

⊕ Global tolerance [mm] 0.1

All dimensions are in mm. Drawings not to scale.

Motor – sensor configurations					
Sensor	Motor				
	PMSM	BLDC	DC BRUSH	STEP (2-ph)	STEP <sup>2</sup> (3-ph)
Incr. Encoder	⊕		⊕	⊕	⊕
Incr. Encoder + Hall	⊕	⊕			
Analog Sin/Cos encoder	⊕	⊕	⊕	⊕	⊕
SSI	⊕	⊕	⊕	⊕	⊕
BISS-C	⊕	⊕	⊕	⊕	⊕
EnDAT <sup>1</sup>	⊕	⊕	⊕	⊕	⊕
Tacho			⊕		
Open-loop (no sensor)				⊕	⊕

<sup>1</sup> Available starting with F514K firmware version

<sup>2</sup> Sensor used only for step loss detection

**Features**

- Motion controller and drive in a single compact unit based on MotionChip™ technology
  - Universal solution for control of rotary and linear brushless, brushed and 2 or 3-phase step motors
  - Advanced motion control capabilities (PVT, S-curve, electronic cam)
  - Motor supply: 11-80V; Logic SELV/ PELV supply: 9-36V; STO SELV/ PELV supply: 18-40V
  - Output current: 20A cont. (BLDC mode); 40A<sub>PEAK</sub>, up to 60kHz PWM
  - Feedback Devices (dual-loop support)
- 1<sup>st</sup> feedback devices supported:
- Incremental encoder interface (differential)

- Analogue sin/cos encoder interface (differential 1V<sub>pp</sub>)
  - Digital Hall sensor interface (single-ended and open collector)
- 2<sup>nd</sup> feedback devices supported:
- Incremental encoder interface (differential)
  - BISS / SSI / EnDAT<sup>1</sup> encoder interface
  - pulse & direction interface (differential) for external (master) digital reference
- STO: 2 safe torque-off inputs, safety integrity level (SIL3/Cat3/PLe) acc. to EN61800-5-1; -2/ EN61508-3; -4/ EN ISO 13849-1.
  - 4 digital inputs, 12-36V, PNP/NPN programmable: 2 for limit switches, 2 general-purpose
  - 4 digital outputs, 5-36V, NPN open-collector: Ready, Error, OUT1 0.5A and OUT2 2A
  - 2 analogue inputs: 12 bit, +/-10V and 0-5V: Reference and Feedback (for Tacho) or general purpose
  - RS-232 serial & dual RJ45 CAN connectors
  - TMLCAN and CANopen (CiA 301 v4.2, CiA 305 v.2.2.13 and CiA 402 v3.0) protocols selectable by DIN switch
  - 127 h/w addresses selectable by DIN switch
  - 16k x 16 SRAM memory for data acquisition
  - 16k x16 E<sup>2</sup>ROM memory to store setup data, TML motion programs, cam tables and other user data
  - Operating ambient temperature: 0-40°C (over 40°C with derating)
  - NTC/PTC analogue Motor Temperature sensor input
  - Protections: short-circuit between motor phases and from motor phases to GND, over/under-voltage, over-current, I<sup>2</sup>t, control error, over temperature, communication error

Name EP	First edition September 5, 2022	Document template: P099.TQT.564.0001	Last edition September 5, 2022	Visa : AN
		Title of document <b>iPOS8020 BX-CAN PRODUCT DATA SHEET</b>	N° document <b>P029.026.E201.DSH.10J</b>	
			Page: 1 of 5	

# iPOS8020 BX-CAN DATASHEET

## P/N: P029.026.E201

Mating Connectors			
Ref	Producer	Part No.	Description
J1	Camden	CTBA9208/4FL	Supply input, 4x5.08 female counter part for cable
J2	Camden	CTBA9208/5FL	Motor power, 5x5.08 female counter part for cable
J3, J4	generic 15-pin High Density D-Sub male		Feedback #1 +Hall & #2
J9	generic RJ10-4/4	phone plug	RS232
J5	generic 15-pin D-Sub male, DB15		I/O; Analog
J8	MOLEX	43025-0400	MICROFIT RECEPTACLE HOUSING, 2x2 WAY
J8	MOLEX	43030-0007	CRIMP PIN, MICROFIT, 5A
J6, J7	-		Standard 8P8C modular jack (RJ-45) male

