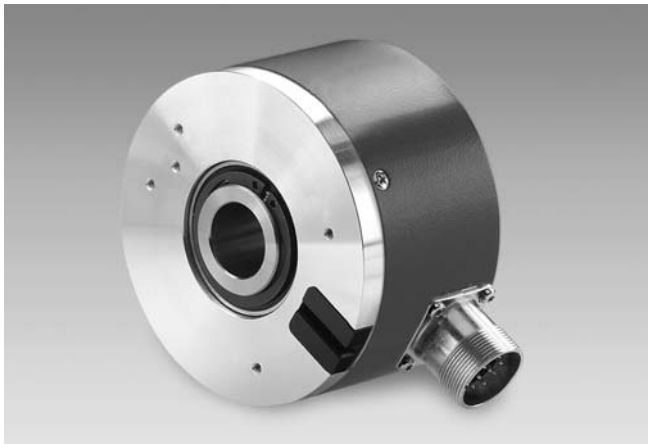
Absolute encoders - SSI

Hollow shaft max. ø20 mm, SIL3 standard

Optical multiturn encoder 13 bit ST / 12 bit MT

G1S2B - SSI



G1S2B with hollow shaft

Features

- **Encoder multiturn / 2 x SSI**
- **Optical sensing**
- **Resolution: singleturn 13 bit, multiturn 12 bit**
- **For safety-relevant applications according SIL3**
- **Hollow shaft with ø20 mm and stud screw groove**
- **Redundancy by two separate SSI signals**
- **High reliability by self-diagnostics**
- **Additional incremental output signals**
- **SIL Approval: 793480**

Technical data - electrical ratings

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤60 mA (24 VDC)
Initializing time (typ.)	1000 ms after power on
Interfaces	SSI, Incremental A, B + inverted
Steps per turn	8192 / 13 bit
Number of turns	4096 / 12 bit
Incremental output	4096 pulses A90°B
Output signals	A, B + inverted
Absolute accuracy	±0.025°
Sensing method	Optical
Code	Binary
Code sequence	CW: ascending values with clockwise sense of rotation (looking at flange)
Inputs	2 x SSI clock (optocoupler input)
Output circuit	SSI data linedriver RS485 Incremental linedriver RS422 Incremental push-pull
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Diagnostic functions	Self-diagnosis Code continuity check Multiturn sensing Temperature control
Approval	UL approval / E63076

Technical data - mechanical design

Housing	ø90 mm
Shaft	ø20 mm hollow shaft
Protection DIN EN 60529	IP 54
Operating speed	≤3800 rpm (mechanical) ≤6000 rpm (electric)
Rotor moment of inertia	2000 gcm²
Materials	Housing: steel Flange: steel
Operating temperature	-25...+85 °C -40...+85 °C (optional)
Relative humidity	95 % non-condensing
Resistance	DIN EN 60068-2-6 Vibration 10 g, 16-2000 Hz DIN EN 60068-2-27 Shock 200 g, 6 ms
Weight approx.	1600 g
E-connection	Connector, 16-pin

G1S2B - SSI

Part number

G1S2B. | **1** | | **B1** | |

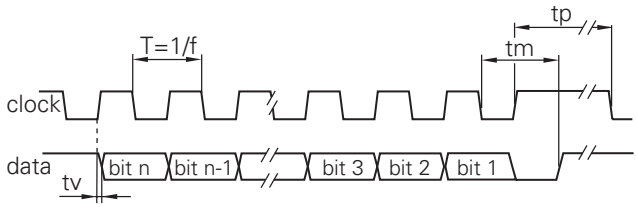
Output circuit
- 01 Incremental push-pull
- 02 Incremental linedriver RS422

E-connection
- B1 Connector M23, 16-pin, radial

Voltage supply / signals
- 12 10...30 VDC / binary code 25 bit (13+12)
- 22 10...30 VDC / binary code 22 bit (12+10)

Hollow shaft
- 1 Hollow shaft ø20 mm with stud screw profile

Data transfer



Number of data bits	n
Bit n...	Position data (MSB)
...Bit 4	Position data (LSB)
Bit 3	Battery control (1 = low voltage)
Bit 2	Collective error (1 = error state)
Bit 1	Life bit, changing with each transmission

Clock frequency f	62.5...1500 kHz
Scan ratio of T	40...60 %
Time lag tv	200 ns
Monoflop time tm	20...30 µs
Clock interval tp	200 µs

Accessories

Connectors and cables (page %S)	
Z 131.001	Mating connector M23, 16-pin, less cable
Z 131.003	Mating connector M23, 16-pin, 2 m cable
Z 131.005	Mating connector M23, 16-pin, 5 m cable
Z 131.007	Mating connector M23, 16-pin, 10 m cable
Mounting accessories (page %S)	
Z 119.037	Rubber buffer element 18.5 mm long, as torque support
Z 119.039	Set of adjusting angles as torque support
Z 119.040	Shoulder screw M5 as torque support
Z 119.043	Spring coupling for GX and G1

Absolute encoders - SSI

Hollow shaft max. ø20 mm, SIL3 standard

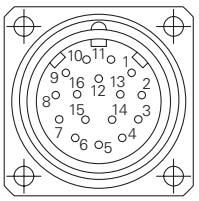
Optical multiturn encoder 13 bit ST / 12 bit MT

G1S2B - SSI

Terminal significance	
UB	Encoder voltage supply.
GND	Encoder ground connection relating to UB.
Data+	Positive, serial data output of differential linedriver.
Data-	Negative, serial data output of differential linedriver.
Clock+	Positive SSI clock input. Clock+ together with clock- is forming a current loop. A current of approx. 7 mA towards clock+ input means logic 1 in positive logic.
Clock-	Negative SSI clock input. Clock- together with clock+ is forming a current loop. A current of approx. 7 mA towards clock- input means logic 0 in positive logic.
Incremental Outputs	Incremental tracks A 90° B and inverted signals.

LED status	
yellow	Ready for operation, less data
green	Ready for operation, with data
red	DV (Display position error 2.5 s)
green or yellow flashing	DV-BAT (battery low)
red with pulsing in green	After power on: Self-test error, not ready for operation

Terminal assignment	
Connector	Assignment
Pin 1	Clock- (1)
Pin 2	Clock+ (1)
Pin 3	Data+ (1)
Pin 4	Data- (1)
Pin 5	–
Pin 6	–
Pin 7	Clock- (2)
Pin 8	Clock+ (2)
Pin 9	Data+ (2)
Pin 10	Data- (2)
Pin 11	Track A
Pin 12	Track A inv.
Pin 13	Track B
Pin 14	Track B inv.
Pin 15	UB
Pin 16	GND



Please use cores twisted in pairs (for example clock+ / clock-) for extension cables of more than 10 m length.

Trigger level	
SSI	**Circuit**
SSI-Clock	Optocoupler
SSI-Data	Linedriver RS485

Control input	**Input circuit**
Input level High	>0.7 UB
Input level Low	<0.3 UB
Input resistance	10 kΩ

Incremental outputs	**Output circuit** Linedriver RS422
Output level High	>2.5 V (I = -20 mA)
Output level Low	<0.5 V (I = 20 mA)
	Push-pull circuit-proof
Output level High	>UB 3.5 V (I = -20 mA)
Output level Low	<0.5 V (I = 20 mA)
Load High	<20 mA
Load Low	<20 mA

G1S2B - SSI

Dimensions