

LinMot[®]



B1100 Drive Installation Guide

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1 Important Safety Notes for B1100 Series Drives

CAUTION!



In order to assure a safe and error free operation, and to avoid severe damage to system components, all system components must be directly attached to a single ground bus that is earth or utility grounded.



Each system component should be tied directly to the ground bus (star pattern), rather than daisy chaining from component to component. (LinMot motors are properly grounded through their power cables when connected to LinMot drives).



All connectors must not be connected or disconnected while DC voltage is applied. Do not disconnect system components until all LinMot drives LEDs have turned off. (Capacitors in the power supply may not fully discharge for several minutes after input voltage has been disconnected). Failure to observe these precautions may result in severe damage to electronic components in LinMot motors and/or drives.

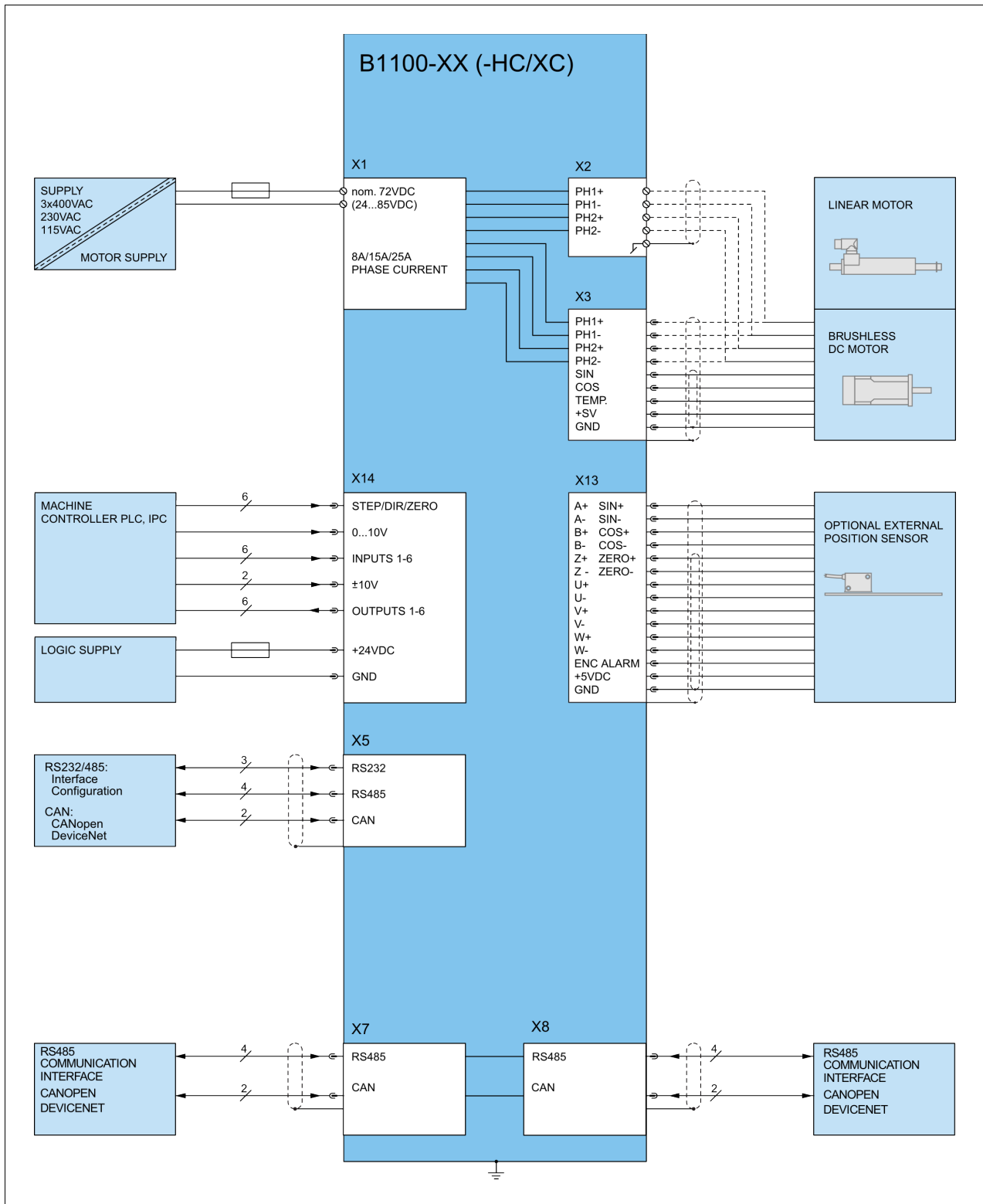


Do not switch Power Supply DC Voltage. All power supply switching and E-Stop breaks should be done to the AC supply voltage of the power supply.



Do not connect or disconnect the motors from drives while voltage is applied. Wait to connect or disconnect motors until all LinMot drives LEDs have turned off. (Capacitors may not fully discharge for several minutes after power has been turned off). Failure to observe these precautions may result in severe damage to electronic components in LinMot motors and/or drives.