### Connector Description

Pin	Name	Type	Description
1	GND	-	Negative return (ground) of the power supply
2	+VMOT	I	Positive terminal of the motor supply: 12 to 80V <sub>DC</sub>
3	+VLOG	I	Positive terminal of the logic supply input: 12 to 36V <sub>DC</sub>
4	Earth	-	Earth connection

Pin	Name	Type	Description
1	A/A+	O	Phase A for 3-ph motors, A+ for 2-ph steppers, Motor+ for DC brush motors
2	B/A-	O	Phase B for 3-ph motors, A- for 2-ph steppers, Motor- for DC brush motors
3	C/B+	O	Phase C for 3-ph motors, B+ for 2-ph steppers
4	CR / B-	O	Chopping Resistor output/ Phase B- for step motors
5	Earth	-	Earth connection

Pin	Name	Type	Description
1	STO1+	I	Safe Torque Off input 1, positive input (opto-isolated, 18÷40V)
2	STO2+	I	Safe Torque Off input 2, positive input (opto-isolated, 18÷40V)
3	STO1-	I	Safe Torque Off input 1, negative return (opto-isolated, 0V)
4	STO2-	I	Safe Torque Off input 2, negative return (opto-isolated, 0V)

Apply between both STO1+, STO2+ and STO1-, STO2- 24V DC from SELV/ PELV power supply for motor PWM output operation


Pin	Name	Type	Description
1	+5V <sub>OUT</sub>	O	5V output supply for I/O usage
2	Hall 1	I	Digital input Hall 1 sensor
3	Hall 2	I	Digital input Hall 2 sensor
4	B1+/Cos+	I	Incr. encoder1 B+ diff. input, or analogue encoder Cos+ diff. input
5	A1+/Sin+	I	Incr. encoder1 A+ diff. input, or analogue encoder Sin+ diff. input
6..8	n.c.	-	Not connected
9	Z1+	I	Incr. encoder1 Z+ diff. input
10	Z1-	I	Incr. encoder1 Z- diff. input
11	GND	-	Return ground for sensors supply
12	Temp Mot	I	Analogue input, 12-bit, 0-3.3V. Used to read an analog temperature value
13	Hall 3	I	Digital input Hall 3 sensor
14	B1-/Cos-	I	Incr. encoder1 B- diff. input, or analogue encoder Cos- diff. input
15	A1-/Sin-	I	Incr. encoder1 A- diff. input, or analogue encoder Sin- diff. input

Pin	Name	Type	Description
1	+5V <sub>OUT</sub>	O	5V output supply for I/O usage
2	Data+/SL+	I	Data+ for SSI & EnDAT, or Slave+ for BiSS C; has 120Ω resistor between pins 2 and 3
3	Data-/SL-	I	Data- for SSI & EnDAT, or Slave- for BiSS C; has 120Ω resistor between pins 2 and 3
4	B2+/Dir+	I	Incr. encoder2 B+ diff. input, or Dir+; has 120Ω resistor between pins 4 and 14
5	A2+/Pulse+	I	Incr. encoder2 A+ diff. input, or Pulse+; has 120Ω resistor between pins 5 and 15
6	+V <sub>LOG</sub>	I	Positive terminal of the logic supply input: 9 to 36V <sub>DC</sub>
7	CLK+/MA+	O	Clock+ for SSI & EnDAT, or Master+ for BiSS C
8	CLK-/MA-	O	Clock- for SSI & EnDAT, or Master- for BiSS C
9	Z2+	I	Incr. encoder2 Z+ diff. input
10	Z2-	I	Incr. encoder2 Z- diff. input
11	GND	-	Return ground for sensors supply
12	FDBK	I	Analogue input, 12-bit, 0-5V. Used to read an analog position or speed feedback (as tacho), or used as general-purpose analog input
13	n.c.	-	Not connected
14	B2-/Dir-	I	Incr. encoder2 B- diff. input, or Dir-; has 120Ω resistor between pins 4 and 14
15	A2-/Pulse-	I	Incr. encoder2 A- diff. input, or Pulse-; has 120Ω resistor between pins 5 and 15

Pin	Name	Type	Description
1	Can-Hi	I/O	CAN-Bus positive line (dominant high)
2	Can-Lo	I/O	CAN-Bus negative line (dominant low)
3	GND	-	Return ground for CAN-Bus
4, 5	-	-	Reserved. Do not use.
6..8	n.c.	-	Not connected

