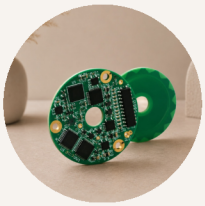
STIMITA
MOTION CONTROL

ENCODER

where accuracy matters

CATALOG

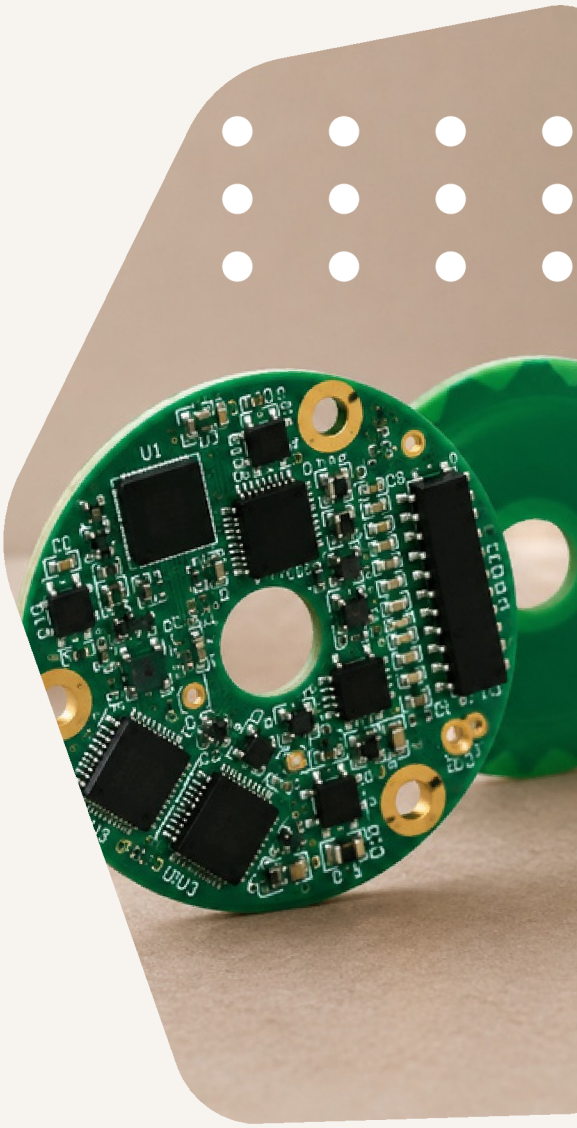
INTRODUCTION



STE 20

The STE Series Absolute Encoders are advanced non-contact inductive encoders designed for high-accuracy angular position sensing in defence, robotics, aerospace, and industrial motion-control applications. The encoder provides true absolute position feedback immediately at power-up without requiring homing or initialization movement.

Designed for harsh operating environments, the STE Series delivers high reliability, long operational life, and stable performance under shock, vibration, EMI/RFI exposure, and temperature variations. Its hollow-shaft, low-profile architecture enables compact integration with direct-drive motors, stabilized platforms, gimbals, robotic actuators, slip rings, and precision servo systems.



The encoder family features compact hollow-shaft and low-profile configurations for seamless integration into direct-drive servo systems, stabilized platforms, gimbals, robotic actuators, slip-ring assemblies, optical systems, autonomous platforms, and precision motion-control mechanisms. The lightweight structure and simplified mounting architecture reduce installation complexity while maintaining high mechanical tolerance capability.

The encoder family supports multiple communication interfaces including SSI, BiSS-C, RS-422, RS-485, UART, and Differential ABZ outputs for seamless integration with modern control systems.