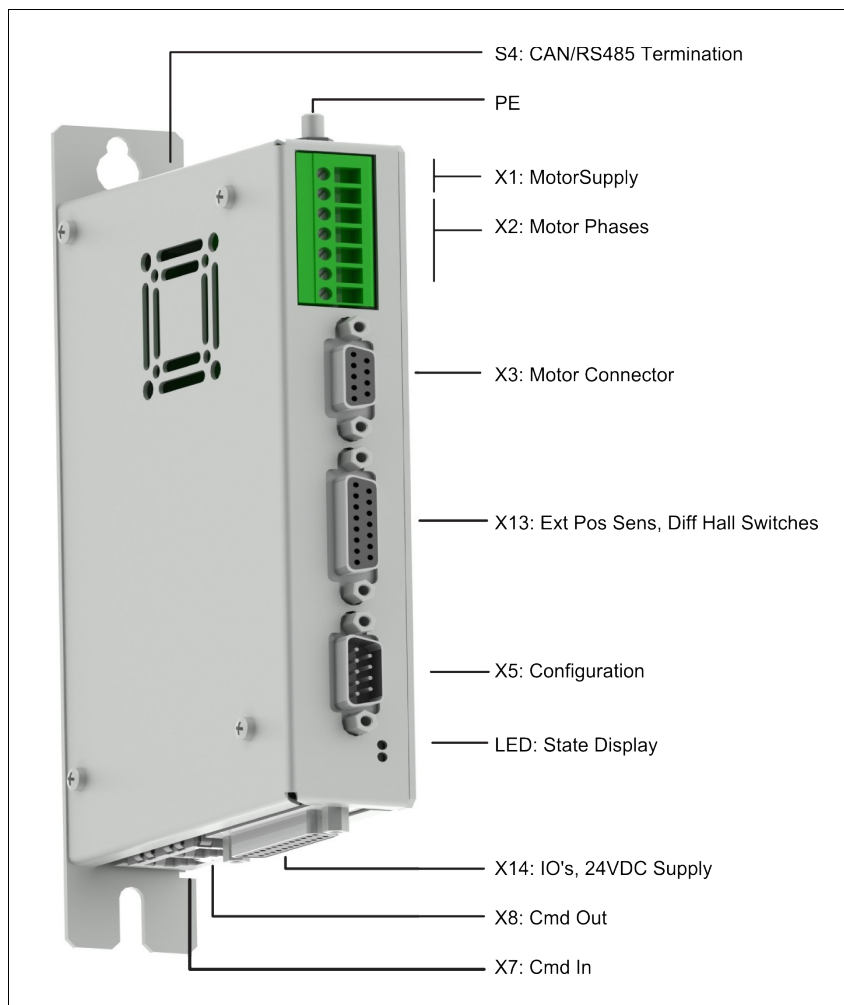
2 System Overview



B1100 Installation Guide

Typical servo system B1100-XX-YY: Servo drive, motor and power supply.

3 B1100 Interfaces



| | | B1100-PP-XX | B1100-VF-XX | B1100-GP-XX |
|-----------|--|-------------|-------------|-------------|
| Connector | | | | |
| X1 | Motor Supply | • | • | • |
| X2 | Motor Phases (Screw Terminals) | • | • | • |
| X3 | Motor / Motor Signals | • | • | • |
| X5 | Com / Config RS232, RS485, CAN | • | • | • |
| X7 | RS485 / CAN In | • | • | • |
| X8 | RS485 / CAN Out | • | • | • |
| X13 | External/Simulated Position Encoder Diff Hall Switches | • | • | • |
| X14 | 6 Digital Inputs 6 Digital Outputs Analog In 0..10V Analog In -10V.. +10V Diff Step Dir zero 24V Logic Supply | • | • | • |
| LED | State Indicator | • | • | • |
| S4 | Bus Termination | • | • | • |

4 Functionality

| | B1100-PP | B1100-PP-HC | B1100-PP-XC | B1100-VF | B1100-VF-HC | B1100-VF-XC | B1100-GP | B1100-GP-HC | B1100-GP-XC |
|---|----------|-------------|-------------|----------|-------------|-------------|----------|-------------|-------------|
| Supply Voltage | | | | | | | | | |
| Motor Supply 72VDC (24...85VDC) | • | • | • | • | • | • | • | • | • |
| Logic Supply 24VDC (22...26VDC) | • | • | • | • | • | • | • | • | • |
| Motor Phase Current | | | | | | | | | |
| 8A _{peak} / 6A _{rms} (0..599Hz) | • | | | • | | | • | | |
| 15A _{peak} / 9A _{rms} (0..599Hz) | | • | | | • | | | • | |
| 25A _{peak} / 12A _{rms} (0..599Hz) | | | • | | | • | | | • |
| Controllable Motors | | | | | | | | | |
| LinMot P01-23x... | • | • | • | • | • | • | • | • | • |
| P01-37x... | • | • | • | • | • | • | • | • | • |
| P01-48x... | • | • | • | • | • | • | • | • | • |
| DC Motors | • | • | • | • | • | • | • | • | • |
| Brushless DC / EC Motors | • | • | • | • | • | • | • | • | • |
| Command Interface | | | | | | | | | |
| Easy Steps Max. 6 Commands | • | • | • | • | • | • | • | • | • |
| +/-10V Current Command Interface | | | | • | • | • | • | • | • |
| Step Direction Indexer Interface | | | | • | • | • | • | • | • |
| Cmd Tab IO Interface (X14-IOs) (with EasySteps) | | | | • | • | • | • | • | • |
| RS232 up to 115.2 kBaud | | | | | | | • | • | • |
| RS485 up to 115.2 kBaud | | | | | | | • | • | • |
| CANOpen up to 1MBaud | | | | | | | • | • | • |
| DeviceNet 125, 250, 500 kBaud | | | | | | | • | • | • |
| External Position Sensor | | | | | | | | | |
| Incremental RS422 up to 2 MHz | • | • | • | • | • | • | • | • | • |
| Position Indexer Input | | | | | | | | | |
| Step Dir Zero/ ABZ RS422 up to 2 MHz | | | | • | • | • | • | • | • |
| Position Encoder Simulation | | | | | | | | | |
| AB RS422 up to 2.5 MHz | | | | • | • | • | • | • | • |
| Configuration | | | | | | | | | |
| RS232 Configuration | • | • | • | • | • | • | • | • | • |
| CAN Multi Axes Configuration | • | • | • | • | • | • | • | • | • |

