LinMot
Servo Drives

LinMot linear motors, together with the associated Servo Drives, create an optimal drive system for linear positioning tasks. The wide range of drive products allows rapid implementation of simple applications with two end positions, up to complex, high-precision multi-axis applications with synchronization to a main electronic shaft.

Simple Integration

Connection to an overlaid control system can be made via analog, digital, or serial interfaces, fieldbusses, or ETHERNET. The wide range of fieldbus interfaces and protocols allows simple integration of LinMot Servo Drives in any controls concept. Regardless of the manufacturer and type of controls, LinMot Servo Drives provide the right interface to connect to an overlaid PLC, industrial PC, or proprietary control system.

Intelligence right in the drive

LinMot Servo Drives are highly integrated inverters with one or more power elements, for controlling the motors, and an intelligent control element with integrated position regulation. The control element performs all drive-related control and monitoring functions. It allows direct position set points, or travel along internally stored motion profiles from the overlaid control, using simple analog or digital signals.

Simplest Applications

Because of their high dynamic capabilities, long life, and ability to travel to several positions, LinMot linear motors are often used as a replacement for pneumatic cylinders.

Various end positions can be stored in the drive and are invoked via digital signals, just as with a pneumatic cylinder. Once the end position is reached, this is reported to the overlaid control via the In-position signal on a digital output.
Speed and acceleration can be configured freely for each motion.

Standard Applications

With control via fieldbusses or an Ethernet interface, standard applications can be implemented with simple point-to-point motions. Position, speed, and acceleration can be configured freely, and are provided via the bus.

Complicated or co-dependent motions can be stored on the drive in the form of travel profiles, and started via digital trigger signals or the bus connection.

High-End Applications

Complex applications with synchronization to a main or master shaft can be implemented without trouble using the integrated master encoder interface.

Travel along paths from an overlaid NC drive can be implemented via the +/-10V interface, or in streaming mode (PVT, PV).

Together with a high-resolution, external position sensor, even high-precision positioning tasks in µm range can be handled.
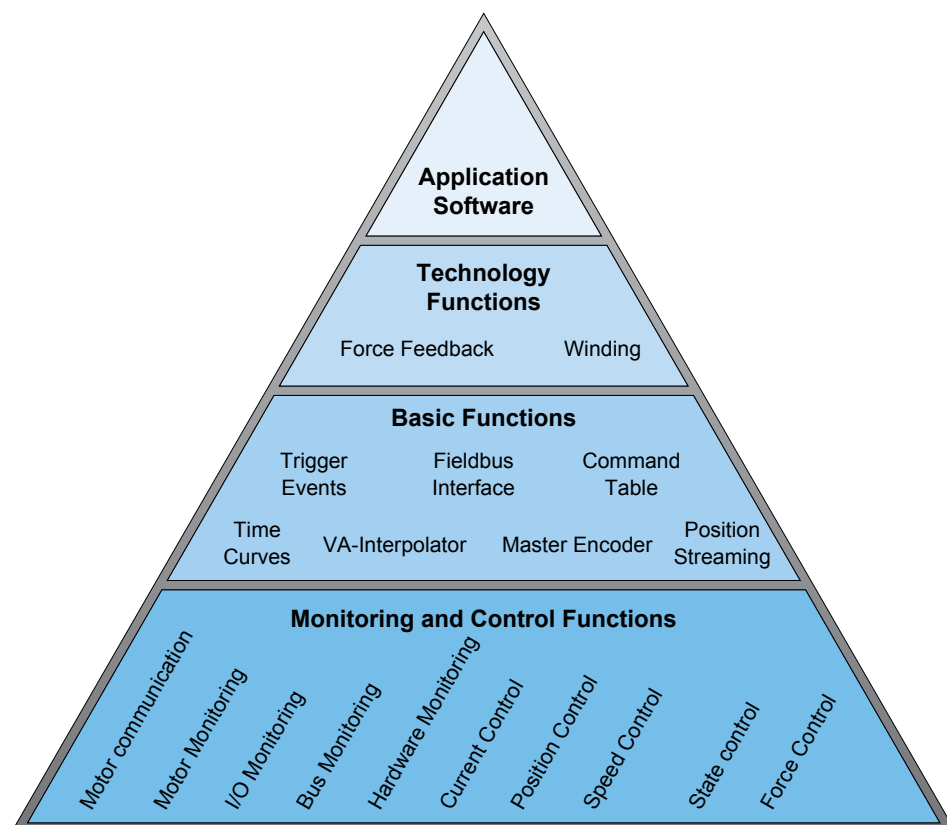
Application Software

Using a software application, customer-specific applications can be programmed directly in the drive. This is mainly an advantage when very fast sequences need to be implemented, for which the communication speed or computing power of the overlaid control are not sufficient.

Technology Functions

Technology functions are generally available functional blocks that provide a complete solution for standard applications. The technology function can take over complete sequence control of a process. With the technology function "winding textile yarns", only a few parameters are provided by the overlaid control, such as the number of windings. The complete winding process then takes place automatically.

Basic Functions

The basic functions include communication with the overlaid control, generation of target values for speed and acceleration-limited point-to-point motions, travel along motion profiles, synchronization of drives to an electronic main or master shaft, and synchronization in multi-axis applications.

Monitoring and Control

The basic functions of the Servo Drive, such as position and current control; control and monitoring of the power element; and monitoring the motor temperature, power, and position are handled by the control, monitoring, and regulation element, which also controls the entire finite state machine of the drive.

Pyramid diagram (top to bottom):

- **Application Software**
- **Technology Functions**: Force Feedback, Winding
- **Basic Functions**: Trigger Events, Fieldbus Interface, Command Table, Time Curves, VA-Interpolator, Master Encoder, Position Streaming
- **Monitoring and Control Functions**: Motor communication, Motor Monitoring, I/O Monitoring, Bus Monitoring, Hardware Monitoring, Current Control, Position Control, Speed Control, State control, Force Control

Modular Firmware

LinMot Servo Drives are used as pure position drives. Additionally, using the technology functions or a customer-specific software application, complete sequences or functions can be implemented for customerspecific applications.

Multi-axis operation

In multi-axes or linked operation, the master encoder interface can control both individually and synchronous to a main or master shaft.

For complex designs, several axes can be synchronized in master-booster or master-gantry mode. This allows simple implementation of portal designs with two synchronized axes, which are controlled by the overlaid control as a single axis.

Linear and Rotary Drives

Using Series E1100 / B1100 Servo Drives, rotary servomotors can be used as well as linear motors, or any 1/2/3-phase actuators.

Primarily in assembly automation and feeding applications, small, light brushless DC motors (EC motors) are often needed to rotate a gripper about the Z-axis. The flexibility of the Servo Drive allows such rotary motors to be integrated into the existing controls concept in the same simple manner as linear motors.

Certified Safety

The safe impulse block on the Series E1100 Servo Drive allows safety concepts to be implemented in machines and system with minimum effort and additional external components.
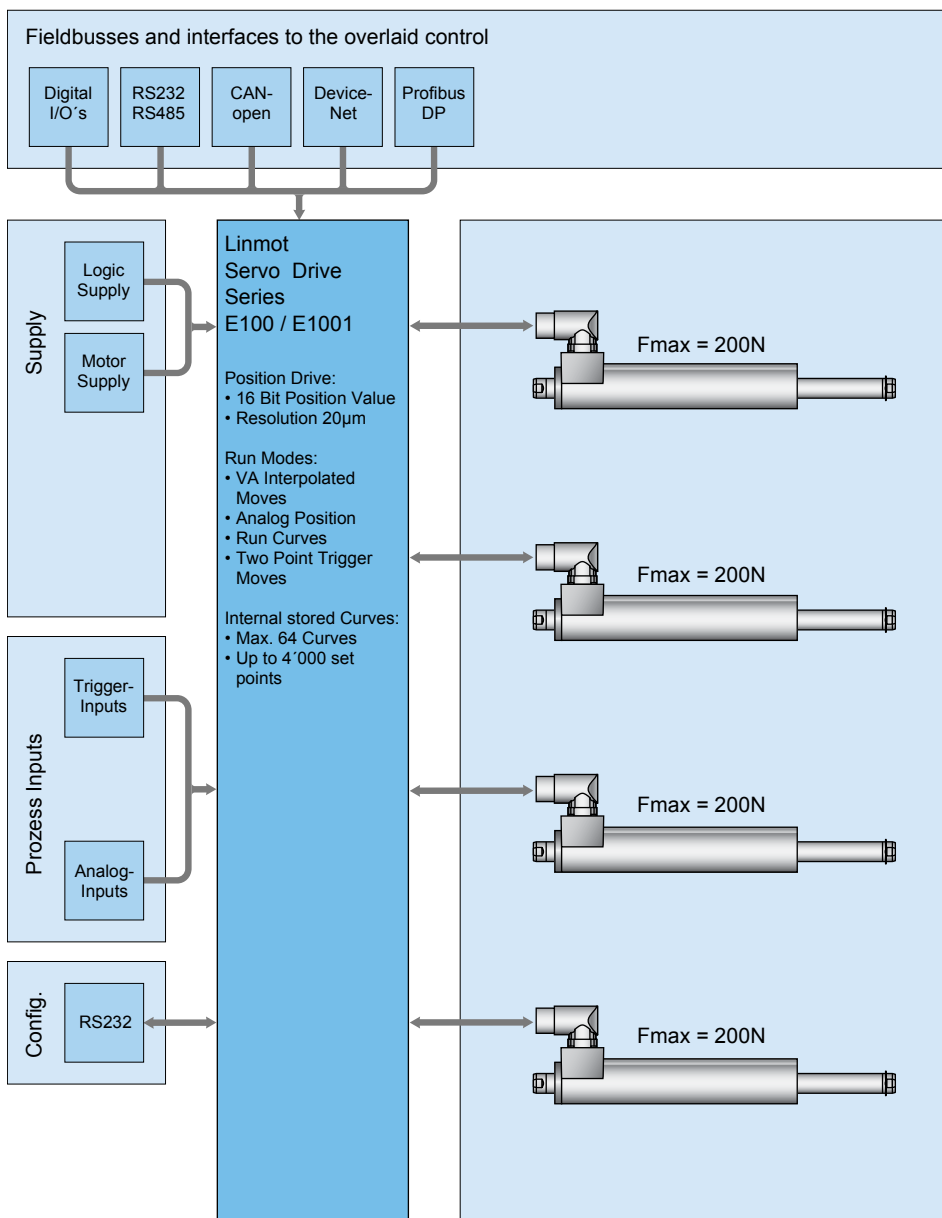
Safety Standard EN954-1

Servo Drive Series
E100/E1001

Servo controls from the Series E100 and E1001 are one, two, or four-axis drives with 16-bit position resolution.

The drives are suitable for simple and standard positioning tasks in the low to medium force range, in which linear motors are operated without optional peripherals such as reference and end stop switches, external high-precision position sensors, or a holding brake.

Connection to the overlaid control is done via analog and digital signals, a serial connection, and fieldbusses.

The compact size is a great advantage of the Series E100/E1001 Servo Drives, primarily for compound and multi-axis applications, with regard to installation space and effort.

Fieldbusses and interfaces to the overlaid control

- Digital I/O´s
- RS232 RS485
- CAN-open
- Device-Net
- Profibus DP

Supply
- Logic Supply
- Motor Supply

Linmot Servo Drive Series E100 / E1001

Position Drive:
- 16 Bit Position Value
- Resolution 20µm

Run Modes:
- VA Interpolated Moves
- Analog Position
- Run Curves
- Two Point Trigger Moves

Internal stored Curves:
- Max. 64 Curves
- Up to 4´000 set points

Prozess Inputs
- Trigger-Inputs
- Analog-Inputs

Config.
- RS232

Fmax = 200N

Fmax = 200N

Fmax = 200N

Fmax = 200N

Servo Drive Series E100

Single and multiple axes drives for standard positioning tasks.

-
- Analog, digital, and industrial fieldbus interfaces
- For low forces
- For standard precision
- 16-Bit position resolution for short and medium stroke ranges
- Point to point motions and travel along setpoint curves
- Electronic cam disc (Option)
- Master gantry and master booster synchronization
- Control of LinMot linear motors

Servo Drive Series E1001

Single and multiple axes drive for standard positioning tasks.

- Analog, digital, and industrial fieldbus interfaces
- For low and medium forces
- For standard precision
- 16-Bit position resolution for short and medium stroke ranges
- Point to point motions and travel along setpoint curves
- Master gantry and master booster synchronization
- Control of LinMot linear motors

Servo Drives E400 in use

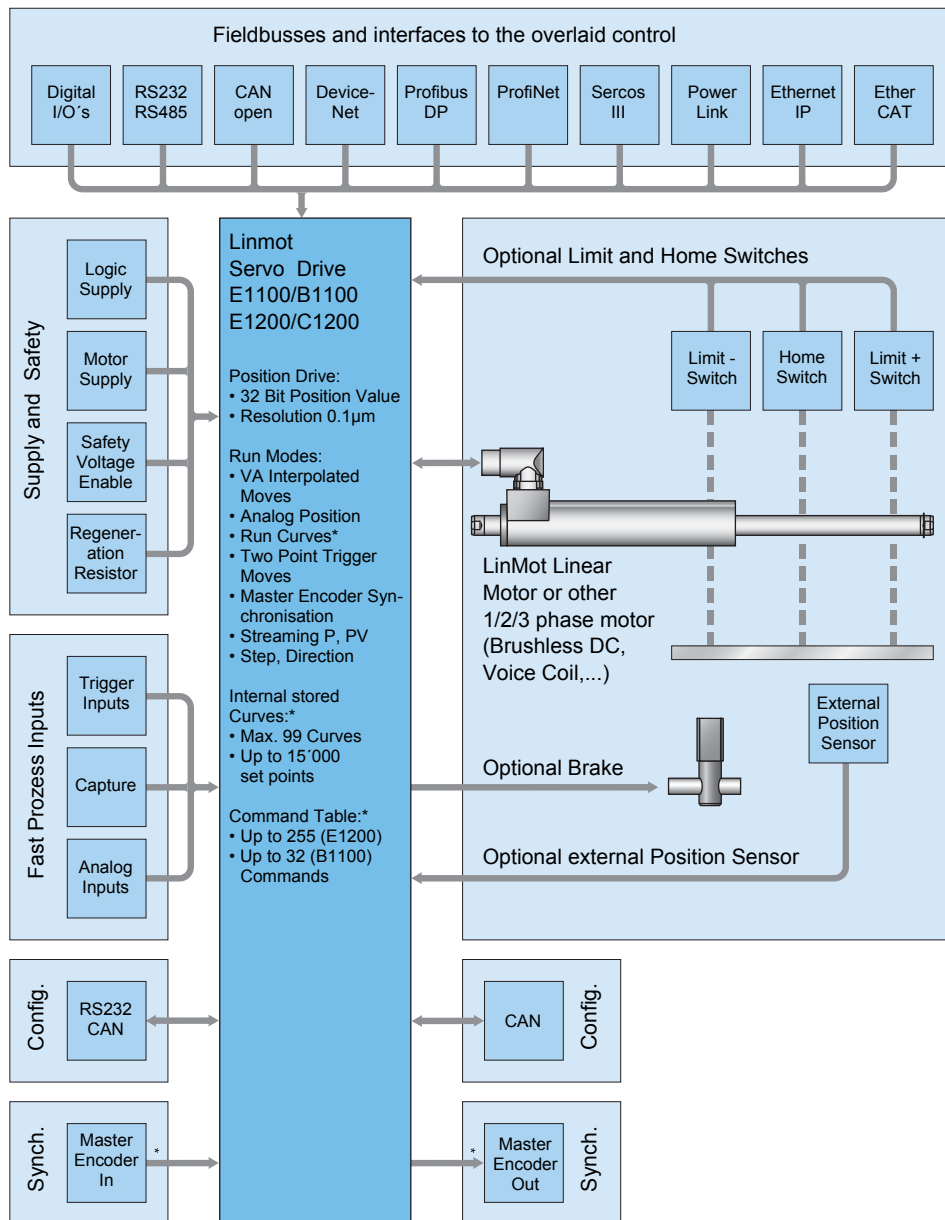## Servo Drive Series E1100/B1100 Series E1200/C1200

Fieldbusses and interfaces to the overlaid control

| Digital I/O´s | RS232 RS485 | CAN open | Device-Net | Profibus DP | ProfiNet | Sercos III | Power Link | Ethernet IP | Ether CAT |

Supply and Safety
- Logic Supply
- Motor Supply
- Safety Voltage Enable
- Regener-ation Resistor

Fast Prozess Inputs
- Trigger Inputs
- Capture
- Analog Inputs

Config.
- RS232 CAN

Synch.
- Master Encoder In *

Linmot Servo Drive E1100/B1100 E1200/C1200

Position Drive:
- 32 Bit Position Value
- Resolution 0.1µm

Run Modes:
- VA Interpolated Moves
- Analog Position
- Run Curves*
- Two Point Trigger Moves
- Master Encoder Synchronisation
- Streaming P, PV
- Step, Direction

Internal stored Curves:*
- Max. 99 Curves
- Up to 15´000 set points

Command Table:*
- Up to 255 (E1200)
- Up to 32 (B1100) Commands

Optional Limit and Home Switches

| Limit - Switch | Home Switch | Limit + Switch |

LinMot Linear Motor or other 1/2/3 phase motor (Brushless DC, Voice Coil,...)

Optional Brake

External Position Sensor

Optional external Position Sensor

Config.
- CAN

Synch.
- Master Encoder Out *

LinMot Servo Drives are modular axis drives with 32-bit position resolution for linear motors and rotary drives.

The drives are suitable for simplest, standard, and high-end positioning tasks, across the entire force range of the LinMot product range. Flexible hardware enables control of any 1/2/3-phase motors. Thus, low-power rotary servomotors, such as brushless DC motors, can be integrated in the same controls concept.

Additionally, the drives can be equipped with optional peripherals, such as reference and end stop switches, high-precision external position sensors, and holding brakes.

LinMot Servo Drives have analog and digital inputs and outputs, serial interfaces, fieldbusses, and ETHERNET connections. The user is therefore not dependent on the selection of the overlaid control. An appropriate interface is available, with associated protocols, for any PLC or IPC solution.

With flexibility and a compact form factor, LinMot Servo Drives provide a complete solution for a flexible drive concept in single and multiple axis applications, with linear motors and other actuators.

Servo Drive Series E1100

Single-axis drive for simplest, standard, and high-end positioning tasks.

- Analog, digital, and industrial fieldbus interfaces, as well as industrial ETHERNET
- For low, medium, and high forces
- For standard and high-precision applications
- 32-bit position resolution for short, medium, and long stroke ranges
- Point to point motions and travel along setpoint curves and motion profiles
- Integrated brake chopper for external brake resistor
- Output for controlling a mechanical brake
- Inputs for external end position and reference switches

- Fast trigger inputs
- Event Capture Input
- Safe pulse inhibitor
- Integrated sequence controller
- Position Indexing
- Position Streaming
- Synchronization to feeds and conveyor belts
- Electronic cam disc / Master Encoder
- Master-slave synchronization for gantry applications
- Technology blocks for standard applications
- Configurable via ETHERNET or fieldbus interfaces
- Control of linear and rotary motor

Servo Drive Series B1100

Single-axis drive for simplest and standard positioning tasks.

- Analog, digital, and CAN/RS232/485 interfaces, encoder simulation
- For low, medium, and high forces
- For standard and high-precision applications
- 32bit position resolution for short, medium, and long stroke ranges
- Position Indexing
- Position Streaming
- Control of linear and rotary motors
- Output for controlling a mechanical brake
- End position and reference switches

Servo Drive	Series E100	Series E1001	Series E1400	Series E1200
Controllable Actuators				
Linear Motors Series P01	★	★	-	★
Linear Motors Series P10	-	-	★	-
Linear Motors Generic (3rd Part)	-	-	★	★
DC Motors	-	-	★	★
EC Motors (Brushless DC Motors)	-	-	★	★
Torque Motors	-	-	★	★
Electric Properties				
Motor Supply Voltage DC	24…48VDC	24…72VDC	200...750VDC	24...85VDC
Motor Supply Voltage AC	-	-	3x200…480VAC	
Max. Phase Current	3A$_{pk}$	8A$_{pk}$	40A$_{pk}$	32A$_{pk}$
Internal Chopper	No	Yes	Yes	Yes
Interfaces				
Analog Force/Torque	-		★	★
Analog Velocity	-		★	★
Analog Position	★	★	★	★
Step/Direction	★	★	★	★
RS232	★	★	★	★
RS485	★	★	★	★
CANopen	★	★	★	★
DeviceNet	★	★	-	-
Profibus DP	★	★	★	★
ETHERCAT	-	-	★	★
PROFINET	-	-	★	★
ETHERNET IP	-	-	★	★
SERCOS III	-	-	★	★
POWERLINK	-	-	★	★
Configuration Interfaces				
RS232 - Single Axes	★	★	★	★
CAN - Multi Axes	★	★	-	-
Ethernet - Multi Axes	-	-	★	★
Ethernet - Remote Maintenance	-	-	★	★
Motion Commands				
Position Streaming P, PV, PVT	-	-	★	★
Interpolated Moves VA-limited	★	★	★	★
Interpolated Moves Bestehorn	-	-	★	★
Curves Time Based	★	★	★	★
Curves Master Encoder	★	★	★	★
Belt Synchronization	-	-	★	★
Command Table	★	★	★	★
Winding Application	★	★	★	★
Closed Loop Force Control	-	-	★	★
Customer Specific Funtionalities	★	★	★	★
Position Feedback				
LinMot Encoder	★	★	Motor Link C	Motor Link P
SinCos (1Vpp)	-	-	★	★
Incremental Encoder A,B,Z (RS422)	★	★	★	★
Incremental Encoder A,B,Z (RS422) with U,V,W	-	-	-	★
Incremental Encoder A,B,Z (RS422) with U,V,W (RS422)	-	-	★	★
Absolute Encoder SSI	-	-	★	★
Absolute Encoder Analog	-	-	★	★
Encoder Emulation Output A,B,Z (RS2422)	-	-	★	★
Synchronisation				
Master Encoder Input A,B,Z (RS422)	★	★	★	★
Master Encoder Output A,B,Z (RS422)	★	★	★	★
Digital & Analoge Interfaces				
Digital Inputs 24VDC	8	8	1	1
Digital IO 24VDC	0	0	8	8
Digital Outputs 24VDC	4	4	0	0
Analog Inputs 0…10VDC	4 (10 Bit)	4 (10 Bit)	1 (12 Bit)	1 (12 Bit)
Analog Inputs -10…+10VDC	-	-	1 (12 Bit)	1 (12 Bit)
Brake Output	-	-	24V/1A	24V/1A
Safety Functions				
Seperate Power Supply Input	★	★	★	★
Safety Voltage Enable SVE	-	-	-	★
Safety Relais	-	-	x (-1S)	-
STO - Safe Torque Off	-	-	x (-1S)	-
Resolutuion & Timings				
Position Drive Resolution	16 Bit	16 Bit	32 Bit	32 Bit
Position Drive Update Rate	-	-	8kHz	10kHz
I/O Update Rate	1.6ms	1.6ms	4kHz	5kHz
I/O Update Rate Trigger and Capture Input	1.25kHz	1.25kHz	8kHz	10kHz
Current Drive Frequency	2.5kHz	2.5kHz	16kHz	20kHz
PWM Frequency	-	-	8kHz	20kHz
Approvals				
CE	CE	CE	CE	CE
UL	-	-	UL pending	UL pending

LinMot®

| Servo Drive	Series C1200	Series E1100	Series B1100
Controllable Actuators			
Linear Motors Series P01	★	★	★
Linear Motors Series P10	-	-	-
Linear Motors Generic (3rd Part)	★	★	★
DC Motors	★	★	★
EC Motors (Brushless DC Motors)	★	★	★
Torque Motors	★	★	★
Electronic Properties			
Motor Supply Voltage DC	24...85VDC	24...85VDC	24...85VDC
Motor Supply Voltage AC	-	-	-
Max. Phase Current	25A$_{pk}$	8 / 15 / 25A$_{pk}$	8 / 15 / 25A$_{pk}$
Internal Chopper	No	Yes	No
Interfaces			
Analog Force/Torque	★	★	★
Analog Velocity	★	★	★
Analog Position	★	★	★
Step/Direction	★	★	★
RS232	★	★	★
RS485	★	★	★
CANopen	★	★	★
DeviceNet	-	★	★
Profibus DP	★	★	-
ETHERCAT	★	-	B1150
PROFINET	★	-	B1150
ETHERNET IP	★	-	B1150
SERCOS III	★	-	B1150
POWERLINK	★	-	B1150
Configuration Interfaces			
RS232 - Single Axes	★	★	★
CAN - Multi Axes	-	★	★
Ethernet - Multi Axes	-	-	-
Ethernet - Remote Maintenance	-	-	-
Motion Commands			
Position Streaming P, PV, PVT	★	★	★
Interpolated Moves VA-limited	★	★	★
Interpolated Moves Bestehorn	★	★	★
Curves Time Based	★	★	★
Curves Master Encoder	-	★	-
Belt Synchronization	-	★	-
Command Table	★	★	★
Winding Application	-	★	★
Closed Loop Force Control	★	★	★
Customer Specific Funtionalities	★	★	★
Position Feedback			
LinMot Encoder	Motor Link P	Motor Link P	Motor Link P
SinCos (1Vpp)	★	★	-
Incremental Encoder A,B,Z (RS422)	★	★	★
Incremental Encoder A,B,Z (RS422) with U,V,W	★	★	★
Incremental Encoder A,B,Z (RS422) with U,V,W (RS422)	★	★	★
Absolute Encoder SSI	★	-	-
Absolute Encoder Analog	★	★	★
Encoder Emulation Output A,B,Z (RS2422)	-	-	★
Synchronisation			
Master Encoder Input A,B,Z (RS422)	-	★	-
Master Encoder Output A,B,Z (RS422)	-	★	-
Digital & Analoge Interfaces			
Digital Inputs 24VDC	4	0 / 16 (GP)	6
Digital IO 24VDC	0	9	0
Digital Outputs 24VDC	5	0 / 8 (GP)	6
Analog Inputs 0…10VDC	-	1 (10 Bit)	1 (10Bit)
Analog Inputs -10…+10VDC	-	0	1 (10Bit)
Brake Output	24V/0.5A	24V/1A	24V/0.5A
Safety Functions			
Seperate Power Supply Input	★	★	★
Safety Voltage Enable SVE	-	★(RS, CO, DN,DP)	-
Safety Relais	★(-1S)	-	-
STO - Safe Torque Off	★(-1S)	-	-
Resolutuion & Timings			
Position Drive Resolution	32 Bit	32 Bit	32 Bit
Position Drive Update Rate	10kHz	3kHz	5kHz
I/O Update Rate	5kHz	1.5kHz	2.5kHz
I/O Update Rate Trigger and Capture Input	10kHz	3kHz	5kHz
Current Drive Frequency	20kHz	6kHz	10kHz
PWM Frequency	20kHz	20kHz	20kHz
Approvals			
CE	CE	CE	CE
UL	UL pending	UL	-

Servo Drive E100/E1001
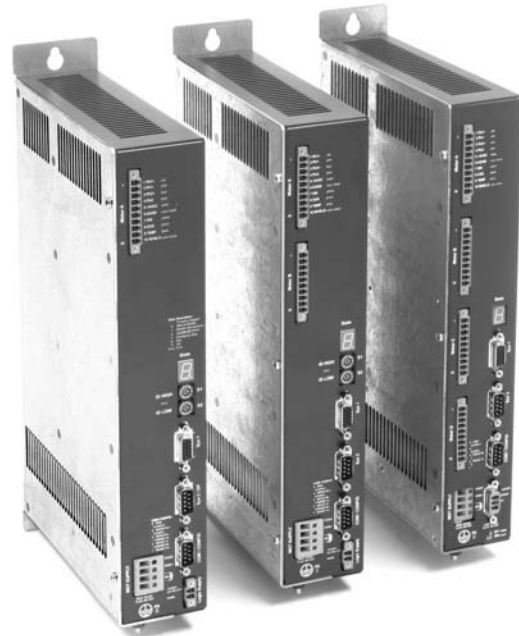
Servo Drive Series E100/E1001

The Series E100 Servo Drive and powerful Series E1001 are compact, one, two or four-axis position drives with 16-bit position resolution and integrated power elements.

The drives are suitable for simple and standard positioning tasks in the low to medium force range.
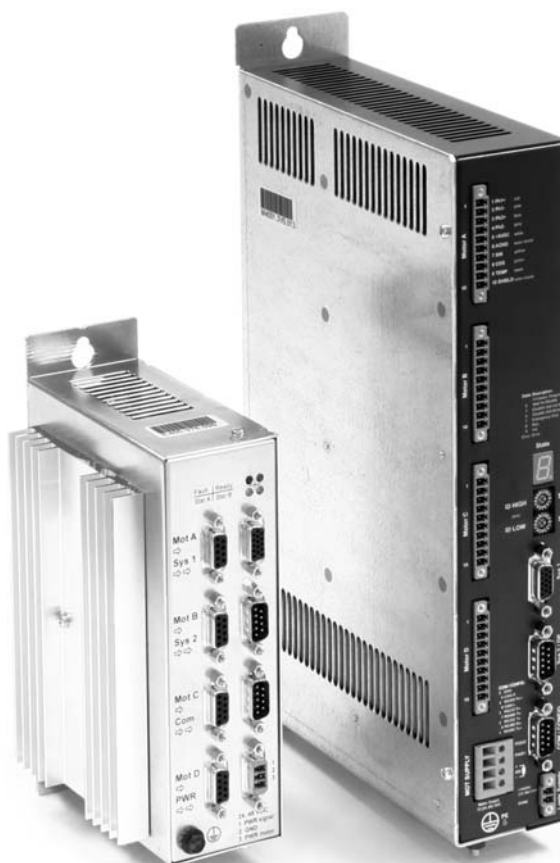
Motor Interfaces

Series E100 and E1001 Servo Drives allow control of up to four linear motors by one drive.
The linear motors themselves are operated without any complicated peripherals, such as end position monitors or reference switches.

The individual linear motors are either completely independently controlled, or they are synchronized with each other in special applications, in master booster or master gantry mode.

Connection to Machine Drive

The E100 and E1001 series Servo Drives can be controlled through the following interfaces:

• Digital inputs and outputs
• Analog Inputs
• RS232 Serial Interface
• RS485 Serial Interface
• CANopen
• DeviceNet
• Profibus DP

Process Interfaces

As a fast process interface for direct reading of sensor signals, one combined analog/digital input per drive is available as an analog position target or a trigger input.

Fieldbusses and interfaces to the overlaid control

| Digital I/O´s | RS232 RS485 | CAN-open | Device-Net | Profibus DP |

Supply
- Logic Supply
- Motor Supply

Linmot Servo Drive Series E100 / E1001

Position Drive:
- 16 Bit Position Value
- Resolution 20µm

Run Modes:
- VA Interpolated Moves
- Analog Position
- Run Curves
- Two Point Trigger Moves

Internal stored Curves:
- Max. 64 Curves
- Up to 4´000 set points

Process Inputs
- Trigger Inputs
- Analog Inputs

Config.
- RS232

Fmax = 200N

Fmax = 200N

Fmax = 200N

Fmax = 200N

System Integration

Series E100/E1001 drives are suitable for controlling linear motors that are operated without optional peripherals such as reference and end stop switches, external high-precision position sensors, or a holding brake.

Connection to the overlaid control is done via analog and digital signals, a serial connection, or fieldbusses.

The compact size is a great advantage of the Series E100/E1001 Servo Drives, primarily for compound and multi-axis applications, with regard to installation space and effort.

Logic and Power Supply

The Servo Drives have two separate power supplies for the logic and power elements.

In an E-stop and safe stop of the drive, only the power element supply is cut off from the drive. The logic supply and the drive continue to run.

This has the advantage that the drive and linear motor do not need to be reinitialized when the machine is restarted, since all process data, including the current position of the linear motor, are still up to date.

Servo Drive E400 in use

Configuration

Parameterization and configuration of the Servo Drive is done via the RS232 interface on the front side.

The menu-drive Windows interface LinMot Talk is used for configuration, with which up to four Axis can be configured simultaneously on one drive. LinMot Talk provides extensive debugging tools, such as an oscilloscope and an error inspector, for simple and rapid start-up of the Axis.

