VLX-60
Absolute position, rotary Electric Encoder™

The VLX-60 is a member of the VLX / DX series of Electric Encoders™, based on Netzer Precision proprietary technology. The Electric Encoder™ offers many advantages - some unparalleled for the induatrial automation market.

Low profile (10 mm).
Hollow, floating shaft.
Absolute position
No bearings or other contacting elements.
High resolution and precision.
High tolerance to temperature extremes , shock, moisture, EMI, RFI and Magnetic fields.
Very low weight.

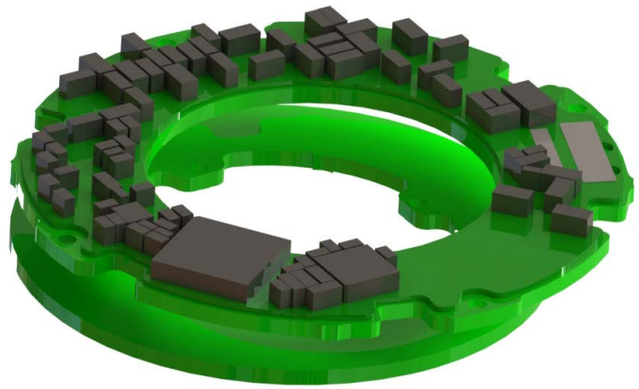
Mechanical	
Allowable mounting eccentricity	±0.1 mm
Allowable rotor axial motion	±0.1 mm
Rotor inertia	8,669 gr · mm^2
Total weight	28 gr
Outer Ø /Inner Ø/ Height	60 / 27 / 10 mm
Material (stator, rotor)	FR4
Nominal air gap (stator, rotor)	1 mm

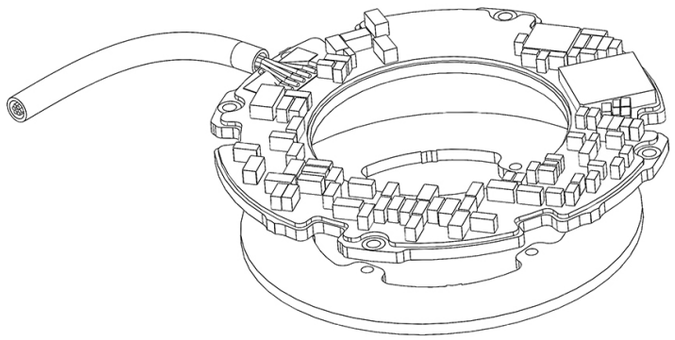
Electrical	
Supply voltage	5V ± 5%
Interconnection	Shielded cable
Cable Length	1,500 mm MAX

Environmental	
Operating temperature range	-40°C to +65°C
Relative humidity	98% Non condensing
Shock endurance	100 g for 11 ms
Vibration endurance	20 g ,10 – 2000 Hz

Characteristics	
Angular resolution	18 bits ; 262,144 CPR
Static error	< 20 mDeg
Maximum operational speed	750 rpm
Measurement range	Unlimited rotation
Position measurement	Absolute , single turn

The Electric Encoder™ is unique in being holistic, i.e., its output reading is the averaged outcome of the whole area of the rotor , This feature makes the Electric Encoder™ forgiving to mounting tolerances, mechanical wander etc. The absence of components such as ball bearings , flexible couplers, glass disc, light sources and detectors, along with very low power consumption makes the Electric Encoder™ virtually failure free.
The internally shielded, DC operated Electric Encoder™ includes an electric field generator, a field receiver, a sinusoidal shaped dielectric rotor, and processing electronics.
The output signals of Electric Encoder™ are analog Sine / Cosine representing the rotation angle. The digital outputs are obtained by further processing - which may be either internal or external to the encoder.
The combination of precision, low profile, low weight and high reliability have made Netzer Precision encoders particularly suitable to a wide variety of critical applications including, but not limited to medical equipment and aerospace.





