iMOT17xB TM-CAN Intelligent Servo Motor Size 17

Brushless Motors with Integrated Drive and Motion Controller for OEM Applications

The iMOT17xB TM-CAN represents the newest family of the Technosoft intelligent brushless servo motors that combine motion controller, drive, encoder and motor into a single compact package in the NEMA17 size (42x42 mm).
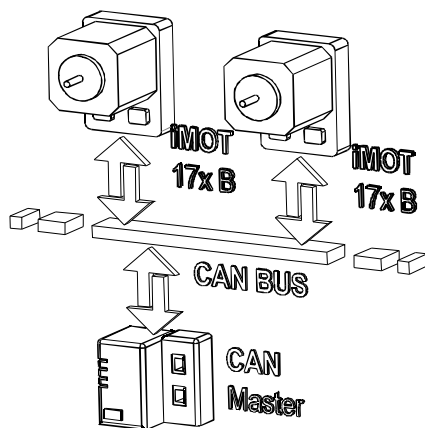
The iMOT17xB series represents a cost-effecive, compact solution specifically targeted to those distriuted motion control applications where the elimination of the cabling between motor, sensor and drive is the success factor.

As an intelligent motor, the iMOT17xB TM-CAN is empowered by the extreme flexibility offered by the TML (Technosoft Motion Language) instruction set. Acting as a programmable motion controller, drive and motor in a compact form, the unit can replace the host in various single or multi-axis stand-alone applications.

DISTRIBUTED CONTROL

Complex motion sequences, advanced positioning profiles like PVT or electronic caming, I/O and program flow control, data transfer between axes, subroutines, ISRs and multiple homing modes ease the motion application implementation task.

In systems that require a host, the iMOT17xB TM-CAN operates as an intelligent slave executing motion sequences triggered via commands received on RS-232 or TMLCAN while fully supporting as well the CiA402 CANopen drive profile.

TYPICAL APPLICATIONS

- **Systems with distributed motor control intelligence**
- **Packaging**
- **Printing**
- **Textile**
- **Medical**
- **Handling**
- **Labeling**
- **Pick and place**
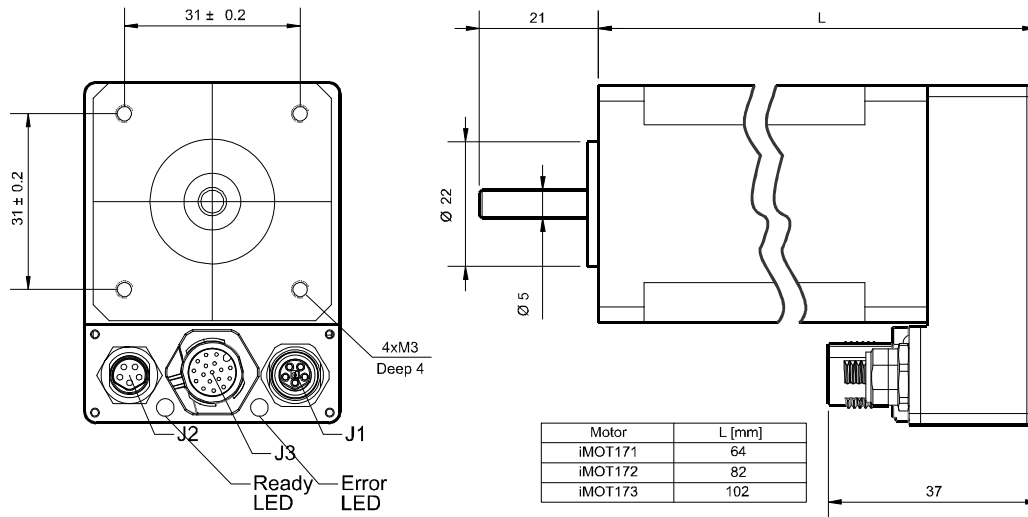- **Factory automation**

FEATURES :