Pin	Name	Type	Description
1	GND	-	Return ground for RS-232 pins
2	232TX	O	RS-232 Data Transmission
3	232RX	I	RS-232 Data Reception
4	GND	-	Return ground for RS-232 pins

Pin	Name	Type	Description
1	GND	-	Return ground for I/O pins
2	IN2/LSP	I	12-36V digital PNP/NPN input. Positive limit switch input
3	OUT2/Error	O	5-36V 0.5A, drive Error output, active low, NPN open-collector/TTL pull-up. Also drives the red LED
4	OUT3/Ready	O	5-36V 0.5A, drive Ready output, active low, NPN open-collector/TTL pull-up. Also drives the green LED.
5	OUT0	O	5-36V 2A, general-purpose digital output, NPN open-collector/TTL pull-up
6	OUT1	O	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
7	+5V <sub>OUT</sub>	O	5V output supply for I/O usage
8	+V <sub>LOG</sub>	I	Positive terminal of the logic supply input: 12 to 36V <sub>DC</sub>
9	IN3/LSN	I	12-36V digital PNP/NPN input. Negative limit switch input
10	IN0	I	12-36V general-purpose digital PNP/NPN input
11	IN1	I	12-36V general-purpose digital PNP/NPN input
12	REF10+	I	Analogue input, 11-bit, positive +/-10V input. Used to read an analog position, speed or torque reference.
13	REF10-	I	Analogue input, 11-bit, negative +/-10V input. Used to read an analog position, speed or torque reference. Connected to GND when REF5 is used.
14	REFSEL	I	Analogue selection, floating for +/-10V input, GND connected when REF5+ is used.
15	REF5	I	Analogue input, 12-bit, 0-5V input. Used to read an analog position, speed or torque reference.

Name EP	First edition September 5, 2022	Document template: P099.TQT.564.0001	Last edition September 5, 2022	Visa : AN
 <b>TECHNOSOFT</b>		Title of document		N° document
		<b>iPOS8020 BX-CAN</b> <b>PRODUCT DATA SHEET</b>		<b>P029.026.E201.DSH.10J</b>  Page: 2 of 5

# iPOS8020 BX-CAN DATASHEET

## P/N: P029.026.E201

Pin	Name	Type	Description
1	CANopen	-	ON: CANopen communication protocol OFF: TMLCAN communication protocol
2	ID-Bit6	-	
3	ID-Bit5	-	
4	ID-Bit4	-	Hardware AxisID selection switches
5	ID-Bit3	-	They represent the first 7 LSB bits of an 8-bit
6	ID-Bit2	-	Axis ID number.
7	ID-Bit1	-	
8	ID-Bit0	-	

### Electrical characteristics

All parameters measured under the following conditions (unless otherwise specified):

- Tamb = 24°C, VLOG = 24 VDC; VMOT = 80VDC
- Supplies start-up / shutdown sequence: any
- Load current (sinusoidal amplitude / continuous BLDC, DC, stepper) = 20A

Operating Conditions		Min.	Typ.	Max.	Units
Ambient temperature <sup>1</sup>		0		+40	°C
Ambient humidity	Non-condensing	0		90	%Rh
Altitude / pressure <sup>2</sup>	Altitude (vs. sea level)	-0.1	0 ÷ 2	2	km
	Ambient Pressure	0 <sup>2</sup>	0.75 ÷ 1	10.0	atm
Storage Conditions		Min.	Typ.	Max.	Units
Ambient temperature		-40		+85	°C
Ambient humidity	Non-condensing	0		100	%Rh
Ambient Pressure		0		10.0	atm
Mechanical Mounting		Min.	Typ.	Max.	Units
Airflow		natural convection <sup>3</sup> , closed box			
Environmental Characteristics		Min.	Typ.	Max.	Units
Size (Length x Width x Height)	Without mating connectors	139 x 94.2 x 24.5			mm
		-5.47 x 3.7 x 0.97			inch
Weight	Without mating connectors	240			g
Power dissipation	Idle (no load)	3.6			W
	Operating	11			
Efficiency		98			%
Cleaning agents	Dry cleaning is recommended	Only Water- or Alcohol- based			
Protection degree	According to IEC60529, UL508	IP20			-
Logic Supply Input (+V <sub>LOG</sub> )		Min.	Typ.	Max.	Units
Supply voltage	Nominal values	12	24	36	V <sub>DC</sub>
	Absolute maximum values, drive operating but outside guaranteed parameters	8	24	40	V <sub>DC</sub>
	Absolute maximum values, surge (duration ≤ 10ms) <sup>†</sup>	-1		+45	V
Supply current	No Load on Digital Outputs	+V <sub>LOG</sub> = 9V	300		mA
		+V <sub>LOG</sub> = 12V	250		
		+V <sub>LOG</sub> = 24V	150		
		+V <sub>LOG</sub> = 36V	100		
Motor Supply Input (+V <sub>MOT</sub> )		Min.	Typ.	Max.	Units
Supply voltage	Nominal values	12	80	90	V <sub>DC</sub>
	Absolute maximum values, drive operating but outside guaranteed parameters	11		94	V <sub>DC</sub>
	Absolute maximum values, surge (duration ≤ 10ms) <sup>4</sup>	-1		95	V
Supply current	Idle		1	5	mA
	Operating	-40	±20	+40	A
	Absolute maximum value, short-circuit condition (duration ≤ 10ms) <sup>1</sup>			45	A