More Information

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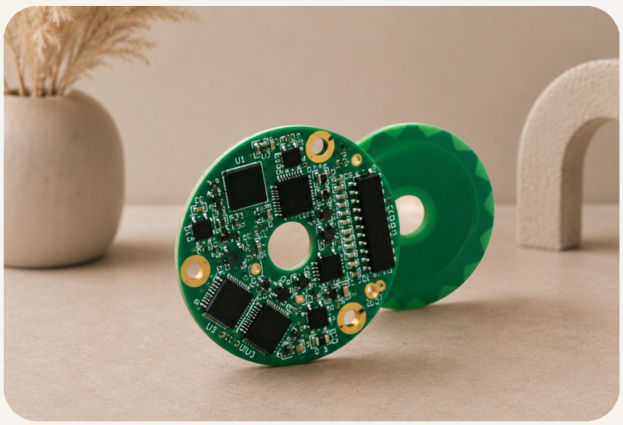
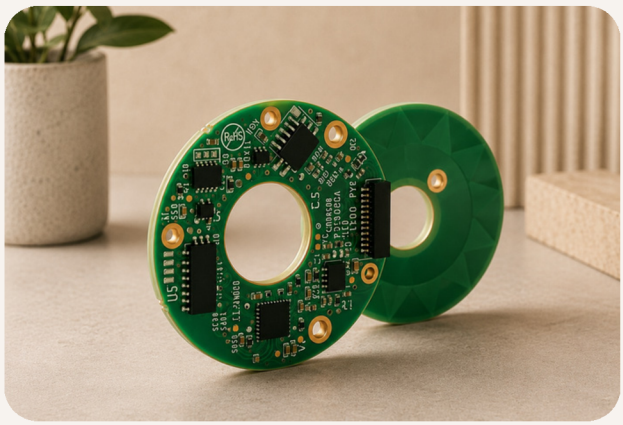
PRODUCT SUBCATEGORIES

STE 20

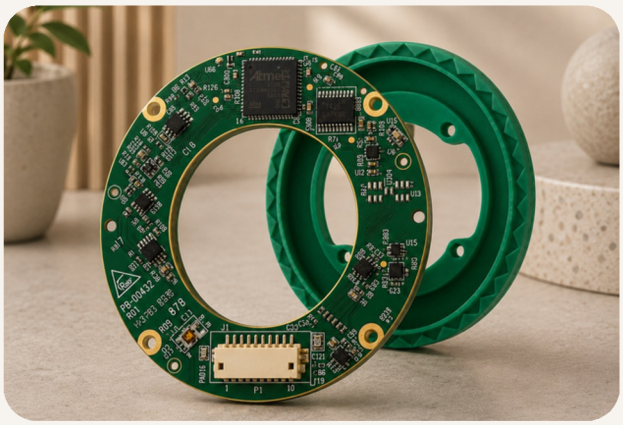
A STE 20



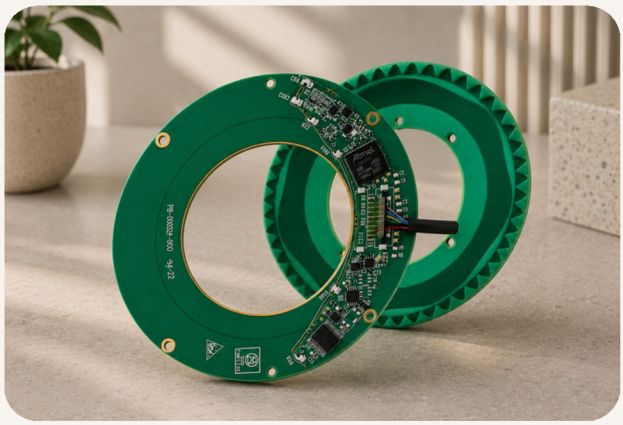
B STE 40



C STE 60



D STE 80



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PRODUCT SPECIFICATIONS

STE 20

General

Resolution	15-17bit
Maximum static error	±0.05°
Repetitive error	±2 LSB
Maximum operational speed	4000 rpm
Measurement range	Single turn
Rotation direction	Adjustable CW/CCW

Mechanical

Outer\Inner\Height	20\4\6.5 mm
Allowable mounting eccentricity	±0.1 mm
Allowable axial mounting tolerance	0.6±0.1 mm
Rotor inertia	0.01 kg·mm2
W eight (stator/ rotor)	4 g
Material (stator/ rotor)	FR-4

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PRODUCT SPECIFICATIONS

STE 20

Electrical

Supply voltage	5v
Current consumption	< 80 mA
Electrical Interface	6-pin connector, 6-core cable
Communication	SSi, BiSS-C, RS-422 (UART)

