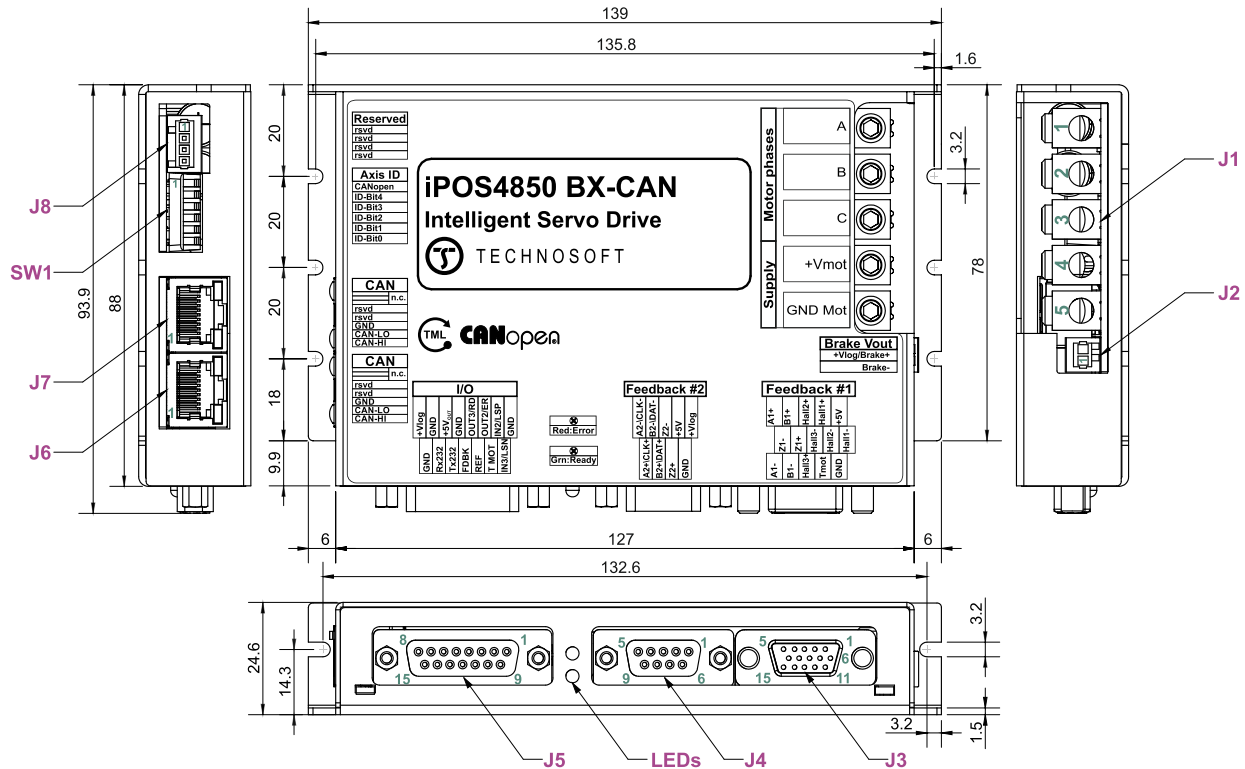




iPOS4850 BX-CAN DATASHEET

P/N: P029.200.E201



⊕ Global tolerance [mm] 0.1

All dimensions are in mm. Drawings not to scale.