LinMot ®

Absolute & Relative Positioning Commands

Stroke [mm]
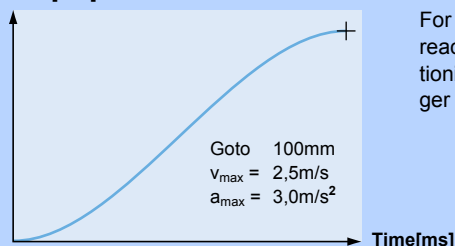
Goto   100mm
v_{max} = 2,5m/s
a_{max} = 3,0m/s^2

Time[ms]

For direct position targets, using absolute or relative positioning, the desired position is reached according to acceleration and velocity-limited motion profiles (VA interpolator). Positioning commands can be invoked via the serial interface, fieldbusses, ETHERNET, or the trigger input.

Stroke range:	±630mm
Position Resolution:	20µm (16 Bit)
Velocity Resolution:	1.0µm/s (16 Bit)
Acceleration:	10.0µm/s^2 (16 Bit)

Travel Along Time Curves

Stroke [mm]
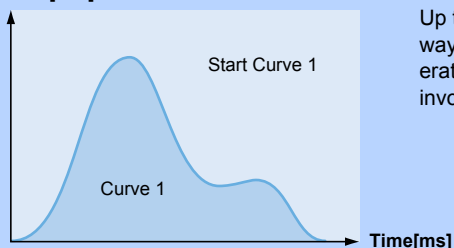
Start Curve 1

Curve 1

Time[ms]

Up to 99 different time curves can be stored Series E1100 drives, with up to 16,000 individual waypoints. The motor can thus travel along time curves of any complexity, such as those generated by CAD programs and stored in the drive (Excel CSV format). The time curves can be invoked via the serial interface, fieldbusses, ETHERNET, or the trigger input.

|	
Stroke range:	±630mm
Position Resolution:	20µm (16 Bit)
Motion profiles:	max. 64 curve profiles
Curve points:	max. 4'000points

Analog Position Target
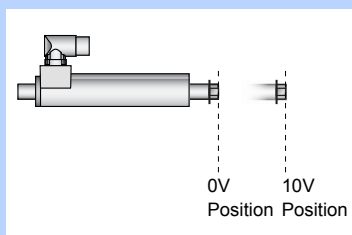
0V
Position

10V
Position

For an analog position target, the linear motor travels to a position proportional to the input voltage. The position is continuously read. In order to prevent uncontrolled jumps in position, the motor travels to the positions with a programmable maximum acceleration and velocity (VA interpolator).

|	
Inputs:	1 analog input per motor
Voltage range:	0-10VDC
Resolution:	10 Bit
Scanning rate:	800µsec

Trigger 2 Point
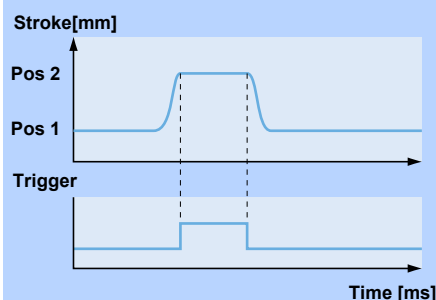
In the two-point trigger operating mode, two freely adjustable positions are controlled by the overarching drive, using a trigger signal.

One target value for the high level, and one for the low level of the digital input signal are stored in the drive electronics. If the signal at the drive electronics input changes, then the associated position is moved to at the programmed acceleration and speed.

Stroke range:	±630mm
Position Resolution:	20µm (16 Bit)
Velocity Resolution:	1.0µm/s (16 Bit)
Acceleration:	10.0µm/s^2 (16 Bit)

Master Slave Synchronization
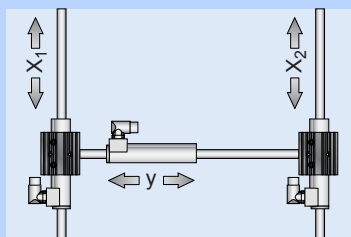
Using master-slave synchronization, two linear motors can be synchronized via a serial communications connection between two drives, so that the overlaid drive can control them as a single axis.

Master Gantry Synchronization
Master gantry synchronization is used for portal designs with two parallel Axis at different locations.

Master Booster Synchronization
Master booster synchronization is used to double the force when two motors are mechanically rigidly connected to each other.

## Internal Command Table   Multi Trigger

Command 1	Pos 125mm
Command 2	Pos 250mm
Command 3	Curve 1
Command 4	Pos -30mm
Command 5	Pos +12,5mm
...	
...	
Command 64	Pos -12,5mm

With the Multi-Trigger-Table, up to 64 positions or independent travel commands can be stored on the drive and addressed directly or indirectly via 4 digital inputs.

Digital inputs:	Max. 4
Interface:	Sys2
Scanning rate:	800µsec

LinMot Talk

LinMot Talk configuration software is a Windows-based interface that supports the user during start-up and configuration of the LinMot Series E100 and E1001 Servo Drives. The software has a powerful, modular, graphical interface that covers all the tasks surrounding the LinMot Servo Drive. Great emphasis was placed on a high level of user-friendliness during development.
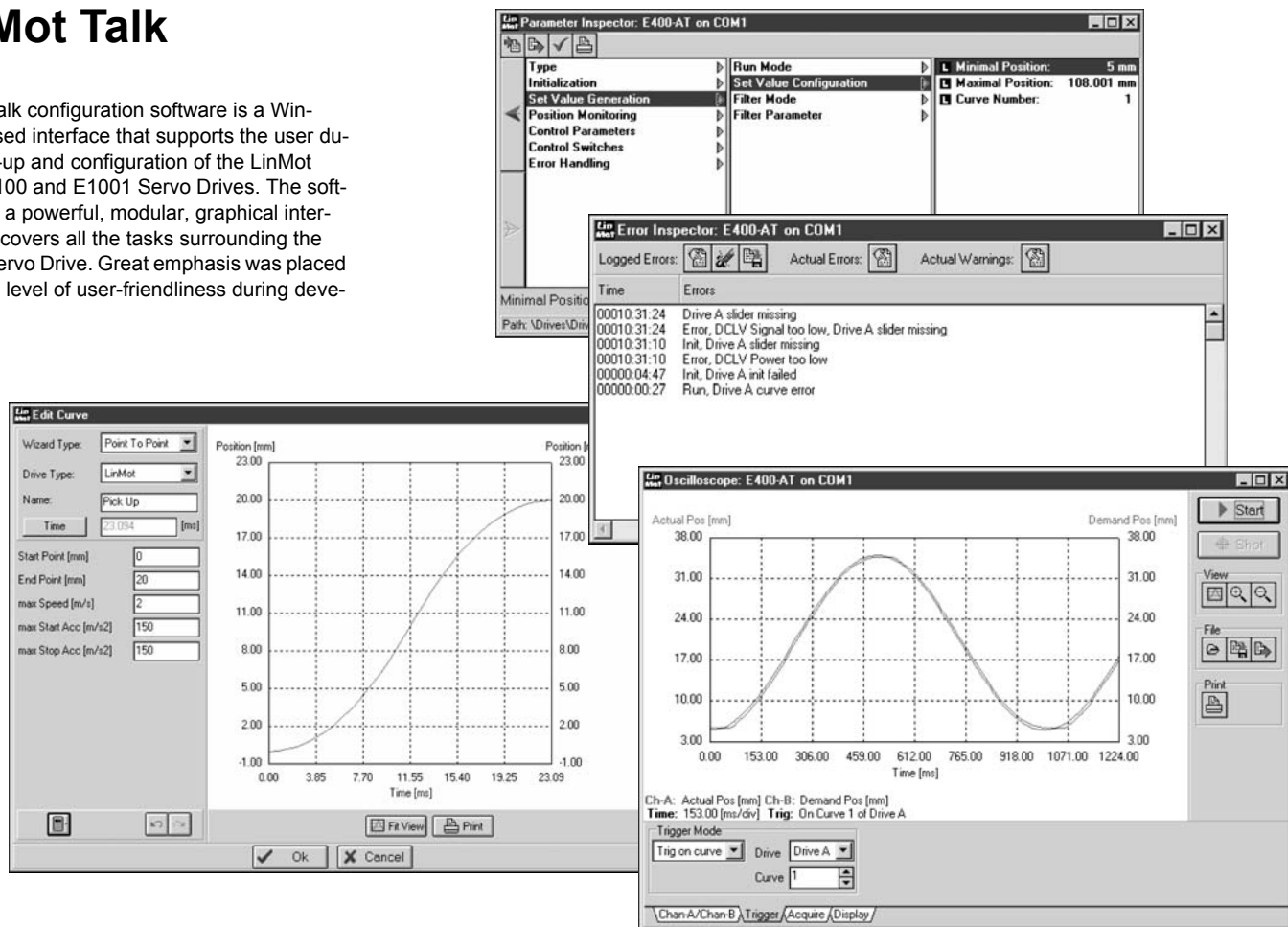
Start-up and Analysis Tools
Using the LinMot Talk PC interface, LinMot Servo Drives are configured. Additionally, the drives can be monitored during operation with the machine running, and the current motion sequences, as well as earlier warnings and error messages, can be analyzed in detail (monitoring).

Simple Installation
For start-up and monitoring, the Servo Drive is connected to a PC via the RS232 interface on the front, using a 9-pole D-sub connector (1:1 Connection). Up to four Axis on one drive can be configured and monitored at the same time using LinMot Talk.

Integrated Documentation
After installation of LinMot Talk on the PC is complete, all manuals and installation instructions are available via the Windows Start Menu. The user thus always has the current documentation available to him.

Parameterization

Using the "Parameter Inspector," the drives are parameterized in a simple manner. The user has a wide range of adjustments available for operating modes, error management, warning messages, and regulating parameters. Entire parameter sets can be stored, loaded, and printed out.

The "Curve Editor" allows creation of travel curves. In addition, existing curves can be loaded, stored, edited, combined, and printed out. Further, complex motion sequences can be generated as desired in MS Excel, and loaded into the drive.

The integrated oscilloscope helps the user during start-up and optimization of the

Optimization

drive system. Internal variables, such as the target and actual position, can be shown in real time on the screen, and then printed out. The displayed data can be stored in CSV format for further processing in MS Excel, or stored for documentation purposes.

Monitoring

Using the "Error Inspector," the user can read out stored errors, as well as the currently active warnings and error messages in the LinMot Servo Drive. The last 10 error messages are stored in non-volatile memory on the Servo Drive, together with the operating hours counter.

Further, the states of the inputs and outputs can be viewed in the "Error Inspector." This allows rapid and uncomplicated checking of signals from and to the overlaid control.
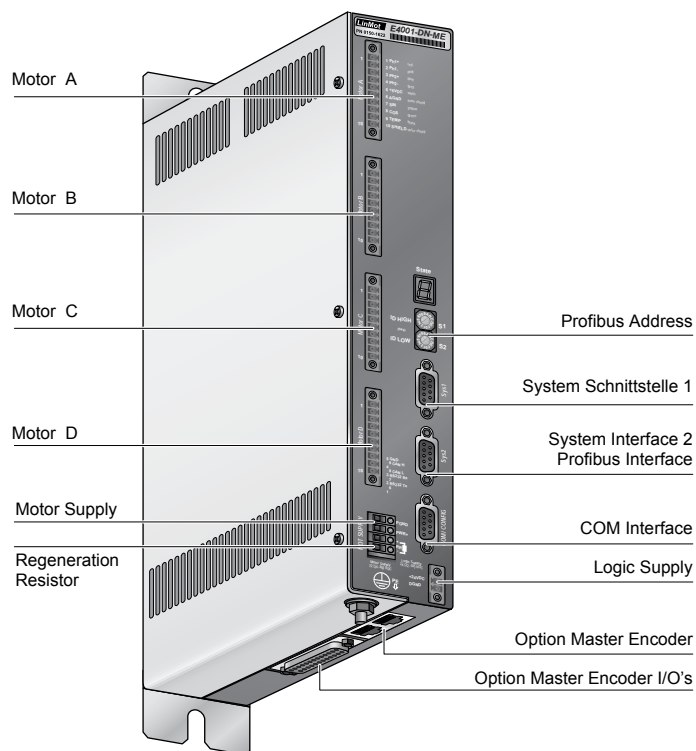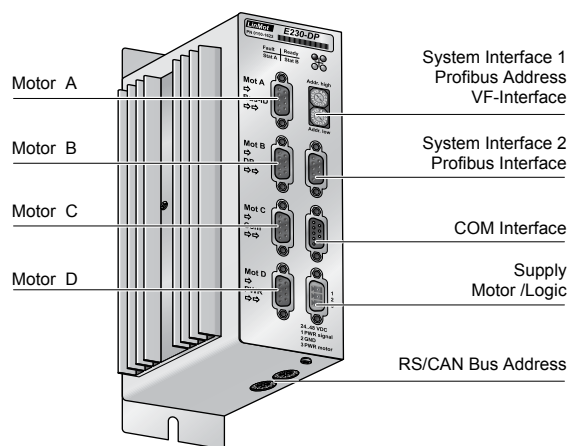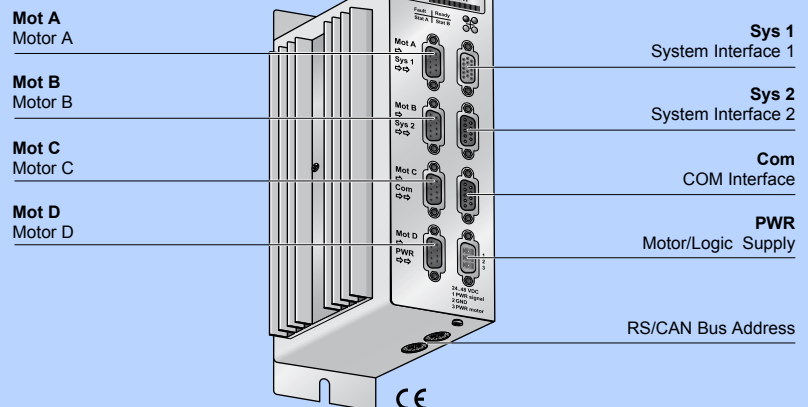
	E100-AT	E1001-AT	E100-MT	E1001-MT	E100-CO	E1001-CO	E100-DN	E1001-DN	E130-DP	E1031-DP
Interface										
System Interface 1	●	●	●	●	●	●	●	●		
System Interface 2	●	●	●	●	●	●	●	●		
Profibus Address		●		●		●		●	●	●
Profibus Interface									●	●
COM Interface	●	●	●	●	●	●	●	●	●	●
Supply Motor		●		●		●		●		●
Supply Logic		●		●		●		●		●
Supply Logic/Motor	●		●		●		●		●	
Regeneration Resistor		●		●		●		●		●
Bus Address RS/CAN	●	●	●	●	●	●	●	●		
Motor Connector DSUB-9	●		●		●		●		●	
Motor Connector MC01-P		●		●		●		●		●

LinMot®

E100-AT	E100-MT
E200-AT	E200-MT
E400-AT	E400-MT
E1001-AT	E1001-MT
E2001-AT	E2001-MT
E4001-AT	E4001-MT

✓ Absolute & Relative
Positioning Commands

✓ Travel Along Time Curves

✓ Trigger Mode: Two Point

✓ Trigger Mode: Curves

✓ Internal Multi Trigger Table (MT)

✓ Analog Position Target

✓ Master-Slave Synchronization

✓ Option:
Customer-Specific Functions (MT)

E100, E200, E400-AT/MT

Mot A — Motor A
Mot B — Motor B
Mot C — Motor C
Mot D — Motor D

Sys 1 — System Interface 1
Sys 2 — System Interface 2
Com — COM Interface
PWR — Motor/Logic Supply
RS/CAN Bus Address

E1001, E2001, E4001-AT/MT

Mot A — Motor A
Mot B — Motor B
Mot C — Motor C
Mot D — Motor D
PWR Motor — Motor Power Supply
Regeneration Resistor

Sys 1 — System Interface 1
Sys 2 — System Interface 2
Com — COM Interface
PWR Logic — Logic Supply
Option Master Encoder
Option Master Encoder I/O's

Analog Trigger Drive AT

The target position is provided by the overlaid control (PLC, industrial PC) as analog position signals, digital trigger signals, or directly via a serial interface.

End positions stored in the AT Servo Drive, or stored travel profiles, can be invoked using simple digital trigger signals.

The target position is provided as a voltage at the analog input of the Servo Drive. The position range associated with the voltage range at the analog input can be freely configured by the user.

Multi Trigger Drive MT

Multi trigger Servo Drives allow direct programming of complex motion sequences, with up to 64 commands. The Servo Drive is actuated by the overlaid control via digital signals.
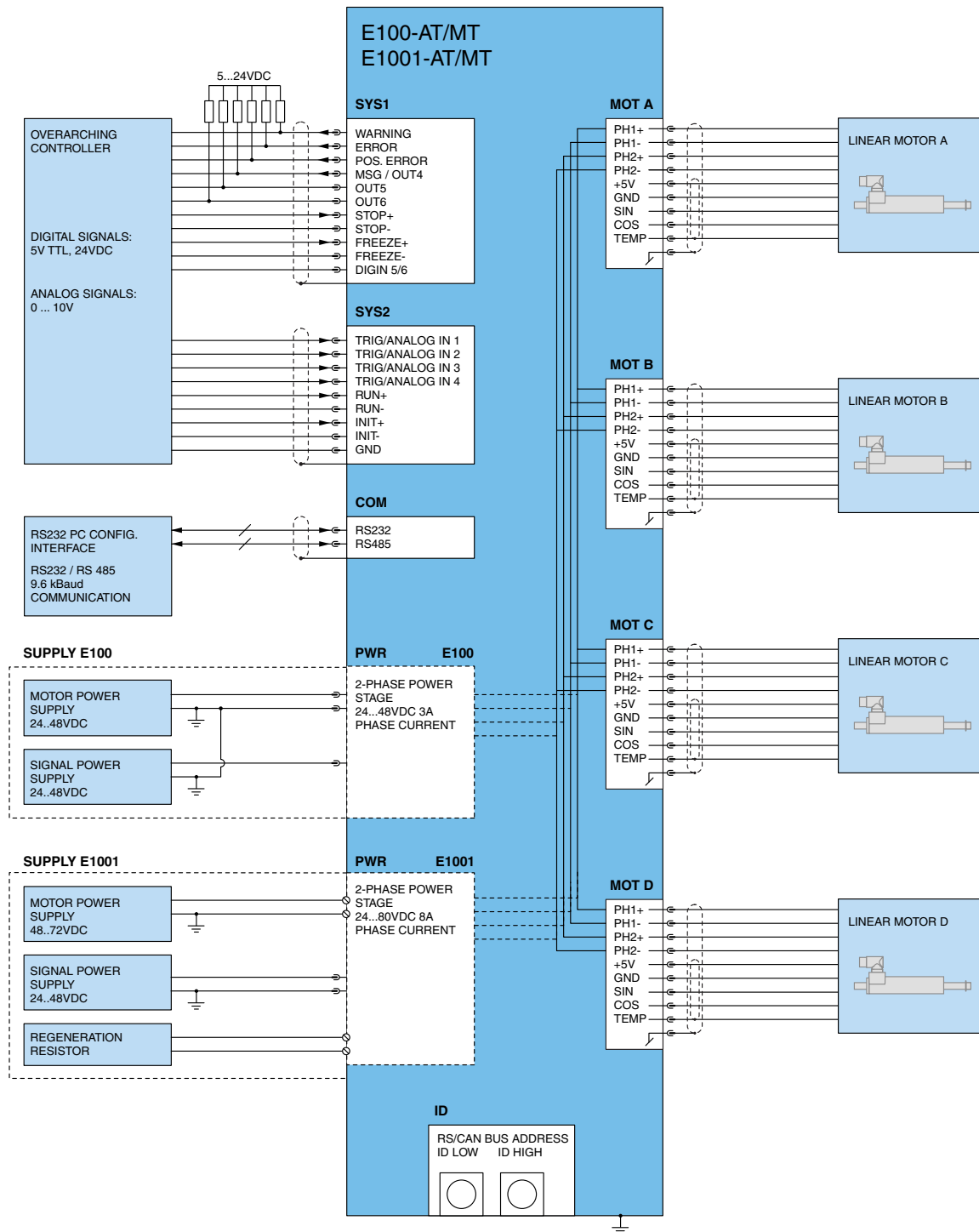
The commands for the individual Axis are stored in the state table in the Servo Drive. The individual states in the table are controlled by the overlaid control via digital signal addressing. As soon as a state is invoked by the overlaid control, the Axis carry out their defined motion or defined command.

Serial Interface RS232/RS485

Series E100/E1001E1001-AT and -MT Servo Drives offfer an ASCII protocol for serial communication over RS232 / RS484 with the overlaid control system.

The E100/E1001 drives have two independent serial interfaces for RS232 and RS485. If the Servo Drive communicates with the RS485 interface with the overlaid control, the RS232 interface may be used the same time for configuration and debugging with configuration software LinMot Talk.
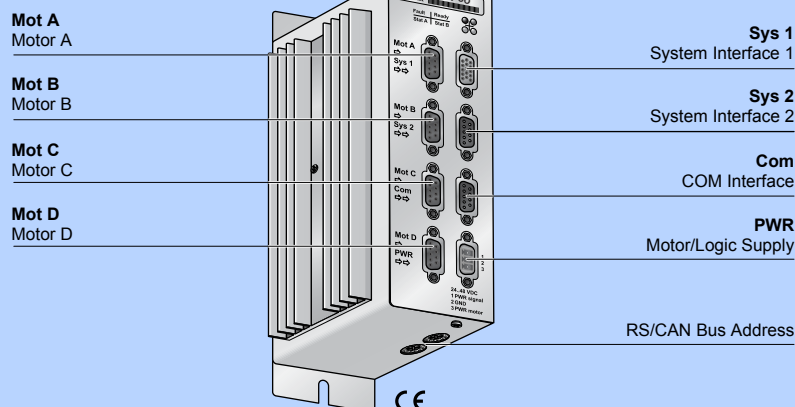
Adjustable Baud rates: 9.6-115.2kBaud

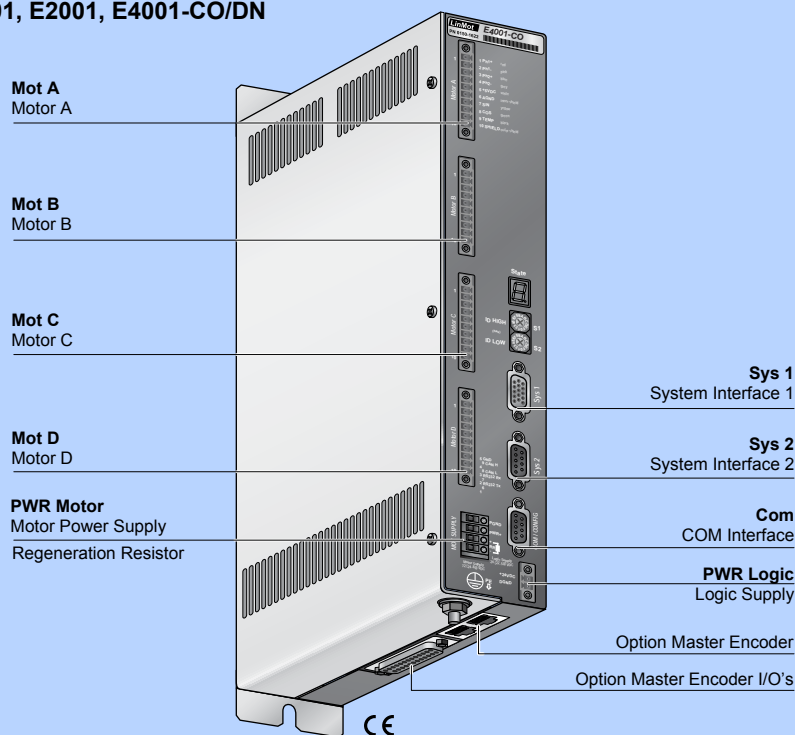| Item	Description	Part Number
E100-AT	AnalogTrigger Drive 1 Axis (48V/3A)	0150-1601
E200-AT	AnalogTrigger Drive 2 Axis (48V/3A)	0150-1602
E400-AT	AnalogTrigger Drive 4 Axis (48V/3A)	0150-1604
E1001-AT	AnalogTrigger Drive 1 Axis (72V/8A)	0150-2300
E2001-AT	AnalogTrigger Drive 2 Axis (72V/8A)	0150-2301
E4001-AT	AnalogTrigger Drive 4 Axis (72V/8A)	0150-2303
E100-MT	Multi Trigger Drive 1 Axis (48V/3A)	0150-1611
E200-MT	Multi Trigger Drive 2 Axis (48V/3A)	0150-1612
E400-MT	Multi Trigger Drive 4 Axis (48V/3A)	0150-1614
E1001-MT	Multi Trigger Drive 1 Axis (72V/8A)	0150-2304
E2001-MT	Multi Trigger Drive 2 Axis (72V/8A)	0150-2305
E4001-MT	Multi Trigger Drive 4 Axis (72V/8A)	0150-2307

E100-CO	E100-DN
E200-CO	E200-DN
E400-CO	E400-DN
E1001-CO	E1001-DN
E2001-CO	E2001-DN
E4001-CO	E4001-DN

✓ Absolute & Relative Positioning Commands

✓ Travel Along Time Curves

✓ Trigger Mode: Two Point

✓ Trigger Mode: Curves

✗ Internal Command Table

✓ Analog Position Target

✓ Master-Slave Synchronization

✓ Option: Customer-Specific Functions

E100, E200, E400-CO/DN

Mot A Motor A
Mot B Motor B
Mot C Motor C
Mot D Motor D

Sys 1 System Interface 1
Sys 2 System Interface 2
Com COM Interface
PWR Motor/Logic Supply
RS/CAN Bus Address

E1001, E2001, E4001-CO/DN

Mot A Motor A
Mot B Motor B
Mot C Motor C
Mot D Motor D
PWR Motor Motor Power Supply
Regeneration Resistor

Sys 1 System Interface 1
Sys 2 System Interface 2
Com COM Interface
PWR Logic Logic Supply
Option Master Encoder
Option Master Encoder I/O's

CANopen

LinMot CO drives, with integrated CANopen interface, support the CiA DS301 communication profile.

The following CANopen resources are available on the CO drives: 1-5 T_PDO, 1-5 R_PDO 1 T_SDO, 1 R_SDO

The following protocols are supported by the CO drives:
- Node Guarding
- PDO acyclic with inhibit time
- SDO Upload and Download
- NMT (Start, Stop, Enter PreOp, Reset Node, Reset Communication)
- Boot-Up Message

DeviceNet

Series DN drives feature an integrated DeviceNet interface. With the DeviceNet interface, even complicated motion sequences can be realized with the highest possible flexibility.

The drive can be actuated and monitored via the DeviceNet connection. The following expanded fieldbus functions are available:

- Direct target position
- Invoke motion profiles
- Read and write access to parameters
- Monitoring internal parameters
- Diagnosis

"Explicit Messaging" The DeviceNet Servo Drives support one "Explicit Messaging" connection per master.
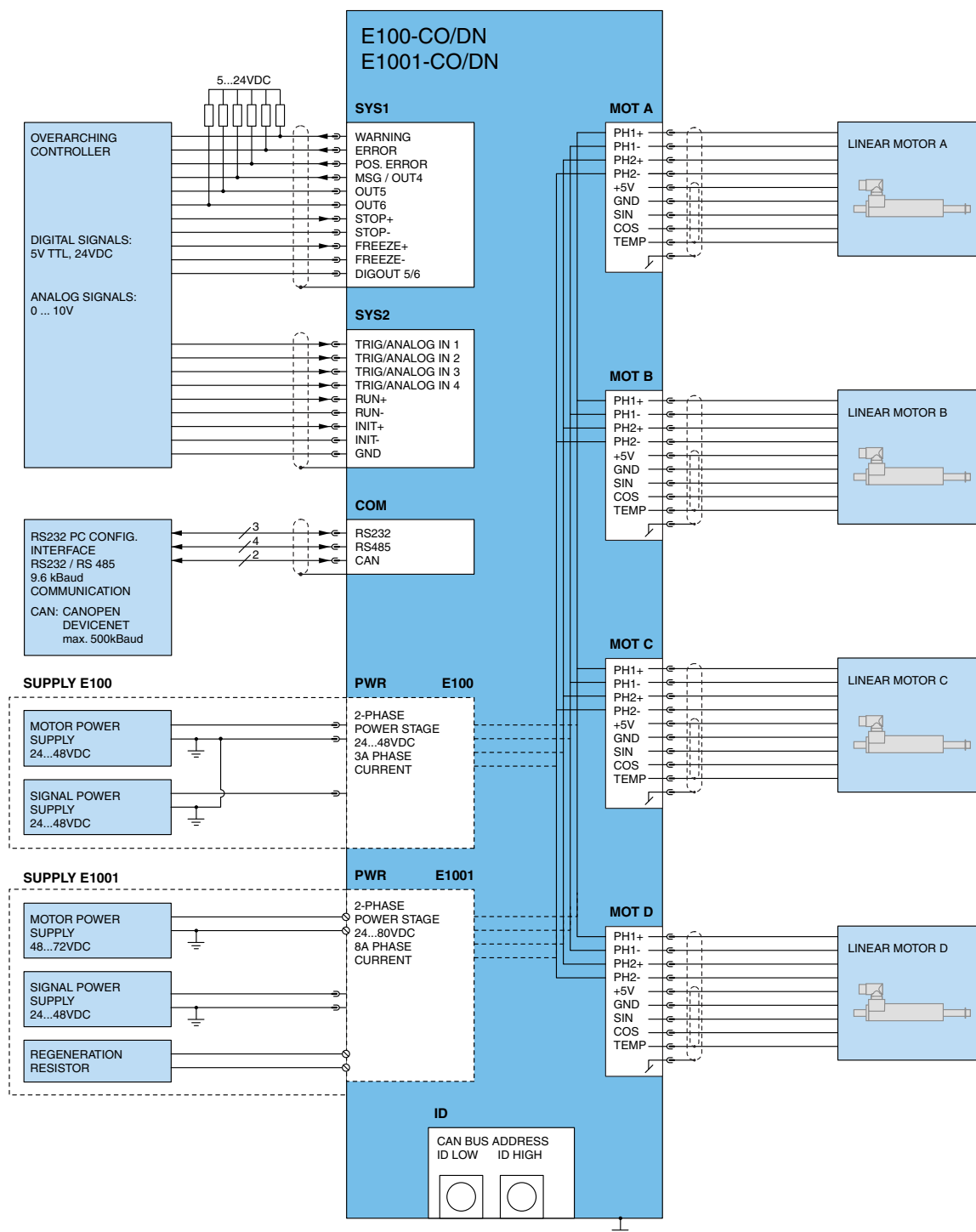
"Polled IO"
The master initiates data interchange with a "Polled IO" command.

"Change of State IO"
With this connection, the data is transferred only if the states or values have changed.