Environmental

EMC	IEC 61000-6-2, IEC 61000-6-4
Operating temperature	-20°C - +60°C
Storage temperature	-50°C - + 100°C
Relative humidity	0 - 99%
Shock endurance/ functional	100 g / 11 ms
Vibration functional	20 g (10 - 2000 Hz)
Protection	IP 40

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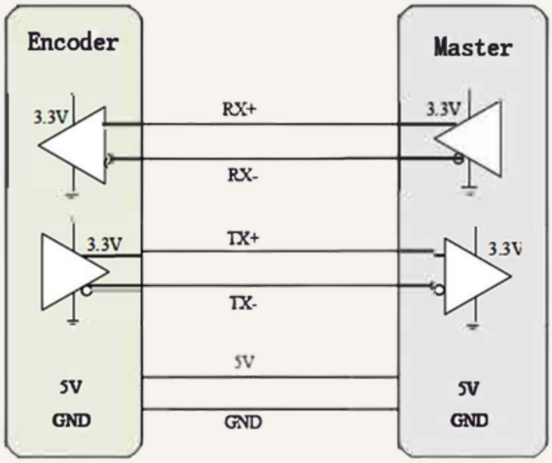
ELECTRICAL CONECTIONS

STE 20

HARDWARE INTERFACE

ST-20 encoder consists of a stator and a rotor, the stator integrates an angle calculation circuit and an encoding output circuit. The encoder uses a multi-core connector for output (connector interface as shown in the figure below), with the output connector located on the outer edge of the stator. The angle output uses two connectors, and can choose to output interface protocols such as SSi, BiSS-C, RS-422(UART).



SSI / BISS / RS 422 CONNECTIONS

No	Description		Colour
1	5V	5V	Red
2	GND	GND	Black
3	CLK+	CLK+	Gray
4	CLK-	CLK-	Blue
5	DADT-	DADT-	Yellow
6	DADT+	DADT+	Green

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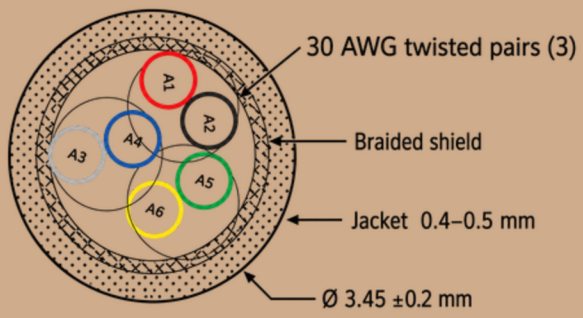
ELECTRICAL CONECTIONS

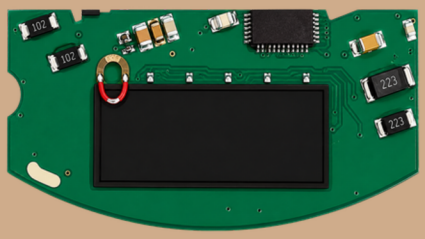
STE 20

4.1 SSI/BISS OUTPUT SIGNAL PARAMETERS

Signal delay	< 50 us
Output code	Binary
Maximum data update rate	25 kHz
Clock/ Serial output	Differential RS-422

Cable: 30 AWG twisted 3 pairs
(30 AWG 25/0.05 tinned copper, Insulation: ETFE 0 0.12-0.15 to 0 0.6 ± 0.05 OD)
Temperature rating: -50° to + 150° C
Braided shield: Thinned copper braided 95% min. coverage
Jacket: 0.4-0.5 silicon rubber 03.45 ±0.2 OD





6-pin thin plug: HDGC0601WR-5-6P
Cable diameter: 0 3.45 ± 0.2mm
Corresponding pairing plug: X0600HI-6P