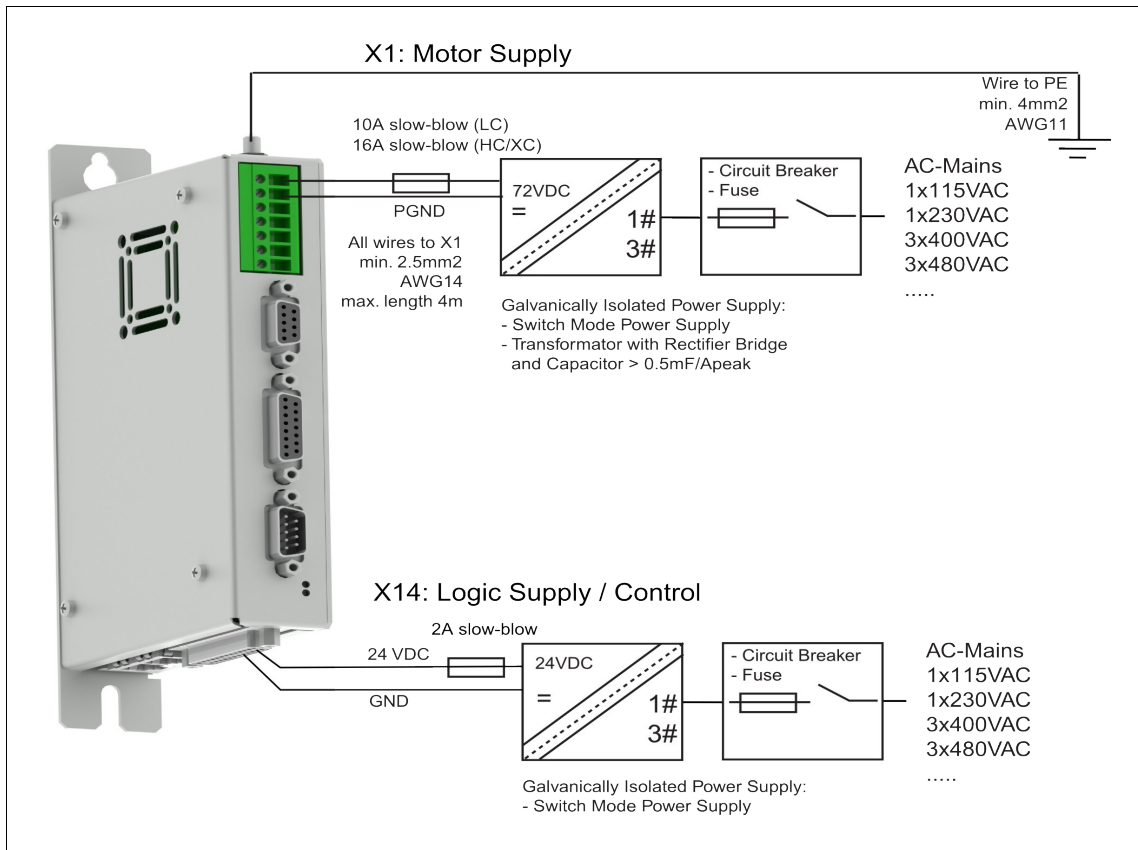
5 Software

The configuration software LinMot-Talk is free of charge and can be downloaded from the LinMot homepage.

For fast results see also the quick start guides and configurations for the B1100-PP and B1100-VF drives:

- QuickStartGuide_B1100-PP.pdf
- QuickStartGuide_B1100-VF.pdf

This quick start guides are distributed with the LinMot-Talk software.



6 Power Supply and Grounding



In order to assure a safe and error free operation and to avoid severe damage to system components, all system components* must be well grounded to either a single earth or utility ground. This includes both LinMot and all other control system components to the same ground bus.



Each system component* should be tied directly to the ground bus (**star pattern**), rather than daisy chaining from component to component. (LinMot motors are properly grounded through their power cables when connected to LinMot drives.)



Power supply connectors must not be connected or disconnected while DC voltage is present. Do not disconnect system components until all LinMot drive LEDs have turned off. (Capacitors in the power supply may not fully discharge for several minutes after input voltage has been disconnected). Failure to observe these precautions may result in severe damage to electronic components in LinMot motors and/or drives.



Do not switch Power Supply DC Voltage. All power supply switching and E-Stop breaks should be done to the AC supply voltage of the power supply. Failure to observe these precautions may result in severe damage to drive.

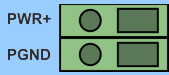
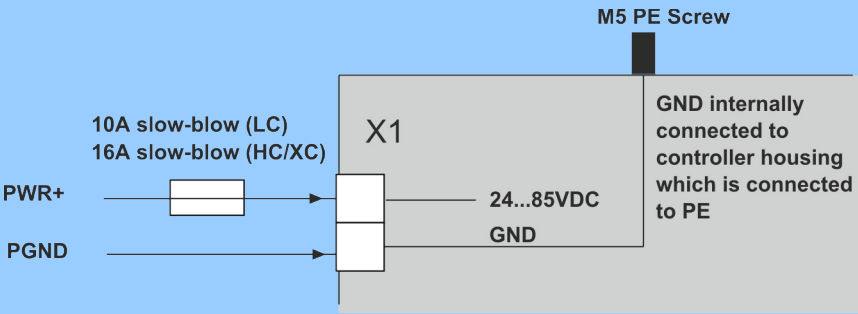
* Inside of the B1100 drive the *PWR motor GND* and *PWR signal GND* is connected together and to the GND of the drive housing. It is recommended that the *PWR motor GND* is NOT grounded at another place than inside of the drive to avoid circular currents.