Features

- Motion controller and drive in a single compact unit based on MotionChip™ technology
- Universal solution for control of rotary and linear brushless and brushed motors
- PMSM and BLDC motion control capability
- Motor supply: 11-60V; Logic supply: 9-36V
- Output current with / without external heat sink:
 - Nominal: 45 / 35.4A_{RMS} (64 / 50A sinusoidal amplitude)
 - Peak: 64A_{RMS} (90A sinusoidal amplitude)
- Thermal Protection: The internal temperature sensor disables the PWM outputs if the measured temperature exceeds 95°C
- Feedback Devices (dual-loop support)
- 1st feedback devices supported:
 - Incremental encoder interface (differential)
- 2nd feedback devices supported:
 - Incremental encoder interface (differential)
 - pulse & direction interface (differential) for external (master) digital reference
 - BiSS / SSI / EnDAT¹ encoder interface
- Digital Hall sensor interface (differential)
- 2 digital PNP inputs, 7-36V: 2 limit switches
- 2 digital outputs, 5-36V, NPN open-collector: Ready, Error 0.5A
- Solenoid driver for motor brake, 2A, commanded by OUT0
- 2 analogue inputs, 12-bit, 0-5V: Reference and Feedback (for Tacho), or general purpose
- CAN-bus 2.0B interface (±58V max voltage)
- 32 h/w addresses selectable by DIN switch
- TMLCAN and CANopen (CiA 301 v4.2, CiA 305 v.2.2.13 and CiA 402 v3.0) protocols selectable by DIN switch
- 16k x 16 SRAM memory for data acquisition
- 16k x 16 E²ROM to store setup data, TML motion programs, cam tables and other user data

Mating Connectors

Ref	Producer	Part No.	Description
J2**	Wago	733-102	Pluggable terminal block 2-pole Pin spacing 2.5 mm
J3	generic	15-pin High Density D-Sub male	Feedback #1 + Digital Hall input
J4	generic		9-pin Sub-D male
J5	generic	15-pin D-Sub male, DB15	I/O; Analog; RS232
J6&J7			Standard 8P8C modular jack (RJ-45) male
J8	-	-	Reserved. Do not connect.
J1*			High AMP wire. 4mm HEX socket. AWG 6-16 wire gauge. Strip: - min 8 mm for cables with isolation diameter less than 6.5 mm; - min 12 mm/ max 15 mm for cables with isolation diameter bigger than 6.5 mm. Avoid generating metal debris/filings into drive from the wire leads! In case of multi-stranded wires, a proper ferrule must be used as wire terminal.

* For more recommendations about wires and ferrules, check the User Manual of the drive.

** Connector delivered with the drive

Motor	PMSM	BLDC	DC BRUSH
Sensor			
Incr. Encoder	Ⓢ		Ⓢ
Incr. Encoder + Dig. Hall	Ⓢ	Ⓢ	
Digital Hall Only	Ⓢ		
SSI / BiSS-C / EnDAT ¹	Ⓢ	Ⓢ	Ⓢ
Tacho			Ⓢ

¹ Available starting with F514K firmware version

Name ALN	First edition May 26, 2020	Document template: P099.TQT.564.0001	Last edition July 27, 2026	Visa: AS
 TECHNOSOFT		Title of document iPOS4850 BX-CAN PRODUCT DATA SHEET		N° document P029.200.E201.DSH.10I Page: 1 of 4



iPOS4850 BX-CAN DATASHEET

P/N: P029.200.E201

Pin	Name	Type	Description
1	A/A+	O	Phase A for 3-ph motors, Motor+ for DC brush motors
2	B/A-	O	Phase B for 3-ph motors, Motor- for DC brush motors
3	C	O	Phase C for 3-ph motors
4	+V _{MOT}	I	Positive terminal of the motor supply input: 11 to 60V _{DC}
5	GND	-	Ground for motor supply

Pin	Name	Type	Description
1	BRAKE-	O	Negative terminal for the motor brake input; commanded as OUT0
2	BRAKE+	O	Positive terminal for the motor brake input; connected internally to +Vlog to pin