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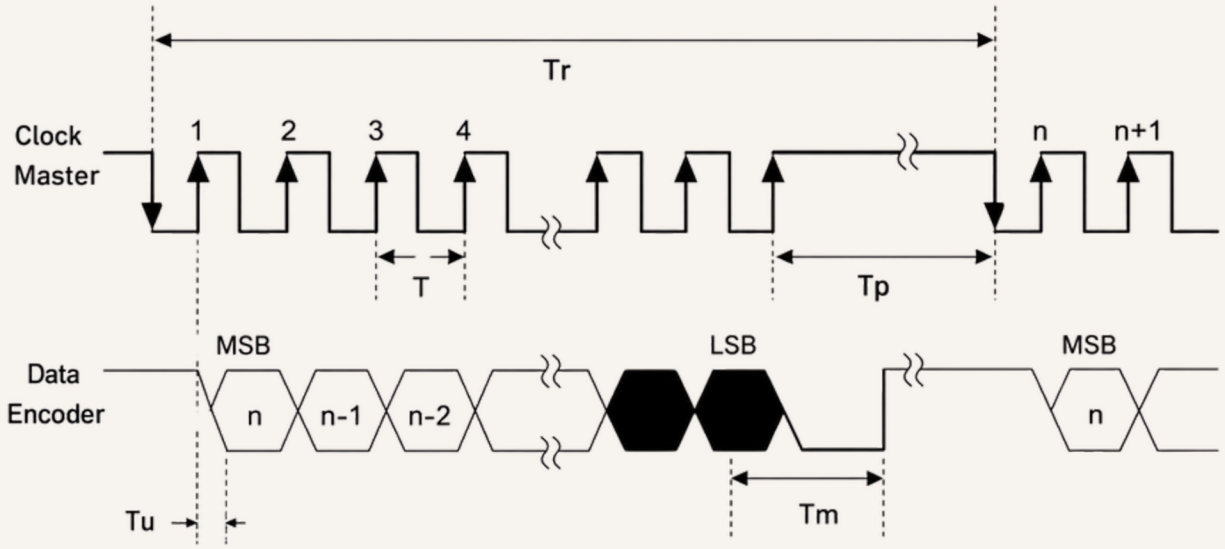
ELECTRICAL CONECTIONS

STE 20

4.2 SSI INTERFACE

SSi (Synchronous Serial Interface) is based on the RS-422 hardware standard and is a commonly used interface for angle encoders. The master sends clock and angle encoder synchronized output data. The default clock is high level. The first low level starts data transmission, and the angle encoder transmits the angle data to the master in sequence according to the clock. The timing diagram is as follows:



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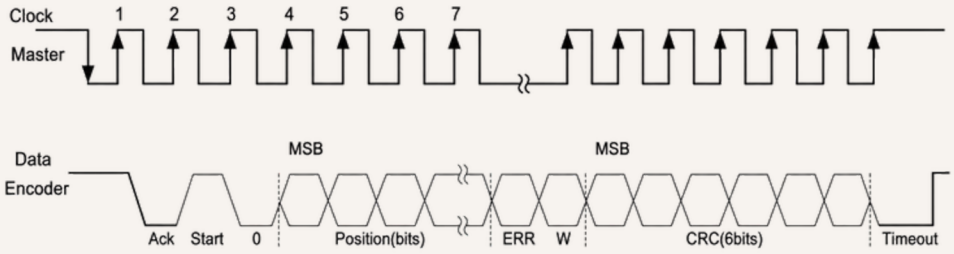
ELECTRICAL CONECTIONS

STE 20

n	Position resolution	12 - 21
f (T)	Clock frequency (Clock period)	0.5 - 5.0 MHz
Tu	Bit update time	50 ns
Tp	Pause time	> 25 us
Tm	Monoflop time	> 25 us
Tr	Time between 2 adjacent requests	Tr > n*T +25 us
fr=1/Tr	Data request frequency	

4.3 BISS-C INTERFACE

The BiSS-C communication protocol is a full duplex, bidirectional, high-speed, synchronous serial communication protocol. This interface is also based on the RS-422 hardware standard and is compatible with the SSi interface. It is widely used in highprecision position control absolute encoders. The product uses BiSS-C as a point-to-point configured unidirectional interface, which can serve as one or more slaves connecting to the master, meeting the requirements of BiSS-C unidirectional interface. The timing diagram is as follows:



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ELECTRICAL CONECTIONS

STE 20

Bit/n		Description	Default Length	Default Length
28	ARK	Period during which the encoder calculates the absolute position, one clock cycle	0	1 bit
27	Start	Encoder signal for "start" data	1	1 bit
26	0	"Start" bit follower	0	1 bit
8-25	Position	Absolute Position encoder data		Per resolution
7	Error	BIT (Built In Test option)	1	1 bit
6	Warn	Warning (non active)	1	1 bit
0-5	CRC	*The CRC polynomial		6 bit
	Time Out	Elapse between the sequential "start" request cycle's		> 26 us

*The CRC polynomial for position, error and warning data is: x6 + x1 + x0 It is transmitted MSB first and inverted. The start bit and "0" bit are omitted from the CRC calculation.