7 Description of the connectors / Interfaces

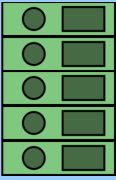
7.1 PE

| PE | Protective Earth |
|----|---|
| PE | <ul style="list-style-type: none"> • Use min. 4mm² (AWG11) • Tightening torque: 2Nm (18lbin) |

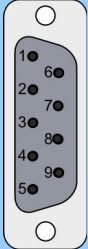
7.2 X1

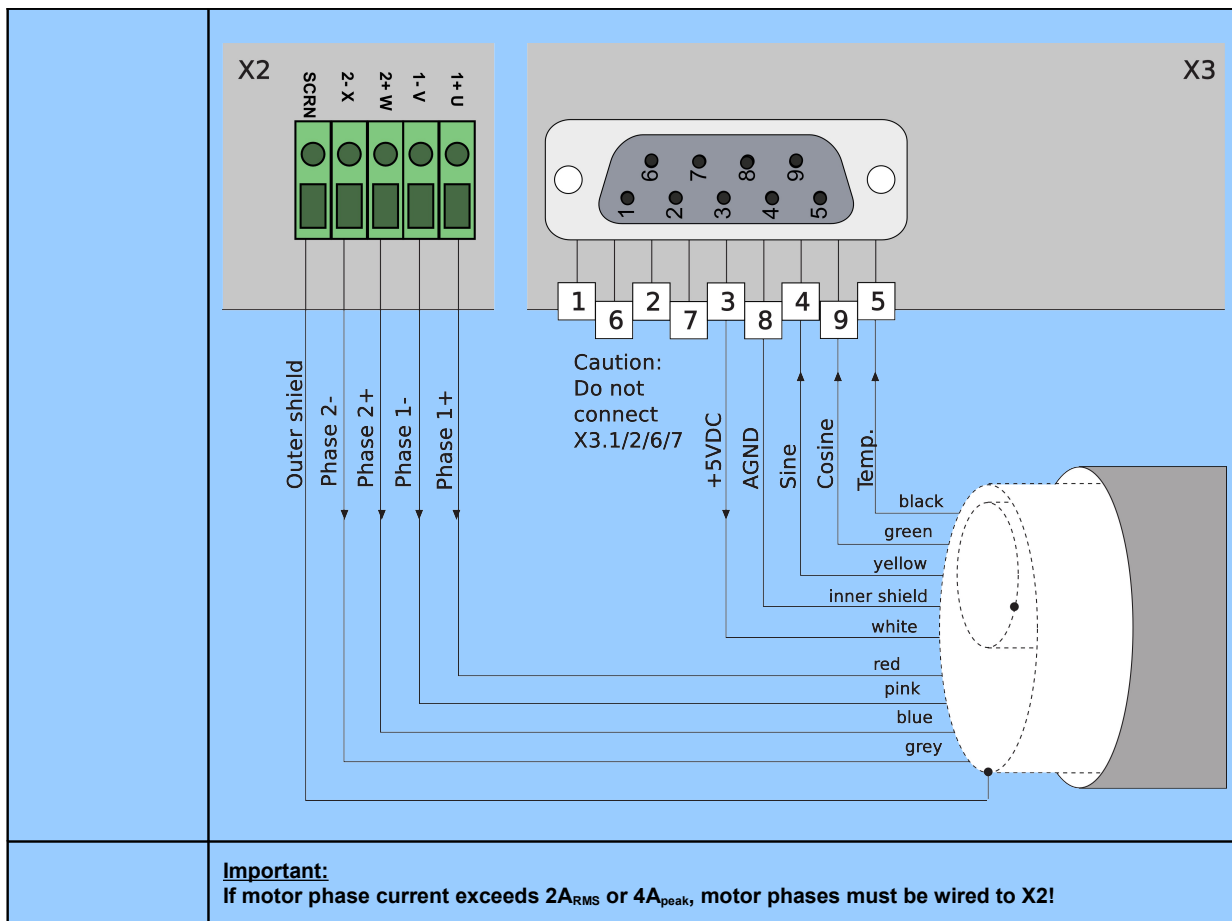
| X1 | Motor Supply |
|---|--|
|  |  |
| Screw Terminals | <p>Motor Supply: 72VDC nominal, 24...85VDC Absolute max. Rating: 72VDC +20%. External Fuse: 10A slow-blow for LC (8Apeak), 16A slow-blow for HC and XC (15A/25Apeak) servos. If motor supply voltage exceeds 90VDC, the drive will go into error state.</p> <ul style="list-style-type: none"> - Tightening Torque: min 0.4Nm (3.5 lbin) - Screw Thread: M 2,5 - Use 60/75°C copper conductors only - Conductor Cross-Section 2.5mm² (AWG14) max Length 4m |