- **Fully digital intelligent brushless servo motor with embedded motion controller, drive and absolute position sensor**
- **Cost effective positioning system, due to compacteness and elimination of motor wiring**
- **Available in 3 motor lengths, offering 100, 200 and 300 mNm of continuous torque**
- **Separate or combined logic and power supply for safety or reduced wiring requirements**
- **Advanced motion control capabilities (PVT, S-curve, electronic cam)**
- **Motion programming via TML (Technosoft Motion Language) or motion libraries for Visual C / VB / LabVIEW / Linux and PLC**
- **Standalone operation with stored motion sequences**
- **Communication:**
  - **CAN-Bus with TMLCAN protocol or**
  - **CANopen protocol (CiA301 and 402)**
- **Digital and analogue I/Os:**
  - **4 digital PNP/NPN programmable inputs, 5-24V**
  - **2 digital NPN outputs, 24V/TTL, 0.5A**
  - **1 analogue input: 12 bits resolution, 0-5 V**
- **Feedback devices:**
  - **Absolute single-turn position sensor offering a resolution of 4096 counts / revolution**
- **Programmable protections:**
  - **Over-current, over-temperature, short circuit**
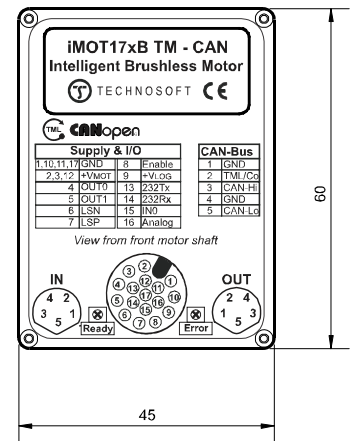 - **Over and undervoltage, i2t, control error**

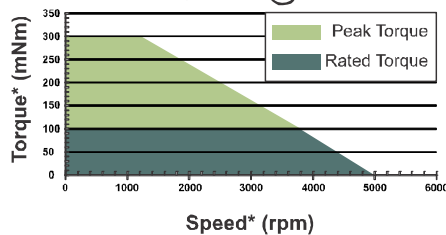Your **Next** **Intelligent** **Move**

TECHNOSOFT
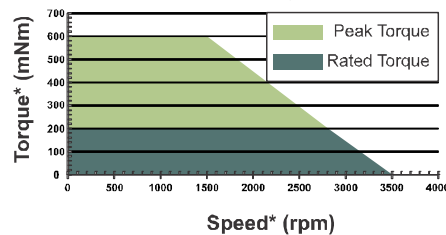MOTION TECHNOLOGY

TECHNICAL AND ORDERING INFORMATION

31 ± 0.2

31 ± 0.2

21   L

Ø 22

Ø 5

4xM3
Deep 4

J2   J3   J1

Ready LED   Error LED

37

iMOT17xB TM - CAN
Intelligent Brushless Motor

TECHNOSOFT CE

TML CANopen

Supply & I/O		CAN-Bus	
1,10,11,17	GND	8	Enable	1	GND
2,3,12	+VMOT	9	+VLOG	2	TML/Co
4	OUT0	13	232Tx	3	CAN-Hi
5	OUT1	14	232Rx	4	GND
6	LSN	15	IN0	5	CAN-Lo
7	LSP	16	Analog		

View from front motor shaft

IN   OUT

Ready   Error

60

45

Motor	L [mm]
iMOT171	64
iMOT172	82
iMOT173	102

iMOT171 @24V

Torque* (mNm) vs Speed* (rpm)
- Peak Torque
- Rated Torque

iMOT172 @24V

Torque* (mNm) vs Speed* (rpm)
- Peak Torque
- Rated Torque

iMOT173 @24V

Torque* (mNm) vs Speed* (rpm)
- Peak Torque
- Rated Torque

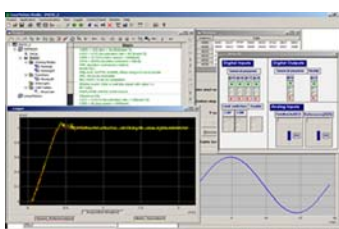## EASYMOTION STUDIO

A graphical development platform, for configuration, para-meterization and programming of the drive, through