"Cyclic IO"
With the "Cyclic IO" connection, the data is transferred strictly cyclically.
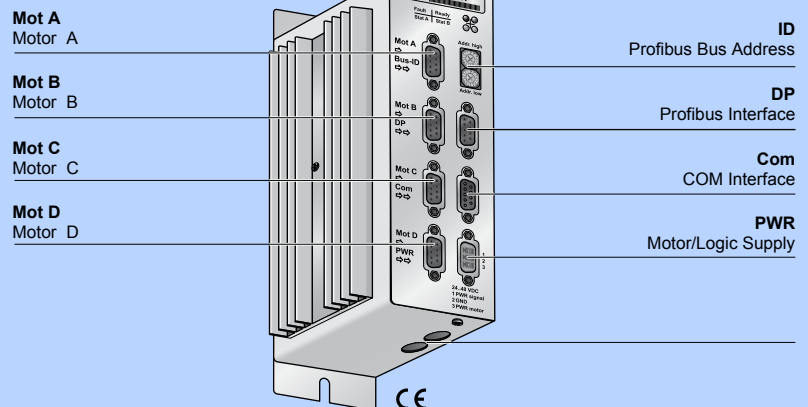
E100-CO/DN
E1001-CO/DN

5...24VDC

SYS1

OVERARCHING CONTROLLER

WARNING
ERROR
POS. ERROR
MSG / OUT4
OUT5
OUT6
STOP+
STOP-
FREEZE+
FREEZE-
DIGOUT 5/6

DIGITAL SIGNALS:
5V TTL, 24VDC

ANALOG SIGNALS:
0 ... 10V

SYS2

TRIG/ANALOG IN 1
TRIG/ANALOG IN 2
TRIG/ANALOG IN 3
TRIG/ANALOG IN 4
RUN+
RUN-
INIT+
INIT-
GND

COM

RS232 PC CONFIG.
INTERFACE
RS232 / RS 485
9.6 kBaud
COMMUNICATION

CAN: CANOPEN
DEVICENET
max. 500kBaud

RS232
RS485
CAN

3
4
2

SUPPLY E100

PWR   E100

MOTOR POWER
SUPPLY
24...48VDC

SIGNAL POWER
SUPPLY
24...48VDC

2-PHASE
POWER STAGE
24...48VDC
3A PHASE
CURRENT

SUPPLY E1001

PWR   E1001

MOTOR POWER
SUPPLY
48...72VDC

SIGNAL POWER
SUPPLY
24...48VDC

REGENERATION
RESISTOR

2-PHASE
POWER STAGE
24...80VDC
8A PHASE
CURRENT

ID

CAN BUS ADDRESS
ID LOW   ID HIGH

MOT A

PH1+
PH1-
PH2+
PH2-
+5V
GND
SIN
COS
TEMP

LINEAR MOTOR A

MOT B

PH1+
PH1-
PH2+
PH2-
+5V
GND
SIN
COS
TEMP

LINEAR MOTOR B

MOT C

PH1+
PH1-
PH2+
PH2-
+5V
GND
SIN
COS
TEMP

LINEAR MOTOR C

MOT D

PH1+
PH1-
PH2+
PH2-
+5V
GND
SIN
COS
TEMP

LINEAR MOTOR D

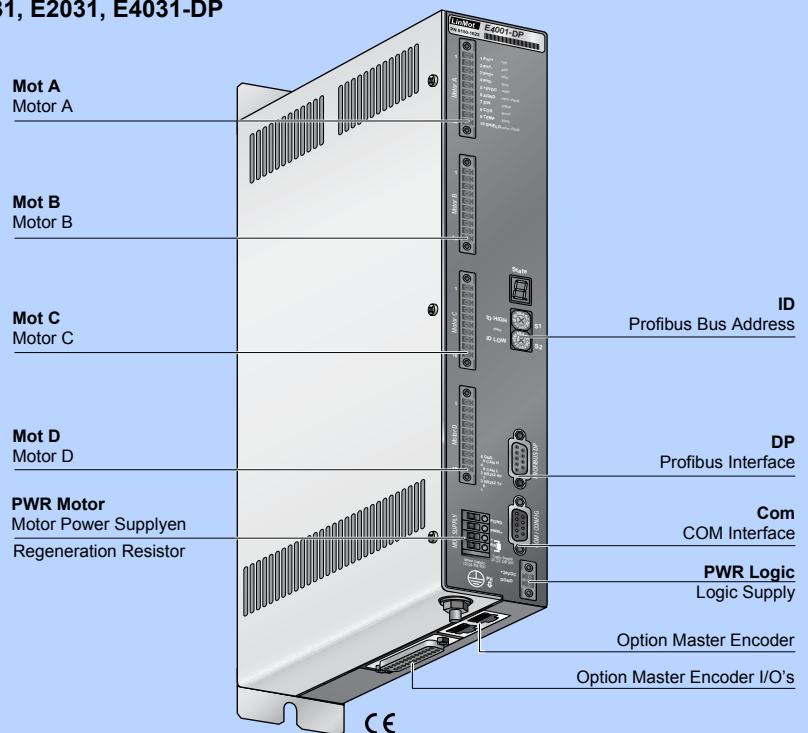| Item	Description	Part Number
E100-CO	CanOpen Drive 1 Axis (48V/3A)	0150-1669
E200-CO	CanOpen Drive 2 Axis (48V/3A)	0150-1670
E400-CO	CanOpen Drive 4 Axis (48V/3A)	0150-1672
E1001-CO	CanOpen Drive 1 Axis (72V/8A)	0150-2308
E2001-CO	CanOpen Drive 2 Axis (72V/8A)	0150-2309
E4001-CO	CanOpen Drive 4 Axis (72V/8A)	0150-2311
E100-DN	DeviceNet Drive 1 Axis (48V/3A)	0150-1641
E200-DN	DeviceNet Drive 2 Axis (48V/3A)	0150-1642
E400-DN	DeviceNet Drive 4 Axis (48V/3A)	0150-1644
E1001-DN	DeviceNet Drive 1 Axis (72V/8A)	0150-2312
E2001-DN	DeviceNet Drive 2 Axis (72V/8A)	0150-2313
E4001-DN	DeviceNet Drive 4 Axis (72V/8A)	0150-2315

E130-DP
E230-DP
E430-DP
E1031-DP
E2031-DP
E4031-DP

✓ Absolute & Relative
  Positioning Commands

✓ Travel Along Time Curves

✗ Trigger Mode: Two Point

✗ Trigger Mode: Curves

✗ Internal Command Table

✗ Analog Position Target

✓ Master-Slave Synchronization

✓ Option:
  Customer-Specific Functions

E130, E230, E430-DP

Mot A Motor A	**ID** Profibus Bus Address
Mot B Motor B	**DP** Profibus Interface
Mot C Motor C	**Com** COM Interface
Mot D Motor D	**PWR** Motor/Logic Supply

E1031, E2031, E4031-DP

Mot A Motor A

Mot B Motor B

Mot C Motor C — **ID** Profibus Bus Address

Mot D Motor D — **DP** Profibus Interface

PWR Motor Motor Power Supplyen — **Com** COM Interface

Regeneration Resistor — **PWR Logic** Logic Supply

Option Master Encoder

Option Master Encoder I/O's

Profibus DP

Series DP Servo Drives feature an integrated PROFIBUSDP interface. PROFIBUS-DP provides the user with a standardized fieldbus interface for rapid data interchange between the Servo Drive and the overlaid control.

With cyclical provision of target positions and other process data, the Profibus drives are the ideal solution for applications with motions and sequences that change frequently, such as are required, for example, in flexible machines and systems for rapid format changes.
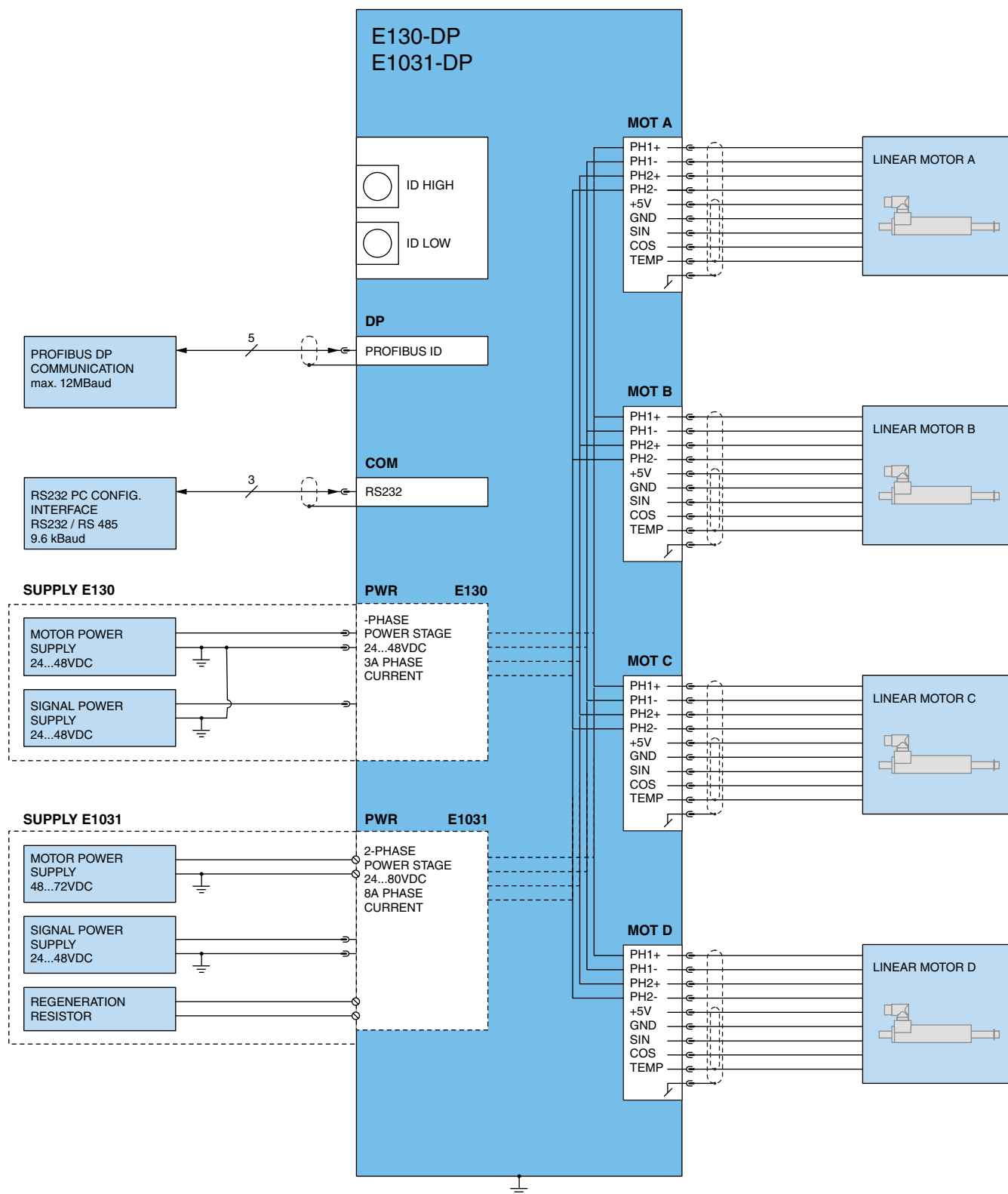
The Profibus interface supports all Baud rates from 9.6 Kbits/s to 12 Mbit/s. The maximum net data quantity exchanged in cyclical data traffic is 64 bytes per cycle. The smallest achievable bus cycle time is 100 µs. The structure and scope of cyclical data can be collected from any individual data modules into an overall data quantity when planning the system, whereby the data for the individually connected motors can be different.

A GSD device master file is provided for open planning in conformance with the standard.

The front-side 9-pin DSUB bus connector meets the PROFIBUS standard. It provides power for an external bus termination. A positive directional control signal is provided to control repeaters or optical fibers.

All signals on the PROFIBUS connector are galvanically separated.

The PROFIBUS-DP address is set by two hex code switches (ID1 and ID2). All addresses permitted by the standard are supported (0..125).

E130-DP
E1031-DP

MOT A

PH1+	
PH1-	
PH2+	
PH2-	LINEAR MOTOR A
+5V	
GND	
SIN	
COS	
TEMP	

ID HIGH

ID LOW

DP

PROFIBUS DP COMMUNICATION max. 12MBaud	5

PROFIBUS ID

MOT B

PH1+	
PH1-	LINEAR MOTOR B
PH2+	
PH2-	
+5V	
GND	
SIN	
COS	
TEMP	

COM

RS232 PC CONFIG. INTERFACE RS232 / RS 485 9.6 kBaud	3

RS232

SUPPLY E130

PWR   E130

MOTOR POWER SUPPLY 24...48VDC	-PHASE POWER STAGE 24...48VDC 3A PHASE CURRENT
SIGNAL POWER SUPPLY 24...48VDC	

MOT C

PH1+	
PH1-	LINEAR MOTOR C
PH2+	
PH2-	
+5V	
GND	
SIN	
COS	
TEMP	

SUPPLY E1031

PWR   E1031

MOTOR POWER SUPPLY 48...72VDC	2-PHASE POWER STAGE 24...80VDC 8A PHASE CURRENT
SIGNAL POWER SUPPLY 24...48VDC	
REGENERATION RESISTOR	

MOT D

PH1+	
PH1-	LINEAR MOTOR D
PH2+	
PH2-	
+5V	
GND	
SIN	
COS	
TEMP	

Item	Description	Part Number
E130-DP	Profibus DP Drive 1 Axis (48V/3A)	0150-1621
E230-DP	Profibus DP Drive 2 Axis (48V/3A)	0150-1622
E430-DP	Profibus DP Drive 4 Axis (48V/3A)	0150-1624
E1031-DP	Profibus DP Drive 1 Axis (72V/8A)	0150-2316
E2031-DP	Profibus DP Drive 2 Axis (72V/8A)	0150-2317
E4031-DP	Profibus DP Drive 4 Axis (72V/8A)	0150-2319

Break Out Module

The Break Out Module for the AT and MT Servo Drives leads all input and output signal from the SYS1 and SYS2 DSUB connectors to plug-type screw terminals.

48 mm
126 mm
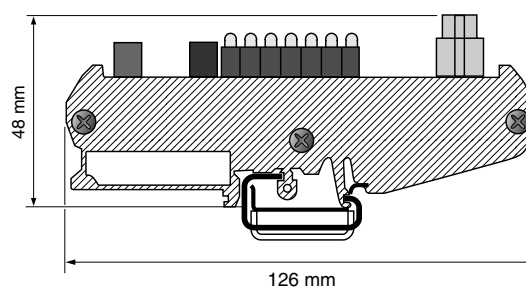
Break Out Module

The Break Out Module is available in two versions, with a digital or analog interface.

The Break Out Module is snapped onto the DIN rail directly in the electrical enclosure. Two tabs for screw mounting are also included.

Features:

- Plug-type screw terminals for all inputs and outputs

- Digital inputs, galvanically isolated, (24V/10mA)

- Digital outputs, galvanically isolated, (24V/0.5A)

- Relay output (48V/2A, max. 60W)

- LED status indicator for all inputs and outputs

- Analog input voltage -10…+10V for analog module.

Cable & Connector Set

The connection cable to the Servo Drive and the plug-type screw terminals are available as a set.
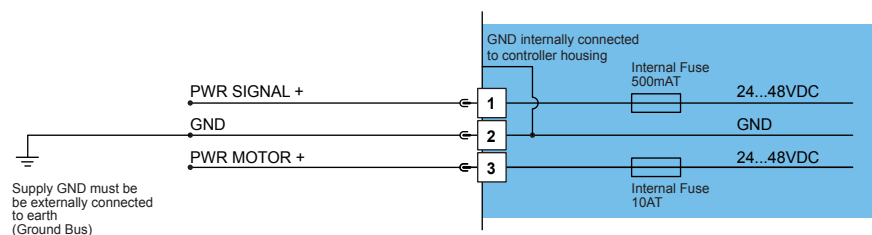
M01-DIGITAL
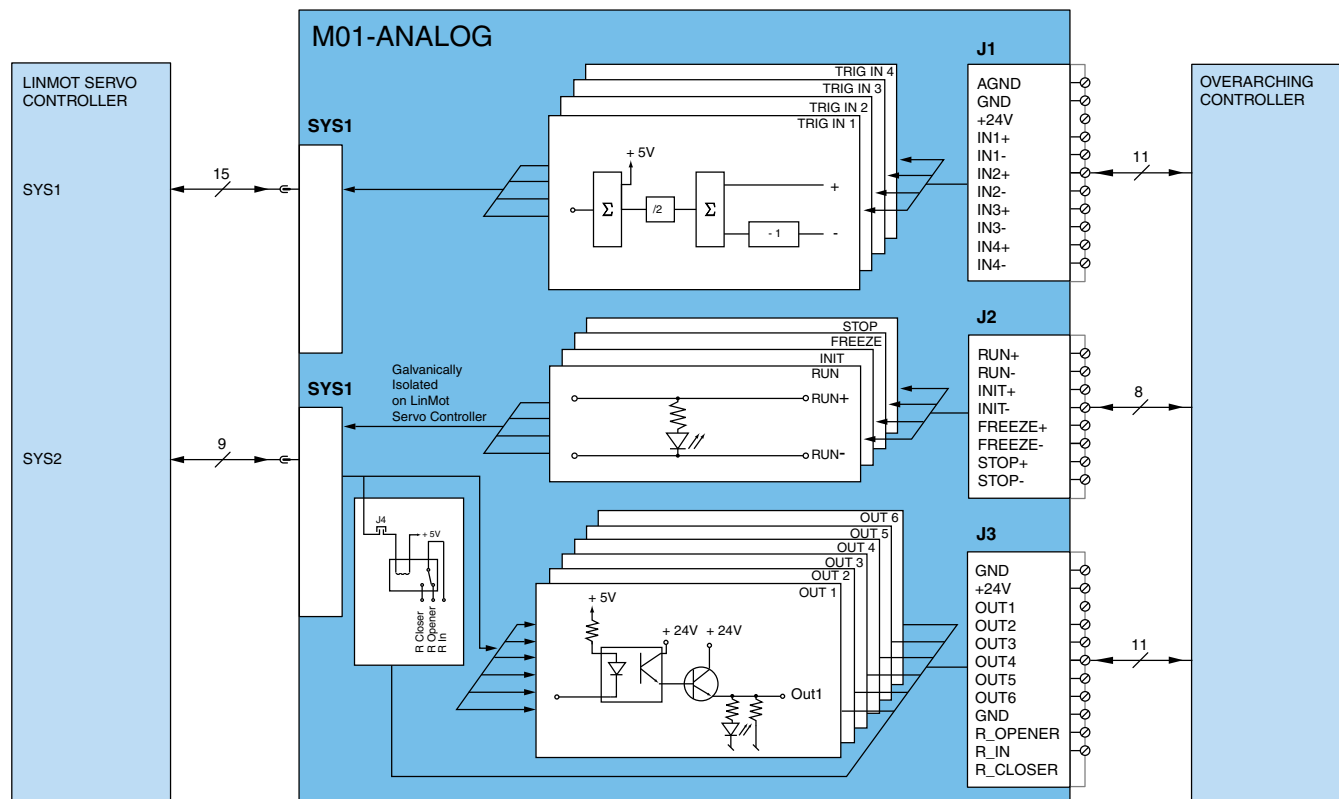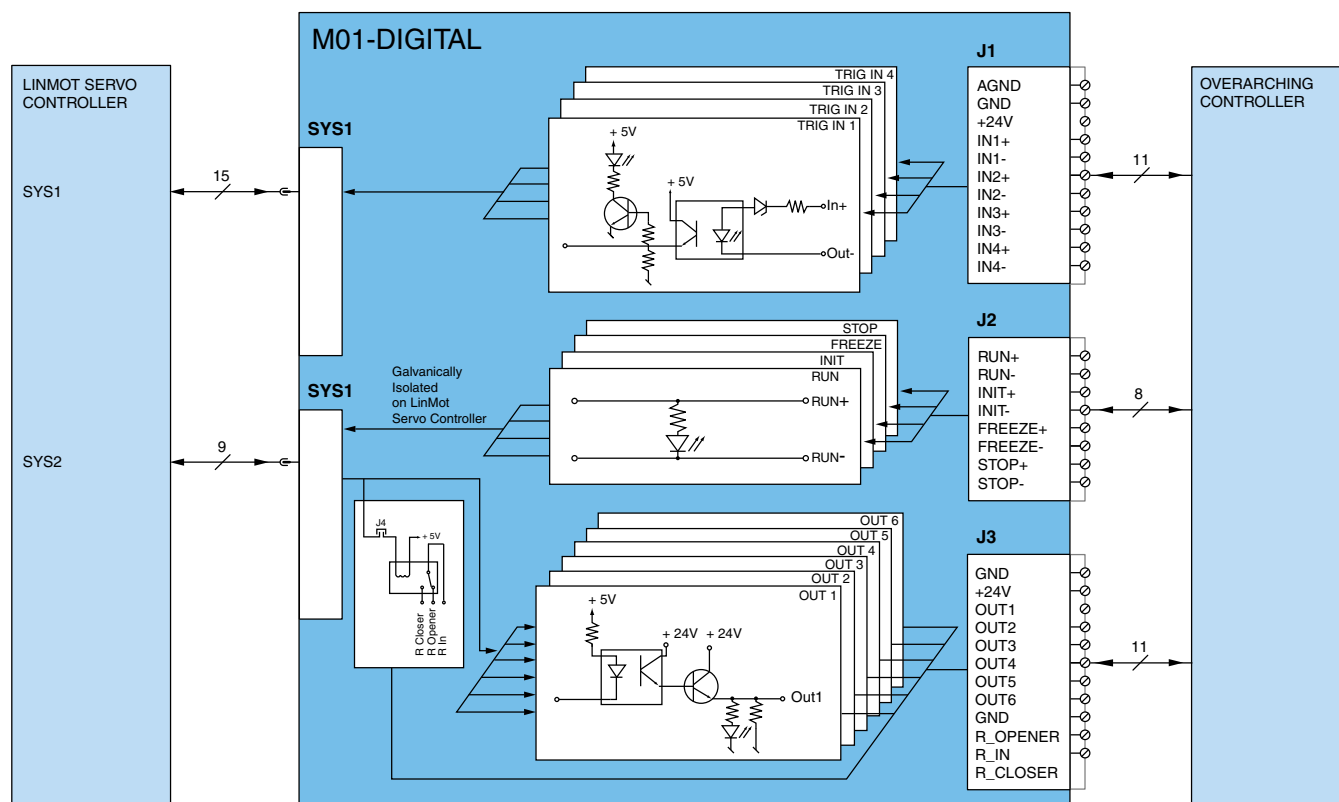
M01-ANALOG

Item	Description	Part Number
M01-digital	Breakout Module digital	0150-1932
M01-analog	Breakout Module analog	0150-1933
M01-Connector	Cable and Connector set	0150-1934

E100 | Supply Motor/Logic

GND internally connected
to controller housing

Internal Fuse
500mAT

PWR SIGNAL + — 1 — 24...48VDC

GND — 2 — GND

PWR MOTOR + — 3 — 24...48VDC

Internal Fuse
10AT

Supply GND must be
be externally connected
to earth
(Ground Bus)
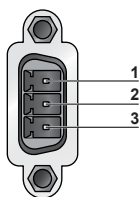
Power Connector
Logic/Motor
1.5 mm² (AWG16)

Supply

Supply Voltage Logic: 24...48VDC (absolute max. Rating 48VDC + 10%)
Supply Voltage Motor: 24...48VDC (absolute max. Rating 48VDC + 10%)

Motor Supply GND must be externally connected to earth

⚠ - By exceeding 52VDC supply voltage, the drive will go into error state.
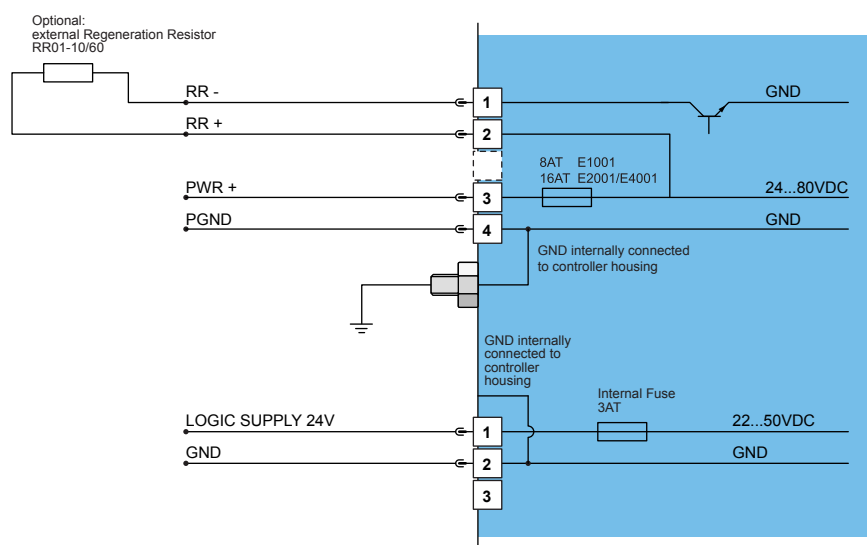- Power supply connectors must not be connected or disconnected while DC voltage is present.

E1001 | Supply Motor/Logic

PGND — 1
PWR+ — 2
RR + — 3
RR - — 4

Screw Terminals
2.5 mm² (AWG14)

Optional:
external Regeneration Resistor
RR01-10/60

RR - — 1 — GND

RR + — 2

8AT   E1001
16AT E2001/E4001

PWR + — 3 — 24...80VDC

PGND — 4 — GND

GND internally connected
to controller housing

GND internally
connected to
controller
housing

Internal Fuse
3AT

LOGIC SUPPLY 24V — 1 — 22...50VDC

GND — 2 — GND

3
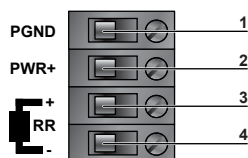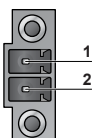
Phoenix MC1,5/2-STF-3.81
0.25-1.5mm² (AWG24-16)
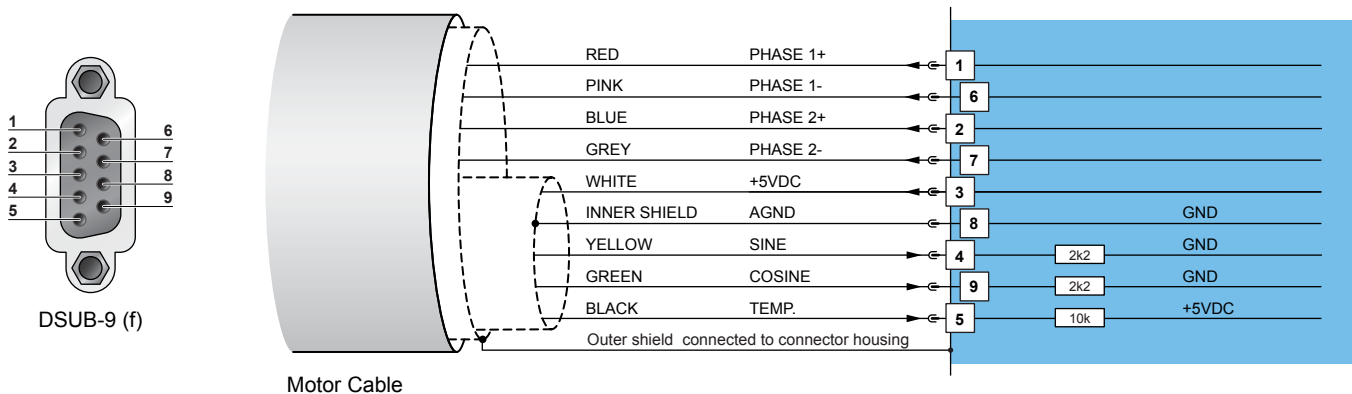
Supply:

Supply Voltage Logic: 24...80VDC (absolute max. Rating 92VDC)
Supply Voltage Motor: 48...72VDC (absolute max. Rating 72VDC + 5%)

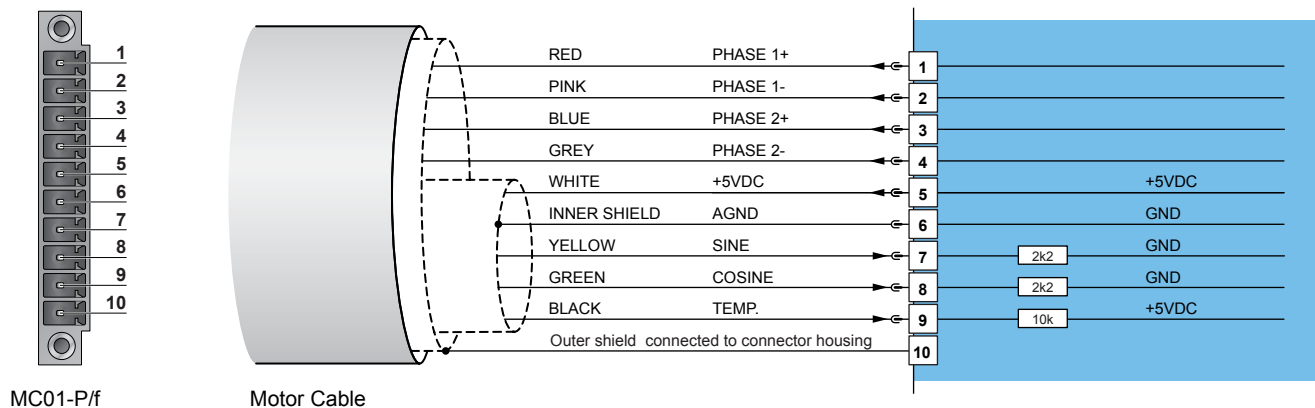Motor and Logic Supply GND must be externally connected to earth

⚠ - By exceeding 92VDC motor supply voltage, the drive will go into error state.
- By exceeding 52VDC logic supply voltage, the drive will go into error state.
- Power supply connectors must not be connected or disconnected while DC voltage is present.
- It is recommended that the motor and the logic be supplied and controlled separately.

Mot A (B, C, D) | Motor connector E100

RED	PHASE 1+	1		
PINK	PHASE 1-	6		
BLUE	PHASE 2+	2		
GREY	PHASE 2-	7		
WHITE	+5VDC	3		
INNER SHIELD	AGND	8		GND
YELLOW	SINE	4	2k2	GND
GREEN	COSINE	9	2k2	GND
BLACK	TEMP.	5	10k	+5VDC

Outer shield connected to connector housing

DSUB-9 (f)

Motor Cable

Mot A (B, C, D) | Motor connector E1001

RED	PHASE 1+	1		
PINK	PHASE 1-	2		
BLUE	PHASE 2+	3		
GREY	PHASE 2-	4		
WHITE	+5VDC	5		+5VDC
INNER SHIELD	AGND	6		GND
YELLOW	SINE	7	2k2	GND
GREEN	COSINE	8	2k2	GND
BLACK	TEMP.	9	10k	+5VDC
		10		

Outer shield connected to connector housing

MC01-P/f

Motor Cable

Motor Cable

- Use only special double-shielded Linear Motor Cable (see motor accesories).
- LinMot offers a wide range of preassambled motor cable in standard and custom length (tested 1.5kV):
    Standard Cable K05-...
    High-Flex Cable KS05-...
    Robot-Cable KR05-...

- Do NOT connect AGND (Pin 6) to ground or earth!
- Inner shield (AGND) and outer shield (earth) must be isolated to each other.
- Use +5V (Pin 3) and AGND (Pin 6) only for motor internal Hall Sensor supply (max. 100mA).

- Wrong Motor wiring may damage Linear Motors and/or Servo Drive.
  If you are assembling motor cables by your own, double check motor wiring carefully before power up.

- Do not connect or disconnect the motors from drives with voltage present.
  Wait to connect or disconnect motors until all LinMot drive LED's have turned off.