Motor Outputs (A/A+, B/A-, C/B+, BR/B-)		Min.	Typ.	Max.	Units
Nominal output current, continuous	for DC brushed, steppers and BLDC motors with Hall-based trapezoidal control			20	A
	for PMSM motors with FOC sinusoidal control (sinusoidal amplitude value)			20	
	for PMSM motors with FOC sinusoidal control (sinusoidal effective value)			14.2	
Motor output current, peak	maximum 10s	-40		+40	A
Short-circuit protection threshold				±45	A
Short-circuit protection delay		5	10		µs
On-state voltage drop	Nominal output current; including typical mating connector contact resistance		±0.3	±0.5	V
Off-state leakage current			±0.5	±1	mA
Motor inductance (phase-to-phase)	Recommended value, for current ripple max. ±5% of full range; +V <sub>MOT</sub> = 80 V	F <sub>PWM</sub> 20 kHz	330		µH
		40 kHz	150		
	Minimum value, limited by short-circuit protection; +V <sub>MOT</sub> = 80 V	20 kHz	120		µH
		40 kHz	40		
Motor electrical time-constant (L/R)	Recommended value for ±5% current measurement error	20 kHz	250		µs
		40 kHz	125		
		60 kHz	100		
Current measurement	FS = Full Scale accuracy		±5	±8	%FS

Digital Inputs (IN0, IN1, IN2/LSP, IN3/LSN) <sup>5</sup>		Min.	Typ.	Max.	Units
Mode compliance		PNP			
Default state	Input floating (wiring disconnected)	Logic LOW			
Input voltage	Logic "LOW"	-36	0	2.4	V
	Logic "HIGH"	7.5	24	36	
	Hysteresis	1.2	2.4	2.8	
	Floating voltage (not connected)		0		
	Absolute maximum, continuous	-36		+39	
Input current	Absolute maximum, surge (duration ≤ 1s) <sup>†</sup>	-50		+50	
	Logic "LOW"; pulled to GND		0		mA
	Logic "HIGH"; pulled to +24V		9	10	

Mode compliance		NPN			
Default state	Input floating (wiring disconnected)	Logic HIGH			
Input voltage	Logic "LOW"	-36	0	2.2	V
	Logic "HIGH"	7.5		36	
	Hysteresis	1.2	2.4	2.8	
	Floating voltage (not connected)		23		
	Absolute maximum, continuous	-36		+39	
Input current	Absolute maximum, surge (duration ≤ 1s) <sup>†</sup>	-50		+50	
	Logic "LOW"; Pulled to GND		9	10	mA
	Logic "HIGH"; Pulled to +24V			0.4	

Input frequency		0		150	kHz
Minimum pulse		3.3			µs
ESD protection	Human body model	±2			kV

<sup>1</sup> Operating temperature can be extended up to +65°C with reduced current and power ratings.


<sup>2</sup> iPOS8020 BX-CAN can be operated in vacuum (no altitude restriction), but at altitudes over 2,500m, current and power rating are reduced due to thermal dissipation efficiency.