- Motion system set-up wizard
- Tuning assistance
- Automatic TML code generation capability
- Definition, programming and testing of motion sequences
- Advanced data logging and customizable control panels

MOTION CONTROL LIBRARIES

The TML_LIB Motion Control Libraries can be used to implement a motion control application on a PC from Visual C / C++, C#, Visual Basic, Delphi or LabVIEW under Windows or Linux operating systems.
If a PLC is used as host, implementations of the TML_LIB according with IEC-61131 standard are available for Siemens, B&R and Omron PLCs.

Application notes with TML program examples at :
www.technosoftmotion.com

ORDERING INFORMATIONS * :

P042.111.E320	iMOT171B TM-CAN Intelligent Brushless Motor, CAN
P042.121.E320	iMOT172B TM-CAN Intelligent Brushless Motor, CAN
P042.131.E320	iMOT173B TM-CAN Intelligent Brushless Motor, CAN
P034.001.E002	EasyMotion Studio Software
P040.001.Exxx	TML_LIB Motion Library**
P038.040.C199	Complete cable set 150 cm for iMOT17x TM-CAN

*Other communication buses available upon request

**ask for existing libraries types

iMOT17xB INTELLIGENT SERVO MOTOR FAMILY SPECIFICATIONS :

ELECTRICAL SPECIFICATIONS

	Units	iMOT171B	iMOT172B	iMOT173B
Rated torque	mNm	100	200	300
Peak torque	mNm	300	600	900
Rotor Inertia	g.cm^2	29	59	89
Speed Range (with full torque @ 24Vdc)	rpm	0 - 5000	0 - 3500	0 - 2300
Encoder resolution	counts/rev		4096	
Logic Power Supply input	V		12 - 36	
Motor Power Supply input	V		24 - 48	
Ambient operating temperature	°C		0-40	
Isolation rating			IP50	

MECHANICAL SPECIFICATIONS *

	Units	iMOT171B	iMOT172B	iMOT173B
Flange and Shaft		NEMA17 compatible, front 42 x 42mm, 5mm shaft		
Frame size	mm	42 x 42; 60 in connectors area		
Length	mm +/-1.5	64	82	102
Weight	kg	0.37	0.54	0.70
Shaft Tolerance	mm		+0 / -0.013	

*Other mechanical configurations, with adapted gearboxes are available upon request

CONNECTORS ON MOTOR:

J1	CAN, M8 plug 5 pin
J2	CAN, M8 socket 5 pin
J3	Supply, I/O, M12 plug 17 pin

SALES OFFICES

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Tel.: +41 32 732 55 00
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sales@technosoftmotion.com

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www.technosoftmotion.com

iMOT17xB TM-CAT Intelligent Servo Motor Size 17

Brushless Motors with Integrated Drive and Motion Controller for OEM Applications

The iMOT17xB TM-CAT represent the newest family of the Technosoft intelligent brushless servo motors that combine motion controller, drive, encoder and motor into a single compact package with EtherCAT communication.

As an intelligent motor, the iMOT17xB TM-CAT is empowered by the extreme flexibility offered by the TML (Technosoft Motion Language).

EtherCAT Networking

The iMOT17xB TM-CAT supports CAN application protocol over EtherCAT® (CoE) in conformance with CiA 402 device profile. Advanced features as cyclic synchronous position, up to 35 customizable homing modes (including all CiA 402 standard homing modes), PVT third order interpolation motion profiles, etc. are covered.