SYS1	System interface 1

DSUB-15 (f)

```
5...24VDC
WARN OUT                    14
ERROR OUT                   13
POS ERROR / DIG OUT 3       11
MSG / DIG OUT 4             12
DIG OUT 5                   10
DIG OUT 6                    6
EMERGENCY STOP +             2
EMERGENCY STOP -             1
FREEZE +                     3
FREEZE-                      7
DIG IN 5                     4      100k
DIG IN 6                     8      100k
DO NOT CONNECT!              9
OUTPUT +5V (max 50 mA)       5      5V
GND                         15             GND
```
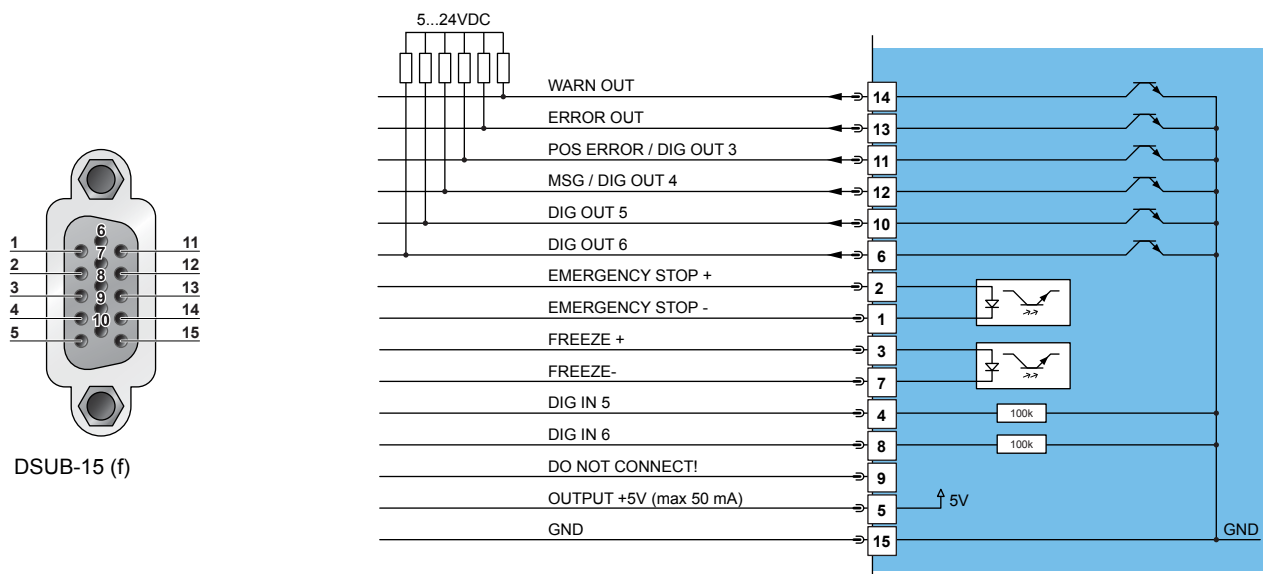
Control Inputs: Stop (active low) / Freeze (active high)
Optical isolated inputs (Input voltage: 0 …. 24V)
  - for logical zero: input voltage < 2V
  - for logical one: input volateg > 3.5V
Input current: < 20 mA (internally limited to 20 mA)
Update rate: 1.6 ms

Digital Inputs: Dig In 5 / Dig In 6
24VDC inputs, input resistance 100kOhm
- for logical zero: input voltage < 2V
- for logical one: input volateg > 3.5V

Digital Outputs: Pos Error Out / MSG / Error Out / Warn Out / Dig Out 5 / Dig Out 6
Open Collector max 24V / 50 mA
Typical pull-up Resistor R:for V+ = 5V supply: R=150 Ohm/0.25 W
                              for V+=24V supply: R=820 Ohm / 1W

SYS2	System interface 2

DSUB-9 (m)

```
TRIG/ANLOG IN 1      1    100k    GND
TRIG/ANLOG IN 2      6    100k    GND
TRIG/ANLOG IN 3      2    100k    GND
TRIG/ANLOG IN 4      7    100k    GND
RUN +                3
RUN -                8
INT +                4
INT -                9
GND                  5            GND
```
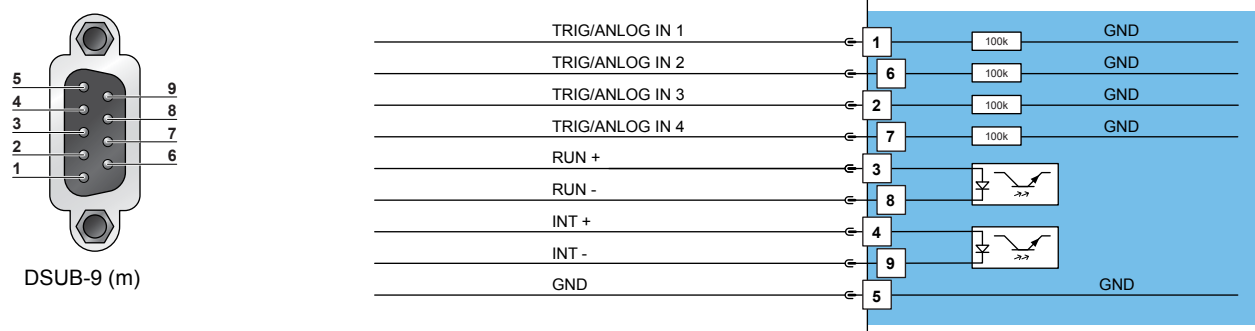
Digital/Analog Input: Trig/Analog IN
Input can be used as analog inputs between 0 … 10V (10 bit resolution) input resistance 100kOhm
or digital inputs (max. 24V, input resistance 100kOhm) for logical zero <2V,
                                                          for logical one   >3.5V

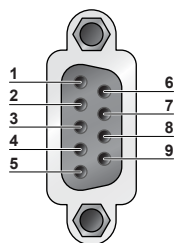**Control Inputs: RUN (active high) / INT (active high)**
Optical isolated 24V inputs
Input voltage: 0 …. 24V   for logical zero <2V
                                            for logical one >3.5V
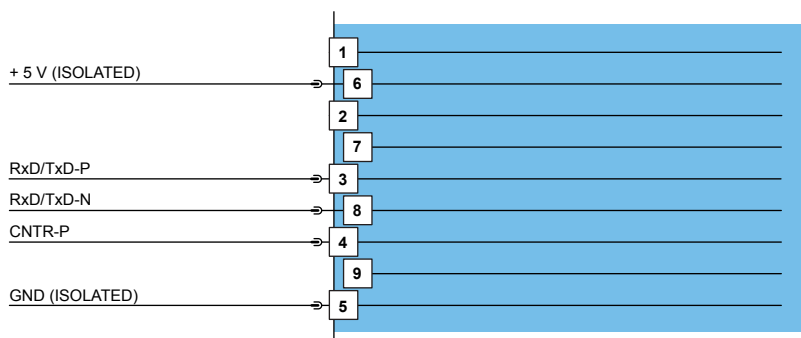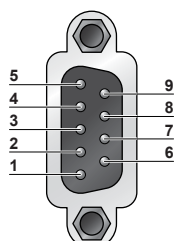
Input current: < 20 mA (internally limited to 20 mA)
Update rate: 1.6 ms

DP — Profibus DP interface

DSUB-9 (f)

+ 5 V (ISOLATED) — 6

RxD/TxD-P — 3

RxD/TxD-N — 8

CNTR-P — 4

GND (ISOLATED) — 5

Isolated 5V output: max 50 mA

COM — Com interface

DSUB-9 (m)

Pin	Signal		Signal
RS485_TX+	1		RS485_TX+
RS485_RX-	6		RS485_RX-
RS232_TX	2		RS232_TX
RS485_TX-	7		RS485_TX-
RS232_RX	3		RS232_RX
CAN_L	8		CAN_L
RS485_RX+	4		RS485_RX+
CAN_H	9		CAN_H
GND	5	100	GND
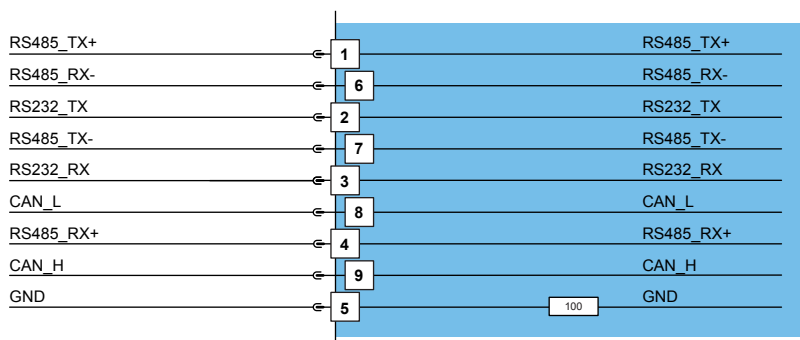
RS232: Configuration on all Drives: use 1:1 connection cable to PC

LED — State display E100

Green

Ready Green:
READY: The system has started correctly
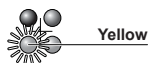
Yellow

Stat A Yellow:
STAT A : Coding for the actual operating state
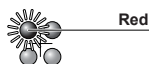The display of the various operating states is shown on the last page of this manual.
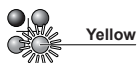
Yellow

Stat B Yelllow:
STAT B: Coding for the actual operating state
The display of the various operating states is shown on the last page of this manual.

Red

Fault Red:
FAULT: An error has occurred
(In the state ERROR a blink code of the STAT LEDs A and B tells what the actual error is.
The blink codes are explained in chapter 'Service'of the user Manual.)

DISPLAY — State display E1001

8 Segement Display
Output of operating states and error codes

Switched-Mode Power Supplies

Item	Description	Part Number
S01-48/300	Switched-Mode Power Supply 48V/300W for Drive Series E100	0150-1941
S01-48/600	Switched-Mode Power Supply 48V/600W for Drive Series E100	0150-1946
S01-72/500	Switched-Mode Power Supply 72V/500W for Drive Serie E1001	0150-1874
S01-72/600	Switched-Mode Power Supply 72V/600W for Drive Serie E1001	0150-1943
S01-72/1000	Switched-Mode Power Supply 72V/1000W for Drive Serie E1001	0150-1872
SM01-300	Mounting part for 300W Switched-Mode Power Supply	0150-3040
SM01-600	Mounting part for 600W Switched-Mode Power Supply	0150-3041

Transformer Supply T01 for E1001   3x230/280/400/480VAC

Item	Description	Part Number
T01-72/420...1500-Multi	Transformer Supply 3x230/280/400/480VAC, 50/60Hz, 420...1500W	see page 536

Control Box B01-04



Item	Description	Part Number
B01-04 230VAC/50Hz	Control Box for E100/E1001-AT/MT (230VAC, incl. cable and connectors)	0150-1930
B01-04 115VAC/60Hz	Control Box for E100/E1001-AT/MT (115VAC, incl. cable and connectors)	0150-1931

COM connection cables and USB-converter

Item	Description	Part Number
RS232 PC config. cabel 2m	for E100/E1001	0150-3009
RS232 PC config. cabel 2m	for E100/E1001/E1100/B1100	0150-3307
RS232 PC config. cabel 2.5m	for E1200/E1400	0150-2143
USB-Serial Converter	USB to 9-pin Serial Converter	0150-3110

178

119

Centers
194

330 Centers
315

210

176

296

55

70

58
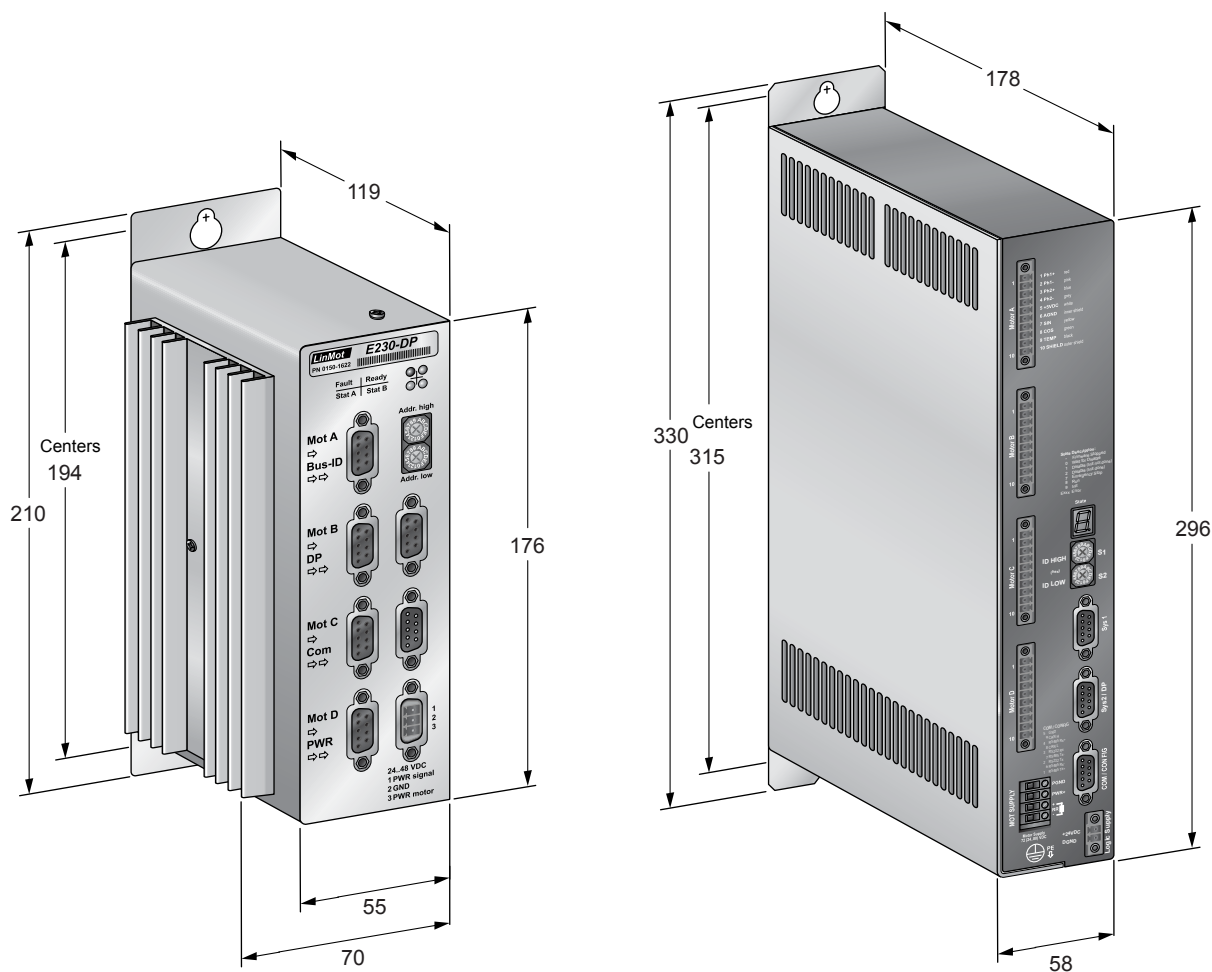
Dimensions in mm

		E100	E200	E400	E1001	E2001	E4001
Interfaces							
Width	mm		70			58	
Height	mm		210			330	
Height without fixings	mm		175			296	
Depth	mm		120			178	
Weight	kg	1.1	1.2	1.3	2. 5	2.6	2.7
Protection Class	IP		40			40	
Storage Temperture	°C		-25..70			-25..70	
Operating Temperature	°C		0..50			0..50	
Max. Case Temperature	°C		65			65	
Max. Power Dissipation	W	22	38	70		80	
Distance between Drives	mm		50			50	

Item	Description	Part Number
E100-AT	AnalogTrigger Drive 1 Axis (48V/3A)	0150-1601
E200-AT	AnalogTrigger Drive 2 Axis (48V/3A)	0150-1602
E400-AT	AnalogTrigger Drive 4 Axis (48V/3A)	0150-1604
E1001-AT	AnalogTrigger Drive 1 Axis (72V/8A)	0150-2300
E2001-AT	AnalogTrigger Drive 2 Axis (72V/8A)	0150-2301
E4001-AT	AnalogTrigger Drive 4 Axis (72V/8A)	0150-2303
E100-MT	Multi Trigger Drive 1 Axis (48V/3A)	0150-1611
E200-MT	Multi Trigger Drive 2 Axis (48V/3A)	0150-1612
E400-MT	Multi Trigger Drive 4 Axis (48V/3A)	0150-1614
E1001-MT	Multi Trigger Drive 1 Axis (72V/8A)	0150-2304
E2001-MT	Multi Trigger Drive 2 Axis (72V/8A)	0150-2305
E4001-MT	Multi Trigger Drive 4 Axis (72V/8A)	0150-2307
E130-DP	Profibus DP Drive 1 Axis (48V/3A)	0150-1621
E230-DP	Profibus DP Drive 2 Axis (48V/3A)	0150-1622
E430-DP	Profibus DP Drive 4 Axis (48V/3A)	0150-1624
E1031-DP	Profibus DP Drive 1 Axis (72V/8A)	0150-2316
E2031-DP	Profibus DP Drive 2 Axis (72V/8A)	0150-2317
E4031-DP	Profibus DP Drive 4 Axis (72V/8A)	0150-2319
E100-DN	DeviceNet Drive 1 Axis (48V/3A)	0150-1641
E200-DN	DeviceNet Drive 2 Axis (48V/3A)	0150-1642
E400-DN	DeviceNet Drive 4 Axis (48V/3A)	0150-1644
E1001-DN	DeviceNet Drive 1 Axis (72V/8A)	0150-2312
E2001-DN	DeviceNet Drive 2 Axis (72V/8A)	0150-2313
E4001-DN	DeviceNet Drive 4 Axis (72V/8A)	0150-2315
E100-CO	CanOpen Drive 1 Axis (48V/3A)	0150-1669
E200-CO	CanOpen Drive 2 Axis (48V/3A)	0150-1670
E400-CO	CanOpen Drive 4 Axis (48V/3A)	0150-1672
E1001-CO	CanOpen Drive 1 Axis (72V/8A)	0150-2308
E2001-CO	CanOpen Drive 2 Axis (72V/8A)	0150-2309
E4001-CO	CanOpen Drive 4 Axis (72V/8A)	0150-2311

Servo Drive E1100

Servo Drive E1100

Series E1100 Servo Drives are modular axis dri-ves, with 32-bit position resolution and an integ-rated power element, for linear motors and rotary drives.

The drives are suitable for simplest, standard, and high-end positioning tasks, across the entire force range of the LinMot product range.

Connection to Machine Drive

The Series E1100 Servo Drives can be actuated by machine controls from any manufacturer or brand, via digital inputs and outputs, RS232 or RS485 serial inter-face, CanBus CANopen and DeviceNet interfaces, Profibus DP.

For complex motion sequences that are run in an overlaid position drive, B1100 small servo amplifiers are available, with analog velocity or force control and enco-der simulation.

Process and Safety Interfaces

Fast process interfaces for direct proces-sing of sensor signals are available as freely programmable analog and digital inputs, a fast trigger input, and a capture input.
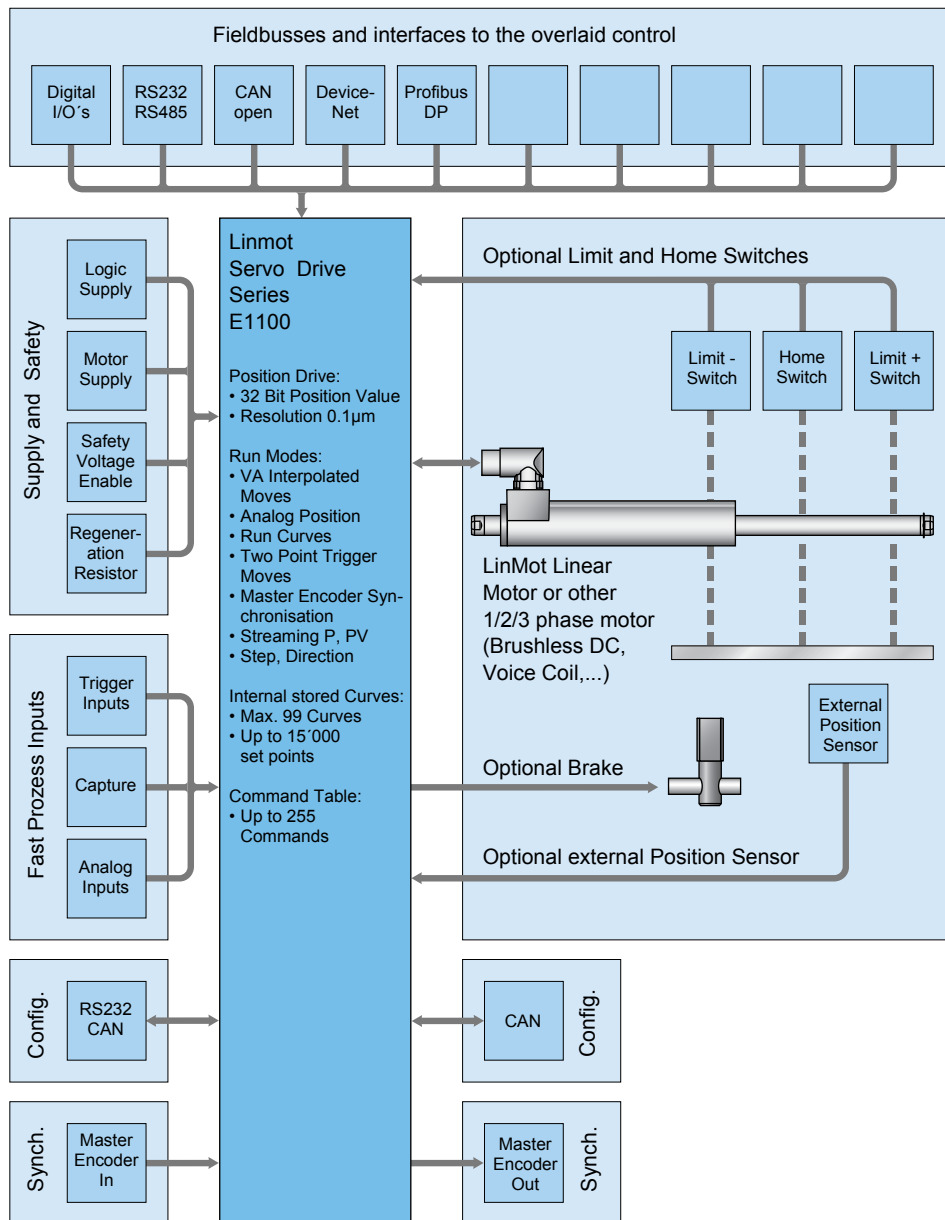
The safe pulse inhibitor on Servo Drive with fieldbus interfaces allows safe stoppage of the drives via control signals, per EN 954-1, without interrupting the power supply.

Logic and Power Supply

The Servo Drives have two separate power supplies for the logic and power elements.

In an E-stop and safe stop of the drive, only the power element supply is cut off from the drive. The logic supply and the drive conti-nue to run.

This has the advantage that the drive and li-near motor do not need to be reinitialized when the machine is restarted, since all pro-cess data, including the current position of the linear motor, are still up to date.

Fieldbusses and interfaces to the overlaid control

| Digital I/O´s | RS232 RS485 | CAN open | Device-Net | Profibus DP | | | | | |

Supply and Safety
- Logic Supply
- Motor Supply
- Safety Voltage Enable
- Regeneration Resistor

Linmot Servo Drive Series E1100

Position Drive:
- 32 Bit Position Value
- Resolution 0.1µm

Run Modes:
- VA Interpolated Moves
- Analog Position
- Run Curves
- Two Point Trigger Moves
- Master Encoder Synchronisation
- Streaming P, PV
- Step, Direction

Internal stored Curves:
- Max. 99 Curves
- Up to 15´000 set points

Command Table:
- Up to 255 Commands

Optional Limit and Home Switches

| Limit - Switch | Home Switch | Limit + Switch |

LinMot Linear Motor or other 1/2/3 phase motor (Brushless DC, Voice Coil,...)

Optional Brake

External Position Sensor

Optional external Position Sensor

Fast Prozess Inputs
- Trigger Inputs
- Capture
- Analog Inputs

Config.
- RS232 CAN
- CAN **Config.**

Synch.
- Master Encoder In
- Master Encoder Out **Synch.**

System Integration

Flexible hardware enables control of any 1/2/3-phase motors. Thus, low-power rotary servomotors, such as brushless DC motors, can be integrated in the same controls concept.

Additionally, the drives can be equipped with optional peripherals, such as reference and end stop switches, high-precision external position sensors, or a mechanical holding brake.

Series E1100 Servo Drives have analog and digital inputs and outputs, serial interfaces, fieldbusses. The user is therefore not dependent on the selection of the overlaid drive. An appropriate interface is available, with associated protocols, for any PLC or IPC solution.

With flexibility and a compact form factor, LinMot Series E1100 Servo Drives provide a complete solution for a flexible drive concept in single and multiple axis applications, with linear motors and other actuators.

Technology Functions

Technology functions are functional blocks that provide a complete solution for standard applications and frequently encountered, customer-specific problems. Technology functions can, for example, handled the complete sequence for winding textile yarns or glass fiber cables, or high-precision joining processes with force control can be implemented directly in the drive.

Option: Master Encoder Module

For synchronization to a mechanical master shaft, or a rotating main drive, the Axis (linear motors and rotary motors) can be coupled to an electronic main shaft via the Master Encoder Interface.

The encoder signal from the main shaft can be passed through by the Master Encoder Interface, so that any number of linear motors can be synchronized to the main shaft.

Motor Interfaces

E1100 Servo Drives provide all necessary interfaces to operate linear or rotary motors with optional external peripherals, such as end position and reference switches, a mechanical brake, or a high-resolution external position sensor.

In special applications, two drives can be synchronized with each other using the synchronization interface in master booster or master gantry mode.

Configuration

Parameterization and configuration of the Servo Drive is done via the RS232 interface on the front side, or CANBus for simultaneous configuration of several drives.

LinMot Talk user-friendly PC software is available for configuration. In addition to on-line documentation, LinMot Talk provides extensive debugging tools, such as an oscilloscope and an error inspector, for simple and rapid start-up of the Axis.

Fieldbus drives can also be configured directly by the overlaid control.

Operating Modes

Interpolated Moves

Stroke [mm]

Goto   100mm
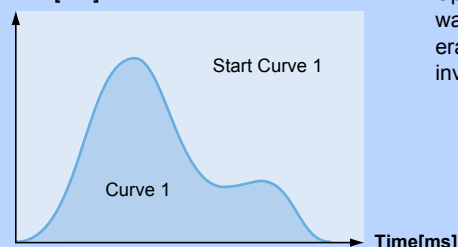v_{max} = 2,5m/s
a_{max} = 3,0m/s^2

Time[ms]
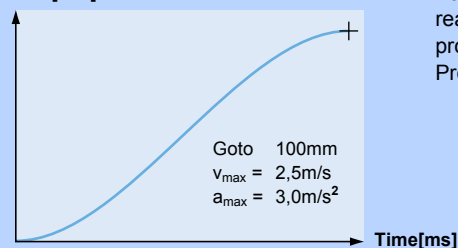
For direct position targets, using absolute or relative positioning, the desired position is reached using acceleration and velocity-limited motion profiles or jerk optimized Bestehorn profiles. Positioning commands can be invoked via the serial interfaces, CANopen, DeviceNet, Profibus or a trigger input.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Velocity Resolution:	1.0µm/s (32Bit)
Velocity Resolution:	10.0µm/s^2 (32Bit)

Time Curves

Stroke [mm]

Start Curve 1

Curve 1

Time[ms]

Up to 99 different time curves can be stored Series E1100 drives, with up to 16,000 individual waypoints. The motor can thus travel along time curves of any complexity, such as those generated by CAD programs and stored in the drive (Excel CSV format). The time curves can be invoked via the serial interface, fieldbusses, ETHERNET, or the trigger input.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Motion profiles:	Max. 99 Time Curves
Curve points:	Max. 16'000 points
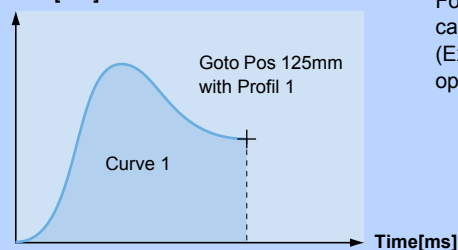
Profiled Moves

Stroke [mm]

Goto Pos 125mm
with Profil 1

Curve 1

Time[ms]

For travel to an absolute position, or shifting by a relative position, any desired motion rules can be stored besides the VA interpolator. They are stored in the drive as motion profiles (Excel CSV format). The positions can be approached, for example, with a sinusoidal motion to optimize power loss, or special reverse optimized motion profiles.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Motion profiles:	Max. 99 Bewegungsprofile
Curve points:	Max. 16'000 Punkte

Setpoint Streaming

Stroke [mm]

Time[ms]
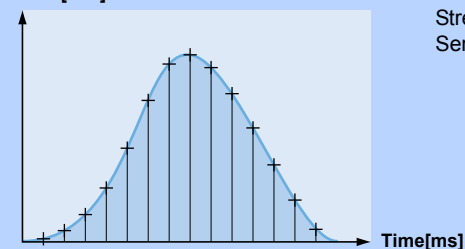
Overlaid NC drives with fieldbus interfaces communicate with the Servo Drives via "Position Streaming". The position and velocity calculated in the overlaid control is transmitted to the Servo Drive cyclically. The P, PV, or PVT mode is available for this transmission.

Position Resolution:	32 Bit
Velocity Resolution	32 Bit
Interpolator:	3 kHz
cycle times:	2-5ms

Easy Steps

Input 1	Pos 125mm
Input 2	Pos 250mm
Input 3	Curve 1
Input 4	Pos -30mm
Input 5	Pos +12,5mm
Input 6	Curve 2
Input 7	Pos 2mm
Input 8	Pos -12,5mm

With the Easy Steps function, up to 8 positions or independent travel commands can be stored on the drive, and addressed via 8 digital inputs or fieldbus interfaces/ETHERNET.

Digital inputs:	max. 8
Interface:	X4
Resolution:	10 Bit
Scanning rate:	330µsec

Command Table

Start → Wait Input → Pos 12mm → Rule 1 → Terminate A / Stop
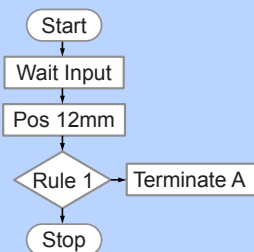
Entire motion sequences with up to 256 individual motion commands can be stored in the Command Table. This is primarily advantageous if complete motion sequences need to be executed very quickly, without dead time from the overlaid drive. In the Command Table, the programmer has access to all motion commands, internal parameters, and digital inputs and outputs.

Commands:	max. 256
Cycle time:	330µsec

Master Encoder Synchronization (MT)
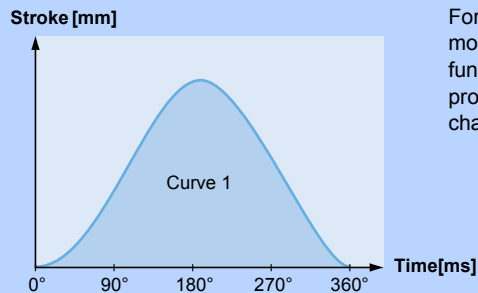
Stroke [mm]

Curve 1

0°   90°   180°   270°   360°   Time[ms]
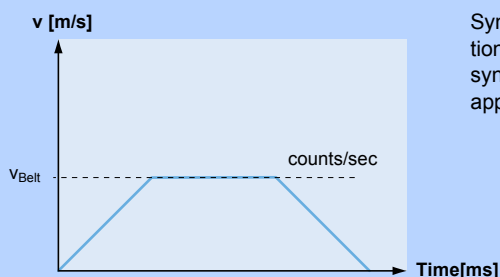
For synchronization to an external main or master shaft, the linear motor travels along the motion profiles stored in the drive, at the machine speed (machine angle 0…360°). Using this function, mechanical cam discs can be replaced with highly dynamic linear motors. The motion profiles can be freely defined, and the correct motion profile can be invoked during product changeover with no changeover time.

Motion profiles	Max. 99 curve profiles
Curve points:	Max. 16'000 points
Encoder Counter:	32 Bit
Encoder Input:	A/B/Z (RS422)
Max. counting frequency	Max. 4.5 MHz

Belt Synchronization

v [m/s]

v_Belt

counts/sec

Time[ms]
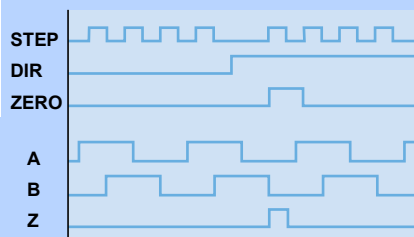
Synchronization to a belt speed can be done using the Master Encoder Interface or Step/Direction/Zero interface. Applications such as the "flying saw", synchronous loading or unloading, synchronous filling or labeling of bottles or containers on a conveyor belt, and many other applications can be implemented in this way.

Encoder Counter:	32 Bit
Encoder Input:	A/B/Z (RS422), max. 5 MHz
	STEP/DIR/ZERO
Max. counting frequency	Max. 4.5 MHz

Operating Modes

**LinMot**®

Position Indexing

In position indexing, the linear motor is controlled like a stepper motor, using Step/Dir/Zero, or A/B/Z signals. The step distance is freely programmable from 1.5x10-6µm to 3.275mm./ step. The input signal can be used directly as the target position, or it can be filtered by the VA interpolator.

|	
Operating Modes:	Step/Dir/Zero, A/B/Z
Inputs:	differential RS422 (X10)
Step distance:	$1.5x10^6$µm....3.275mm, 32 Bit
Max. counting frequency:	4.5 MHz

Master-Booster Synchronisation
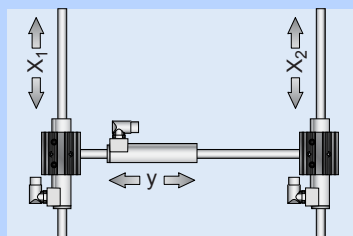
Using master-slave synchronization, two linear motors can be synchronized via a serial communications connection between two drives, so that the overlaid drive can control them as a single axis.