7.3 X2

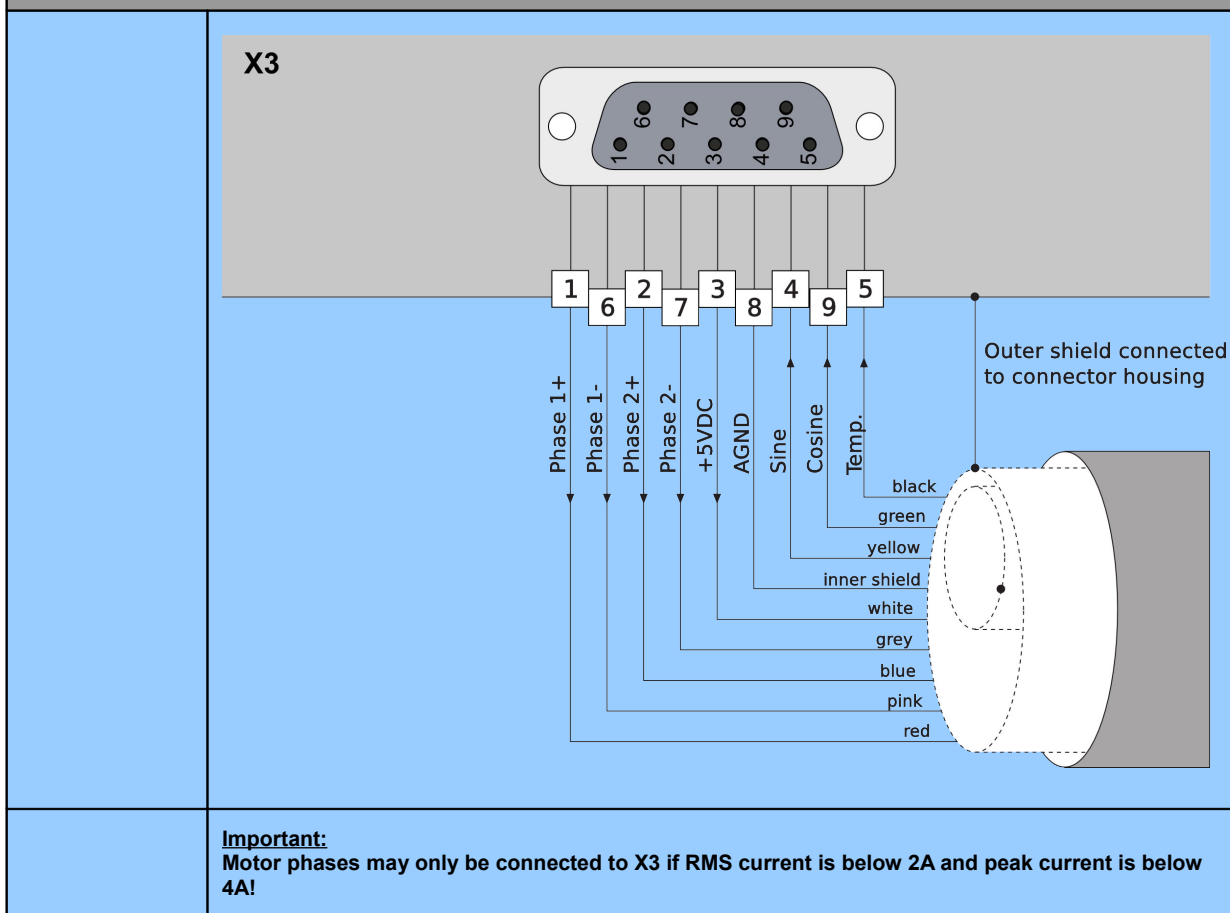
| X2 | | Motor Phases | |
|---|---|--|--|
|  | <p>PH1+ /U PH1- /V PH2+ /W PH2- SCRN</p> | <p>LinMot Motor:</p> <p>Motor Phase 1+ red Motor Phase 1- pink Motor Phase 2+ blue Motor Phase 2- grey Shield</p> | <p>3-phase EC-Motor:</p> <p>Motor Phase U Motor Phase V Motor Phase W</p> |
| Screw Terminals | <p>The motor phases are present at X2 and X3. It is recommended to use X2. It is only allowed to use X3 for connecting motor phases if RMS current is below 2A and peak current is below 4A.</p> <p>Never connect motor phases on X2 and X3!</p> <ul style="list-style-type: none"> - Tightening Torque: min 0.4Nm (3.5 lbin) - Screw Thread: M 2,5 - Conductor Cross-: max. 2.5mm² (AWG14), Length < 30m - Use 60/75°C copper conductors only | | |

7.4 X3

| X3 | | Motor | |
|--|---|-----------------------------|---|
|  | <p>1 Motor Phase 1+ 2 Motor Phase 2+ 3 +5VDC 4 Sensor Sine 5 Temp. In 6 Motor Phase 1- 7 Motor Phase 2- 8 AGND 9 Sensor Cosine case Shield</p> | <p>LinMot Motor:</p> | <p>3-phase EC-Motor:</p> <p>+5VDC (Hall Supply) Hall 1 Hall 3</p> <p>AGND (Hall Supply) Hall 2</p> |
| DSUB-9 (f) | <p><u>Note:</u> Use +5V (X3.3) and AGND (X3.8) only for motor internal hall sensor supply (max. 100mA). Cable length < 30m.</p> <p><u>Caution:</u> Do NOT connect AGND (X3.8) to ground or earth! It is only allowed to use X3 for connecting the motor phases if RMS current is below 2A and peak current below 4A.</p> | | |
| <p>Motor Wiring for Phase Currents above 2A RMS or 4A peak (recommended general wiring)</p> | | | |