Motion programming can be done via an EtherCAT® master, or using the unit built-in motion controller executing a TML program. A distributed control approach, combining the above options, like for example a master calling motion functions programmed on the units in TML is also possible.
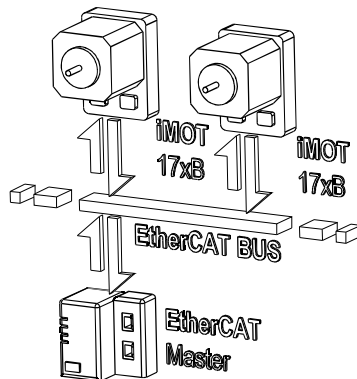
Typical Applications

- **Systems with distributed motor control intelligence**
- **Packaging**
- **Printing**
- **Textile**
- **Medical**
- **Pick and place**
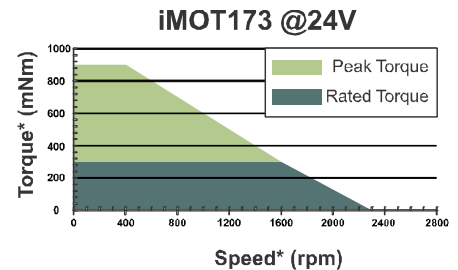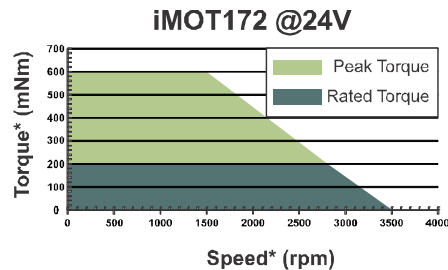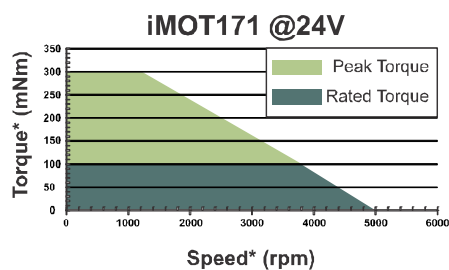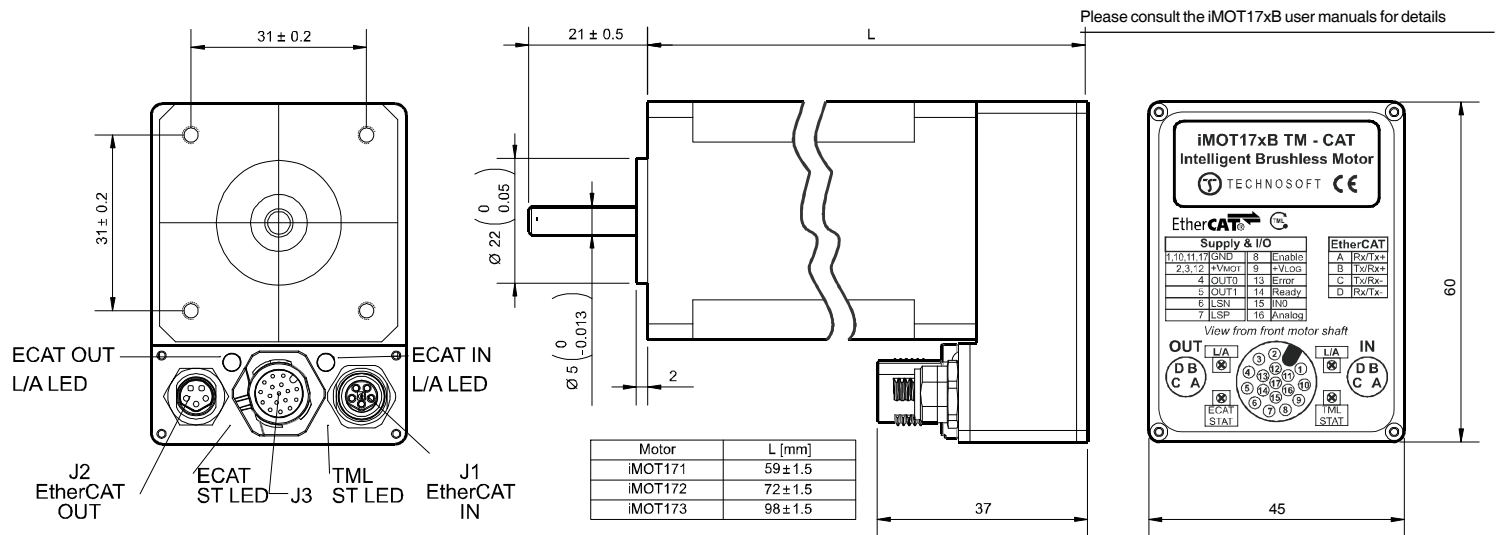- **Factory automation**