Master Booster Synchronization
Master booster synchronization is used to double the force when two motors are mechanically rigidly connected to each other.

Master-Gantry Synchronisation
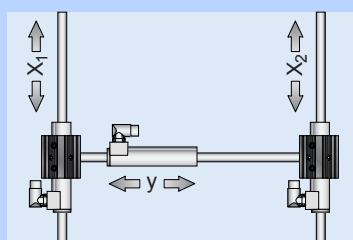
Using master-slave synchronization, two linear motors can be synchronized via a serial communications connection between two drives, so that the overlaid drive can control them as a single axis.

Master Gantry Synchronization
Master gantry synchronization is used for portal designs with two parallel Axis at different locations.

Analog Position
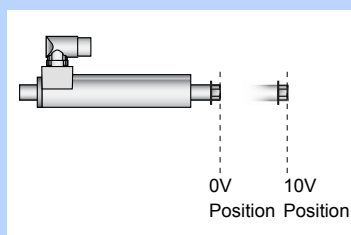
For an analog position target, the linear motor travels to a position proportional to the input voltage. The position is either scanned continuously, or only after a rising edge of the trigger signal. In order to prevent uncontrolled jumps in position, the motor travels to the positions with a programmable maximum acceleration and velocity (VA interpolator).

Inputs:	Analog Input (X4.4)
Voltagvte range:	0-10VDC
Resolution:	10 Bit
Scanning rate:	330µsec

Easy Steps Parameter Scale
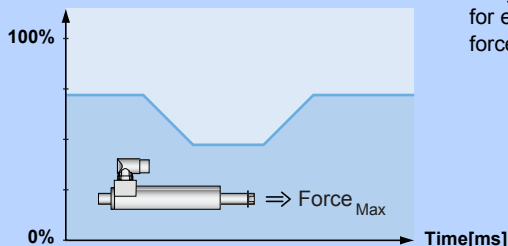
Maximum Force [0...10V => 0...100%]


Easy Steps provide the ability to parameterize internal parameters using two analog inputs. If, for example, the maximum motor current is read at an analog input, then the maximum motor force can be provided as analog for freely programmable joining processes.

Inputs:	2 x Analog (X4.4, X4.7)
Voltage range:	0-10VDC
Resolution:	10 Bit
Resolution	330µsec

Winding Application
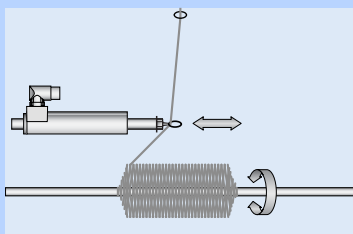
For winding textile yarns, glass fiber optics, or wires, a complete functional block is available that controls the entire sequence of a complete winding process.

Closed Loop Force Control
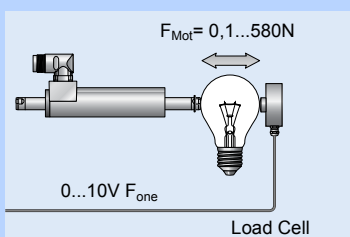
Using the Force Control technology function, precise joining processes can be implemented reliably and reproducibly with high-precision force control. For force control, the current motor force is measured with a load cell and controlled in the drive. Joining process or quality checks with high requirements for applied force can be implemented.

Analog Input:	0-10V
Resolution:	10 Bit
Min. Force Resolution:	0.1N

LinMot Talk

LinMot Talk configuration software is a Windows-based interface that supports the user during start-up and configuration of the LinMot Servo Drives. The software has a powerful, modular, graphical interface that covers all the tasks surrounding the LinMot Servo Drive. Great emphasis was placed on a high level of user-friendliness during development.

In addition to start-up, LinMot Talk can also be used for training purposes and for actuation via serial interfaces, fieldbusses, or industrial ETHERNET. Using the integrated Control Panel, the user has direct access to control and status words, as well as all commands that are invoked for operation by the overlaid control. The user learns the meaning of the control and status words easily, and can get to know the individual commands in the Motion Command Interface.
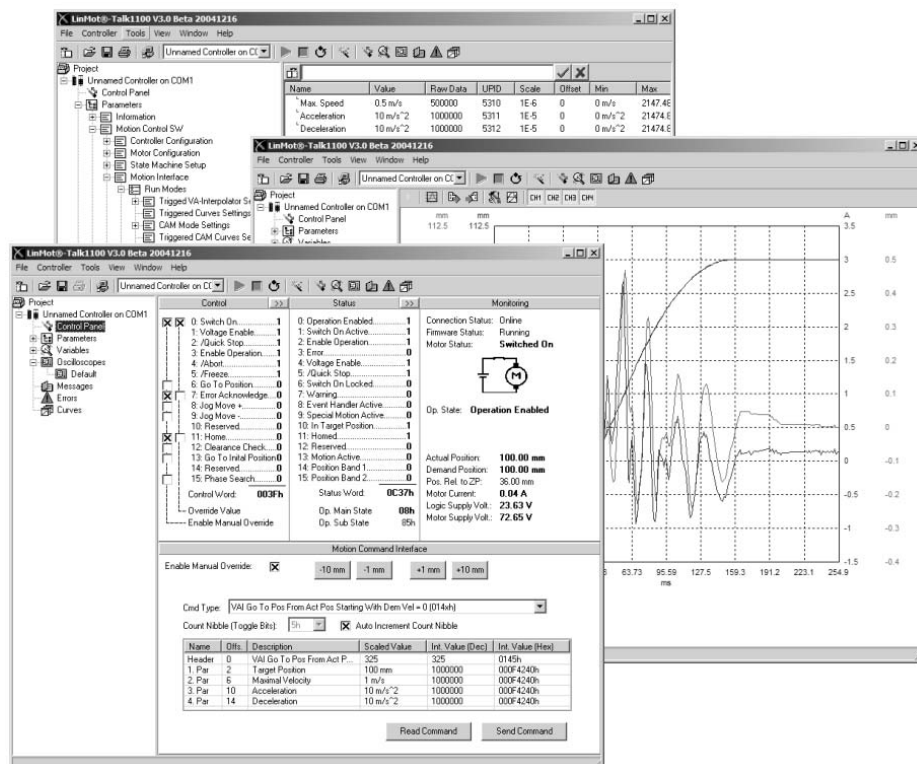
Start-up and Analysis Tools
Using the LinMot Talk PC interface, LinMot Servo Drives are configured. Additionally, the drives can be monitored during operation with the machine running, and the current motion sequences, as well as earlier warnings and error messages, can be analyzed in detail (monitoring).

Single or Multiple Axis Configuration
For start-up and monitoring, the Servo Drive is connected to a PC via the RS232 interface on the front or via CAN Bus. If the connection to the PC is made via USBSCAN converter (see accessories,) then up to 16 Axis can be configured and monitored simultaneously.

Online Help & Documentation
Using the multilingual Online Help, the user can find useful information about the individual parameters and their functionality. All manuals and installation instructions can then be called up on the PC, after LinMot Talk is installed, via the Windows Start Menu, or they can be directly generated in HTML format.

Parameterization

Using the "Parameter Inspector," the drives are parameterized in a simple manner. The user has a wide range of adjustments available for operating modes, error management, warning messages, and regulating parameters. Entire parameter sets can be stored, loaded, and printed out.

The "Curve Inspector" allows creation of motion profiles. In addition, existing curves can be loaded, stored, edited, combined, and printed out. Further, complex motion sequences can be generated as desired in MS Excel, and loaded into the drive.

Optimization

The integrated 8-channel oscilloscope helps the user during start-up and optimization of the drive system. Internal variables, such as the target and actual position, can be shown in real time on the screen, and then printed out. The displayed data can be stored in CSV format for further processing in MS Excel, or stored for documentation purposes.

Monitoring

The user has many tools available for monitoring and analysis of the drive. Both current warnings and fault messages, and older fault messages stored in non-volatile memory, state changes, and many other pieces of information can be obtained.

Internal variables, drive parameters, inputs, and outputs can be combined as desired and display cyclically.

Using the oscilloscope, internal parameters can be charted when warning and fault messages occur.

E1100

X1:	Motor Supply Regenerator Resistor
X2:	Motor Phases
X3:	Motor Connector
X4:	Control Logic Supply
LED	State Display
S1-2:	Bus Address RS/CAN/Profibus
X5:	Com Interface
S3:	Bus Termination
X6:	Digital I/O
X9:	Profibus Interface
X7:	RS485 / CAN In
X8:	RS485 / CAN Out
X10:	Master Encoder In
X11:	Master Encoder Out
X12:	External Encoder
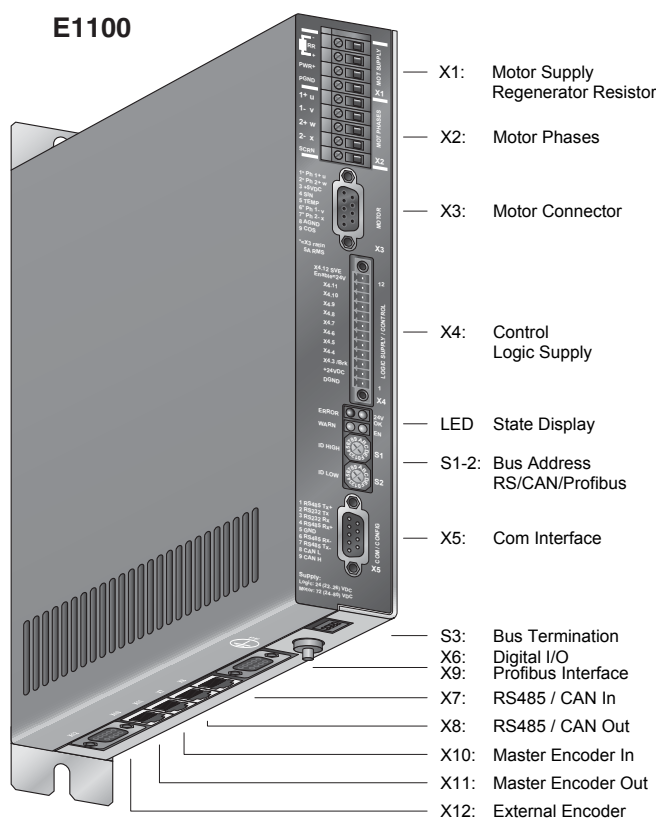
	Interfaces		E1100-RS	E1100-CO	E1100-DN	E1100-DP	E1100-GP
X1	Motor Supply		●	●	●	●	●
	Regeneration Resistor		●	●	●	●	●
X2	Motor Phases		●	●	●	●	●
X3	Motor Connector		●	●	●	●	●
X4	Control / Logic Supply		●	●	●	●	●
X5	COM Interface	RS232	●	●	●	●	●
		RS485	●	●	●	●	●
		CAN	●	●	●	●	●
X6	Digital I/O						●
X7	RS485 / CAN In		●	●	●	●	
X8	RS485 / CAN Out		●	●	●	●	
X9	Profibus Interface					●	
X10	Master Encoder In		●	●	●	●	●
X11	Master Encoder Out		●	●	●	●	●
X12	External Encoder (D-Sub 9)		●	●	●	●	●
X13	External Encoder (D-Sub 15)						
LED	State Display		●	●	●	●	●
S1	Bus Address RS/CAN/ETH High		●	●	●	●	●
S2	Bus Address RS/CAN/ETH Low		●	●	●	●	●
S3	Bus Termination		●	●	●	●	●

E1100-RS   **E1100-DN**
E1100-RS-HC **E1100-DN-HC**
E1100-RS-XC **E1100-DN-XC**

E1100-CO
E1100-CO-HC
E1100-CO-XC

✓ Absolute & Relative Positioning

✓ Travel Along Time Curves

✓ Positioning using Motion Profiles

✓ Internally stored Motion Commands

✓ Internally stored Motion Sequences

✓ Master Encoder Synchronization

✓ Synchronization to Belt Speed

✓ Step and Direction Interface

✓ Position Streaming

✓ Master-Slave Synchronization

✓ Analog Position Target

✓ Analog Parameter Scaling

✓ Winding Function Block

✓ Force Control Technology Function

✓ Customer-Specific Functions

RS 232 RS 485 DeviceNet CANopen

X1: Motor Supply Regeneration Resistor
X2: Motor Phases
X3: Motor Connector
X4: Control I/O's Logic Supply
LED State Display
S1-2: Bus Address RS/CAN
X5: COM Interface
S3: Bus Termination
X8: RS485 / CAN Out
X7: RS485 / CAN In
X10: Master Encoder In
X11: Master Encoder Out
X12: External Encoder
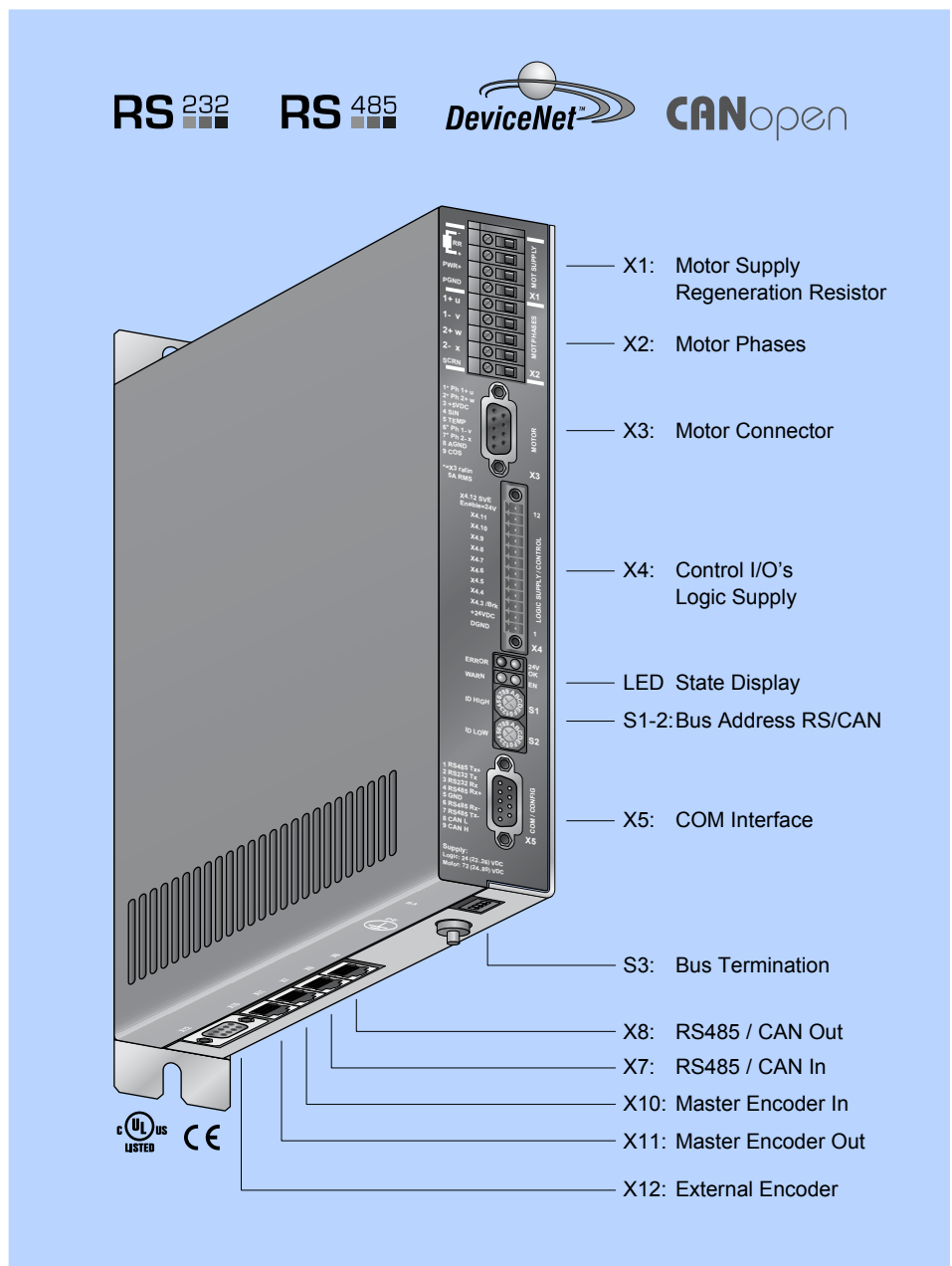
LinRS Serial Interface

The LinMot Series E1100-RS Servo Drives support the LinRS serial communication protocol. LinRS is a proprietary protocol for actuating LinMot Servo Drives via the RS 232, RS 422, and RS 485 interfaces.

If the drive is actuated by the overlaid control via the serial interface, then this is configured from the PC via CANBus. The USBSCAN converter (item no. 0150-3134), supported by LinMot Talk, is used for this.

Adjustable Baud rates: 9.6-115.2kBaud

CANopen

LinMot CO drives, with integrated CANopen interface, support the CiA DS301 communication profile.

The following resources are available: 3 T_PDO, 3 R_PDO, 1 T_SDO, 1 R_SDO

The following protocols are supported by the CO drives:
- NMT Error Control (Nodeguarding Protocol or HeartBeat Protocol)
- PDO (Transmission type 254 and 1)
- SDO Upload and Download - NMT (Start, Stop, Enter PreOp, Reset Node, Reset Communication)
- Boot-Up Message

DeviceNet

Series E1100-DN drives feature an integrated DeviceNet interface. With the DeviceNet interface, even complicated motion sequences can be realized with the highest possible flexibility.

The drive can be actuated and monitored via the DeviceNet connection.

E1100-DN are UCMM Group 3-capable slaves, and support polled IO runtime data transfer

E1100-RS
E1100-CO
E1100-DN

X1

REGENERATION RESISTOR

1,2,3-PHASE POWERSTAGE

24...80V DC
8A/15/25A
PHASECURRENT

SUPPLY
3x400VAC
230VAC
115VAC

MOTOR SUPPLY

X2
PH1+
PH1-
PH2+
PH2-

LINEAR MOTOR

X3
PH1+
PH1-
PH2+
PH2-
SIN
COS
TEMP.
+SV
GND

BRUSHLESS DC MOTOR

X12
A+   SIN+
A-   SIN-
B+   COS+
B-   COS-
Z+   ZERO+
Z-   ZERO-
ENC
ALARM
+5VDC

OPTIONAL EXTERNAL POSITION SENSOR

X4
LIMIT SWITCH+
LIMIT SWITCH-
HOME SWITCH
BRAKE OUTPUT

PTC1
PTC2

TRIGGER INPUT
CAPTURE INPUT
ANALOG INPUT

SVE

+24VDC
GND

MOTOR PERIPHERY

ROTRAY MOTOR & SUPPLY PROTECTION

FAST PROCESS INPUTS

MACHINE SAFETY

LOGIC SUPPLY

X5
RS232 PC INTERFACE CONFIGURATION RS232 CAN

RS232/RS458

3

RS485

4

CAN

2

X7
COMMUNICATION INTERFACE RS232/RS485 CANOPEN DEVICENET

RS485

4

CAN

2

X8
RS485

CAN

4

2

COMMUNICATION INTERFACE RS232/RS485 CANOPEN DEVICENET

X10
MASTER ENCODER

A+   STEP+
A-   STEP-
B+   DIRECTION+
Z+   ZERO+
Z-   ZERO-
B-   DIRECTION-

X11
A+   STEP+
A-   STEP-
B+   DIRECTION+
Z+   ZERO+
Z-   ZERO-
B-   DIRECTION-

MASTER ENCODER

Item	Description	Part Number
E1100-RS	RS232/485 Drive (72V/8A)	0150-1677
E1100-RS-HC	RS232/485 Drive (72V/15A)	0150-1678
E1100-RS-XC	RS232/485 Drive (72V/25A)	0150-1862
E1100-CO	CANopen Drive (72V/8A)	0150-1681
E1100-CO-HC	CANopen Drive (72V/15A)	0150-1682
E1100-CO-XC	CANopen Drive (72V/25A)	0150-1683
E1100-DN	DeviceNet Drive (72V/8A)	0150-1679
E1100-DN-HC	DeviceNet Drive (72V/15A)	0150-1680
E1100-DN-XC	DeviceNet Drive (72V/25A)	0150-1863

E1130-DP
E1130-DP-HC
E1130-DP-XC

PROFIBUS PROCESS FIELD BUS RS 232 RS 485 CANopen DeviceNet™
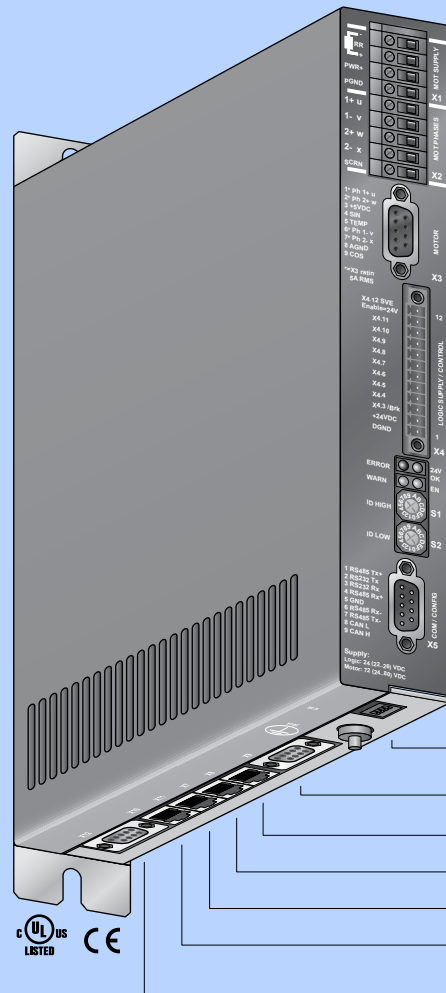
✓ Absolute & Relative Positioning

✓ Travel Along Time Curves

✓ Positioning using Motion Profiles

✓ Internally stored Motion Commands

✓ Internally stored Motion Sequences

✓ Master Encoder Synchronization

✓ Synchronization to Belt Speed

✓ Step and Direction Interface

✓ Position Streaming

✓ Master-Slave Synchronization

✓ Analog Position Target

✓ Analog Parameter Scaling

✓ Winding Function Block

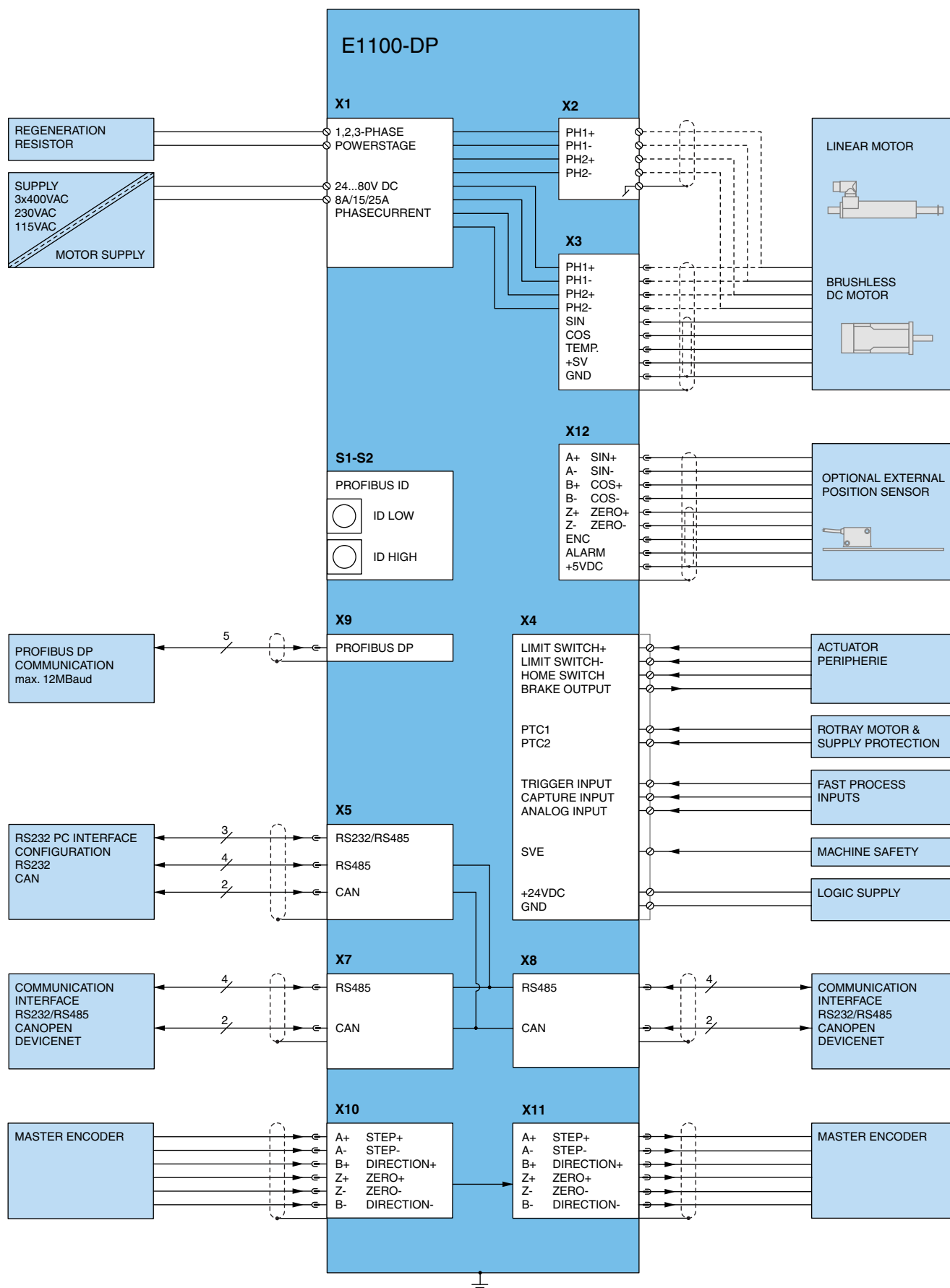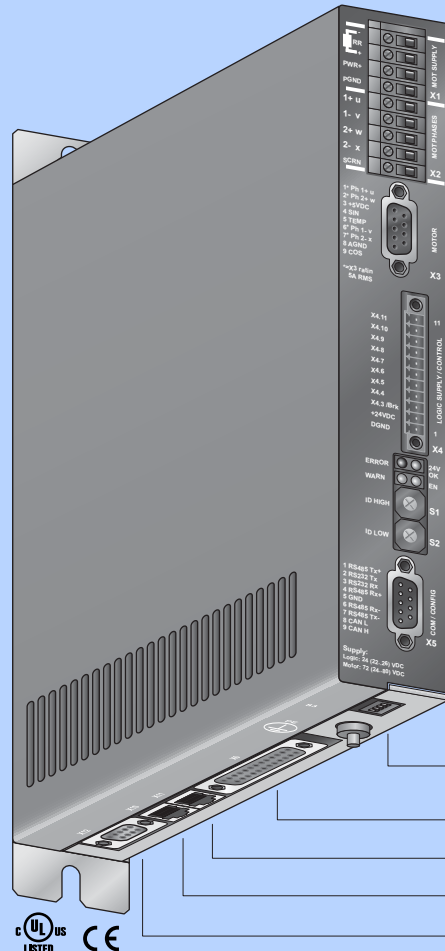✓ Force Control Technology Function

✓ Customer-Specific Functions

X1: Motor Supply
Regeneration Resistor

X2: Motor Phases

X3: Motor Connector

X4: Control I/O's
Logic Supply

LED State Display

S1-2: Busadresse RS/CAN

X5: Configuration

S3: Bus Termination

X9: Profibus Interface

X8: RS485 / CAN Out

X7: RS485 / CAN In

X10: Master Encoder In

X11: Master Encoder Out

X12: External Encoder

Profibus DP

DP Servo Drives feature an integrated PROFIBUS-DP interface. PROFIBUS-DP provides the user with a standardized fieldbus interface for rapid data interchange between the Servo Drive and the overlaid control.

With fast data transfer and command initiation, as well as simple system integration, the Profibus drives are the ideal solution for applications with motions and sequences that change frequently, such as are required, for example, in flexible machines and systems with automatic format changes.

The PROFIBUS-DP interface supports all Baud rates from 9.6 Kbits/s to 12 Mbit/s. The maximum net data quantity exchanged in cyclical data traffic is 64 bytes per cycle. The smallest achievable bus cycle time is 100 µs.

The structure and scope of cyclical data can be collected from any individual data modules into an overall data quantity when planning the system.

A GSD device master file is provided for open planning in conformance with the PROFIBUS-DP standard.

The 9-pole Profibus connector on the front side provides power for an external bus termination. A positive directional control signal is provided to control repeaters or optical fibers.

All signals on the PROFIBUS connector are galvanically separated.

The PROFIBUS-DP address is set by two hex code switches (ID1 and ID2).

All addresses permitted by the standard are supported (0..125).

E1100-DP

X1

| 1,2,3-PHASE |
| POWERSTAGE |

REGENERATION RESISTOR

SUPPLY
3x400VAC
230VAC
115VAC

MOTOR SUPPLY

24...80V DC
8A/15/25A
PHASECURRENT

X2

PH1+
PH1-
PH2+
PH2-

LINEAR MOTOR

X3

PH1+
PH1-
PH2+
PH2-
SIN
COS
TEMP.
+SV
GND

BRUSHLESS DC MOTOR

S1-S2

PROFIBUS ID

ID LOW

ID HIGH

X12

A+   SIN+
A-   SIN-
B+   COS+
B-   COS-
Z+   ZERO+
Z-   ZERO-
ENC
ALARM
+5VDC

OPTIONAL EXTERNAL POSITION SENSOR

X9

PROFIBUS DP

PROFIBUS DP COMMUNICATION max. 12MBaud

X4

LIMIT SWITCH+
LIMIT SWITCH-
HOME SWITCH
BRAKE OUTPUT

PTC1
PTC2

TRIGGER INPUT
CAPTURE INPUT
ANALOG INPUT

SVE

+24VDC
GND

ACTUATOR PERIPHERIE

ROTRAY MOTOR & SUPPLY PROTECTION

FAST PROCESS INPUTS

MACHINE SAFETY

LOGIC SUPPLY

X5

RS232/RS485
RS485
CAN

RS232 PC INTERFACE
CONFIGURATION
RS232
CAN

X7

RS485
CAN

COMMUNICATION INTERFACE
RS232/RS485
CANOPEN
DEVICENET

X8

RS485
CAN

COMMUNICATION INTERFACE
RS232/RS485
CANOPEN
DEVICENET

X10

A+   STEP+
A-   STEP-
B+   DIRECTION+
Z+   ZERO+
Z-   ZERO-
B-   DIRECTION-

MASTER ENCODER

X11

A+   STEP+
A-   STEP-
B+   DIRECTION+
Z+   ZERO+
Z-   ZERO-
B-   DIRECTION-

MASTER ENCODER

Item	Description	Part Number
E1130-DP	Profibus DP Drive, (72V/8A)	0150-1667
E1130-DP-HC	Profibus DP Drive, (72V/15A)	0150-1668
E1130-DP-XC	Profibus DP Drive, (72V/25A)	0150-1861

E1100-GP
E1100-GP-HC
E1100-GP-XC

✓ Absolute & Relative Positioning

✓ Travel Along Time Curves

✓ Positioning using Motion Profiles

✓ Internally stored Motion Commands

✓ Internally stored Motion Sequences

✓ Master Encoder Synchronization

✓ Synchronization to Belt Speed

✓ Step and Direction Interface

✓ Position Streaming

✓ Master-Slave Synchronization

✓ Analog Position Target

✓ Analog Parameter Scaling

✓ Winding Function Block

✓ Force Control Technology Function

✓ Customer-Specific Functions

RS 232   RS 485   CANopen   DeviceNet™

X1: Motor Supply Regeneration Resistor

X2: Motor Phases

X3: Motor Connector

X4: Control I/O's Logic Supply

LED State Display

S1-2: RS/CAN Bus Address

X5: Configuration

S3: Bus Termination

X6: Digital I/O

X10: Master Encoder In

X11: Master Encoder Out

X12: External Encoder

General Purpose Drive

Series E1100-GP drives are multifunctional Servo Drives, on which the firmware from the following drives can be installed:

- Series E1100-RS
- Series E1100-CO
- Series E1100-DN

All functions of the drives listed above, except for safe pulse inhibitors (X4.12) are available in the Series E1100-GP Servo Drives.

