



Safety

SCT202 Safety counter module with integrated frequency measuring

The SCT202 is a safety module for measuring safety-related rotations. For this it provides inputs and outputs which enable the implementation of safety applications up to SIL 2 and PL d.

The module offers the following I/Os:

- 2 safety input blocks that can be used as an incremental interface (each connectable with symmetrical A/B/N tracks). The measuring result is available to the user both as a frequency as well as in the form of a counter status.
- 2 safety input blocks that can either be used as a counter input (connection of initiators) or latch or referencing inputs.
- 2 safety digital inputs that can also be used as latch or referencing inputs.
- 2 safety digital outputs as safety short response shutdown contacts which are ideal for overspeed detection (reaction time: ≤ 1 ms).

Features

- Frequency measuring directly in the module
- Qualified for use as non-safety counter/speed measuring module
- Integrated referencing function (initiator, zero pulse and combination, as well as via software)
- High speed shutdown on overfrequency
- Standstill detection
- Available as ColdClimate module

Part type designation	Part number
SCT202	00022320-00
SCT202 CC	00024877-00

SCT202

Incremental encoder inputs (INC)	
Number	2 single-channel; Inputs supply counter status and frequency
Counter resolution	32 bit
Count direction	A/B sequence
Input signals	A-, A+, B-, B+, N-, N+
Signal evaluation	1/2/4-fold edge evaluation
Maximum input frequency	≤ 300 kHz
Digital input filter	Adjustable via software
Signal level	HTL (24 V) and TTL/RS422 on D-sub socket

Counter inputs (CNT)	
Number	2 channels exclusively as counter inputs (HTL only) Inputs supply counter status and frequency
Counter resolution	32 bit
Count direction	Switchable via digital input or software (Pulse direction function)
Signal evaluation	1/2-fold edge evaluation optional rising or falling edge
Maximum input frequency	5 kHz (CNT inputs)
Sensor support	PNP
Digital input filter	Programmable
Signal level	HTL (24 V) – for the 2 counter channels (CNT)

Digital safety function inputs	
Number	2 single-channel, can be used up to SIL CL 2; PL d
Trigger function	Edge adjustable (transfer of value)
Input filter	1 ms
Signal level for 0 status (inactive)	0 V to +5 V
Signal level for 1 status (active)	+15 V to 34 V

Encoder supply	+5 V	+24 V
Voltage	+5 V	$U_{\text{ext}}^{1)}$ –1 V
Tolerance	±5 %	Like U_{ext}
Max. current/encoder	200 mA	300 mA
Residual ripple	< 150 mVss	Like U_{ext}
Short-circuit-proof	Yes, permanent	Yes, permanent

¹⁾ External power supply

Safety functions of incremental encoder and counter inputs	
Overspeed function	Upper cut-off frequency exceeded (configurable and programmable)
Standstill detection function	Lower limit frequency configurable
Referencing function	Via <ul style="list-style-type: none"> ● Switch (digital signal) ● Zero track ● Switch & zero track ● Software (safety application)
Position function	In combination with the latch function or also referencing function
Error detection	Cable break, plausibility, undervoltage and overvoltage of the encoder supply
Cycle time	6 ms to 50 ms
Reaction time	SCT202 direct shutdown: 1 ms In association with safety application: ≤ 12 to 100 ms

Safety digital outputs		
Number	2 digital outputs Single-channel usable up to SIL CL 2; PL d Configurable shutdown delay	
Output voltage range	18 V DC to 34 V DC	
Output current per channel	0.5 A	
0 to 1 delay	Max. 35 µs at full load	
1 to 0 delay	Max. 155 µs at full load	
Error monitoring	Short-circuit, overload, undervoltage, overvoltage of the power supply	
Status indications		
Status LED	Green LED (SAFE), compliant with other safety modules	
Channel indication	One green LED per channel	
Digital inputs and outputs		
M200 module status	Orange LED (RDY)	
Internal power supply		
Galvanic isolation from the system	500 V	
Internal power supply	Backplanes BS2xx	
Internal current consumption	5 V / < 150 mA via backplane	
External power supply		
Reverse polarity protection	Yes	
Input voltage	24 V DC (18 V DC to 34 V DC)	
Current consumption	Typ. 70 mA at +24 V DC + Σ current consumption of actuators and sensors	
Connection technology		
HTL incremental and counter inputs	D-sub male socket 9-pin	
I/O connection	RM 3.5 connector with flange	
Power supply	RM 5.08 connector with flange	
Connection technology	Screw or spring terminal, connector can be coded and labeled	
Standards and approvals		
Machine safety	EN 61508:2010: Functional safety of E/E/PE safety-related systems	
Approved for	EN ISO 13849-1:2015: Safety of machinery EN 62061:2005/A2:2015: Functional safety machine-related E/E/PE systems EN 61511-1:2017 & IEC 61511-1:2016: Functional safety equipment and process industry	
Product standard	EN 61131-2:2007 & EN 61131-6:2012 UL 61010-1 & UL 61010-2-201	
Approvals/Certificates		
	Standard	ColdClimate (❄️)
General	CE, UKCA, cULus	
Marine	ABS, BV, DNV, LR	ABS, BV, DNV, KR, LR, NK, RINA

Environmental conditions	Standard	ColdClimate (❄)
Operating temperature	-30 °C to +60 °C fanless	
Relative humidity, operation	5 % to 95 % noncondensing	55 % to 95 % with condensation
Storage temperature	-40 °C to +85 °C	
Relative humidity, storage	5 % to 95 % noncondensing	5 % to 95 % with condensation
Maximum altitude ¹⁾	4500 m	
Pollution degree (IEC 60664-1)	2 (noncondensing)	2
Protection class	3	

¹⁾ For operation at an altitude of 2000 m above sea level, a derating of -0.5 Kelvin per 100 m to a maximum altitude of 4500 m above sea level must be taken into account

Order data

Part type designation	Part number	Description
SCT202	00022320-00	Safety counter module; SIL2/PL d: 2x DO 24 V / 1 A: 2x DI, 24 V; 2x INC HTL/TTL 300 kHz + 2x counter HTL 5 kHz; HTL = 24 V; 32 bit; INC A,A/B/N; counter; frequency; trigger; isolated
SCT202 CC	00024877-00	Like SCT202; ColdClimate (❄)

Accessories

Part type designation	Part number	Description
KZ-SCT 202 B+C	00027026-00	Terminal set Phoenix cage clamp (1x KZ 51/03; 2x KZ 35/07) with labeling strips + keying elements