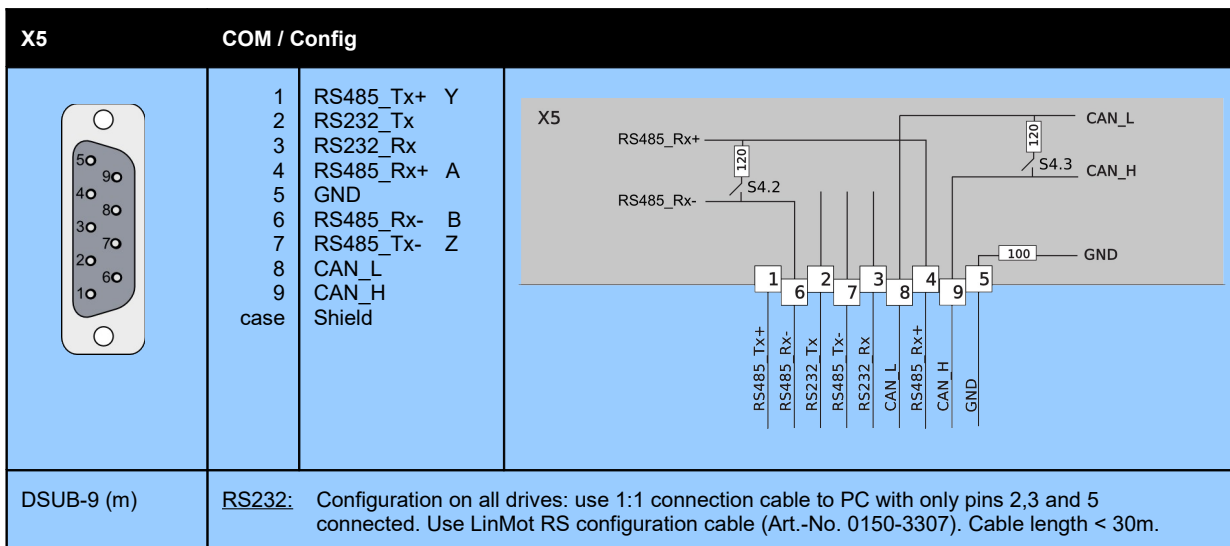


Motor wiring for Phase Currents below 2A RMS and 4A peak

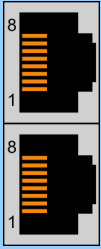


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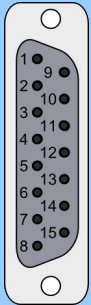
7.5 X5



7.6 X7 - X8

| X7 - X8 | | RS485/CAN | |
|---|---|-----------|---|
|  | 1 | RS485_Rx+ | A |
| | 2 | RS485_Rx- | B |
| | 3 | RS485_Tx+ | Y |
| | 4 | GND | |
| | 5 | GND | |
| | 6 | RS485_Tx- | Z |
| | 7 | CAN_H | |
| | 8 | CAN_L | |
| | case | Shield | |
| RJ-45 | Use twisted pair (1-2, 3-6, 4-5, 7-8) cable for wiring. The built in CAN and RS485 terminations can be activated by S4.2 and S4.3. X7 is internally connected to X8 (1:1 connection). Cable length < 30m. | | |

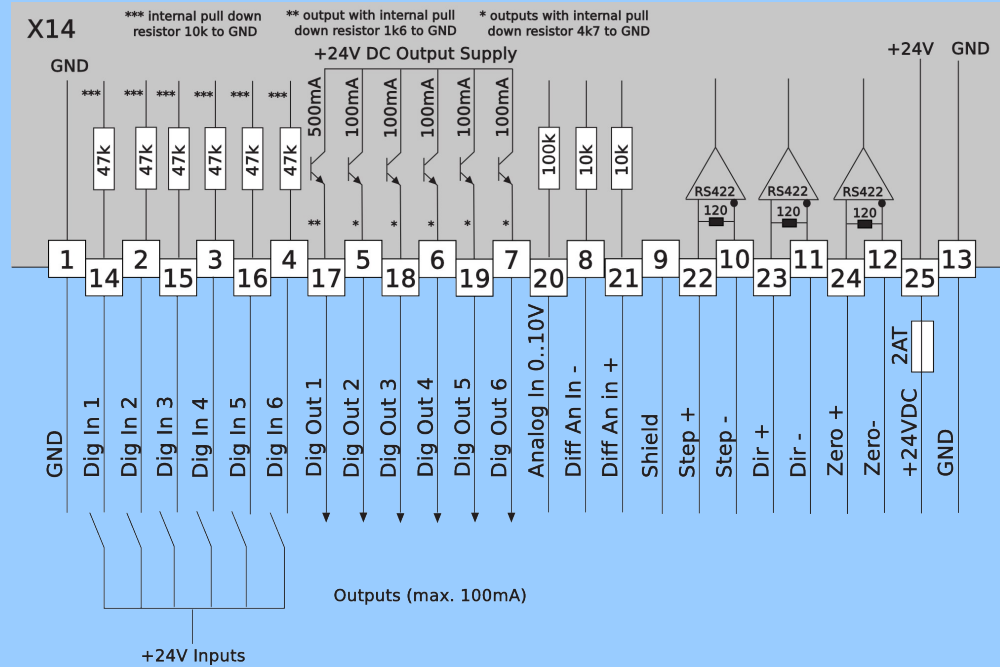
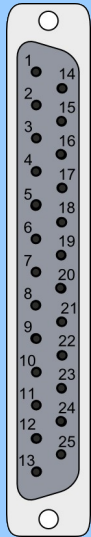
7.7 X13