For actuation by an overlaid drive, the following digital, serial, and fieldbus interfaces are available:

- LinRS via RS232, RS485 and RS422
- CANopen - DeviceNet

In addition to actuation via serial interfaces and fieldbusses, Series E1100-GP drives can use direct addressing of up to 256 commands in the Command Table, via 8 digital inputs (X6).

Even complex drive tasks and complete, automated sequences can be controlled using simple digital signals.
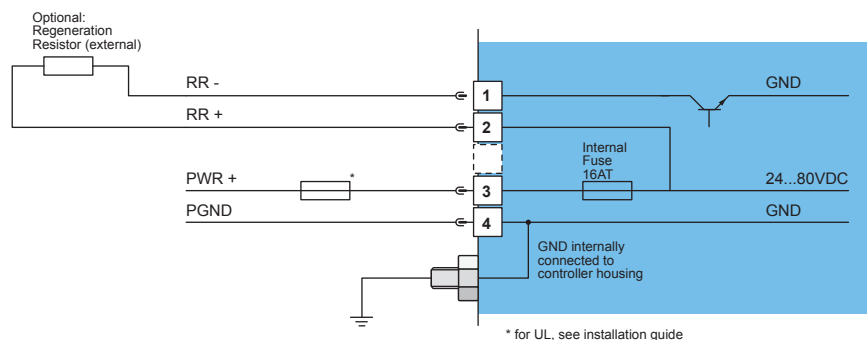
E1100-GP

X1

REGNERATION RESISTOR

1,2,3-PHASE POWERSTAGE

SUPPLY
3x400VAC
230VAC
115VAC

MOTOR SUPPLY

24...80V DC
8A/15A/25A
PHASECURRENT

X2

PH1+
PH1-
PH2+
PH2-

LINEAR MOTOR

X3

PH1+
PH1-
PH2+
PH2-
SIN
COS
TEMP.
+SV
GND

BRUSHLESS DC MOTOR

X6

MACHINE CONTROLLER PLC, IPC

8

GOTO POSITION INPUTS 1-8

TRIGGER INPUT

5

CMD GROUP SELECT

8

IN POSITION OUTPUTS 1-8

X12

A+   SIN+
A-   SIN-
B+   COS+
B-   COS-
Z+   ZERO+
Z-   ZERO-
ENC
ALARM
+5VDC

OPTIONAL EXTERNAL POSITION SENSOR

X4

LIMIT SWITCH+
LIMIT SWITCH-
HOME SWITCH
BRAKE OUTPUT

PTC1
PTC2

TRIGGER INPUT
CAPTURE INPUT
ANALOG INPUT

+24VDC
GND

BRAKE

ROTRAY MOTOR & SUPPLY PROTECTION

FAST PROCESS INPUTS

LOGIC SUPPLY

X5

RS232 PC INTERFACE CONFIGURATION
RS232
CAN

3

RS232/RS485

4

RS485

2

CAN

X10

MASTER ENCODER

A+   STEP+
A-   STEP-
B+   DIRECTION+
Z+   ZERO+
Z-   ZERO-
B-   DIRECTION-
CAN_H
CAN_L

X11

A+   STEP+
A-   STEP-
B+   DIRECTION+
Z+   ZERO+
Z-   ZERO-
B-   DIRECTION-
CAN_H
CAN_L

MASTER ENCODER

Item	Description	Part Number
E1100-GP	General Pupose (72V/8A)	0150-1665
E1100-GP-HC	General Pupose (72V/15A)	0150-1666
E1100-GP-XC	General Pupose (72V/25A)	0150-1864

X1 — Motor Supply / Regeneration Resistor

Screw Terminals
2.5 mm² (AWG14)

Optional:
Regeneration
Resistor (external)

RR -
RR +
PWR +
PGND

GND
1
2
Internal Fuse 16AT
3   24...80VDC
4   GND

GND internally connected to controller housing

* for UL, see installation guide

Motor Supply:

Motor Supply Voltage 24...80VDC.
Absolute max. Rating 72VDC + 20%

⚠ If motor supply voltage is exceeding 90VDC, the drive will go into error state

X2 — Motor Phases

1+ u
1- v
2+ w
2- x
SCRN
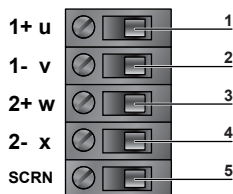
Screw Terminals
1.5-2.5mm²
(AWG16-14)

Nr.	Designation	LinMot Linear Motor	Color	3-Phase-Motor
1	PH1+ /U	Motor Phase 1+	red	Motor Phase U
2	PH1- /V	Motor Phase 1-	pink	Motor Phase V
3	PH2+ /W	Motor Phase 2+	blue	Motor Phase W
4	PH2-	Motor Phase 2-	grey	
5	SCRN	Shield		

- If the RMS current is not higher than 5Arms, respectively 7.5 Apeak, the phases can be connected to X3.
- Do NOT connect X2 and X3.

X3 — Motor
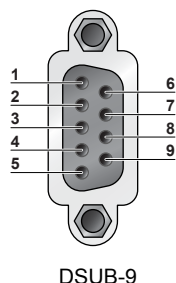
DSUB-9

Nr	LinMot Linear Motor	3-Phase-Motor
1	Motor Phase 1+	Motor Phase U
2	Motor Phase 2+	Motor Phase W
3	+5VDC	
4	Sine	Hall U
5	Temperature	Hall W
6	Motor Phase 1-	Motor Phase V
7	Motor Phase 2-	
8	AGND	
9	Cosine	Hall V
Case	Shield	

- Use X2 for motor phase wiring if phase current exceeds 5Arms or 7.5Apeak
- Use +5V (X3.3) and AGND (X3.8) only for motor internal Hall Sensor supply (max. 100mA)
- Do NOT connect AGND (X3.8) to ground or earth!

Motor — Motor wiring

1+ u 1
1- v 2
2+ w 3
2- x 4
SCRN 5

X2: Screw Terminals

X3: DSUB-9 (f)

OUTER SHIELD
GREY — PHASE 2-
BLUE — PHASE 2+
PINK — PHASE 1-
RED — PHASE 1+
WHITE
INNER SHIELD
YELLOW
GREEN — +5VDC
BLACK — AGND
SINE
COSINE
TEMP

For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR
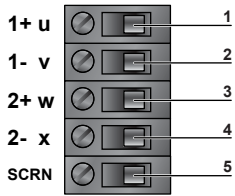
Motor — Motor wiring for phase current below 5Arms and below 7.5Apeak
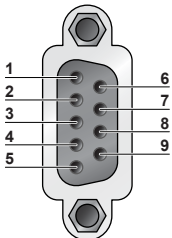
X3: DSUB-9 (f)

RED — PHASE 1+
PINK — PHASE 1-
BLUE — PHASE 2+
GREY — PHASE 2-
WHITE — +5VDC
INNER SHIELD — AGND
YELLOW — SINE
GREEN — COSINE
BLACK — TEMP.
Outer shield connected to connector housing

For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR
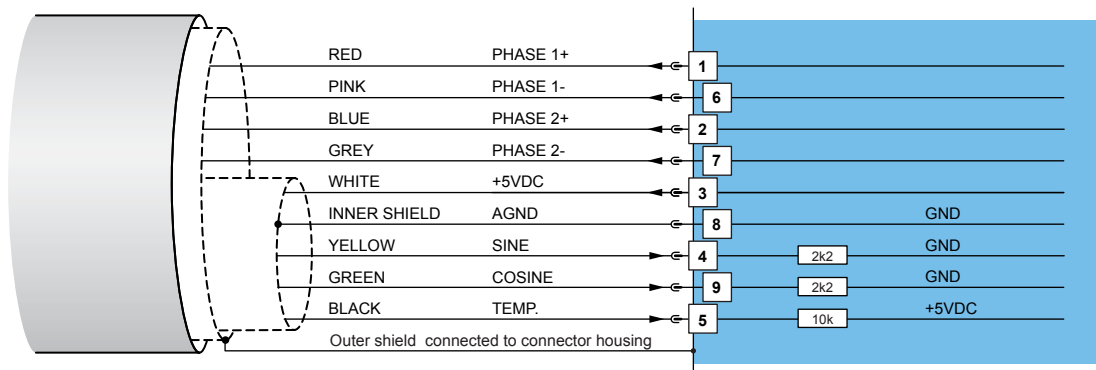
S1-3 — Address Selectors / Bus Termination

Switch		
S1	Bus ID High (0…F)	HEX-Switches for Bus ID address range 0.255
S2	Bus ID Low(0…F)	

Switch	E1100	
S3	Switch 1: RS232 "off" / RS485 "on"	Select serial RS23 or RS485
	Switch 2: RS485 Terminatio on/off	
	Switch 3: CAN Termination on/off	
	Switch 4: Bus Interface on/off	Factory settings: all switches "off"

LinMot ®

X4: 12pin — Control / Supply E1130-DP, E1100-CO, E1100-DN, E1100-RS

X4.12 SVE Enable=24V — 12
X4.11
X4.10
X4.9
X4.8
X4.7
X4.6
X4.5
X4.4
X4.3 /Brk
+24VDC
DGND — 1

LOGIC SUPPLY / CONTROL

Phoenix MC1,5/12-STF-3,5
0.25-1.5mm² (AWG24-16)

Pin	Signal	
12	POWER STAGE ENABLE (HW ENABLE)	4,7k
11	CONFIGURABLE IO, PTC 2	* MAX. 100mA
10	CONFIGURABLE IO, PTC 1	* MAX. 100mA
9	CONFIGURABLE IO	* MAX. 100mA
8	CONFIGURABLE IO	* MAX. 100mA
7	CONFIGURABLE IO, HOME SWITCH	* MAX. 100mA
6	CONFIGURABLE IO, TRIGGER	* MAX. 100mA
5	CONFIGURABLE IO	* MAX. 100mA
4	CONFIGURABLE IO, ANALOG INPUT	* MAX. 100mA
3	CONFIGURABLE IO, BRAKE DRIVER 1A	* MAX. 1.0A
2	LOGIC SUPPLY 22-26 VDC	Internal Fuse 3AT
1	GND	

* ALL OUTPUTS WITH INTERNAL PULL DOWN RESISTOR 4K7 TO GND

X4: 11pin — Control / Supply E1100-GP

X4.11 — 11
X4.10
X4.9
X4.8
X4.7
X4.6
X4.5
X4.4
X4.3 /Brk
+24VDC
GND — 1

LOGIC SUPPLY / CONTROL

Phoenix MC1,5/11-STF-3,5
0.25-1.5mm² (AWG24-16)

Pin	Signal	
11	CONFIGURABLE IO, PTC 2	* MAX. 100mA
10	CONFIGURABLE IO, PTC 1	* MAX. 100mA
9	CONFIGURABLE IO	* MAX. 100mA
8	CONFIGURABLE IO	* MAX. 100mA
7	CONFIGURABLE IO, HOME SWITCH	* MAX. 100mA
6	CONFIGURABLE IO, TRIGGER	* MAX. 100mA
5	CONFIGURABLE IO	* MAX. 100mA
4	CONFIGURABLE IO, ANALOG INPUT	* MAX. 100mA
3	CONFIGURABLE IO, BRAKE DRIVER 1A	* MAX. 1.0A
2	LOGIC SUPPLY 22-26 VDC	Internal Fuse 3AT
1	GND	

* ALL OUTPUTS WITH INTERNAL PULL DOWN RESISTOR 4K7 TO GND

No		Description	
12	Input	Safety Voltage Enable	Power Stage Enable (HW Enable)
11	I/O	X4.11	Configurable IO, PTC 2
10	I/O	X4.10	Configurable IO, PTC 1
9	I/O	X4.9	Configurable IO
8	I/O	X4.8	Configurable IO
7	I/O	X4.7	Configurable IO, Home Switch
6	I/O	X4.6	Configurable IO, Trigger
5	I/O	X4.5	Configurable IO
4	I/O	X4.4	Configurable IO, Analog Input
3	I/O	X4./Brk	Configurable IO, Brake Driver 1A
2	+24VDC	Supply	Logic Supply 22-26 VDC
1	GND	Supply	Ground

Inputs	24V / 1mA
Outputs	24V / max.100mA
Brake Output (X4.3)	24V / max.1.0A
Sample Rate	Inputs/Outputs 1ms, Trigger Input 0.315msec
Supply	24VDC / typ. 400mA / max. 2.1A (if all outputs "on" with max. load.)
Wiring	0.25-1.5mm² (AWG24-16)

X6	Digital I/O E1100-GP

367

X6: DSUB-25 (f)

INPUT X6.1
INPUT X6.14
INPUT X6.2
INPUT X6.15
INPUT X6.3
INPUT X6.16
INPUT X6.4
INPUT X6.17
INPUT X6.5
INPUT X6.18
INPUT X6.6
INPUT X6.19
INPUT X6.7
INPUT X6.20
INPUT X6.8
INPUT X6.21
OUTPUT X6.9
OUTPUT X6.22
OUTPUT X6.10
OUTPUT X6.23
OUTPUT X6.11
OUTPUT X6.24
OUTPUT X6.12
OUTPUT X6.25
GND

INPUTS
+24V
INPUTS
OUTPUTS (MAX. 100mA)

50k (×16)
100mA (×8)
+24V DC

* OUTPUTS WITH INTERNAL PULL DOWN RESISTOR 4K7 TO GND

All Inputs:	Direct interfacing to digital 24VDC PLC outputs.	
	Input current:	1mA
	low level:	-0.5…5VDC
	high level:	15…30VDC
	Sample rate:	625µs

All Outputs:	Short circuit and overload protected high side switches	
	Voltage:	24VDC
	Max. current:	100mA
	High Level:	15…30VDC
	Update rate:	625µs

Outputs may directly drive inductive loads

X5 COM — COM Interface
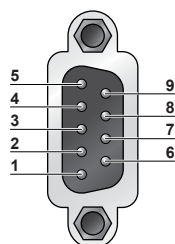
X5: DSUB-9 (m)
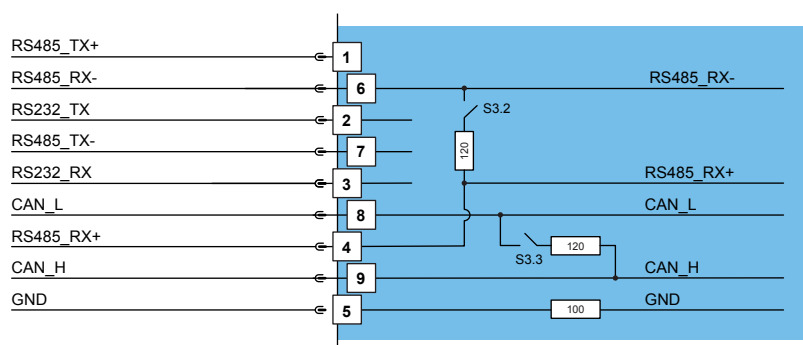
RS232: Configuration on all Drives: use 1:1 connection cable to PC

LED — State Display
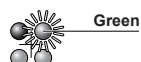
Green:	
Green	24VDC Logic Supply OK
Stat A Yellow:	
Yellow	Motor Enabled
Stat B Yelllow:	
Yellow	Warning
Red:	
Red	Error
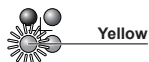
X7-X8 — RS485/CAN
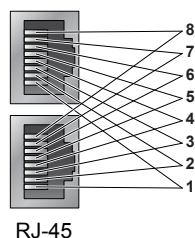
RJ-45

Nr		
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	

- X7 internally connected to X8 (1:1 connection)
- 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 S3.2 and S3.3.

X9 — Profibus DP

DSUB-9

	Nr		
	1	-	
	2	-	
	3	RxD/TxD-P	
	4	CNTR-P	
	5	GND	(galvanically seperated)
	6	+5V	(galvanically seperated)
	7	-	
	8	RxD/TxD-N	
	9	-	
	Case	Shield	

Max. Baud rate: 12 Mbaud

X10-X11 — Master Encoder IN (X10) / Master Encoder OUT (X11)

RJ-45

Nr	Incremental	Step/Direction	EIA/TIA 568A colors
1	A+	Step+	Green/White
2	A-	Step-	Green
3	B+	Direction+	Orange/White
4	Z+	Zero+	Blue
5	Z-	Zero-	Blue/White
6	B-	Direction-	Orange
7	CAN_H*	CAN_H*	Brown/White
8	CAN_L*	CAN_L*	Brown
Case	Shield	Shield	

*only on E1100-GP

- CAN internally connected to X7, X8
- CAN und RS485 Termination can be turned on by S3.2 alt. S3.3.
- X10 an X11: Use twisted pair (1-2, 3-6, 4-5, 7-8) cable for wiring.
- X10 Master Encoder Inputs:Differential RS422, max. Input Frequency 4.5MHz
- X11Master Encoder Outputs:Amplified RS422 differential signals from Master Encoder IN (X10)

X12 — External Positions Sensor
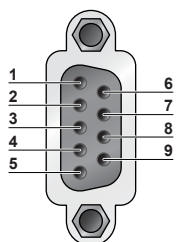
DSUB-9

Nr	Incremental:	Sin/Cos
1	+5V DDC	+5V DC
2	A-	SIN-
3	B-	COS-
4	Z-	ZERO-
5	GND	GND
6	A+	SIN+
7	B+	COS+
8	Z+	ZERO+
9	Enc. Alarm	Enc. Alarm
Case	Shield	Shield

Encoder Inputs:	- Incremental:RS422 - Sin/Cos:1Vpp
Maximal Input Frequency:	4.5 Mio. Incr./sec (incremental RS422), minimal pulsewidth > 220nsec 10kHz (analog 1Vpp), 10Bit AD
Sensor Supply:	5VDC (max. 100mA)
Sensor Alarm Input:	5V / 1mA

E1100

Dimensions in mm
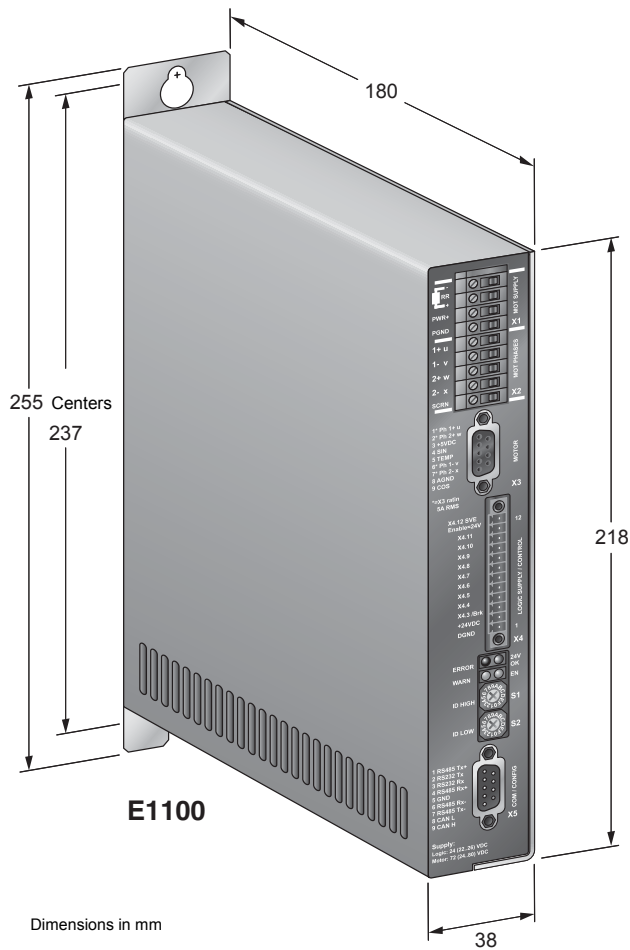
Servo Drives Series		E1100		
Width	mm (in)	38	(1.5)	
Height	mm (in)	255	(10.0)	
Height without fixings	mm (in)	218	(8.6)	
Depth	mm (in)	180	(7.1)	
Weight	kg (lb)	1.5	(3.3)	
IP Protection class	IP	20		
Storage temperature	°C	-25...40		
Transport temperature	°C	-25...70		
Operating temperture	°C	0...40 at rated date		
		40...50 with power derating		
Max. case temperature	°C	65		
Max. power dissipation	W	30		
Min. distance between drives	mm (in)	20	(0.8)	left/right
		50	(2)	top/bottom

Artikel	Beschreibung	Artikelnummer
E1100-RS	RS232/485 Drive (72V/8A)	0150-1677
E1100-RS-HC	RS232/485 Drive (72V/15A)	0150-1678
E1100-RS-XC	RS232/485 Drive (72V/25A)	0150-1862
E1100-CO	CANopen Drive (72V/8A)	0150-1681
E1100-CO-HC	CANopen Drive (72V/15A)	0150-1682
E1100-CO-XC	CANopen Drive (72V/25A)	0150-1683
E1100-DN	DeviceNet Drive (72V/8A)	0150-1679
E1100-DN-HC	DeviceNet Drive (72V/15A)	0150-1680
E1100-DN-XC	DeviceNet Drive (72V/25A)	0150-1863
E1100-GP	General Pupose (72V/8A)	0150-1665
E1100-GP-HC	General Pupose Drive (72V/15A)	0150-1666
E1100-GP-XC	General Pupose Drive (72V/25A)	0150-1864
E1130-DP	Profibus DP Drive, (72V/8A)	0150-1667
E1130-DP-HC	Profibus DP Drive, (72V/15A)	0150-1668
E1130-DP-XC	Profibus DP Drive, (72V/25A)	0150-1861

Switched-Mode Power Supplies   115VAC / 230VAC

Item	Description	Part Number
S01-72/500	Switched-Mode Power Supply 72V/500W	0150-1874
S01-72/1000	Switched-Mode Power Supply 72V/1000W	0150-1872

Transformer Supply T01   3x230/280/400/480VAC

Item	Description	Part Number
T01-72/420...1500-Multi	Transformer Supply 3x230/280/400/480VAC, 50/60Hz, 420...1500W	see page 536

Control Box B01-E1100

Item	Description	Part Number
B01-E1100	Control Box for E1100 (incl. cable and connectors)	0150-1970

Connector Cable and USB-Converter

| 0150-3009 | 0150-3110 | 0150-3134 | 0150-2143 | 0150-1852 | 0150-1853 |

Item	Description	Part Number
RS232 PC config. cabel 2m	for E100/E1001	0150-3009
RS232 PC config. cabel 2m	for E100/E1001/E1100/B1100	0150-3307
RS232 PC config. cabel 2.5m	for E1200/E1400	0150-2143
USB-Serial Converter	USB to 9-pin Serial Converter	0150-3110
USB-CAN Converter	USB to CAN Converter for E1100	0150-3134
RJ45-08/0.3	RJ45 patch cable 0.3m for E1100	0150-1852
RJ45-08/0.6	RJ45 crossover patch cable 0.6m	0150-1853
RJ45/RJ45-0,2-ML1	MC-Link cable 0,2m	0150-3308

Option: External High Resolution Encoder

Item	Description	Part Number
MS01-1/D	Linear Encoder 1um, A/B (for 1mm magnetic band)	0150-1840
MB01-1000	Magnetic Band 1mm pitch, per cm	0150-1963

Servo Drive Series E1200
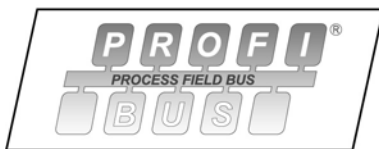
Servo Drive E1200

Series E1200 Servo Drives are modular axis drives, with 32-bit position resolution and an integrated power stage, for linear motors and rotary drives.

The drives are suitable for simplest, standard, and high-end positioning tasks, across the entire force range of the LinMot product range.

Connection to Machine Drive

The Series E1200 Servo Drives can be actuated by machine controls from any manufacturer or brand, via digital inputs and outputs, RS232 or RS485 serial interface, CanBus CANopen and DeviceNet interfaces, Profibus DP, or industrial ETHERNET.

Process and Safety Interfaces

Fast process interfaces for direct processing of sensor signals are available as freely programmable analog and digital inputs, a fast trigger input, and a capture input.

The safe pulse inhibitor on Servo Drive with fieldbus interfaces or industrial ETHERNET allows safe stop of the drives via control signals, per EN 954-1, without interrupting the power supply.

Logic and Power Supply

The Servo Drives have two separate power supply inputs for the logic and power elements.

In an E-stop and safe stop of the drive, only the power element supply is cut off from the drive. The logic supply and the drive continue to run.

This has the advantage that the drive and linear motor do not need to be reinitialized when the machine is restarted, since all process data, including the current position of the linear motor, are still up to date.

Fieldbusses and interfaces to the overlaid control

Digital I/O´s	RS232 RS485	CAN open	Device-Net	Profibus DP	ProfiNet	Sercos III	Power Link	Ethernet IP	Ether CAT

Supply and Safety
- Logic Supply
- Motor Supply
- Safety Voltage Enable
- Regeneration Resistor

Linmot Servo Drive Series E1200

Position Drive:
- 32 Bit Position Value
- Resolution 0.1µm

Run Modes:
- VA Interpolated Moves
- Analog Position
- Run Curves
- Two Point Trigger Moves
- Master Encoder Synchronisation
- Streaming P, PV
- Step, Direction

Internal stored Curves:
- Max. 99 Curves
- Up to 15´000 set points

Command Table:
- Up to 255 Commands

Optional Limit and Home Switches

Limit - Switch	Home Switch	Limit + Switch

LinMot Linear Motor or other 1/2/3 phase motor (Brushless DC, Voice Coil,...)

Optional Brake

External Position Sensor

Optional external Position Sensor

Fast Prozess Inputs
- Trigger Inputs
- Capture
- Analog Inputs

Config.
- ETHERNET (RS232)
- ETHERNET

Synch.
- Master Encoder In
- Master Encoder Out

System Integration

Flexible hardware enables control of any 1/2/3-phase motors. Thus, low-power rotary servomotors, such as brushless DC motors, can be integrated in the same controls concept.

Additionally, the drives can be equipped with optional peripherals, such as reference and end stop switches, high-precision external position sensors, or a mechanical holding brake.

Series E1200 Servo Drives have analog and digital inputs and outputs, serial interfaces, fieldbusses, and ETHERNET connections. The user is therefore not dependent on the selection of the overlaid drive. An appropriate interface is available, with associated protocols, for any PLC or IPC solution.

With flexibility and a compact form factor, LinMot Series E1200 Servo Drives provide a complete solution for a flexible drive concept in single and multiple axis applications, with linear motors and other actuators.

Technology Functions

Technology functions are functional blocks that provide a complete solution for standard applications and frequently encountered, customer-specific problems. Technology functions can, for example, handled the complete sequence for winding textile yarns or glass fiber cables, or high-precision joining processes with force control can be implemented directly in the drive.

Option: Master Encoder Module

For synchronization to a mechanical master shaft, or a rotating main drive, the Axis (linear motors and rotary motors) can be coupled to an electronic main shaft via the Master Encoder Interface.

The encoder signal from the main shaft can be passed through by the Master Encoder Interface, so that any number of linear motors can be synchronized to the main shaft.

Motor Interfaces

E1200 Servo Drives provide all necessary interfaces to operate linear or rotary motors with optional external peripherals, such as end position and reference switches, a mechanical brake, or a high-resolution external position sensor.

In special applications, two drives can be synchronized with each other using the synchronization interface in master booster mode.
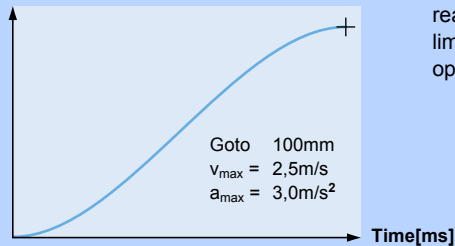
Configuration

Parameterization and configuration of the Servo Drive is done via the Ethernet interface on the front side for simultaneous configuration of several drives.

LinMot Talk user-friendly PC software is available for configuration. In addition to on-line documentation, LinMot Talk provides extensive debugging tools, such as an oscilloscope and an error inspector, for simple and rapid start-up of the Axis.

Fieldbus and ETHERNET drives can also be configured directly by the overlaid control.

Interpolated Moves

Stroke [mm]

Goto   100mm
$v_{max} = 2,5m/s$
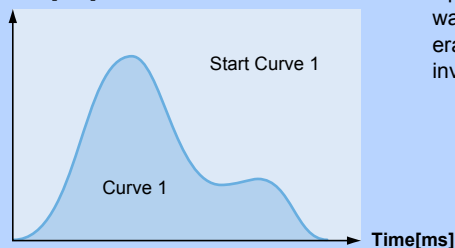$a_{max} = 3,0m/s^2$

Time[ms]

For direct position targets, using absolute or relative positioning, the desired position is reached using acceleration and velocity-limited motion profiles or jerk optimized profiles (jerk limited and Bestehorn). Positioning commands can be invoked via the serial interfaces, CAN-open, DeviceNet, Profibus, Ethernet or a trigger input

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Velocity Resolution:	1.0µm/s (32Bit)
Velocity Resolution:	10.0µm/s² (32Bit)

Time Curves

Stroke [mm]

Start Curve 1

Curve 1

Time[ms]

Up to 100 different time curves can be stored Series E1200 drives, with up to 16,000 individual waypoints. The motor can thus travel along time curves of any complexity, such as those generated by CAD programs and stored in the drive (Excel CSV format). The time curves can be invoked via the serial interface, fieldbusses, ETHERNET, or the trigger input.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Motion profiles:	Max. 100 Time Curves
Curve points:	Max. 16'000 points

Profiled Moves

Stroke [mm]

Goto Pos 125mm
with Profil 1

Curve 1

Time[ms]

For travel to an absolute position, or shifting by a relative position, any desired motion rules can be stored besides the VA interpolator. They are stored in the drive as motion profiles (Excel CSV format). The positions can be approached, for example, with a sinusoidal motion to optimize power loss, or special reverse optimized motion profiles.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Motion profiles:	Max. 100 Time Curves
Curve points:	Max. 16'000 points

Setpoint Streaming

Stroke [mm]

Time[ms]

Overlaid NC drives with fieldbus or ETHERNET interfaces communicate with the Servo Drives via "Position Streaming". The position and velocity calculated in the overlaid control is transmitted to the Servo Drive cyclically. The P, PV, or PVT mode is available for this transmission.

Position Resolution:	32 Bit
Velocity Resolution	32 Bit
Interpolator:	10 kHz
cycle times:	0.4-5ms

Easy Steps

Input 1	Pos 125mm
Input 2	Pos 250mm
Input 3	Curve 1
Input 4	Pos -30mm
Input 5	Pos +12,5mm
Input 6	Curve 2
Input 7	Pos 2mm
Input 8	Pos -12,5mm

With the Easy Steps function, up to 8 positions or independent travel commands can be stored on the drive, and addressed via 8 digital inputs or fieldbus interfaces/ETHERNET.

Digital inputs:	max. 8
Interface:	X4
Scanning rate:	200µsec

Command Table

Start
Wait Input
Pos 12mm
Rule 1 → Terminate A
Stop

Entire motion sequences with up to 255 individual motion commands can be stored in the Command Table. This is primarily advantageous if complete motion sequences need to be executed very quickly, without dead time from the overlaid drive. In the Command Table, the programmer has access to all motion commands, internal parameters, and digital inputs and outputs.

Commands:	max. 255
Cycle time:	100µsec

Master Encoder Synchronization (MT)
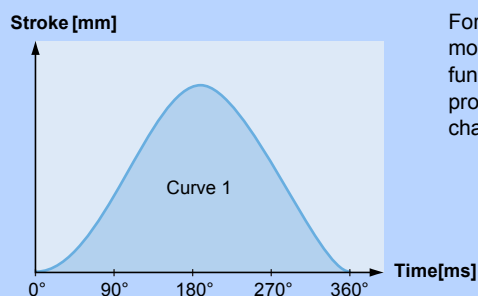
Stroke [mm]

Curve 1

0°   90°   180°   270°   360°   **Time[ms]**

For synchronization to an external main or master shaft, the linear motor travels along the motion profiles stored in the drive, at the machine speed (machine angle 0…360°). Using this function, mechanical cam discs can be replaced with highly dynamic linear motors. The motion profiles can be freely defined, and the correct motion profile can be invoked during product changeover with no changeover time.