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ELECTRICAL CONECTIONS

STE 20

4.4 RS-422 UART INTERFACE

Asynchronous serial communication interface over RS422 (UART), by default, the master does not need to send requests, and the encoder automatically outputs data to the master. The update rate of the encoder data is 2000Hz, the baud rate is 460800bps, and the data format is 1 start bit, 8 data bits, 1 even check bit, and 1 stop bit. Each frame of data contains 10 bytes, and the format is shown in the table below.

	Bit	Description	Note
Header	1	5E	Defined Header
	2	AD	
Protocol Flag Bit	3	01	Single byte
Position	4	Most Significant 8 Bits	LSB effective, MSB padding 0
	5	Middle Significant 8 Bits	
	6	Least Significant 8 Bits	
Frame Count	7	Most Significant 8 Bits	0-65535 Accumulate
	8	Least Significant 8 Bits	
Check	9	Most Significant 8 Bits	Accumulate the 3rd, 4th, 5th, 6th, and 7th, 8th bytes taking the lower 16 bits,
	10	Least Significant 8 Bits	

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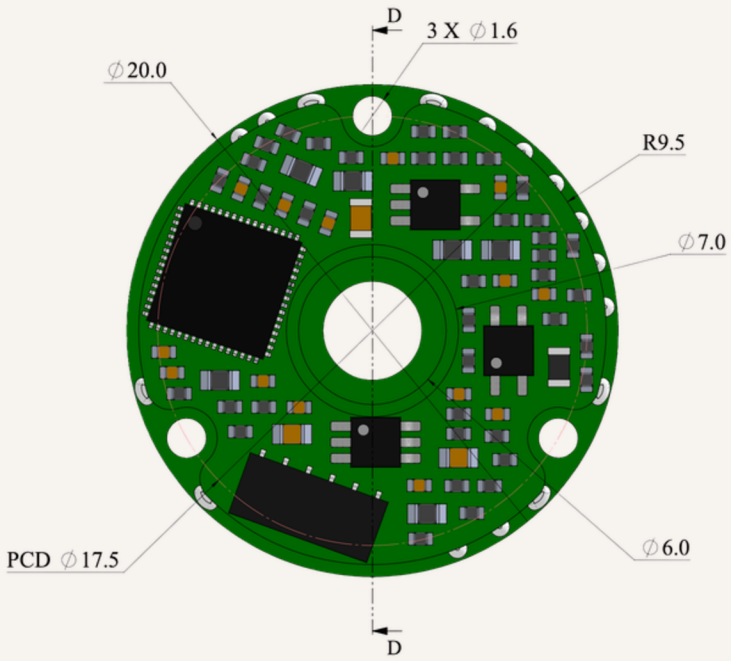
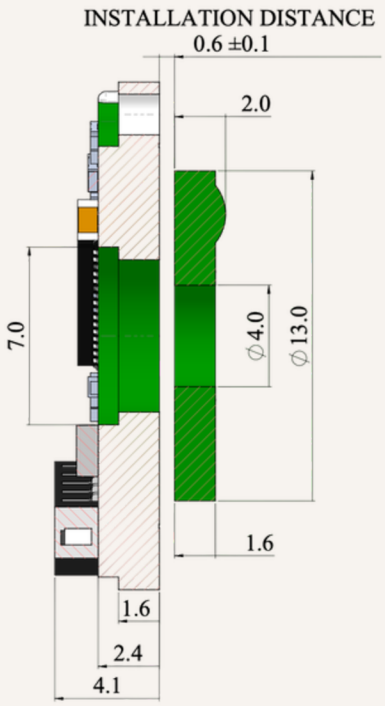
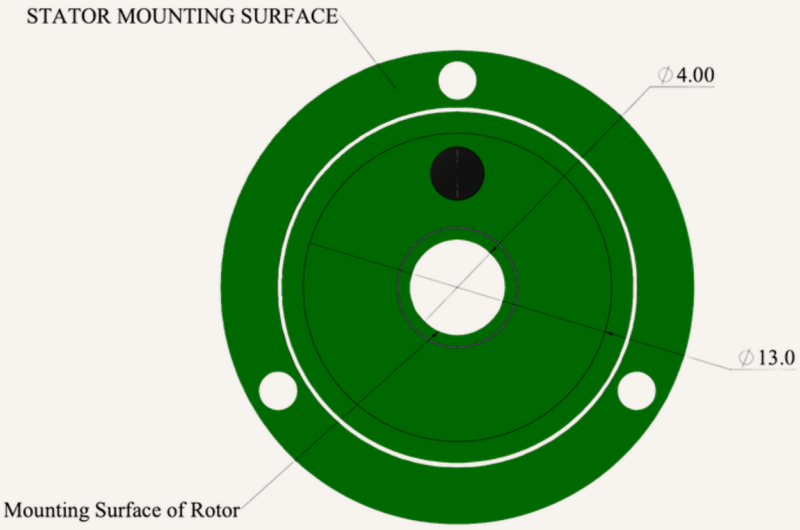
MECHANICAL MOUNTING