Features :

- **Fully digital intelligent brushless servo motor with embedded motion controller, drive and absout position sensor**
- **Cost effective positioning system, due to compacteness and elimination of motor wiring**
- **Available in 3 motor lengths, offering 100, 200 and 300 mNm of continuous torque**
- **Separate or combined logic and power supply for safety or reduced wiring requirements**
- **Advanced motion control capabilities (PVT, S-curve, electronic cam)**
- **Motion programming via TML (Technosoft Motion Language) or motion libraries for Visual C / VB / LabVIEW / Linux and PLC**

- `Standalone operation with stored motion sequences`
- **Communication:**
  - **- EtherCAT: CoE protocol**
- **Digital and analogue I/Os:**
  - **- 4 digital programmable inputs, 5-24V**
  - **- 4 digital outputs, 0 - 5V, 0.5A**
  - **- 1 analogue input: 12 bits resolution, 0-5 V**
- **Feedback devices:**
  - **- Absolute single-turn position sensor offering a resolution of 4096 counts / revolution**
- **Programmable protections:**
  - **- Over-current, over-temperature, short circuit**
  - **- Over and undervoltage, i2t, control error**

TECHNOSOFT
MOTION TECHNOLOGY

Your **Next** Intelligent **Move**

TECHNICAL AND ORDERING INFORMATION

31 ± 0.2   31 ± 0.2

21 ± 0.5   L

Ø 22 $_{-0.05}^{0}$

Ø 5 $_{-0.013}^{0}$

2

ECAT OUT L/A LED
ECAT IN L/A LED

J2 EtherCAT OUT
ECAT ST LED   J3   TML ST LED
J1 EtherCAT IN

Motor	L [mm]
iMOT171	59 ± 1.5
iMOT172	72 ± 1.5
iMOT173	98 ± 1.5

37

iMOT17xB TM - CAT
Intelligent Brushless Motor
TECHNOSOFT   CE
EtherCAT

Supply & I/O				EtherCAT	
1,10,11,17	GND	8	Enable	A	Rx/Tx+
2,3,12	+VMOT	9	+VLOG	B	Tx/Rx+
4	OUT0	13	Error	C	Tx/Rx-
5	OUT1	14	Ready	D	Rx/Tx-
6	LSN	15	IN0		
7	LSP	16	Analog		

View from front motor shaft

OUT   L/A   L/A   IN
D B   D B
C A   C A
ECAT STAT   TML STAT

60

45

iMOT171 @24V

iMOT172 @24V

iMOT173 @24V

EASYMOTION STUDIO

The configuration, tuning and programming of the iMOT17xB TM-CAT motor is easy with Technosoft's powerful graphical platform, EasyMotion Studio.

The high level graphical development environment Easy-Motion Studio supports the configuration, parameterization and programming of the drive, through:

- Motion system set-up wizard
- Tuning assistance with capture functions
- Definition, programming and testing of motion sequences

Application notes with TML program examples at : www.technosoftmotion.com

ORDERING INFORMATIONS * :

P042.111.E322	iMOT171B TM-CAT Intelligent Brushless Motor, EtherCAT
P042.121.E322	iMOT172B TM-CAT Intelligent Brushless Motor, EtherCAT
P042.131.E322	iMOT173B TM-CAT Intelligent Brushless Motor, EtherCAT
P034.001.E002	EasyMotion Studio Software
P038.040.C299	Complete cable set 150 cm for iMOT17xB TM-CAT