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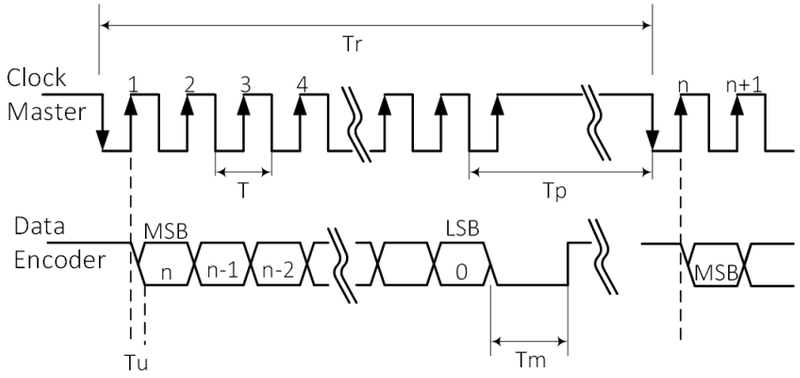
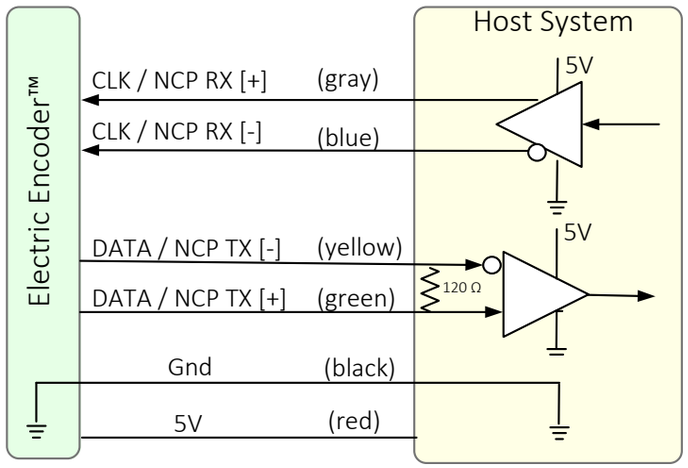
Digital SSi Interface

Synchronous Serial Interface (SSI) is a point to point serial interface standard between a master (e.g. controller) and a slave (e.g. sensor) for digital data transmission.



	Description	Recommendations
n	Total number of data bits	12- 22
T	Clock period	
f= 1/T	Clock frequency	0.5 - 2.0 MHz
Tu	Bit update time	200 nsec
Tp	Pause time	26 - ∞ µsec
Tm	Monoflop time	>25 µsec
Tr	Time between 2 adjacent requests	Tr > n*T+26 µsec
fr=1/Tr	Data request frequency	



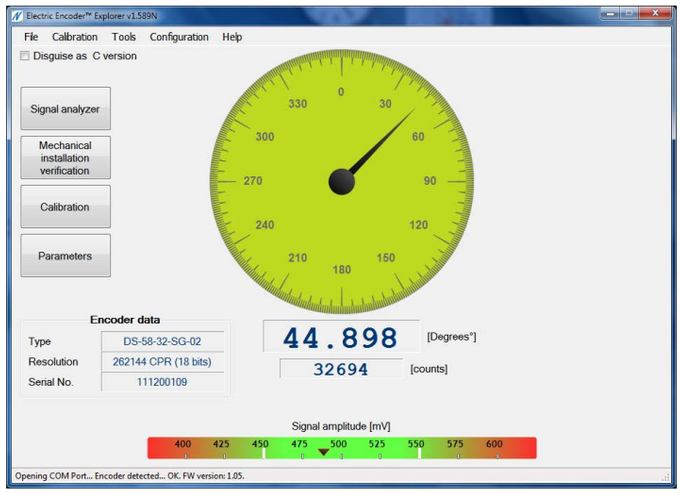
SSi / BiSS Output signal parameters	
Signal latency	~250 µSec
Output code	Binary
Serial output	Differential RS-422
Clock	Differential RS-422
Clock Frequency	0.5 ÷ 2.0 MHz
Position update rate (Max)	30 KHz
Current consumption	180 mA

SSi	
Monoflop time	25 µSec

SSi / BiSS interface wires color code		
Clock +	Grey	Clock
Clock -	Blue	
Data -	Yellow	Data
Data +	Green	
GND	Black	Ground
+5V	Red	Power supply

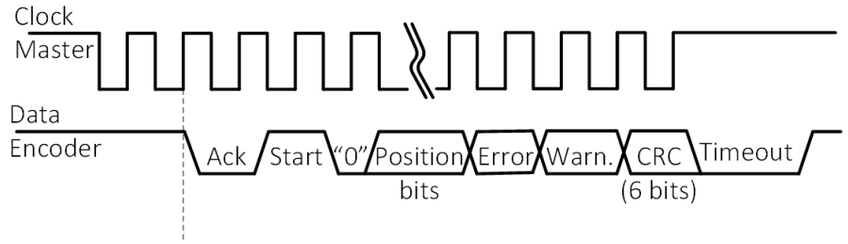
Software tools: (SSi / BiSS - C)

Advanced calibration and monitoring options are available by using the factory supplied Electric Encoder Explorer software, This facilitates proper mechanical mounting, offsets calibration and advanced signal monitoring.