STE 20







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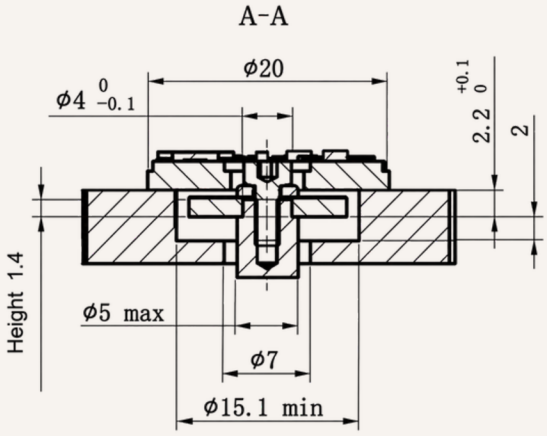
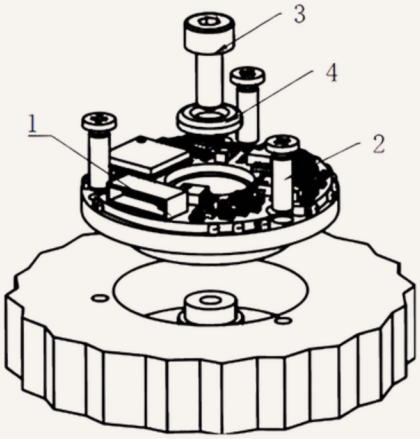
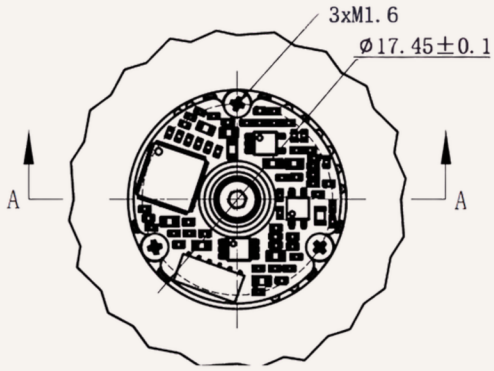
MECHANICAL MOUNTING

STE 20







Tolerance	
0-50	±0.05mm
50～	±0.1mm

No	Details	Qty	
1	CAP/ST-20	1	*Product*
2	M1.6x5 Bolt	3	*Accessories*
3	M2x5 Bolt CAP/	1	
4	ST-20 Ring	1	

More Information

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ORDERING INFO

STE 20

STE - 20 - 16 - SSI1 - 03 - 05

Product Line

Product Outer diameter

Resolution	
15	32,768
16	65,536
17	131,072

Communication	
ASI1	RS-422
SSI1	SSi
BIS1	BiSS-C

SHAPE & CONNECTOR	
01	Side flying leads 250mm
03	Side connector

supply Voltage	
05	5V

*Make sure to confirm all the product specifications before ordering any of our products product specifications may change with any prior notice

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