*Other communication buses available upon request

iMOT17xB INTELLIGENT SERVO MOTOR FAMILY SPECIFICATIONS :

ELECTRICAL SPECIFICATIONS

	Units	iMOT171B	iMOT172B	iMOT173B
Rated torque	mNm	100	200	300
Peak torque	mNm	300	600	900
Rotor Inertia	g.cm²	29	59	89
Speed Range (with full torque @ 24Vdc)	rpm	0 - 5000	0 - 3500	0 - 2300
Encoder resolution	counts/rev	4096		
Logic Power Supply input	V	12 - 36		
Motor Power Supply input	V	24 - 48		
Ambient operating temperature	°C	0-40		
Isolation rating		IP50		

MECHANICAL SPECIFICATIONS *

	Units	iMOT171B	iMOT172B	iMOT173B
Flange and Shaft	NEMA17 compatible, front 42 x 42mm, 5mm shaft			
Frame size	mm	42 x 42; 60 in connectors area		
Length	mm +/-1.5	59	78	98
Weight	kg	0.37	0.54	0.70
Shaft Tolerance	mm	+0 / -0.013		

*Other mechanical configurations, with adapted gearboxes are available upon request

CONNECTORS ON MOTOR :

J1, J2	EtherCAT, M8 socket 4 pin
J3	Supply, I/O, M12 plug 17 pin

iMOT17ₓB XM-CAN Intelligent Servo Motor Size 17

Brushless Motors with Integrated Drive and Motion Controller

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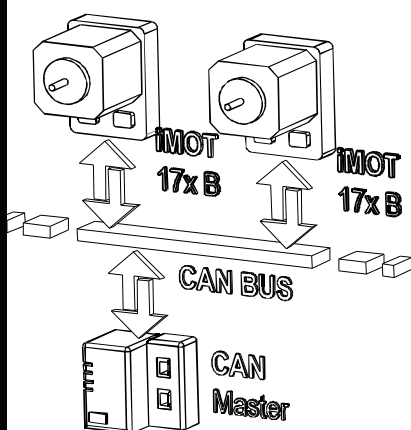
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DISTRIBUTED CONTROL

Complex motion sequences, advanced positioning profiles like PVT or electronic caming, I/O and program flow control, data transfer between axes, subroutines, ISRs and multiple homing modes ease the motion application implementation task.

In systems that require a host, the iMOT17xB XM-CAN operates as an intelligent slave executing motion sequences triggered via commands received on RS-232 or TMLCAN while fully supporting as well the CiA402 CANopen drive profile.

Your Next Intelligent Move

TYPICAL APPLICATIONS

- **Systems with distributed motor control intelligence**
- **Packaging**
- **Printing**
- **Textile**
- **Medical**
- **Handling**
- **Labeling**
- **Pick and place**
- **Factory automation**