| X13 | | External Position Sensor Differential Hall Switches | |
|--|---|---|---------------|
|  | 1 | 9 | +5V DC |
| | 2 | 10 | A+ |
| | 3 | 11 | B+ |
| | 4 | 12 | Z+ |
| | 5 | 13 | Encoder Alarm |
| | 6 | 14 | U+ |
| | 7 | 15 | V+ |
| | 8 | | W+ |
| | case | | Shield |
| DSUB-15 (f) | <p><u>Position Encoder Inputs (RS422):</u> Max Input Frequency: 2MHz, 4 M counts/s with quadrature decoding, 240ns edge separation</p> <p><u>Encoder Simulation Outputs (RS422):</u> Max Output Frequency: 2.5MHz, 5 M counts/s with quadrature decoding, 200ns edge separation</p> <p><u>Differential Hall Switch Inputs (RS422):</u> Input Frequency: <1kHz</p> <p><u>Enc. Alarm In:</u> 5V / 1mA</p> <p><u>Sensor Supply:</u> 5VDC max 100mA</p> <p>Cable length < 30m.</p> | | |

7.8 X14

X14

24VDC Supply and IOs



DSUB-25 (f)

Logic Supply:
 Switch Mode Power Supply: 24VDC (22...26VDC)
 External Fuse: 2A slow-blow

All Digital Inputs:
 Direct interfacing to digital 24VDC PLC outputs.
 Input Current: 1mA
 Logic Levels: Low Level: guaranteed: -5 to 5VDC, typically < 8VDC
 High Level guaranteed: 20..30VDC, typically > 16VDC
 Sample Rate: 400us

All Digital Outputs:
 Short circuit and overload protected high side switches.
 Voltage: 24VDC
 Update Rate: 400us
 Max. Current: 100mA / 500mA for X14.17
 Peak Current: 370mA / 1200mA for X14.17

Outputs may directly drive inductive loads. Do not connect any capacity because of the peak current!



Analog Input on X14.20:
 Range: 0V..+10V 10Bit ADC
 Sample Rate: 400us

Differential Analog Input on X14.8 X14.21 X14.9 Shield:
 Range: -10V..+10V 10Bit ADC
 Sample Rate: 400us

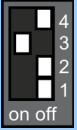
Differential Step Dir Zero:
 Indexer Inputs: RS422, Max. Input Frequency: 2MHz, 4 M counts/s with quadrature decoding, 240ns edge separation

Cable length < 30m.

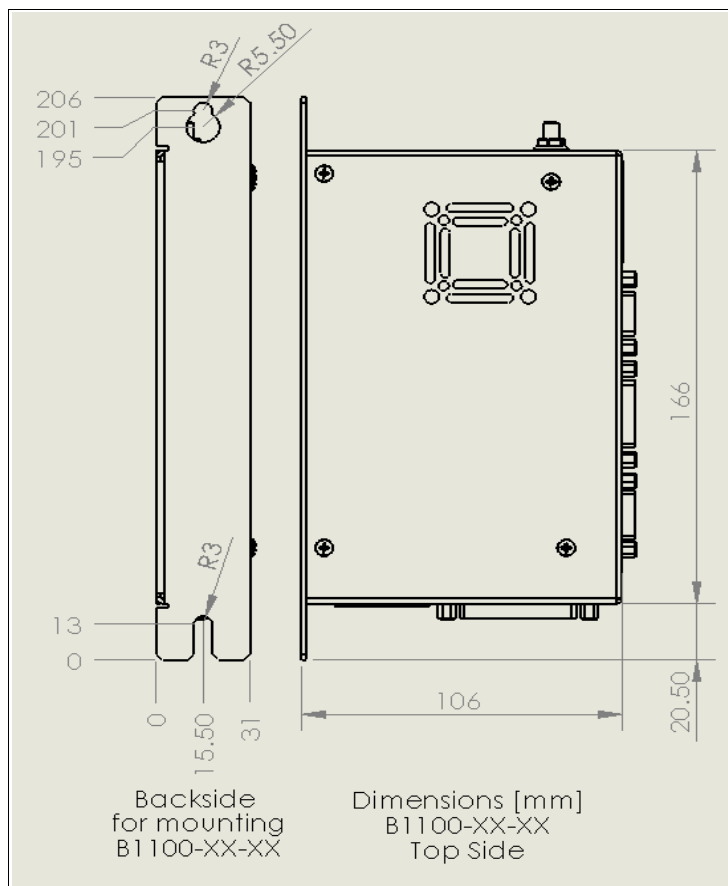
7.9 LEDs

| LEDs | State Display | |
|---|--------------------------|--|
| Error   24VOK | Green Red | 24V Logic Supply OK Error |
| • ~0.5Hz | Green On Red blinking | Signal Supply 24V too low: The error LEDs blinks slowly if the signal supply +24VDC (X14.25) is less than 18VDC. |

7.10 S4

| S4 | Bus Termination | |
|---|-----------------|---|
|  | S4 | Switch 4: Bootstrap Switch 3: Termination CAN on/off Switch 2: Termination RS485 on/off Switch 1: RS232 (switch "off" / RS485 "on"). Selection for RS232 or RS485 Factory settings: Switch 3 "on", all other switches "off" |