Pin	Name	Type	Description
1	+5V _{OUT}	O	5V output supply for I/O usage
2	Hall 1+	I	Digital input Hall 1+ diff. sensor input; has 120Ω resistor between pins 2 and 6
3	Hall 2+	I	Digital input Hall 2+ diff. sensor input; has 120Ω resistor between pins 3 and 7
4	B1+	I	Incr. encoder 1 B+ diff. input; has 120Ω resistor between pins 4 and 14
5	A1+	I	Incr. encoder 1 A+ diff. input; has 120Ω resistor between pins 5 and 15
6	Hall 1-	I	Digital input Hall 1- diff. sensor input; has 120Ω resistor between pins 2 and 6
7	Hall 2-	I	Digital input Hall 2- diff. sensor input; has 120Ω resistor between pins 3 and 7
8	Hall 3-	I	Digital input Hall 3- diff. sensor input; has 120Ω resistor between pins 13 and 8
9	Z1+	I	Incr. encoder 1 Z+ diff. input; has 120Ω resistor between pins 9 and 10
10	Z1-	I	Incr. encoder 1 Z- diff. input; has 120Ω resistor between pins 9 and 10
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+ diff. sensor input; has 120Ω resistor between pins 13 and 8
14	B1-	I	Incr. encoder 1 B- diff. input; has 120Ω resistor between pins 4 and 14
15	A1-	I	Incr. encoder 1 A- diff. input; has 120Ω resistor between pins 5 and 15

Pin	Name	Type	Description
1	+V _{LOG}	I	Positive terminal of the logic supply input: 12 to 36V _{DC}
2	+5V _{OUT}	O	5V output supply
3	Z2-	I	Incr. encoder 2 Z- diff. input; has 120Ω resistor between pins 3 and 7
4	B2-/ Dir-/ Data-/SL-	I	Incr. encoder 2 B- diff. input, or Dir-, or Data- for SSI & EnDAT, or Slave- for BiSS; has 120Ω resistor between pins 4 and 8
5	A2-/ Pulse-/CLK-/MA-	I	Incr. encoder 2 A- diff. input, or Pulse-, or Clock- for SSI & EnDAT, or Master- for BiSS; has 120Ω resistor between pins 5 and 9
6	GND	-	Ground
7	Z2+	I	Incr. encoder 2 Z+ diff. input; has 120Ω resistor between pins 3 and 7
8	B2+/ Pulse+/ Data+/SL+	I	Incr. encoder 2 B+ diff. input, or Dir+, or Data+ for SSI & EnDAT, or Slave+ for BiSS; has 120Ω resistor between pins 4 and 8
9	A2+/ Pulse+/CLK+/MA+	I	Incr. encoder 2 A+ diff. input, or Pulse+, or Clock+ for SSI & EnDAT, or Master+ for BiSS; has 120Ω resistor between pins 5 and 9

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 to 4	rsvd	-	Reserved. do not connect.

Pin	Name	Type	Description
1	GND	-	Ground
2	IN2/LSP	I	5-36V digital PNP 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	GND	-	Ground
6	+5V _{OUT}	O	5V output supply
7	GND	-	Ground
8	+V _{LOG}	I	Positive terminal of the logic supply input: 9 to 36V _{DC} from SELV/ PELV type power supply
9	IN3/LSN	I	5-36V digital PNP input. Negative limit switch input
10	Temp Mot	I	Analogue input, 12-bit, 0-3.3V. Used to read an analog temperature value
11	REF	I	Analogue input, 12-bit, 0-5V
12	FDBK	I	Analogue input, 12-bit, 0-5V
13	232TX	O	RS-232 Data Transmission
14	232RX	I	RS-232 Data Reception
15	GND	-	Ground

Pin	Name	Type	Description
1	CANopen	-	ON (down): CANopen communication protocol OFF (up): TMLCAN communication protocol
2	ID-Bit4	-	Hardware AxisID selection switches
3	ID-Bit3	-	All ON – AxisID= 31
4	ID-Bit2	-	All OFF – AxisID = 255 in TMLCAN
5	ID-Bit1	-	or 127 in CANopen
6	ID-Bit0	-	

Electrical characteristics

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

- T_{amb} = 24°C, V_{LOG} = 24 VDC; V_{MOT} = 48VDC
- Supplies start-up / shutdown sequence: any
- Load current (sinusoidal amplitude) = 64A

Operating Conditions		Min.	Typ.	Max.	Units
Ambient temperature ¹		0		+40	°C
Ambient humidity	Non-condensing	0		90	%Rh
Altitude / pressure ²	Altitude (vs. sea level)	-0.1	0 ± 2	2	km
	Ambient Pressure	0 ²	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
Mounted on heatsink	It is necessary to mount the iPOS4850 BX-CAN on a metallic heatsink using the provided mounting holes. If the integrated internal thermal sensor exceeds 95°C, the drive outputs turn off.				