TECHNOSOFT
MOTION TECHNOLOGY
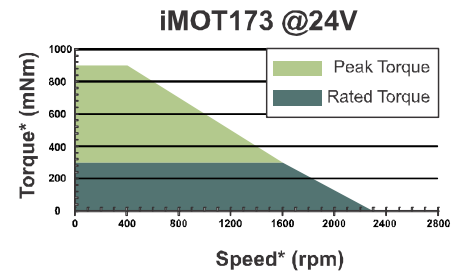
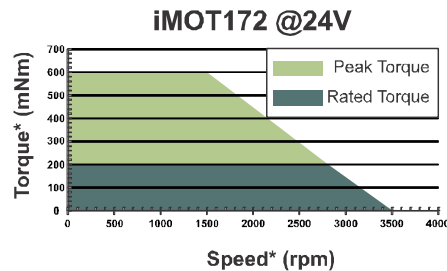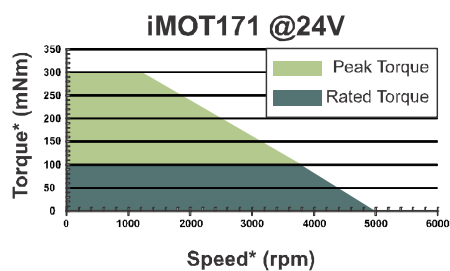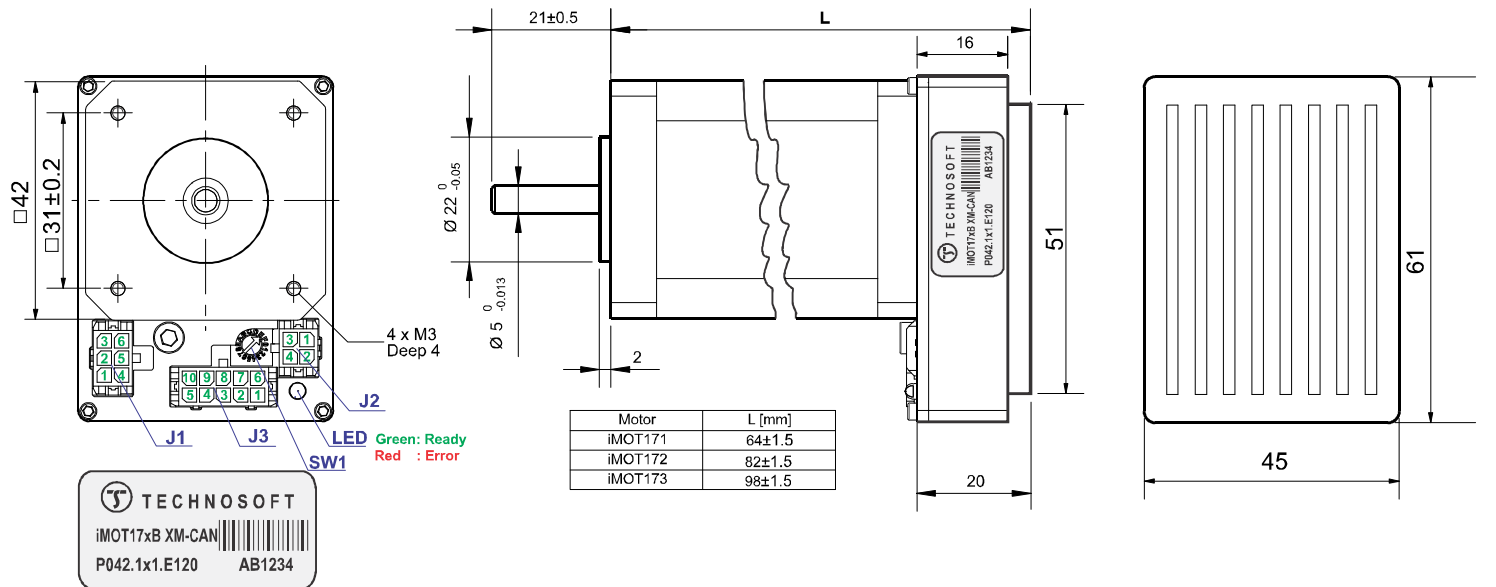P091.042.iMOTxB_XM-CAN.LFT.1115

FEATURES :

- **Fully digital intelligent brushless servo motor with embedded motion controller, drive and absolute position sensor**
- **Available in 3 motor lengths, offering 100, 200 and 300 mNm of continuous torque**
- **Cost effective positioning system, due to compacteness and elimination of motor wiring**
- **Advanced motion control capabilities (PVT, S-curve, electronic cam)**
- **Motion programming via TML (Technosoft Motion Language) or motion libraries for Visual**
- **C / VB / LabVIEW / Linux and PLC**
- **Standalone operation with stored motion sequences**
- **Motor supply:12-48V; Logic supply: 12-36V**
- **Communication:**
  - **CAN-Bus with TMLCAN protocol or**
  - **CANopen protocol (CiA301 and 402)**
- **Digital and analogue I/Os:**
  - **5 programmable PNP/NPN digital inputs**
  - **2 digital outputs, 0 - 5V, 0.5A**
  - **1 analogue input: 12 bits resolution, 0-5 V**
- **Feedback device:**
  - **Absolute single-turn position sensor offering a resolution of 4096 counts / revolution**
- **16 h/w addresses selectable by hex switch**
- **Programmable protections:**
  - **Over-current, over-temperature, short circuit**
  - **Over and undervoltage, i2t, control error**