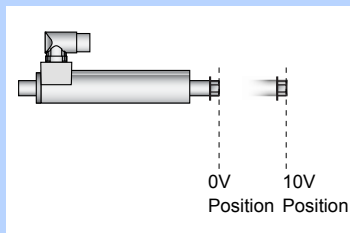|	
Motion profiles	Max. 100 curve profiles
Curve points:	Max. 16'000 points
Encoder Counter:	32 Bit
Encoder Input:	A/B/Z (RS422)
Max. counting frequency	Max. 4.5 MHz

Belt Synchronization

v [m/s]

counts/sec

v_{Belt}

Time[ms]

Synchronization to a belt speed can be done using the Master Encoder Interface or Step/Direction/Zero interface. Applications such as the "flying saw", synchronous loading or unloading, synchronous filling or labeling of bottles or containers on a conveyor belt, and many other applications can be implemented in this way.

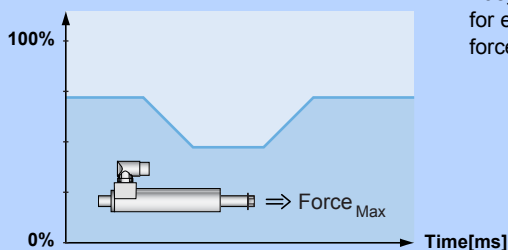|	
Encoder Counter:	32 Bit
Encoder Input:	A/B/Z (RS422), max. 5 MHz
	STEP/DIR/ZERO
Max. counting frequency	Max. 4.5 MHz

Analog Position

For an analog position target, the linear motor travels to a position proportional to the input voltage. The position is either scanned continuously, or only after a rising edge of the trigger signal. In order to prevent uncontrolled jumps in position, the motor travels to the positions with a programmable maximum acceleration and velocity (VA interpolator).

Inputs:	Analog Input X4 or X20
Voltagvte range:	0-10VDC or ±10V
Resolution:	12 Bit
Scanning rate:	>=100µsec (adjustable)

Easy Steps Parameter Scale

Maximum Force [0...10V => 0...100%]

Easy Steps provide the ability to parameterize internal parameters using two analog inputs. If, for example, the maximum motor current is read at an analog input, then the maximum motor force can be provided as analog for freely programmable joining processes.

Inputs:	2 x Analog (X4.4, X4.7)
Voltage range:	0-10VDC
Resolution:	12 Bit
Resolution	200µsec

Closed Loop Force Control
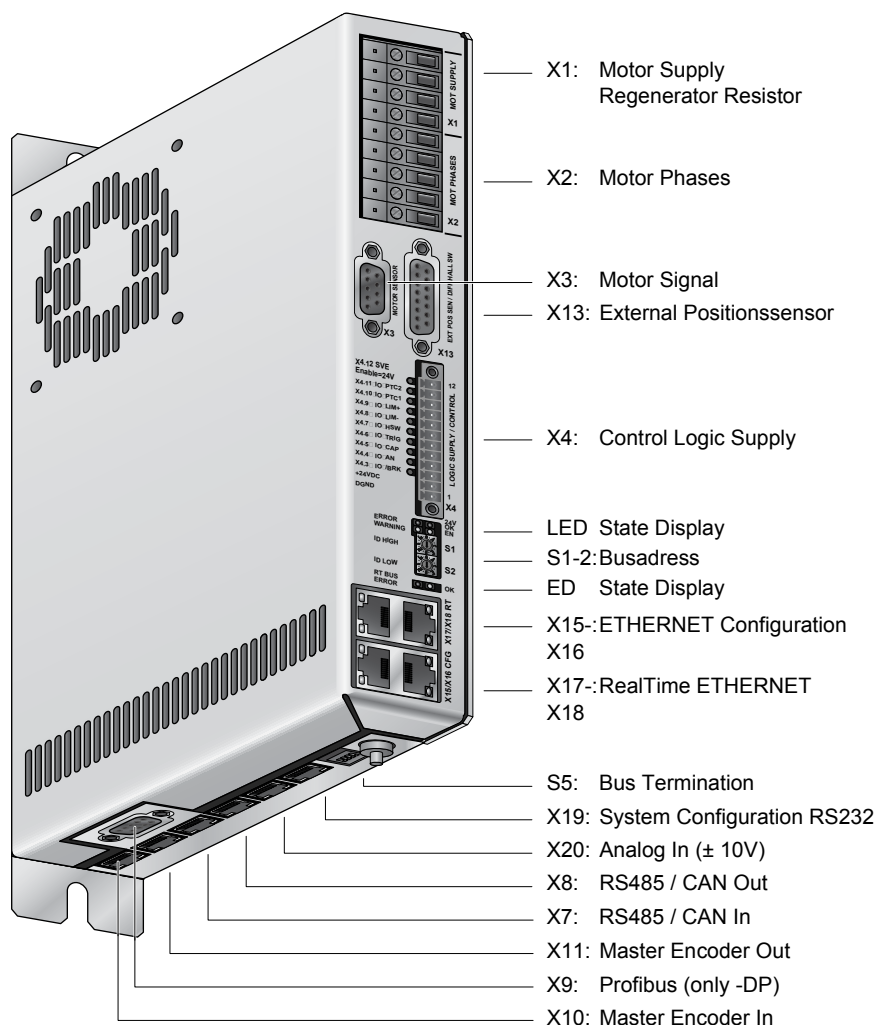
$F_{Mot} = 0,1...580N$

$0...10V\ F_{one}$

Load Cell

Using the force control technology function, precise joining processes can be implemented reliably and reproducibly with high-precision force control. For force control, the current motor force is measured with a load cell and controlled in the drive. Joining process or quality checks with high requirements for applied force can be implemented.

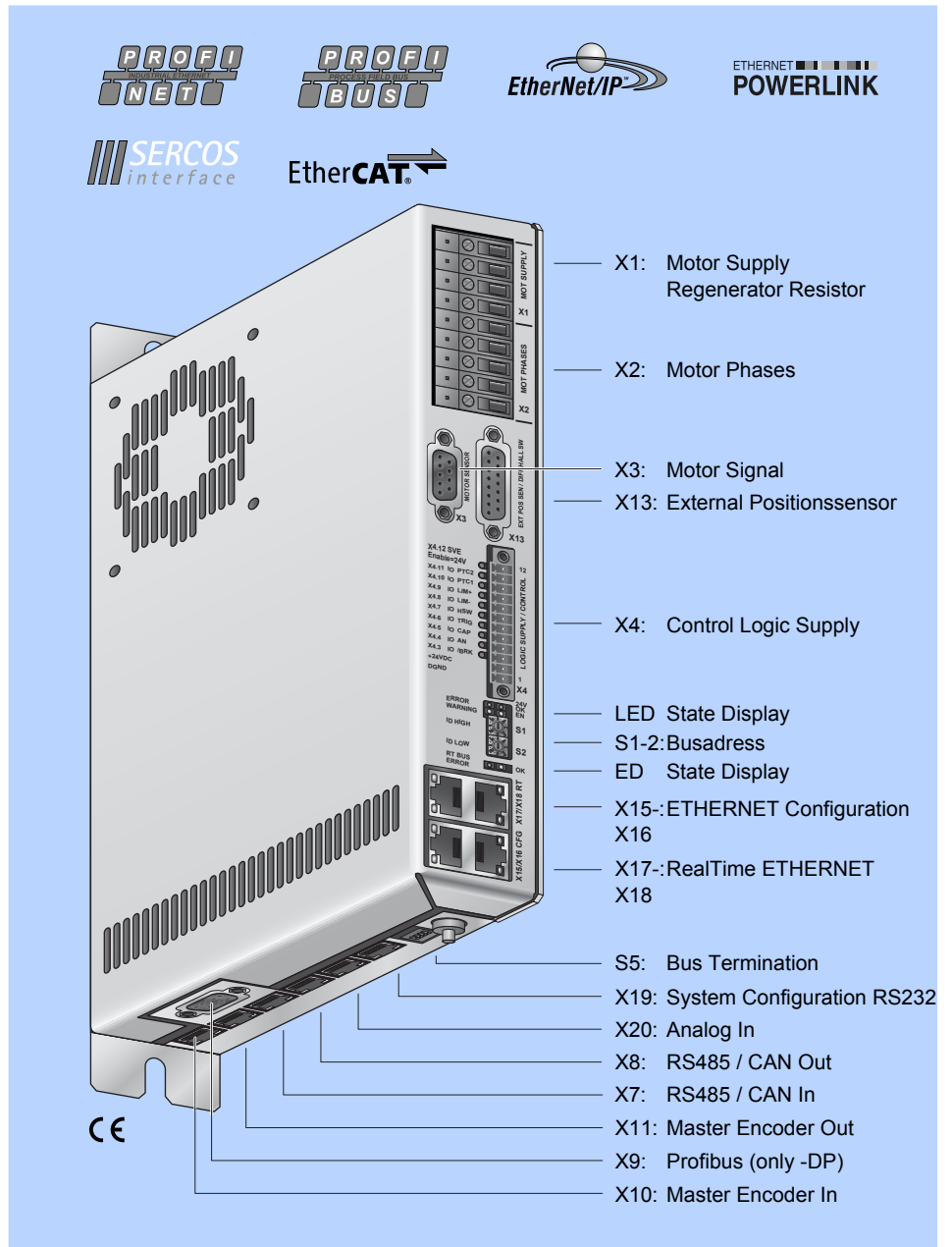|	
Analog Input:	0-10V or ±10V
Resolution:	12 Bit
Min. Force Resolution:	0.1N

Winding Application

For winding textile yarns, glass fiber optics, or wires, a complete functional block is available that controls the entire sequence of a complete winding process.

X1: Motor Supply
Regenerator Resistor

X2: Motor Phases

X3: Motor Signal
X13: External Positionssensor

X4: Control Logic Supply

LED State Display
S1-2: Busadress
ED State Display
X15-: ETHERNET Configuration
X16
X17-: RealTime ETHERNET
X18

S5: Bus Termination
X19: System Configuration RS232
X20: Analog In (± 10V)
X8: RS485 / CAN Out
X7: RS485 / CAN In
X11: Master Encoder Out
X9: Profibus (only -DP)
X10: Master Encoder In

Interfaces	E1250-PL-UC	E1250-PN-UC	E1250-DP-UC	E1250-SC-UC	E1250-IP-UC	E1250-LU-UC	E1250-EC-UC	E1250-SE-UC	E1250-DS-UC	E1230-DP-UC	E1200-GP-UC
CANopen											●
LinRS											●
POWERLINK	●										
PROFINET		●									
PROFINET Profidrive			●								
sercos				●							
sercos over EtherCAT								●			
ETHERNET IP					●						
LinUDP						●					
EtherCAT							●				
ETHERCAT CiA402									●		
PROFIBUS-DP										●	

E1250-PL-UC
E1250-PN-UC
E1250-PD-UC
E1250-SC-UC
E1250-IP-UC
E1250-LU-UC
E1250-EC-UC
E1250-SE-UC
E1250-DS-UC
E1230-DP-UC
E1200-GP-UC

✓ Absolute & Relative Positioning

✓ Travel Along Time Curves

✓ Positioning using Motion Profiles

✓ Internally stored Motion Commands

✓ Internally stored Motion Sequences

✓ Master Encoder Synchronization

✓ Synchronization to Belt Speed

✓ Position Streaming

✓ Analog Position Target

✓ Analog Parameter Scaling

✓ Winding Function Block

✓ Force Control Technology Function

✓ Customer-Specific Functions

X1:   Motor Supply
      Regenerator Resistor

X2:   Motor Phases

X3:   Motor Signal
X13: External Positionssensor

X4:   Control Logic Supply

LED   State Display
S1-2: Busadress
ED   State Display
X15-: ETHERNET Configuration
X16
X17-: RealTime ETHERNET
X18

S5:   Bus Termination
X19: System Configuration RS232
X20: Analog In
X8:   RS485 / CAN Out
X7:   RS485 / CAN In
X11: Master Encoder Out
X9:   Profibus (only -DP)
X10: Master Encoder In

Industrial ETHERNET

Series E1200 drives allow integration of LinMot linear motors in controls concepts with industrial ETHERNET interfaces. The user can integrate Series E1200 drives regardless of the provider of the overlaid control.

LinMot drives are available with common industrial ETHERNET protocols. Since all ETHERNET drives have the same motion command interface, and the control and status word are identical, software blocks that have been implemented once can be transferred to other drives without a problem.

Series 1200 Servo Drives support the following industrial ETHERNET protocols:

- Profinet
- Industrial IP
- PowerLink
- EtherCat
- Sercos III

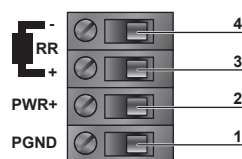The appropriate drive is available for each protocol.

Technical Data

Type: Realtime ETHERNET

Switch/Hub: Integrated 2-Port
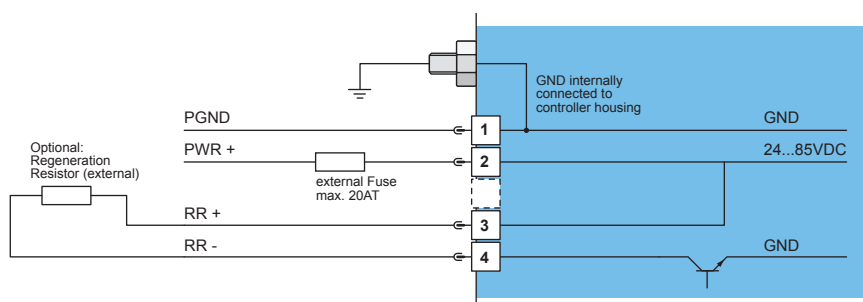   Hub/Switch

Transfer rate: 10/100MBit/sec

E12x0-Series

X1
1,2,3-PHASE
POWERSTAGE

24...80V DC
8A/15A/25A
PHASE CURRENT

REGENERATION RESISTOR

SUPPLY
3x400VAC
230VAC
115VAC

MOTOR SUPPLY

X2
PH1+
PH1-
PH2+
PH2-

LINEAR MOTOR

BRUSHLESS DC MOTOR

X3
SIN
COS
TEMP.
+5V
GND

X9 (only on -DP)
PROFIBUS DP

PROFIBUS DP

S1-S2
ETHERNET
ID LOW (S2)
ID HIGH (S1)

X13
A+ SIN+
A- SIN-
B+ COS+
B- COS-
Z+ ZERO+
Z- ZERO-
U+
U-
V+
V-
W+
W-
ENC ALARM
+5VDC
GND

OPTIONAL
EXTERNAL
POSITIONS SENSOR

X17 / X18
10/100 MBaud
INDUSTRIAL
ETHERNET

10/100 MBaud
INDUSTRIAL
ETHERNET

X4
LIMIT SWITCH+
LIMIT SWITCH-
HOME SWITCH
BRAKE OUTPUT

PTC1
PTC2

TRIGGER INPUT
CAPTURE INPUT
ANALOG INPUT

SVE

+24VDC
GND

BRAKE

ROTRAY MOTOR &
SUPPLY PROTECTION

FAST PROCESS
INPUTS

SAVE PULSE
INHIBITOR

LOGIK SUPPLY

X15 / X16
10/100 MBaud
Configuration
ETHERNET

10/100 MBaud
Configuration
ETHERNET

X19
RS232

SYSTEM
INTERFACE:
RS232

X7
RS485

CAN

X8
RS485

CAN

COMMUNICATION
INTERFACE
RS485
CANOPEN
DEVICENET

COMMUNICATION
INTERFACE
RS485
CANOPEN
DEVICENET

X10
A+ STEP+
A- STEP-
B+ DIRECTION+
Z+ ZERO+
Z- ZERO-
B- DIRECTION-
CAN_H
CAN_L

MASTER ENCODER

X11
A+ STEP+
A- STEP-
B+ DIRECTION+
Z+ ZERO+
Z- ZERO-
B- DIRECTION-
CAN_H
CAN_L

MASTER ENCODER

LinMot®

X1 — Motor Supply / Regeneration Resistor

Screw Terminals
2.5 mm² (AWG14)

Screw Terminals:

External Regeneration Resistor (RR01-10/60, Art. Nr. 0150-3088)
External Fuse: max. 20AT
Supply nominal 72VDC (24...85VDC)
(See chapter Power Supply Requirements for compatible power supplies.)
Absolute max. Rating 72VDC +20%.
If motor supply voltage is exceeds 90VDC, the drive will go into error state.
- Tightening torque: 0.5 - 0.6 Nm (4.4 – 5.3 lbin)
- Screw thread: M2.5
- Use 60/75°C copper conductors only
- Conductor cross-section: use only 2.5mm2 / AWG 14
- Stripping length: 13-15mm
- Max. length: 4m

X2 — Motor Phases
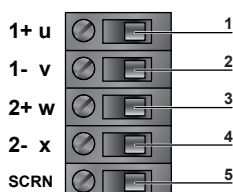
Screw Terminals
1.5-4mm²
(AWG16-14)

Nr.	Designation	LinMot Linear Motor	Color	3-Phase-Motor
1	PH1+ /U	Motor Phase 1+	red	Motor Phase U
2	PH1- /V	Motor Phase 1-	pink	Motor Phase V
3	PH2+ /W	Motor Phase 2+	blue	Motor Phase W
4	PH2- /X	Motor Phase 2-	grey	
5	SCRN	Shield		

Screw Terminals:
- Tightening torque: 0.5 - 0.6 Nm (4.4 – 5.3 lbin)
- Screw thread: M2.5
- Use 60/75°C copper conductors only
- Conductor cross-section: 0.5 – 2.5mm2 (depends on Motor current) / AWG 21 -14
- Stripping length 13-15mm

X3 — Motor Encoder
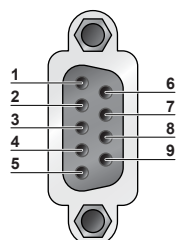
DSUB-9 (f)

Nr	LinMot Linear Motor	3-Phase-Motor
1		
2		
3	+5VDC	+5VDC (Hall Supply)
4	Sensor Sine	Hall 1
5	Temperature In	Hall 2
6		
7		
8	AGND	AGND (Hall Supply)
9	Sensor Cosine	Hall 2
Case	Shield	

Note :
Use +5VDC (X3.3) and AGND (X3.8) only for motor internal hall sensor supply (max. 100mA).
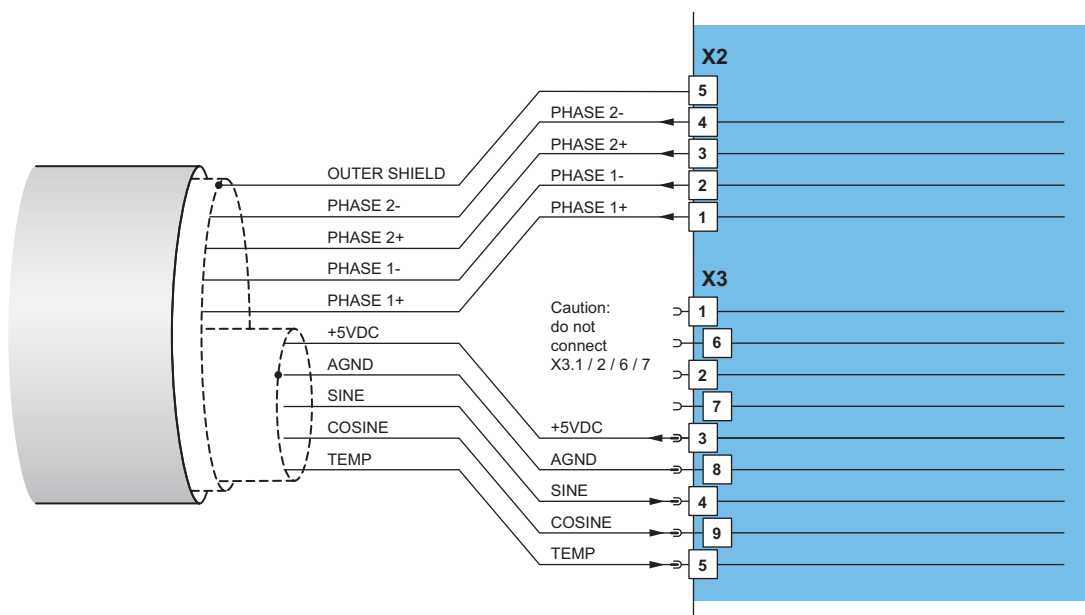Caution :
Do NOT connect AGND (X3.8) to ground or earth!

Motor | Motor wiring
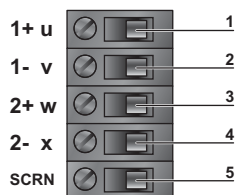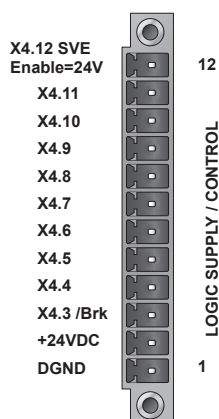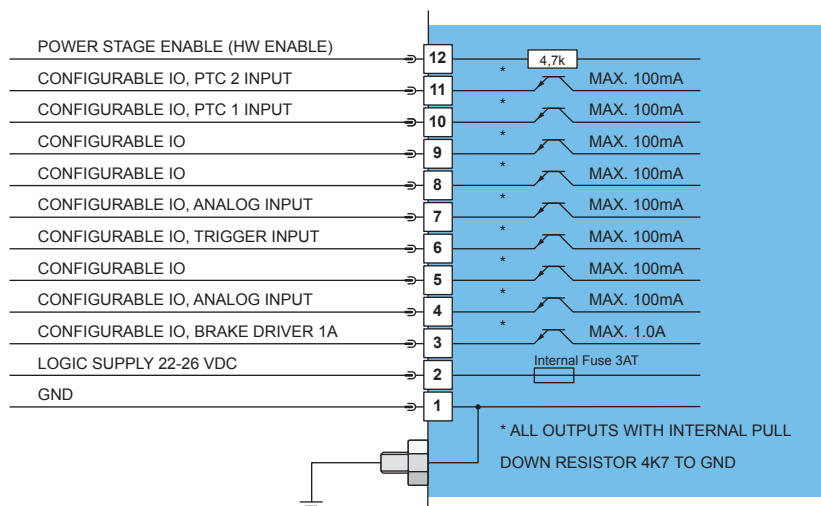

X2: Screw Terminals
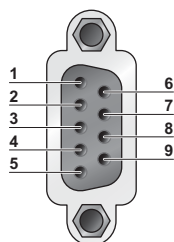
X3: DSUB-9 (f)

X4: 12pin | Logic Control / Supply

Phoenix MC1,5/12-STF-3,5
(delivered with drive)

Inputs (X4.3 .. X4.12): 24V / 5mA (Low Level: –0.5 to 5VDC, High Level: 15 to 30VDC)
Outputs (X4.4 .. X4.11): 24V / max.100mA, Peak 370mA (will shut down if exceeded)
Brake Output (X4.3): 24V / max.1.0A
Input X4.12: SVE (Safety Voltage Enable) must be high for enabling the power stage.). If it goes low for more than 0.5ms the PWM generation of the power stage is disabled by hardware.
Supply 24V / typ. 1.1A / max. 2.1A (if all outputs "on" with max. load and brake.)
- Tightening torque: min 0.22Nm
- Screw thread: M2
- Use 60/75°C copper conductors only
- Conductor cross-section max. 1.5mm2
- Internal Fuse (F2): 3AT (slow blow, Schurter OMT125, 3404.0118.xx, UL File Number: E41599)
CAUTION: For continued protection against risk of fire, replace only with same type and rating of fuse.
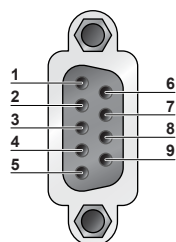
X7-X8 — RS485/CAN
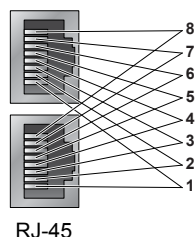
RJ-45

Nr		
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	

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 S5.2 and S5.3.
X7 is internally connected to X8 (1:1 connection)
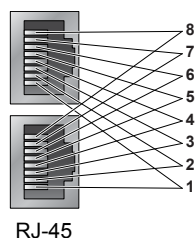
X9 — Profibus DP (only available on E1230-DP-UC)

DSUB-9 (f)

Nr		
1	-	
2	-	
3	RxD/TxD-P	
4	CNTR-P	
5	GND	(isolated)
6	+5V	(isolated)
7	-	
8	RxD/TxD-N	
9	-	
Case	Shield	

Max. Baud rate: 12 Mbaud

X10-X11 — Master Encoder IN (X10) / Master Encoder OUT (X11)

RJ-45

Nr	Incremental	Step/Direction	EIA/TIA 568A colors
1	A+	Step+	Green/White
2	A-	Step-	Green
3	B+	Direction+	Orange/White
4	Z+	Zero+	Blue
5	Z-	Zero-	Blue/White
6	B-	Direction-	Orange
7	CAN_H	CAN_H	Brown/White
8	CAN_L	CAN_L	Brown
Case	Shield	Shield	

Use twisted pair (1-2, 3-6, 4-5, 7-8) cable for wiring.
Master Encoder Inputs: Diff. RS422, max. counting frequency 25 Mcounts/s, quadrature evaluation, 40ns edge separation
Master Encoder Outputs: Amplified RS422 differential signals from Master Encoder IN (X10)
The CAN bus can be terminated with S5.4.
All devices, which are connected to X10/X11 must be referenced to the same ground.

S1-3 — Address Selectors / Bus Termination
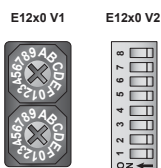
Switch	
S1	Bus ID High (0…F). Bit 5 is LSB, bit 8 MSB
S2	Bus ID Low(0…F). Bit 1 is LSB, bit 4 MSB

The use of these switches depends on the type of fieldbus which is used.
Please see the corresponding manual for further information.

S5 — Bus Termination

Switch	E1200
S5	Switch 1: AnIn2 Pulldown (4k7 Pulldown on X4.4). Set to ON, if X4.4 is used as digital Output.
	Switch 2: Termination Resistor for RS485 on CMD (120R between pin 1 and 2 on X7/X8) on/off
	Switch 3: CAN Termination on CMD (120R between pin 7 and 8 on X7/X8) on/off
	Switch 4: CAN Termination on ME (120R between pin 7 and 8 on X10/X11) on/off
	Factory settings: all switches "off"

X13 — External Position Sensor Differential Hall Switches / SSI

DSUB-15 (f)
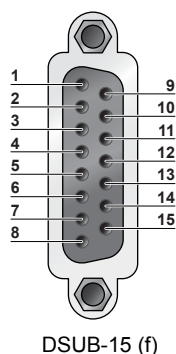
Nr	ABZ with Hall Switches		Sin/Cos 1Vpp with SSI
1	+5V DC		+5V DC
9		A+	Sin+
2	A-		Sin-
10		B+	Cos+
3	B-		Cos-
11		Z+	Data+
4	Z-		Data-
12		Encoder Alarm	Encoder Alarm
5	GND		GND
13		U+	
6	U-		
14		V+	
7	V-		
15		W+	Clock+
8	W-		Clock-
case	Shield		Shield

Position Encoder Inputs (RS422) :
Max. counting frequency: 25 Mcounts/s with quadrature decoding, 40ns edge separation

Encoder Simulation Outputs (RS422):
Max Output Frequency: 2.5MHz, 5 M counts/s with quadrature decoding, 200ns edge separation

Differential Hall Switch Inputs (RS422):
Input Frequency: <1kHz

Enc. Alarm In:
5V / 1mA

Sensor Supply:
5VDC max 100mA

X15-X16 — Ethernet Configuration 10/100Mbit/s

RJ-45

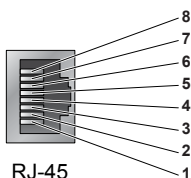| Nr	Bez.
X15	Internal 2-Port 10BASE-T and 100BASE-TX Ethernet Switch
X16	HP Auto MDIX
	LEDs on the lower side of the device indicate "Link/Activity" per port, the upper ones are not used.

X17-X18 — Ethernet RealTime

RJ-45

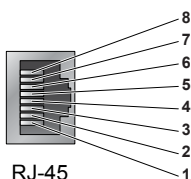| Nr	Bez.
X17 RT ETH In	Specification depends on RT-Bus Type. Please refer to according documentation.
X18 RT ETH Out	

X19 — RS232 Configuration

RJ-45

Nr	Bez.
1	Reserved, do not connect
2	Reserved, do not connect
3	RS232 RX
4	GND
5	GND
6	RS232 TX
7	Reserved, do not connect
8	Reserved, do not connect
case	Shield

Use isolated USB-RS232 converter (Art.-No. 0150-2473) for configuration over RS232.

X20 — Analog In (+-10V Differential Analog Input)

RJ-45

Nr	Bez.
1	n.c.
2	n.c.
3	Analog In-
4	GND
5	GND
6	Analog In+
7	n.c.
8	n.c.
case	Shield

LEDs — State Display

Error ● ● 24VOK
Warn ● ● EN

Green	24V Logic Supply OK
Yellow	Motor Enabled / Error Code Low Nibble
Yellow	Warning / Error Code High Nibble
Red	Error

RT BUS LEDs

BUS ● ● BUS
Error ● ● OK

Green	OK
Red	Error
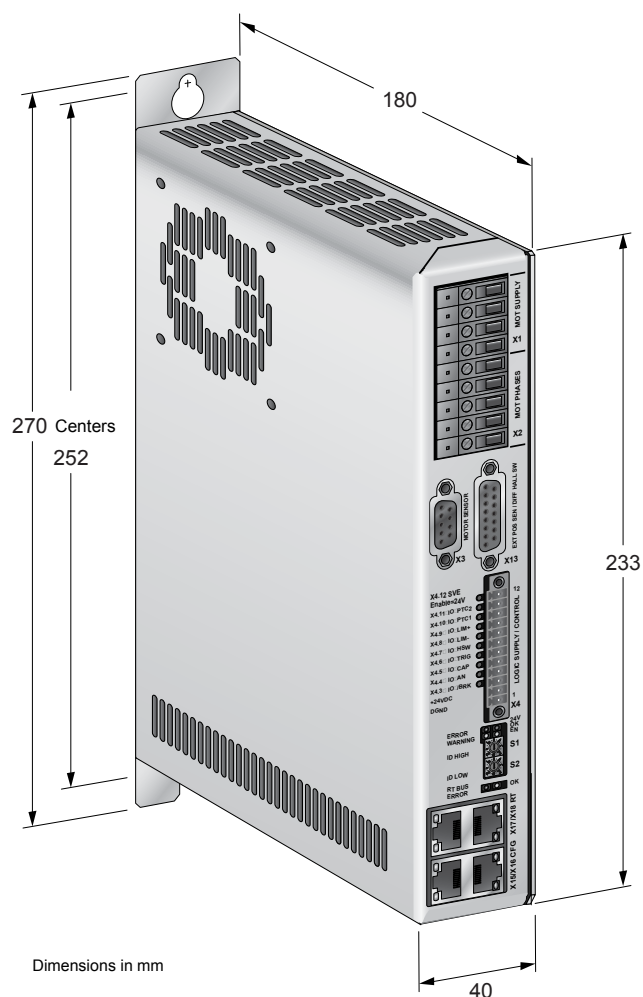
Dimensions in mm

Servo Drives Series		E1200
Width	mm (in)	40 (1.6)
Height	mm (in)	270 (10.6)
Height without fixings	mm (in)	233 (9.2)
Depth	mm (in)	180 (7.1)
Weight	kg (lb)	1.5 (3.3)
Case	IP	20
Mounting Screws		2 x M5
Mounting Distance	mm (in)	252 (9.92)
Storage temperature	°C	-25...40
Transport temperature	°C	-25...70
Operating temperature	°C	0...40 at rated date
		40...50 with power derating
Relative humidity		95% (non-condensing)
Max. case temperature	°C	65
Max. power dissipation	W	30
Clearance around drives	mm (in)	20 (0.8) left/right
		50 (2) top/bottom

Item	Description	Part Nummber
E1250-PL-UC	POWERLINK Servo Drive 72VDC/32A	0150-1760
E1250-PN-UC	PROFINET Servo Drive 72VDC/32A	0150-1762
E1250-PD-UC	ProfiDrive Servo Drive 72VDC/32A	0150-2620
E1250-EC-UC	EtherCAT Servo Drive 72VDC/32A	0150-1763
E1250-SE-UC	sercos over EtherCAT Servo Drive 72VDC/32A	0150-1898
E1250-DS-UC	EtherCAT CoE Servo Drive 72VDC/32A	0150-2410
E1250-SC-UC	sercos Servo Drive 72VDC/32A	0150-1764
E1250-IP-UC	ETHERNET IP Servo Drive 72VDC/32A	0150-1761
E1250-LU-UC	LinUDP Servo Drive 72VDC/32A	0150-2493
E1230-DP-UC	PROFIBUS-DP Servo Drive 72VDC/32A	0150-1766
E1200-GP-UC	GENERAL PURPOSE Servo Drive 72VDC/32A	0150-1771

Item	Description	Part Nummber
Capacitor	Capacitor 10'000 mF / 100 V	0150-3075
Regeneration Resistor	R01-10/60 (10 Ohm, 60 W)	0150-3088
Regeneration Resistor	RR01-10/150 (10 Ohm, 150 W)	0150-3090

Item	Description	Part Nummber
T01-72/420	72VDC, 15A peak, 420VA, 3x400VAC	
T01-72/420-US	72VDC, 15A peak, 420VA, 3x230VAC	
T01-72/900	72VDC, 30A peak, 900VA, 3x400VAC	
T01-72/900-US	72VDC, 30A peak, 900VA, 3x230VAC	
T01-72/1500	72VDC, 2x30A peak, 1500VA, 3x400VAC	
T01-72/1500-US	72VDC, 2x30A peak, 1500VA, 3x230VAC	
S01-72/500	72VDC, 500W, 750W peak, 1x100..120VAC/200..240VAC	
S01-72/1000	72VDC, 1000W, 2000W peak, 3x380..500VAC	

| Item	Description	Part Nummber
Isolated USBRS232converter	Isolated USB RS232 converter with config. cable	0150-2473
Connector for X4	Connector MC 1,5/12-STF-3,5, delivered with drive	0150-3300
RS232 PC config. Cable 2.5m	For C1100/C1250/E1200/E1400/M8000	0150-2143
Isolated USB-serial converter	Isolated USB RS232/422/485 converter	0150-3120

Servo Drive Series C1200

Servo Drive C1200

Series C1200 Servo Drives are modular axis controllers, with 32-bit position resolution and an integrated power stage, for linear motors and rotary drives.