¹ For extended temperature range, down to -30°C, a special execution is required.

² iPOS4850 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.

Name ALN	First edition May 26, 2020	Document template: P099.TQT.564.0001	Last edition July 27, 2026	Visa: AS
 TECHNOSOFT		Title of document iPOS4850 BX-CAN PRODUCT DATA SHEET		N° document P029.200.E201.DSH.10I Page: 2 of 4



iPOS4850 BX-CAN DATASHEET

P/N: P029.200.E201

Environmental Characteristics			Min.	Typ.	Max.	Units
Size (Length x Width x Height)	Without mating connectors		139 x 93.9 x 24.6			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		see theoretical chart			
Efficiency				98		%
Cleaning agents	Dry cleaning is recommended		Only Water- or Alcohol- based			
Protection degree	According to IEC60529, UL508		IP20			-
Logic Supply Input (+V _{LOG})			Min.	Typ.	Max.	Units
Supply voltage	Nominal values		9	24	36	V _{DC}
	Absolute maximum values, drive operating but outside guaranteed parameters		8	24	40	V _{DC}
	Absolute maximum values, surge (duration ≤ 10ms) [†]		-1		+45	V
Supply current	No enc. No Load on Digital Outputs	+V _{LOG} = 9V		280		mA
		+V _{LOG} = 12V		200		
		+V _{LOG} = 24V		130		
		+V _{LOG} = 36V		90		
Motor Supply Input (+V _{MOT})			Min.	Typ.	Max.	Units
Supply voltage	Nominal values		12	48	60	V _{DC}
	Absolute maximum values, drive operating but outside guaranteed parameters		11		70	V _{DC}
	Absolute maximum values, surge (duration ≤ 10ms) [†]		-1		75	V
Supply current	Idle			1	5	mA
	Operating		-50	±10	+50	A
	Absolute maximum value, short circuit condition (duration ≤ 10ms) [†]				100	A
Motor Outputs (A/A+, B/A-, C)			Min.	Typ.	Max.	Units
Nominal current	Sinusoidal RMS ¹				45	A _{RMS}
	Sinusoidal RMS ²				35.4	
	Sinusoidal amplitude ¹				64	A
	Sinusoidal amplitude ²				50	
Peak current	maximum 13s with 6 AWG wires, external heatsink		-90		+90	A
Short-circuit protection threshold					±100	A
Short-circuit protection delay			5	10		µs
Off-state leakage current				±0.5	±1	mA
Motor inductance (phase-to-phase)	Recommended value, for current ripple max. ±5% of full range; +V _{MOT} = 48 V	F _{PWM}				µH
		20 kHz	330			
		40 kHz	150			
	Minimum value, limited by short-circuit protection; +V _{MOT} = 48 V	20 kHz	120			µH
		40 kHz	40			
		60 kHz	30			
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 (IN2/LSP, IN3/LSN)			Min.	Typ.	Max.	Units
Mode compliance			PNP			
Default state	Input floating (wiring disconnected)		Logic LOW			
Input voltage	Logic "LOW"		-10	0	3.3	V
	Logic "HIGH"		6.7		36	
	Floating voltage (not connected)			0		
	Absolute maximum, continuous		-10		+39	
	Absolute maximum, surge (duration ≤ 1s) [†]		-20		+40	
Input current	Logic "LOW"; pulled to GND			0		mA
	Logic "HIGH"	V _{LOG} =24V		9.15		
		V _{LOG} =36V		13.7		
Input frequency			0		150	kHz
Minimum pulse			3.3			µs
ESD protection	Human body model 0.1nF 1.5kΩ		±1			kV