Motor	L [mm]
iMOT171	64±1.5
iMOT172	82±1.5
iMOT173	98±1.5

4 x M3 Deep 4

J1 J3 J2 LED Green: Ready Red: Error SW1

TECHNOSOFT
iMOT17xB XM-CAN
P042.1x1.E120   AB1234

iMOT171 @24V

iMOT172 @24V

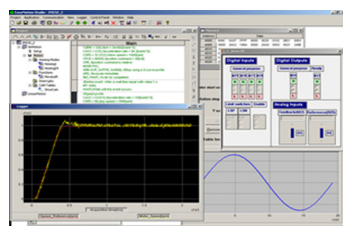### iMOT173 @24V

* ALL VALUES ±10%

EASYMOTION STUDIO

A graphical development platform, for configuration, parameterization and programming of the drive, through

- Motion system set-up wizard
- Tuning assistance
- Automatic TML code generation capability
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- Advanced data logging and customizable control panels

MOTION CONTROL LIBRARIES

The TML_LIB Motion Control Libraries can be used to implement a motion control application on a PC from Visual C / C++, C#, Visual Basic, Delphi or LabVIEW under Windows or Linux operating systems.

If a PLC is used as host, implementations of the TML_LIB according with IEC-61131 standard are available for Siemens, B&R and Omron PLCs.

Application notes with TML program examples at :
www.technosoftmotion.com

ORDERING INFORMATIONS * :

P042.111.E120	iMOT171B XM-CAN Intelligent Brushless Motor, CAN
P042.121.E120	iMOT172B XM-CAN Intelligent Brushless Motor, CAN
P042.131.E120	iMOT173B XM-CAN Intelligent Brushless Motor, CAN
P034.001.E002	EasyMotion Studio Software
P040.001.Exxx	TML_LIB Motion Library
P038.040.C099	Complete cable set 100 cm for iMOT17xB XM-CAN
P038.040.C079	Housing & crimp pins set for iMOT17xB XM-CAN

*Other communication buses available upon request

iMOT17xB INTELLIGENT SERVO MOTOR FAMILY SPECIFICATIONS :

ELECTRICAL SPECIFICATIONS

	Units	iMOT171B	iMOT172B	iMOT173B
Rated torque	mNm	100	200	300
Peak torque	mNm	300	600	900
Rotor Inertia	g.cm^2	29	59	89
Speed Range (@ 24Vdc)	rpm	0 - 5000	0 - 3500	0 - 2300
Encoder resolution	counts/rev		4096	
Logic Power Supply input	V		12-36	
Motor Power Supply input	V		12-48	
Ambient operating temperature	°C		0-40	
Isolation rating			IP40	

MECHANICAL SPECIFICATIONS *

	Units	iMOT171B	iMOT172B	iMOT173B
Flange and Shaft		NEMA17 compatible, front 42 x 42mm, 5mm shaft		
Frame size	mm	42 x 42; 45 x 61 in connectors area		
Length	mm +/-1.5	59	79	99
Weight	g	395	515	720

*Other mechanical configurations, with adapted gearboxes are available upon request

MATING CONNECTORS :

J1	Molex 2X3 MiniFit 43045-0600
J2	Molex 2X2 MiniFit 43045-0400
J3	Molex 2X5 MiniFit 43045-1000
Crimp pins	Molex 04303 0-0007