8 Physical Dimension



| B1100 Single axis drive | | |
|--------------------------------|----------------|---|
| Width | mm (in) | 31 (1.3) |
| Height | mm (in) | 166 (6.6) |
| Height with fixings | mm (in) | 206 (8.1) |
| Depth | mm (in) | 106 (4.2) |
| Weight | g (lb) | 700 (1.6) |
| Mounting Screws | | 2 x M5 |
| Mounting Distance | mm (in) | 188 (7.4) |
| Case | IP | 20 |
| Storage Temperature | °C | -25...40 |
| Transport Temperature | °C | -25...70 |
| Operating Temperature | °C | 0...40 at rated data 40...50 with power derating |
| Relative humidity | | 95% (non-condensing) |
| Pollution | IEC/EN 60664-1 | Pollution degree 2 |
| Max. Case Temperature | °C | 70 |
| Max. Power Dissipation | W | 30 |
| Mounting Place | | In the Control Cabinet |
| Mounting Position | | vertical |
| Distance between Drives | mm (in) | 20 (0.8) horizontal 50 (2) vertical |

() dimensions in inch

9 Power Supply Requirement

Motor Power Supply

The calculation of the needed power for the motor supply depends on the application and the used motor. The nominal supply voltage is 72 VDC. The possible range is from 24 to 85 VDC.



ATTENTION: The motor supply can rise up to 95 VDC when braking. This means that everything connected to that power supply needs a voltage rating of 100 VDC. (Additional capacitors, etc...)



To provide short circuit power limitation, it is required to use an external fuse (10A slow-blow for blank labeled (LC) and 16A slow-blow for HC and XC labeled drives).

Recommended Power supplies:

| Item | Description | Art. No. |
|----------------|---|-----------|
| T01-72/420 | 72VDC, 15A peak, 420VA, 3x400VAC | 0150-1966 |
| T01-72/420-US | 72VDC, 15A peak, 420VA, 3x230VAC | 0150-1967 |
| T01-72/900 | 72VDC, 30A peak, 900VA, 3x400VAC | 0150-1842 |
| T01-72/900-US | 72VDC, 30A peak, 900VA, 3x230VAC | 0150-1843 |
| T01-72/1500 | 72VDC, 2x30A peak, 1500VA, 3x400VAC | 0150-1844 |
| T01-72/1500-US | 72VDC, 2x30A peak, 1500VA, 3x230VAC | 0150-1845 |
| S01-72/500 | 72VDC, 500W, 750W peak, 1x100..120VAC/200..240VAC | 0150-1874 |
| S01-72/1000 | 72VDC, 1000W, 2000W peak, 3x380..500VAC | 0150-1872 |

Signal Power Supply

The logic supply needs a regulated power supply with a nominal voltage of 24 VDC. The voltage must be between 22 and 26 VDC.

Current Consumption

Min. 200mA (no load on the outputs)
 Typ. 0.5A (all 6 outputs "on" with 50mA load and /Brake with no load)
 Max. 1.2A (all 6 outputs "on" with 100mA load and /Brake with 0.5A load)





To limit the power in case of malfunction, it is required to use an external fuse (2A slow-blow)!

10 Ordering Information

| Drive | Description | Art. No. |
|--------------------|---|-----------|
| B1100-GP | General Purpose Drive 72VDC/8A | 0150-1737 |
| B1100-GP-HC | General Purpose Drive 72VDC/15A | 0150-1738 |
| B1100-GP-XC | General Purpose Drive 72VDC/25A | 0150-1741 |
| B1100-PP | Point to Point Drive 72VDC/8A | 0150-1735 |
| B1100-PP-HC | Point to Point Drive 72VDC/15A | 0150-1736 |
| B1100-PP-XC | Point to Point Drive 72VDC/25A | 0150-1740 |
| B1100-VF | Current Command Drive 72VDC/8A | 0150-1685 |
| B1100-VF-HC | Current Command Drive 72VDC/15A | 0150-1686 |
| B1100-VF-XC | Current Command Drive 72VDC/25A | 0150-1739 |
| Accessories | Description | Art. No. |
| RS232 Config Cable | AC01-Df/Df-2-RS1 RS232 Config Cable DSUB9 f/f 2m (2-2/3-3/5-5) | 0150-3307 |

11 International Certifications

| Certifications | |
|---|---|
| Europe  | See chapter "EU Declaration of Conformity / CE-Marking" |
| UK  | See chapter "UK Declaration of Conformity UKCA-Marking" |

12 EU Declaration of Conformity / CE-Marking

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declares under sole responsibility the compliance of the products:

- **Drives of the Series B11x0-xx-xx**

with the **EMC Directive 2014/30/EU**.

Applied harmonized standards:

- **EN 61000-6-2: 2005 (Immunity for industrial environments)**
- **EN 61000-6-4: 2007 + A1:2011 (Emission for industrial environments)**

According to the EMC directive, the listed devices are not independently operable products.

Compliance of the directive requires the correct installation of the product, the observance of specific installation guides and product documentation. This was tested on specific system configurations.

The safety instructions of the manuals are to be considered.

These products are intended for installation in machines. Operation is prohibited until it has been determined that the machines in which these products are to be installed, conforms to the above mentioned EC directive.

The product must be mounted and used in strict accordance with the installation instructions contained within the installation guide, a copy of which may be obtained from NTI AG.

Company: NTI AG
Spreitenbach, 11.04.2016



Dr. Ronald Rohner / CEO NTI AG

13 UK Declaration of Conformity UKCA-Marking

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declares under sole responsibility the compliance of the products:
- **Drives of the Series B11x0-xx-xx**

with the **EMC Regulation S.I. 2016 No. 1091.**

Applied designated standards:

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Spreitenbach, 24.03.2022



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14 Contact & Support

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Smart solutions are...