<sup>3</sup> It is recommended to mount the iPOS8020 BX-CAN on a metallic support using the provided mounting holes, for better reliability and reduced de-rating due to heat dissipation

<sup>4</sup> Stresses beyond values listed under "absolute maximum ratings" may cause

permanent damage to the device. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

<sup>5</sup> The digital inputs are software selectable as PNP or NPN

Name EP	First edition September 5, 2022	Document template: P099.TQT.564.0001	Last edition September 5, 2022	Visa : AN
		Title of document <b>iPOS8020 BX-CAN</b> <b>PRODUCT DATA SHEET</b>	N° document <b>P029.026.E201.DSH.10J</b>  Page: 3 of 5	

# iPOS8020 BX-CAN DATASHEET

## P/N: P029.026.E201


Digital Outputs (OUT0, OUT1, OUT2/Error, OUT3/ Ready)		Min.	Typ.	Max.	Units	
Mode compliance	All outputs (OUT0, OUT1, OUT2/Error, OUT3/Ready)	NPN 24V				
Default state	Not supplied (+V <sub>LOG</sub> floating)	High-Z (floating)				
	Immediately after power-up	Logic "HIGH"				
	Normal operation	Logic "HIGH"				
Output voltage	Logic "LOW"; output current = 2A for OUT0/ 0.5A for the other digital outputs			0.8	V	
	Logic "HIGH"; output current = 0, no load	OUT2/Error, OUT3/ Ready	2.9	3		3.3
		OUT0, OUT1	4	4.5		5
	Logic "HIGH", external load to +V <sub>LOG</sub>		V <sub>LOG</sub>			
	Absolute maximum, continuous	-0.5		V <sub>LOG</sub> +0.5		
Absolute maximum, surge (duration ≤ 1s) †	-1		V <sub>LOG</sub> +1			
Output current	Logic "LOW", sink current, continuous	OUT2/Error, OUT3/ Ready, OUT1		0.5	A	
		OUT0		2	A	
	Logic "HIGH", source current; external load to GND; V <sub>OUT</sub> ≥ 2.0V	OUT2/Error, OUT3/ Ready			2.5	mA
		OUT0, OUT1			7	mA
Logic "HIGH", leakage current; external load to +V <sub>LOG</sub> ; V <sub>OUT</sub> = V <sub>LOG</sub> max = 40V		0.05	0.7	mA		
Minimum pulse width		0.5			µs	
ESD protection	Human body model	±15			kV	
Digital Hall Inputs (Hall1, Hall2, Hall3)		Min.	Typ.	Max.	Units	
Mode compliance		TTL / CMOS / Open-collector				
Default state	Input floating (wiring disconnected)	Logic HIGH				
Input voltage	Logic "LOW"		0	0.8	V	
	Logic "HIGH"	1.8				
	Floating voltage (not connected)		4.5			
	Absolute maximum, surge (duration ≤ 1s) †	-10		+15		
Input current	Logic "LOW"; Pull to GND		5	3	mA	
	Logic "HIGH"; Internal 1KΩ pull-up to +5	0	0	0		
Minimum pulse width		2			µs	
ESD protection	Human body model	±5			kV	
Encoder Inputs (A+, A-, B+, B-, Z+, Z-, A2+, A2-, B2+, B2-, Z2+, Z2-)²		Min.	Typ.	Max.	Units	
Differential mode compliance	For full RS422 compliance, see ²	TIA/EIA-422-A				
Input voltage	Hysteresis	±0.06	±0.1	±0.2	V	
	Differential mode	-14		+14		
	Common-mode range (A+ to GND, etc.)	-11		+14		
Input impedance, differential	A+, A2+, B+, B2+, Z+, Z2+		2.2		kΩ	
	A-, A2-, B-, B2-, Z-, Z2-		1.6			
Input frequency	Differential mode	0		10	MHz	
Minimum pulse width	Differential mode	50			ns	


