DS-247
D - 32,768	DS-25 ... DS-247
E - 65,536	DS-25 ... DS-247
F - 131,072	DS-25 ... DS-247
G - 262,144	DS-58 ... DS-247
H - 524,288	DS-90 ... DS-247
I - 1,048,576	DS-130 ... DS-247

Resolution CPR	
Decimal	
K - 8,000	DS-25 ... DS-247
L - 16,000	DS-25 ... DS-247
M - 32,000	DS-25 ... DS-247
N - 64,000	DS-25 ... DS-247
O - 128,000	DS-58 ... DS-247

- Major SC2SSI Configuration commands**
- Read Absolute Position
 - Read Electric Angle
 - Read Analog Channels
 - Nm Algorithm
 - Change to Course
 - Change to Fine
 - Read Status
 - Reset
 - Set Parameter
 - Read Parameter
 - Write User Register
 - Read User Register
 - Read Error
 - Reset Error
 - Offset Calibration