Digital Outputs (OUT2/Error, OUT3/Ready)		Min.	Typ.	Max.	Units
Mode compliance	All outputs (OUT2/Error, OUT3/Ready)	NPN 24V			
Default state	Not supplied (+V _{LOG} floating or to GND)	High-Z (floating)			
	Immediately after power-up	OUT2/Error, OUT3/Ready		Logic "LOW"	
	Normal operation	OUT2/Error		Logic "HIGH"	
		OUT3/Ready		Logic "LOW"	
Output voltage	Logic "LOW"; output current = 0.5A			0.8	V
	Logic "HIGH"; output current = 0, no load	2.9	3	5	
	Logic "HIGH", external load to +V _{LOG}		V _{LOG}		
	Absolute maximum, continuous	-0.5		V _{LOG} +0.5	
	Absolute maximum, surge (duration ≤ 1s) [†]	-1		V _{LOG} +1	
Output current	Logic "LOW", sink current, continuous, OUT2/Error, OUT3/Ready			0.5	A
	Logic "HIGH", source current; external load to GND; V _{OUT} ≥ 2.0V			2	mA
	Logic "HIGH", leakage current; external load to +V _{LOG} ; V _{OUT} = V _{LOG} max = 40V		0.1	0.2	mA
Minimum pulse width		2			µs
ESD protection	Human body model	±15			kV
Digital Hall Inputs (Hall1+, Hall1-, Hall2+, Hall2-, Hall3+, Hall3-) ³		Min.	Typ.	Max.	Units
Differential mode compliance	For full RS422 compliance, see ³	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	A1+/A1-, B1+/B1-, Z1+/Z1-, A2+/A2-, B2+/B2-, Z2+/Z2-		120		Ω
Input frequency	Differential mode	0		10	MHz
Minimum pulse width	Differential mode	50			ns
Encoder Inputs (A1+, A1-, B1+, B1-, Z1+, Z1-, A2+, A2-, B2+, B2-, Z2+, Z2-) ³		Min.	Typ.	Max.	Units
Differential mode compliance	For full RS422 compliance, see ³	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	A1+/A1-, B1+/B1-, Z1+/Z1-, A2+/A2-, B2+/B2-, Z2+/Z2-		120		Ω
Input frequency	Differential mode	0		10	MHz
Minimum pulse width	Differential mode	50			ns

¹ With adequate thermal heat sink

² No thermal heat sink (worst case scenario)

³ All differential input pins have internal 120Ω termination resistors connected across

No thermal heat sink (worst case scenario)					
Name	First edition	Document template: P099.TQT.564.0001		Last edition	Visa:
ALN	May 26, 2020			July 27, 2026	AS
 TECHNOSOFT		Title of document		N° document	
		iPOS4850 BX-CAN PRODUCT DATA SHEET		P029.200.E201.DSH.10I	
Page: 3 of 4					



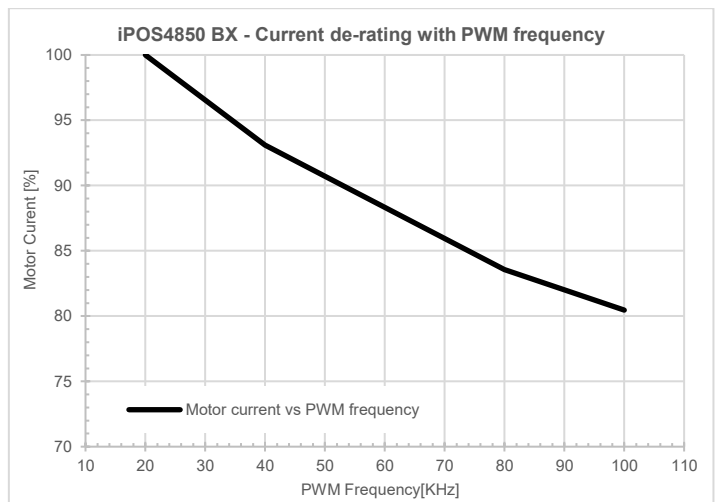
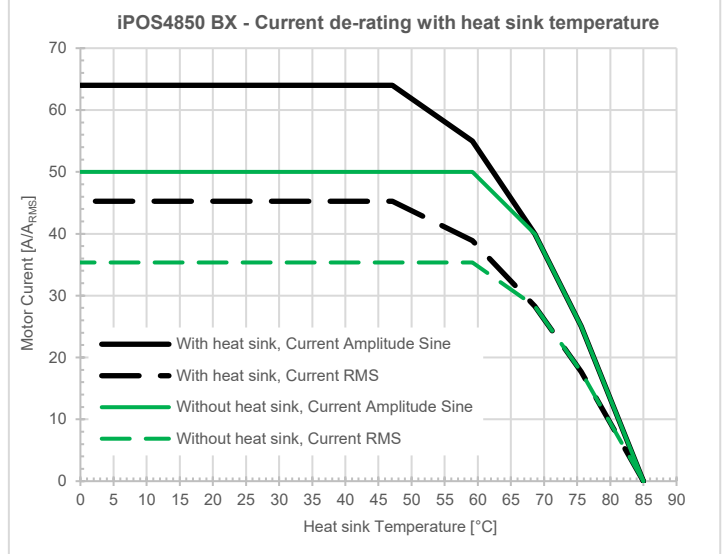
iPOS4850 BX-CAN DATASHEET