Digital BiSS-C Interface

BiSS – C Interface is unidirectional serial synchronous protocol for digital data transmission where the Encoder acts as “slave” transmits data according to “Master” clock. The BiSS protocol is designed in B mode and C mode (continuous mode) .The BiSS-C interface as the SSi is based on RS-422 standards.



bit #		Description	Default	Length
28	Ack	Period during which the encoder calculates the absolute position , one clock cycle	0	1/clock
27	Start	Encoder signal for “start” data transmit	1	1 bit
26	“0”	“start” bit follower	0	1 bit
8...25	AP	Absolute Position encoder data		
7	Warn.	Warning	1	1 bit
6	Error	Error	1	1 bit
0...5	CRC	The CRC polynomial for position, error and warning data is: $x^6 + x^1 + x^0$. It is transmitted MSB first and inverted. The start bit and “0” bit are omitted from the CRC calculation.		6 bits
	Timeout	Elapse between the sequential “start”request cycle’s.		25 µs

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VLX	-	60	-	32	-	S	G	-	S	0	-	n	n	n

DS Product line

Outer Diameter

Fine ECR

Outputs:
S - Digital : SSi
I - Digital : BiSS-C

Resolution		
Code	Bit	CPR
G	18	262,144

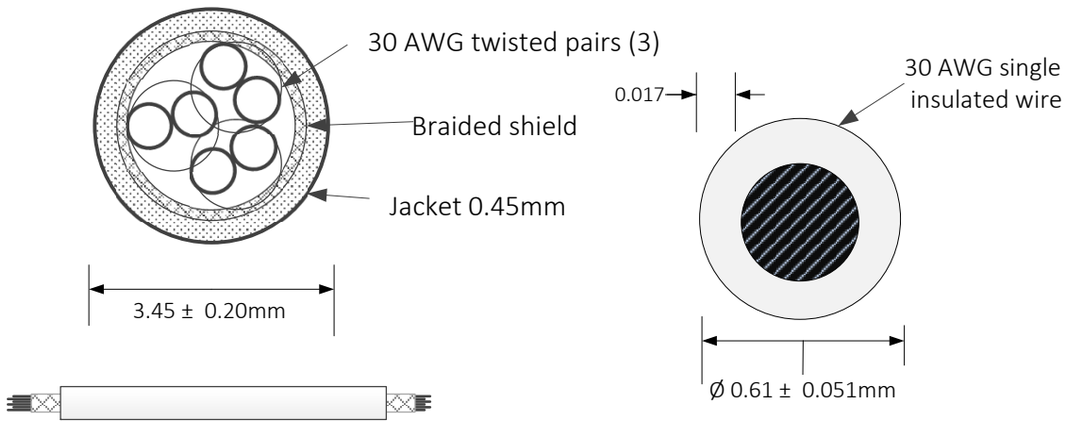
Interconnection:
S - shielded cable 250 mm (default)

C - Connector (optional)
0 - Flying leads (default)

nnn - Custom

Netzer Cat No.: **CB-00014**
Provider: *Ray-Q USA.* wire CAT No: RQ213210
Cable: 30 AWG twisted pair (3) :2 (30 AWG 25/44 finned copper , 0.15 PFE to Ø0.6 ± 0.05 OD).
Temperature rating: -60 to +150 Deg C.
Braided shield: Thinned copper braided 95% min. coverage.
Jacket: 0.45 silicon rubber jacket Ø3.45 ±0.2 OD

Pair #	Color
1	Red / Black
2	Gray / Blue
3	Green / Yellow



Related documents:

VLX User Manual : Mechanical , Electrical and calibration setup.

Demonstration Kit:

VLX-70DKIT-01: Includes ,mounted encoder on rotary jig , and RS-422 to USB converter.

Netzer Precision Motion Sensors Ltd.