Sin-Cos Encoder Inputs (Sin+, Sin-, Cos+, Cos-)²		Min.	Typ.	Max.	Units	
Input voltage, differential	Sin+ to Sin-, Cos+ to Cos-		1	1.25	V <sub>PP</sub>	
Input voltage, any pin to GND	Operational range	-1	2.5	4	V	
	Absolute maximum values, continuous	-7		+7		
	Absolute maximum, surge (duration ≤ 1s) †	-11		+14		
Input impedance	Differential, Sin+ to Sin-, Cos+ to Cos-	4.2	4.7		kΩ	
	Common-mode, to GND		2.2		kΩ	
Resolution with interpolation	Software selectable, for one sine/cosine period	2		10	bits	
Frequency	Sin-Cos interpolation	0		450	kHz	
	Quadrature, no interpolation	0		10	MHz	
ESD protection	Human body model	±2			kV	
Analog 0...5V Inputs (REF, FDBK)		Min.	Typ.	Max.	Units	
Input voltage	Operational range	0		4.95	V	
	Absolute maximum values, continuous	-12		+18		
	Absolute maximum, surge (duration ≤ 1s) †			±36		
Input impedance	To GND		8		kΩ	
Resolution			12		bits	
Integral linearity				±2	bits	
Offset error				±2	bits	
Gain error				±1%	±3%	% FS³
Bandwidth (-3dB)	Software selectable	0		1	kHz	
ESD protection	Human body model	±2			kV	
Analog ±10V Input (Ref)		Min.	Typ.	Max.	Units	
Differential voltage range				±10	V	
Common-mode voltage range	Referenced to GND	-12	0...10	+50	V	
Input impedance	Differential		40		kΩ	
Common-mode impedance	Referenced to GND		20		kΩ	
Resolution			12		bits	
Integral linearity				0.036	%FS²	
Offset error	Common-mode voltage = 0...10 V		±0.2	±0.5	%FS²	
Gain error	Common-mode voltage = 0...10 V		±10	±12	%FS²	
Bandwidth (-3dB)	Depending on software settings		1.5		kHz	
RS-232		Min.	Typ.	Max.	Units	
Compliance		TIA/EIA-232-C				
Bit rate	Software selectable	9600		115200	Baud	
Short-circuit	232TX short to GND	Guaranteed				
ESD protection	Human body model	±2			kV	
CAN-Bus		Min.	Typ.	Max.	Units	
Compliance		ISO11898, CiA-301v4.2, CiA 305 v2.2.13, 402v3.0				
Bit rate	Software selectable	125		1000	Kbps	
Bus length	1Mbps			25	m	
	500Kbps			100		
	≤ 250Kbps			250		
Resistor	Between CAN-Hi, CAN-Lo	none on-board				
Node addressing	Hardware: by DIP switch	1 ÷ 127 & LSS non-configured (CANopen); 1-127 & 255 (TMLCAN)				
	Software	1 ÷ 127 (CANopen); 1- 255 (TMLCAN)				
Voltage, CAN-Hi or CAN-Lo to GND		-26		26	V	
ESD protection	Human body model	±15			kV	

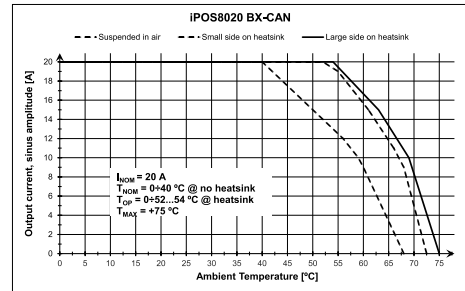
¹ Stresses beyond values listed under "absolute maximum ratings" may cause permanent damage to the device. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

² All differential input pins have internal 120Ω termination resistors connected across

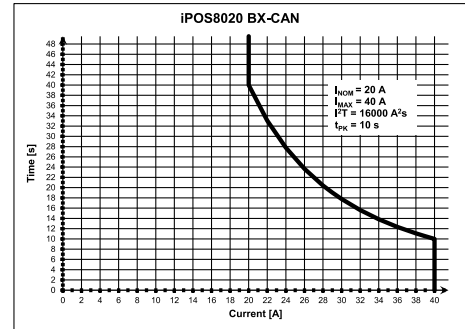
³ "FS" stands for "Full Scale"

Name EP	First edition September 5, 2022	Document template: P099.TQT.564.0001	Last edition September 5, 2022	Visa : AN
 <b>TECHNOSOFT</b>		Title of document <b>iPOS8020 BX-CAN PRODUCT DATA SHEET</b>	N° document <b>P029.026.E201.DSH.10J</b>  Page: 4 of 5	