P/N: P029.200.E201

BiSS/SSI Encoder Interface			Min.	Typ.	Max.	Units
Differential mode (CLOCK, DATA)	For full RS422 compliance, see ¹		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) [†]		-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					
Analog 0...5V Inputs (REF,FDBK)			Min.	Typ.	Max.	Units
Input voltage	Operational range		0		5	V
	Absolute maximum values, continuous		-12		+18	
	Absolute maximum, surge (duration ≤ 1s) [†]				±36	
Input impedance	To GND			14.7		kΩ
Resolution				12		bits
Integral linearity					±2	bits
Offset error				±2	±10	bits
Gain error				±1%	±3%	% FS ²
Bandwidth (-3dB)	Software selectable		0		1	kHz
ESD protection	Human body model		±2			kV
CAN-Bus			Min.	Typ.	Max.	Units
Compliance			ISO11898			
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 DIN switches		1-31 & 255			TMLCAN
			1-31 & 255(LSS inactive)			CANopen
	Software		1- 255 (TMLCAN); 1-127 (CANopen)			
Voltage, CAN-Hi or CAN-Lo to GND			-58		58	V
ESD protection	Human body model		±8			kV
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
Solenoid Driver (OUT0/Brake)			Min.	Typ.	Max.	Units
Brake+/Brake-: solenoid driver, 2A, overcurrent protected (Brake+ connected internally to +Vlog). Current flows into solenoid from Brake+ to Brake-; commanded by OUT0 digital output						
Default state	Not supplied (+VLOG floating or to GND)		High-Z (floating)			
	Immediately after power-up	Brake-	High-Z (floating)			
	Normal operation	Brake-	High-Z (floating)			
Output voltage	Logic "LOW" (Brake-)				0.2	V
	Logic "HIGH"; load present			+Vlog		
	Logic "HIGH", no load present			+5V		
	Absolute maximum, continuous		-0.5		55	
Output current	Logic "LOW", sink current, continuous, Brake-				2	A
	Logic "HIGH", leakage current; external load to +VLOG; VOUT = VLOG max = 55V				0.2	mA

Supply Output (+5V)		Min.	Typ.	Max	Units
Output voltage	Current sourced = 500mA	4.8	5	5.2	V
Output current				450	mA
Short-circuit		protected			
Over-voltage		NOT protected			
ESD protection	Human body model 0.1nF 1.5 kΩ	±2			kV
Operating temperature		Min.	Typ.	Max	Units
Ambient Temperature	Non condensing	0		40	°C
		Ambient temperature can exceed 40°C if the internal temperature sensor measures less than 95°C			
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)				

[†] 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.



¹ All differential input pins have internal 120Ω termination resistors connected across

² "FS" stands for "Full Scale"

Name ALN	First edition May 26, 2020	Document template: P099.TQT.564.0001	Last edition July 27, 2026	Visa: AS
TECHNOSOFT		Title of document iPOS4850 BX-CAN PRODUCT DATA SHEET		N° document P029.200.E201.DSH.10I Page: 4 of 4