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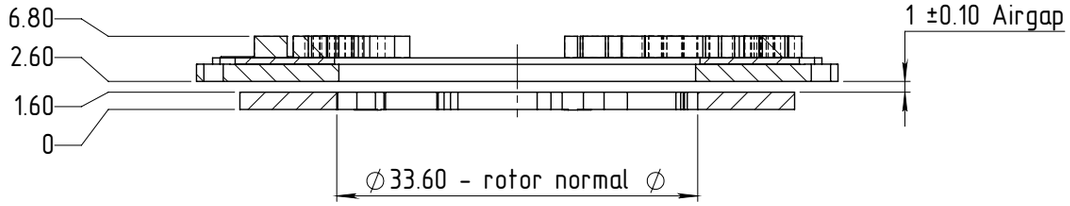
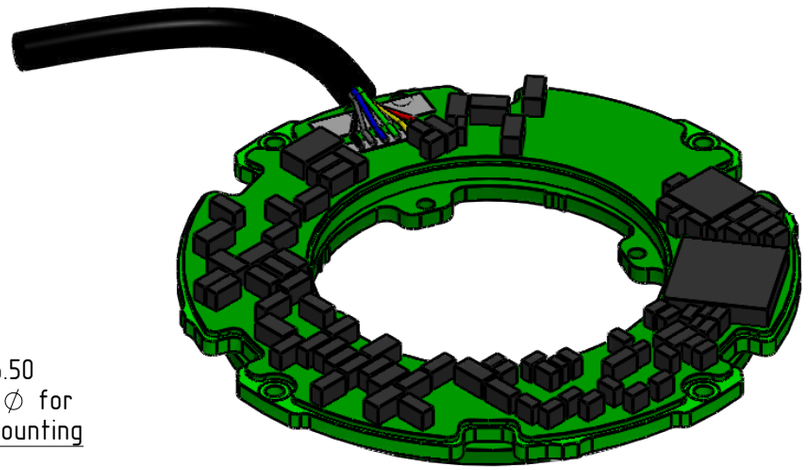
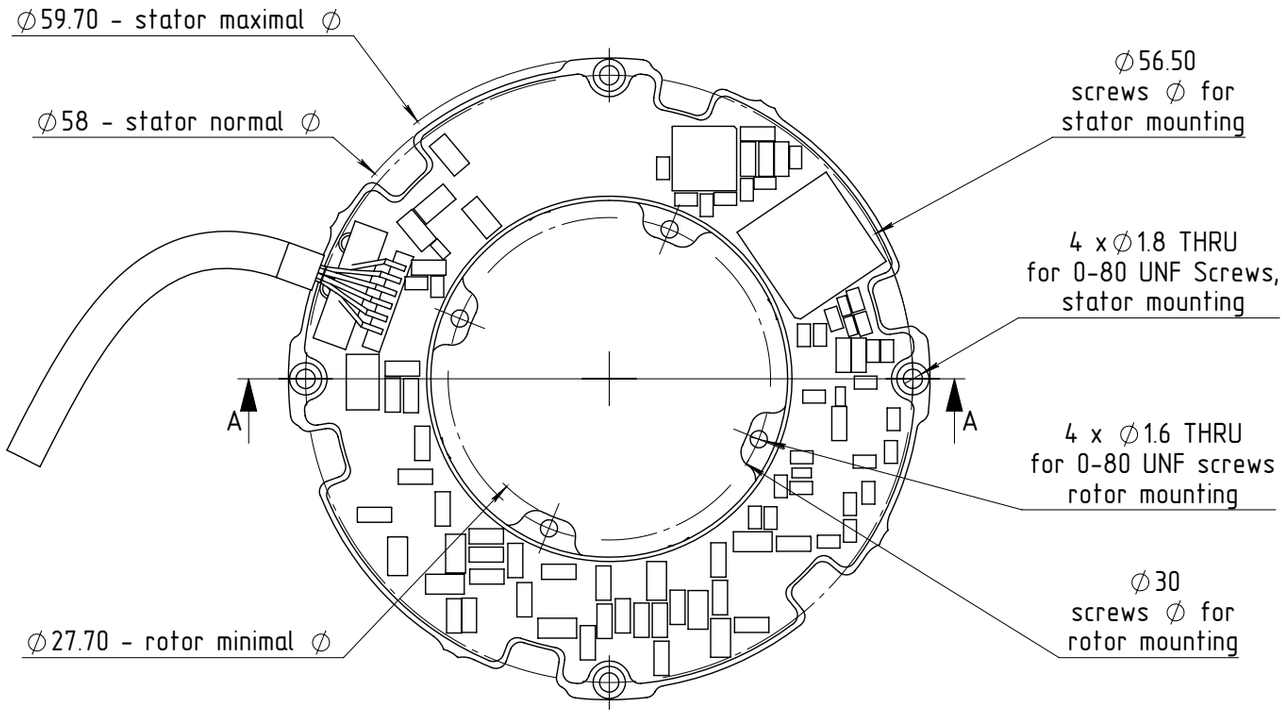
SECTION A-A







	NAME	SIGNATURE	DATE
DRAWN	Michael A.		06-Jun-17
CHK'D	Jacob H.		06-Jun-17
APPV'D	Jacob H.		06-Jun-17

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN: mm
SURFACE FINISH: N6
LINEAR TOLERANCES: ±0.1 mm
ANGULAR TOLERANCES: ±0.5 deg
ALL CHAMFER: 0.1 mm x 45°

Netzer Precision Motion Sensors Ltd.

TITLE: VLX-60 ICD			
MATERIAL:		Coating:	SCALE: 2:1
DWG NO. : VLX-60 ICD		Revision : 00	A3
CAT NO. : VLX-60 ICD			SHEET 1 OF 1