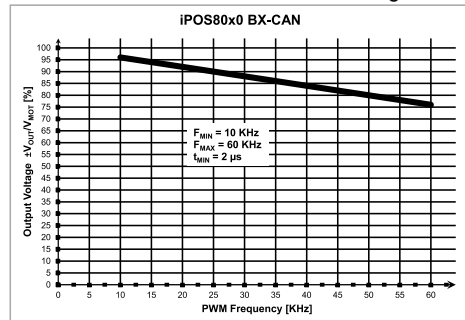
Safe torque OFF (STO1+, STO1-, STO2+, STO2+)		Min.	Typ.	Max.	Units
Safety function	According to EN61800-5-2	STO (Safe Torque OFF)			
EN 61800-5-1/-2 and EN 61508-5-3/-4 Classification	Safety Integrity Level PFHd (Probability of Failures per Hour - dangerous)	safety integrity level 3 (SIL3) 8*10 <sup>-10</sup> hour <sup>-1</sup> (0.8 FIT)			
EN13849-1 Classification	Performance Level MTTFd (meantime to dangerous failure)	Cat3/PLe 377 years			
Mode compliance		PNP			
Default state	Input floating (wiring disconnected)	Logic LOW			
Input voltage	Logic "LOW" (PWM operation disabled)	-20		5.6	V
	Logic "HIGH" (PWM operation enabled)	18		36	
	Absolute maximum, continuous	-20		+40	
Input current	Logic "LOW"; pulled to GND		0		mA
	Logic "HIGH", pulled to +Vlog		5	13	
Repetitive test pulses (High-low-high)	Ignored high-low-high			5	ms
				20	Hz
Fault reaction time	From internal fault detection to register DER bit 14 =1 and OUT2/Error high-to-low			30	ms
PWM operation delay	From external STO low-high transition to PWM operation enabled			30	ms
ESD protection	Human body model	±2			kV
BiSS/SSI Encoder Interface		Min.	Typ.	Max.	Units
Differential mode (CLOCK, DATA) <sup>1</sup>	For full RS422 compliance, see <sup>1</sup>	TIA/EIA-422			
CLOCK Output voltage	Differential; 50Ω differential load	2.0	2.5	5.0	V
	Common-mode, referenced to GND	2.3	2.5	2.7	
CLOCK frequency	Software selectable	1000, 2000, 3000			kHz
DATA Input hysteresis	Differential mode	±0.1	±0.2	±0.5	V
Data input impedance	Termination resistor on-board		120		Ω
DATA Input common mode range	Referenced to GND	-7		+12	
	Absolute maximum, surge (duration≤1s) <sup>†</sup>	-25		+25	
DATA format	Software selectable	Binary / Gray			
		Single-turn / multi-turn			
		Counting direction			
DATA resolution	Single-turn			56	Bits
	Multi-turn and single-turn			56	
If total resolution >31 bits, some bits must be ignored by software setting to achieve a max 31 bits resolution					
Supply Output (+5V)		Min.	Typ.	Max.	Units
Output voltage	Current sourced = 500mA	4.8	5	5.2	V
Output current		600	650		mA
Short-circuit		NOT protected			
Over-voltage		NOT protected			
ESD protection	Human body model	±2			kV
Conformity		Min.	Typ.	Max.	Units
EU Declaration	2014/30/EU (EMC), 2014/35/EU (LVD), 2011/65/EU (RoHS), 1907/2006/EC (REACH), 93/68/EEC (CE Marking Directive), EC 428/2009 (non dual-use item, output frequency limited to 590Hz)				
	IEC61800-5-1 / UL 61800-5-1	 <b>CAUTION!</b> This drive is UL compliant only if the applied voltage does not exceed 60V			



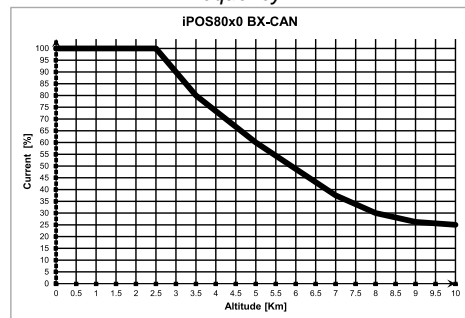
iPOS8020 BX-CAN De-rating with ambient temperature



iPOS8020 BX-CAN Over-current diagram



iPOS8020 BX-CAN Output Voltage De-rating with PWM frequency 1




iPOS8020 BX-CAN De-rating with altitude

**CAUTION!**  
 FOR PWM FREQUENCIES LESS THAN 20 KHZ, CORRELATE THE PWM FREQUENCY WITH THE MOTOR PARAMETERS IN ORDER TO AVOID POSSIBLE MOTOR DAMAGE.



<sup>1</sup> V<sub>OUT</sub> – the output voltage, V<sub>MOT</sub> – the motor supply voltage

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		<b>iPOS8020 BX-CAN</b>	<b>P029.026.E201.DSH.10J</b>	
		<b>PRODUCT DATA SHEET</b>		Page: 5 of 5