Rotary Joint || BN 637421

Contactless Data Transmission Channel

The contactless data transmission channel offers improved lifetime and reliability without the need for maintenance. The contactless design guarantees error free data transmission even at very high rotating speeds. The IRT version supports PROFINET class C and other real time protocols. The data transmission channel is realized by a rotating capacitive coupler.

PROFINET

ETHERNET POWERLINK

Available Configurations

Type	
1	1000BASE-T Ethernet
3	CAN-Channel (Repeater 500 Kbit/s)
4 + 5	1 Channel 100BASE-TX, for Real-Time Ethernet applications
7 + 8	2 Channels 100BASE-TX, multiplexed, for Real-Time Ethernet applications

Transmission Type 1:

1000BASE-T Ethernet-Channel	One contactless coupler for one channel
Supported Ethernet Standards	10BASE-T (IEEE802.3 Clause 14) 100BASE-TX (IEEE802.3 Clause 25) 1000BASE-T (IEEE802.3 Clause 40) Auto negotiation provided to select Ethernet-Standard and full/ half duplex mode automatically
OSI Layer operation	Layer 1 - 2
Supported Protocols	PROFINET CC-A, CC-B
Ethernet Frame Loss Ratio According to RFC2544	≤ 1×10^{-9} Measured for 800s with 64 byte frames at 99% channel utilization, corresponds to BER ≤ 1×10^{-12}
Data Interface Connection	Cat.6A S/FTP 4x2xAWG26/7 (PiMF) at stator and rotor side

Transmission Type 3:

CAN-Channel	One contactless coupler for one channel
Supported CAN Standards	ISO 11898-1:2003
CAN-functionality	Repeater (fast mode)
Data Rate, max.	500 Kbit/s
Alarm Signal	Open Collector output $V_{CE} \leq 40V$, $I_C < 10mA$ Active if no failure detected Current has to be limited externally
Data and Alarm Signal Connection	Cat.6A S/FTP 4x2xAWG26/7 (PiMF) at stator and rotor side

Transmission Type 4 + Type 5:

100BASE-TX Ethernet Channel	One signal channel provided	
	Type 4	**Type 5**
Supported Ethernet Standards	100BASE-TX (IEEE802.3 Clause 25), autonegotiation (full duplex only)	100BASE-TX (IEEE802.3 Clause 25), autonegotiation (half duplex only)
Supported Protocols	PROFINET CC-A, CC-B, CC-C (IRT) POWERLINK	
OSI Layer operation	Layer 1 (physical)	
Ethernet Frame Loss Ratio According to RFC2544	$\leq 1 \times 10^{-9}$ Measured for 8000s with 64 byte frames at 99% channel utilization, corresponds to BER $\leq 1 \times 10^{-12}$	
Data Interface Connection	Cat.6A S/FTP 4x2xAWG26/7 (PiMF) at stator and rotor side	

Transmission Type 7 + Type 8:

100BASE-TX Ethernet Channel	Two signal channels over one contactless transmission channel, signals are multiplexed, no redundancy	
	Type 7	**Type 8**
Supported Ethernet Standards	100BASE-TX (IEEE802.3 Clause 25), autonegotiation (full duplex only)	100BASE-TX (IEEE802.3 Clause 25), autonegotiation (half duplex only)
Supported Protocols	PROFINET CC-A, CC-B, CC-C (IRT) POWERLINK	
OSI Layer operation	Layer 1 (physical)	
Multiplexer	Time Domain Multiplexing	
Ethernet Frame Loss Ratio According to RFC2544	$\leq 1 \times 10^{-9}$ Measured for 8000s with 64 byte frames at 99% channel utilization, corresponds to BER $\leq 1 \times 10^{-12}$	
Data Interface Connection	Cat.6A S/FTP 4x2xAWG26/7 (PiMF) at stator and rotor side	

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Power Requirements

External Power Supply	Power Supply has to be a SELV type acc. to IEC60950-1 The current must be externally limited to 4 A
Input Voltage Range	21.6 V to 28.8 V DC; 0 V is connected to Case Ground internally
Current Consumption, typ. / max.	0.33 A / 0.5 A @ 24 V Supply Voltage
Inrush Current	3 A (duration 2 ms)
Power Consumption, typ. / max.	8 W/ 12 W
Supply Voltage Connection	2 x 0.25 mm^2 LiYCY cable, shielded, outer diameter ~3.9 mm, at stator and rotor side

Standards and Directives

Applicable EU Directive	EMC Directive 2014/30/EU	
Applied standards	DIN EN 55032 Class B DIN EN 61000-4-2 DIN EN 61000-4-3 DIN EN 61000-4-4 DIN EN 61000-4-6	Radio disturbance characteristics ESD immunity RF immunity, radiated Transient / burst immunity RF immunity, conducted

Mechanical Data

Rotating speed, max.	1000 rpm
Acceleration, max.	1500 rad/s² (239 rounds/s²)
Life, min.	200 x 10^6 revolutions
MTBF	300 000 h
Torque (room / min. temperature), max.	0.2 Nm / 0.5 Nm @ start-up 0.2 Nm / 0.5 Nm @ rotation
Interface loads, max.	no loads allowed
Case material	aluminum alloy
Case surface finish	chromate conversion coat
Weight, approx.	1.5 kg
Marking	adhesive label

Environmental Conditions

Operation	
Ambient temperature range	-30 °C to +71 °C
Relative humidity, max.	95% (non-condensing)
Shock	30 g / 11 ms half sine, 3 shocks in each direction of 3 orthogonal axes
Vibration	20-50 Hz, PSD of 0,02 g²/Hz falling to 0,001 g²/Hz at 500 Hz in each of 3 orthogonal axes. Duration: 15 min/axis.

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IP protection level	IP60 per EN 60529 (all interfaces connected with appropriate gaskets)
Maintenance	Not required
Storage	
Ambient temperature range	-40 °C to +85 °C
Relative humidity, max.	95% (non-condensing)

Applicable documents

Drawing	637421CXXYY-0E (XXYY according to ordering number)
Circuit Diagram	637421CXXYY-CD (XXYY according to ordering number)

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Ordering numbers

BN	Type	Data Interface Connection				Supply Voltage Connection			
		Stator	L1* / mm	Rotor	L2* / mm	Stator	L3* / mm	Rotor	L4* / mm
637421C0001	1	Cat.6A RJ45 connector	1400	Cat.6A RJ45 connector	1400	Flying leads	1400	Flying leads	1400
637421C0003	3	Flying leads	1400	Flying leads	1400	Flying leads	1400	Flying leads	1400
637421C0004	4	Cat.6A RJ45 connector	1400	Cat.6A RJ45 connector	1400	Flying leads	1400	Flying leads	1400
637421C0005	5	Cat.6A RJ45 connector	1400	Cat.6A RJ45 connector	1400	Flying leads	1400	Flying leads	1400
637421C0007	7	Cat.6A RJ45 connector	1400	Cat.6A RJ45 connector	1400	Flying leads	1400	Flying leads	1400
637421C0008	8	Cat.6A RJ45 connector	1400	Cat.6A RJ45 connector	1400	Flying leads	1400	Flying leads	1400

**Cable length tolerance ±5%*

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Outline (all dimensions in millimeter)