The controllers are suitable for simplest, standard, and high-end positioning tasks, across the entire force range of the LinMot product range.
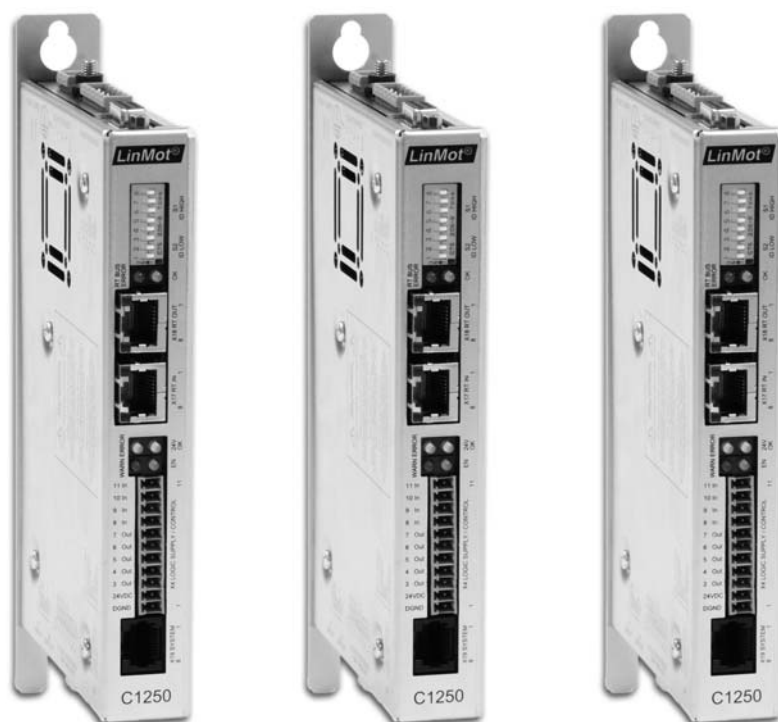
Connection to Machine Drive

The Series C1200 Servo Drives can be actuated by machine controls from any manufacturer or brand, via digital inputs and outputs, RS232 or RS485 serial interface, CanBus CANopen and DeviceNet interfaces, Profibus DP, or industrial ETHERNET.
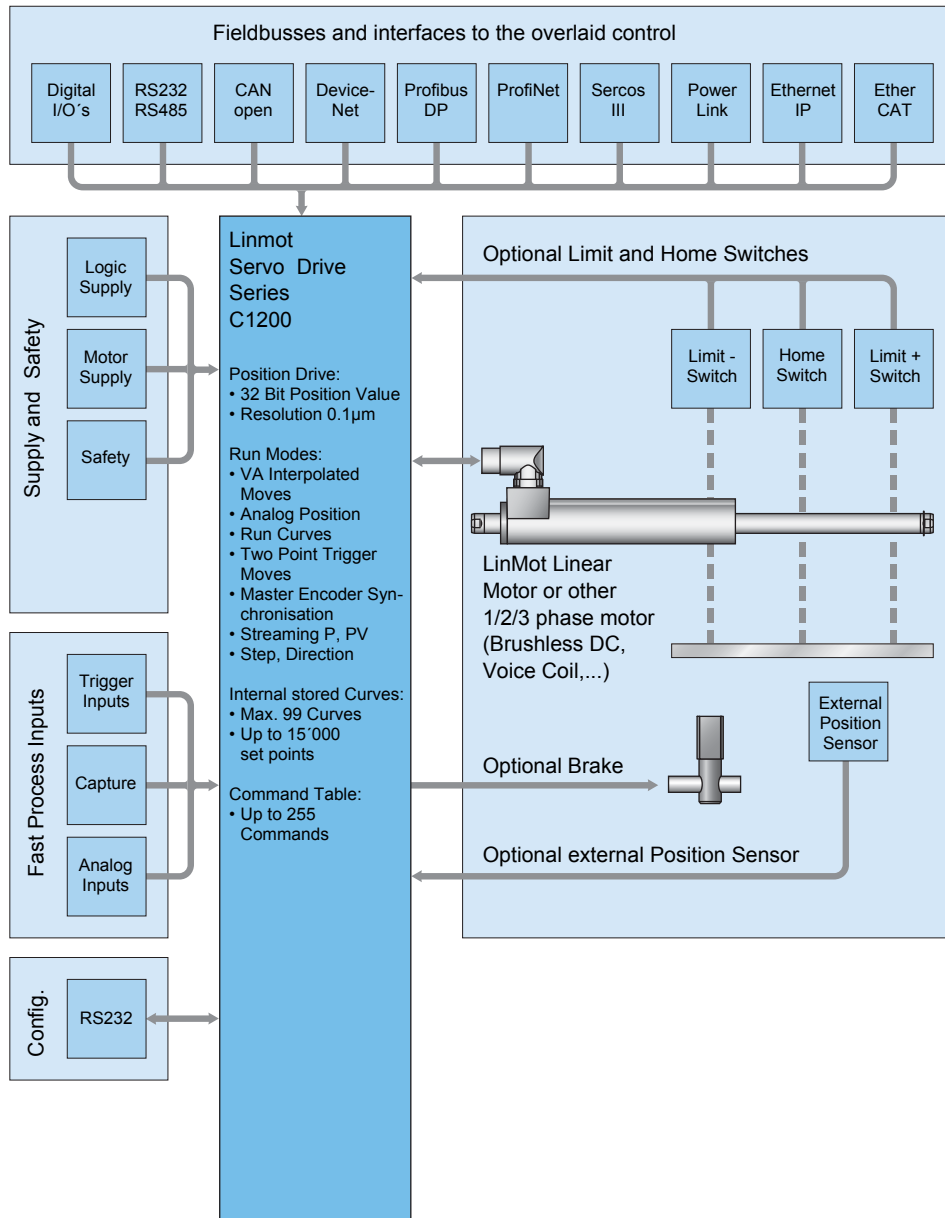
Process and Safety Interfaces

Fast process interfaces for direct processing of sensor signals are available as freely programmable analog and digital inputs, a fast trigger input, and a capture input.

Logic and Power Supply

The Servo Drives have two separate power supply inputs for the logic and power elements.

In an E-stop and safe stop of the drive, only the power element supply is cut off from the drive. The logic supply and the drive continue to run.

This has the advantage that the drive and linear motor do not need to be reinitialized when the machine is restarted, since all process data, including the current position of the linear motor, are still up to date.

Fieldbusses and interfaces to the overlaid control

| Digital I/O´s | RS232 RS485 | CAN open | Device-Net | Profibus DP | ProfiNet | Sercos III | Power Link | Ethernet IP | Ether CAT |

Supply and Safety

- Logic Supply
- Motor Supply
- Safety

Fast Process Inputs

- Trigger Inputs
- Capture
- Analog Inputs

Config.

- RS232

Linmot Servo Drive Series C1200

Position Drive:
- 32 Bit Position Value
- Resolution 0.1µm

Run Modes:
- VA Interpolated Moves
- Analog Position
- Run Curves
- Two Point Trigger Moves
- Master Encoder Synchronisation
- Streaming P, PV
- Step, Direction

Internal stored Curves:
- Max. 99 Curves
- Up to 15´000 set points

Command Table:
- Up to 255 Commands

Optional Limit and Home Switches

| Limit - Switch | Home Switch | Limit + Switch |

LinMot Linear Motor or other 1/2/3 phase motor (Brushless DC, Voice Coil,...)

Optional Brake

External Position Sensor

Optional external Position Sensor

System Integration

Flexible hardware enables control of any 1/2/3-phase motors. Thus, low-power rotary servomotors, such as brushless DC motors, can be integrated in the same controls concept.

Additionally, the drives can be equipped with optional peripherals, such as reference and end stop switches, high-precision external position sensors, or a mechanical holding brake.

Series C1200 Servo Drives have analog and digital inputs and outputs, serial interfaces, fieldbusses, and ETHERNET connections. The user is therefore not dependent on the selection of the overlaid controller. An appropriate interface is available, with associated protocols, for any PLC or IPC solution.

With flexibility and a compact form factor, LinMot Series C1200 Servo Drives provide a complete solution for a flexible drive concept in single and multiple axis applications, with linear motors and other actuators.

Technology Functions

Technology functions are functional blocks that provide a complete solution for standard applications and frequently encountered, customer-specific problems. Technology functions can, for example, handled the complete sequence for winding textile yarns or glass fiber cables, or high-precision joining processes with force control can be implemented directly in the drive.

Motor Interfaces

C1200 Servo Drives provide all necessary interfaces to operate linear or rotary motors with optional external peripherals, such as end position and reference switches, a mechanical brake, or a high-resolution external position sensor.

In special applications, two drives can be synchronized with each other using the synchronization interface in master booster mode.
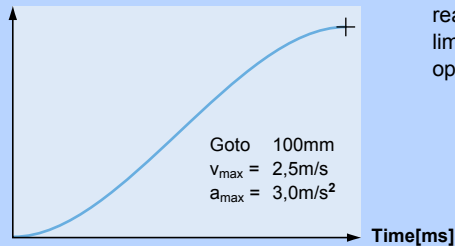
Configuration

LinMot Talk user-friendly PC software is available for configuration. In addition to on-line documentation, LinMot Talk provides extensive debugging tools, such as an oscilloscope and an error inspector, for simple and rapid start-up of the Axis.

Fieldbus and ETHERNET drives can also be configured directly by the overlaid control.

Interpolated Moves

Stroke [mm]

Goto 100mm
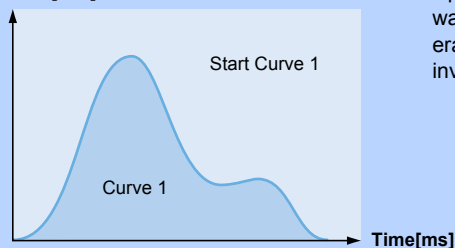v_{max} = 2,5m/s
a_{max} = 3,0m/s²

Time[ms]

For direct position targets, using absolute or relative positioning, the desired position is reached using acceleration and velocity-limited motion profiles or jerk optimized profiles (jerk limited and Bestehorn). Positioning commands can be invoked via the serial interfaces, CAN-open, DeviceNet, Profibus, Ethernet or a trigger input.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Velocity Resolution:	1.0µm/s (32Bit)
Velocity Resolution:	10.0µm/s² (32Bit)

Time Curves

Stroke [mm]

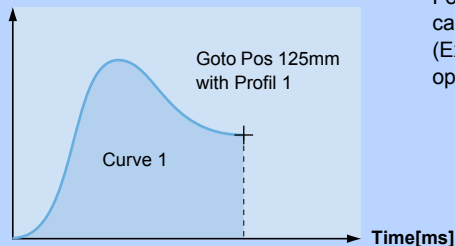Start Curve 1

Curve 1

Time[ms]

Up to 100 different time curves can be stored Series C1200 drives, with up to 16,000 individual waypoints. The motor can thus travel along time curves of any complexity, such as those generated by CAD programs and stored in the drive (Excel CSV format). The time curves can be invoked via the serial interface, fieldbusses, ETHERNET, or the trigger input.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Motion profiles:	Max. 100 Time Curves
Curve points:	Max. 16'000 points

Profiled Moves

Stroke [mm]

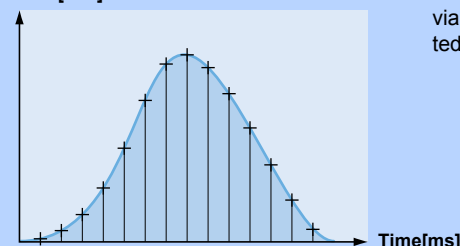Goto Pos 125mm
with Profil 1

Curve 1

Time[ms]

For travel to an absolute position, or shifting by a relative position, any desired motion rules can be stored besides the VA interpolator. They are stored in the drive as motion profiles (Excel CSV format). The positions can be approached, for example, with a sinusoidal motion to optimize power loss, or special reverse optimized motion profiles.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Motion profiles:	Max. 100 Time Curves
Curve points:	Max. 16'000 points

Setpoint Streaming

Stroke [mm]

Time[ms]

Overlaid NC drives with fieldbus or ETHERNET interfaces communicate with the Servo Drives via "Position Streaming". The position and velocity calculated in the overlaid control is transmitted to the Servo Drive cyclically. The P, PV, or PVT mode is available for this transmission.

Position Resolution:	32 Bit
Velocity Resolution	32 Bit
Interpolator:	10 kHz
cycle times:	0.4-5ms

Easy Steps

Input 1	Pos 125mm
Input 2	Pos 250mm
Input 3	Curve 1
Input 4	Pos -30mm
Input 5	Pos +12,5mm
Input 6	Curve 2
Input 7	Pos 2mm
Input 8	Pos -12,5mm

With the Easy Steps function, up to 8 positions or independent travel commands can be stored on the drive, and addressed via 8 digital inputs or fieldbus interfaces/ETHERNET.

Digital inputs:	max. 8
Interface:	X4
Scanning rate:	200µsec

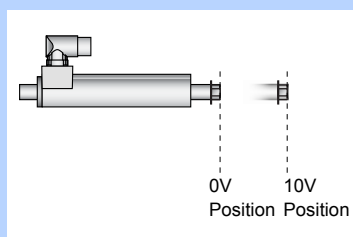## Command Table

Start
↓
Wait Input
↓
Pos 12mm
↓
Rule 1 → Terminate A
↓
Stop

Entire motion sequences with up to 255 individual motion commands can be stored in the Command Table. This is primarily advantageous if complete motion sequences need to be executed very quickly, without dead time from the overlaid drive. In the Command Table, the programmer has access to all motion commands, internal parameters, and digital inputs and outputs.

Commands:	max. 255
Cycle time:	100µsec

Analog Position
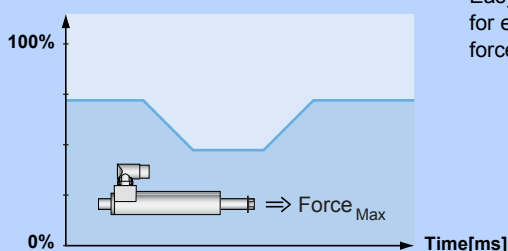
0V Position   10V Position

For an analog position target, the linear motor travels to a position proportional to the input voltage. The position is either scanned continuously, or only after a rising edge of the trigger signal. In order to prevent uncontrolled jumps in position, the motor travels to the positions with a programmable maximum acceleration and velocity (VA interpolator).

Inputs:	Analog Input X4 or X20
Voltagvte range:	0-10VDC or ±10V
Resolution:	12 Bit
Scanning rate:	>=100µsec (adjustable)

Easy Steps Parameter Scale

Maximum Force [0...10V => 0...100%]

100%

⟹ Force Max

0%   Time[ms]
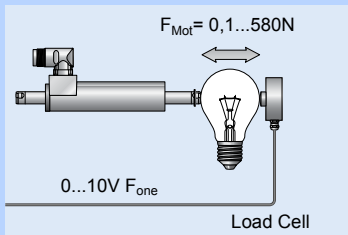
Easy Steps provide the ability to parameterize internal parameters using two analog inputs. If, for example, the maximum motor current is read at an analog input, then the maximum motor force can be provided as analog for freely programmable joining processes.

Inputs:	2 x Analog (X4.4, X4.7)
Voltage range:	0-10VDC
Resolution:	12 Bit
Resolution	200µsec

Closed Loop Force Control

$F_{Mot} = 0,1...580N$

$0...10V$ F_{one}
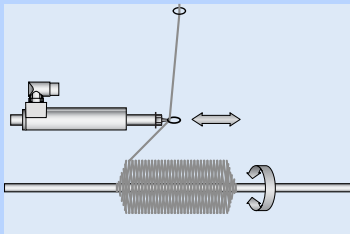
Load Cell

Using the force control technology function, precise joining processes can be implemented reliably and reproducibly with high-precision force control. For force control, the current motor force is measured with a load cell and controlled in the drive. Joining process or quality checks with high requirements for applied force can be implemented.

Analog Input:	0-10V or ±10V
Resolution:	12 Bit
Min. Force Resolution:	0.1N

Winding Application

For winding textile yarns, glass fiber optics, or wires, a complete functional block is available that controls the entire sequence of a complete winding process.

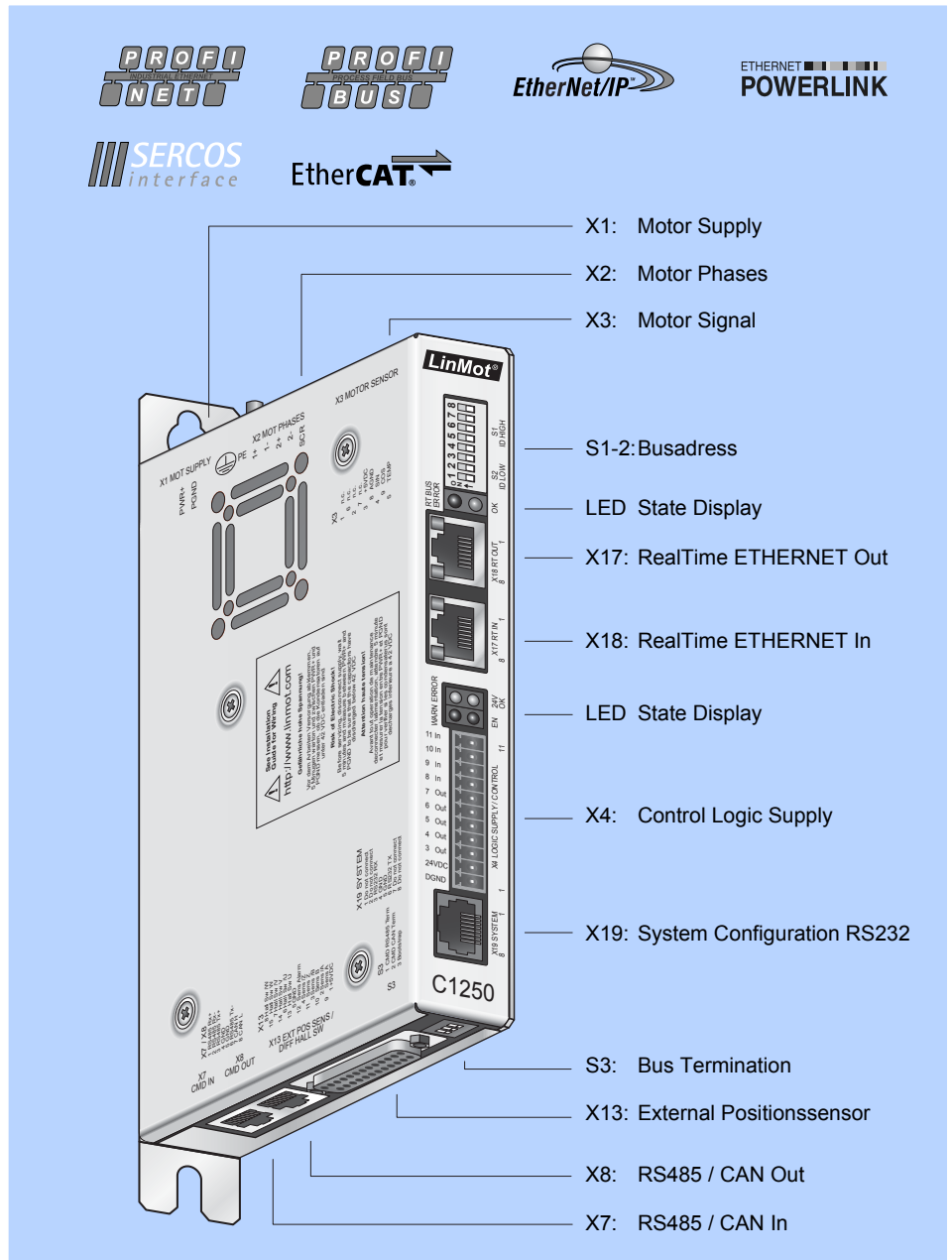| X1: | Motor Supply |
X2:	Motor Phases
X3:	Motor Signal
S1-2:	Busadress
LED	State Display
X17:	RealTime ETHERNET Out
X18:	RealTime ETHERNET In
LED	State Display
X4:	Control Logic Supply
X19:	System Configuration RS232
S3:	Bus Termination
X13:	External Positionssensor
X8:	RS485 / CAN Out
X7:	RS485 / CAN In

Interfaces	C1200-GP-XC	C1230-DP-XC	C1250-PL-XC	C1250-EC-XC	C1250-PN-XC	C1250-IP-XC	C1250-SC-XC	C1250-SE-XC
CANopen	●	●	●	●	●	●	●	●
DeviceNet	●	●	●	●	●	●	●	●
LinRS	●	●	●	●	●	●	●	●
PROFIBUS-DP		●						
POWERLINK			●					
ETHERCAT				●				●
PROFINET					●			
ETHERNET IP						●		
SERCOS III							●	
SERCOS over EtherCAT				●				●
Konfig RS232	●	●	●	●	●	●	●	●

C1200-GP-XC
C1230-DP-XC
C1250-PL-XC
C1250-EC-XC
C1250-PN-XC
C1250-IP-XC
C1250-SC-XC

- ✓ Absolute & Relative Positioning
- ✓ Travel Along Time Curves
- ✓ Positioning using Motion Profiles
- ✓ Internally stored Motion Commands
- ✓ Internally stored Motion Sequences
- ✓ Position Streaming
- ✓ Analog Position Target
- ✓ Analog Parameter Scaling
- ✓ Force Control Technology Function
- ✓ Customer-Specific Functions

X1: Motor Supply
X2: Motor Phases
X3: Motor Signal
S1-2: Busadress
LED State Display
X17: RealTime ETHERNET Out
X18: RealTime ETHERNET In
LED State Display
X4: Control Logic Supply
X19: System Configuration RS232
S3: Bus Termination
X13: External Positionssensor
X8: RS485 / CAN Out
X7: RS485 / CAN In

Industrial ETHERNET

Series C1200 drives allow integration of LinMot linear motors in controls concepts with industrial ETHERNET interfaces. The user can integrate Series C1200 drives regardless of the provider of the overlaid control.

LinMot drives are available with common industrial ETHERNET protocols. Since all ETHERNET drives have the same motion command interface, and the control and status word are identical, software blocks that have been implemented once can be transferred to other drives without a problem.
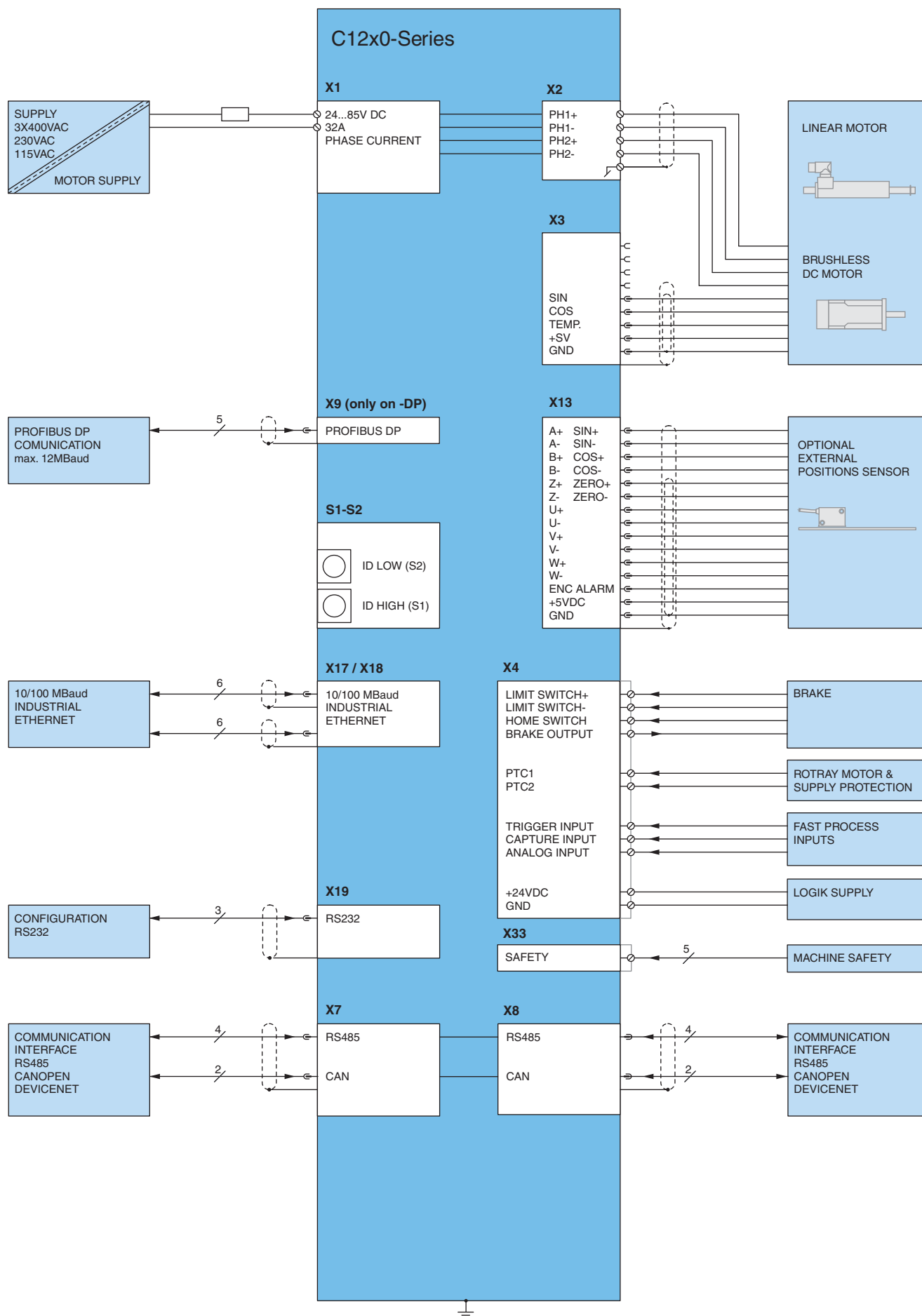
Series 1200 Servo Drives support the following industrial ETHERNET protocols:

- Profinet
- Industrial IP
- PowerLink
- EtherCat
- Sercos III

The appropriate drive is available for each protocol.

Technical Data

Type:	Realtime ETHERNET
Switch/Hub:	Integrated 2-Port Hub/Switch
Transfer rate:	10/100MBit/sec

C12x0-Series

X1

SUPPLY
3X400VAC
230VAC
115VAC

MOTOR SUPPLY

24...85V DC
32A
PHASE CURRENT

X2

PH1+
PH1-
PH2+
PH2-

LINEAR MOTOR

BRUSHLESS
DC MOTOR

X3

SIN
COS
TEMP.
+SV
GND

X9 (only on -DP)

PROFIBUS DP
COMUNICATION
max. 12MBaud

PROFIBUS DP

X13

A+   SIN+
A-   SIN-
B+   COS+
B-   COS-
Z+   ZERO+
Z-   ZERO-
U+
U-
V+
V-
W+
W-
ENC ALARM
+5VDC
GND

OPTIONAL
EXTERNAL
POSITIONS SENSOR

S1-S2

ID LOW (S2)

ID HIGH (S1)

X17 / X18

10/100 MBaud
INDUSTRIAL
ETHERNET

10/100 MBaud
INDUSTRIAL
ETHERNET

X4

LIMIT SWITCH+
LIMIT SWITCH-
HOME SWITCH
BRAKE OUTPUT

PTC1
PTC2

TRIGGER INPUT
CAPTURE INPUT
ANALOG INPUT

+24VDC
GND

BRAKE

ROTRAY MOTOR &
SUPPLY PROTECTION

FAST PROCESS
INPUTS

LOGIK SUPPLY

X19

CONFIGURATION
RS232

RS232

X33

SAFETY

MACHINE SAFETY

X7

COMMUNICATION
INTERFACE
RS485
CANOPEN
DEVICENET

RS485

CAN

X8

RS485

CAN

COMMUNICATION
INTERFACE
RS485
CANOPEN
DEVICENET

X1 — Motor Supply / Regeneration Resistor

PWR+ — 3
PGND — 4

Screw Terminals
2.5 mm² (AWG14)

PWR + — 3 — 24...80VDC
PGND — 4 — GND

GND intern mit
Controller Gehäuse
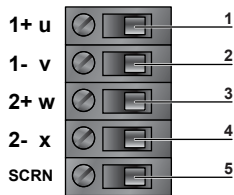verbunden

* SIEHE INSTALLATION GUIDE

Motor Supply:

Motor Supply Voltage 24...85VDC.
Absolute max. Rating 72VDC + 20%

⚠️ If motor supply voltage is exceeding 90VDC, the controller will go into error state
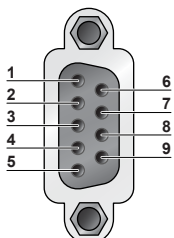
X2 — Motor Phases

1+ u — 1
1- v — 2
2+ w — 3
2- x — 4
SCRN — 5

Nr.	Designation	LinMot Linear Motor	Color	3-Phase-Motor
1	PH1+ /U	Motor Phase 1+	red	Motor Phase U
2	PH1- /V	Motor Phase 1-	pink	Motor Phase V
3	PH2+ /W	Motor Phase 2+	blue	Motor Phase W
4	PH2-	Motor Phase 2-	grey	
5	SCRN	Shield		

Screw Terminals
1.5-4mm²
(AWG16-14)

X3 — Motor

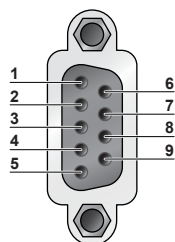| Nr	LinMot Linear Motor	
1	Motor Phase 1+	
2	Motor Phase 2+	
3	+5VDC	
4	Sine	
5	Temperature	
6	Motor Phase 1-	
7	Motor Phase 2-	
8	AGND	
9	Cosine	
Case	Shield	

DSUB-9

- Use X2 for motor phase wiring if phase current exceeds 5Arms or 7.5Apeak
- Use +5V (X3.3) and AGND (X3.8) only for motor internal Hall Sensor supply (max. 100mA)
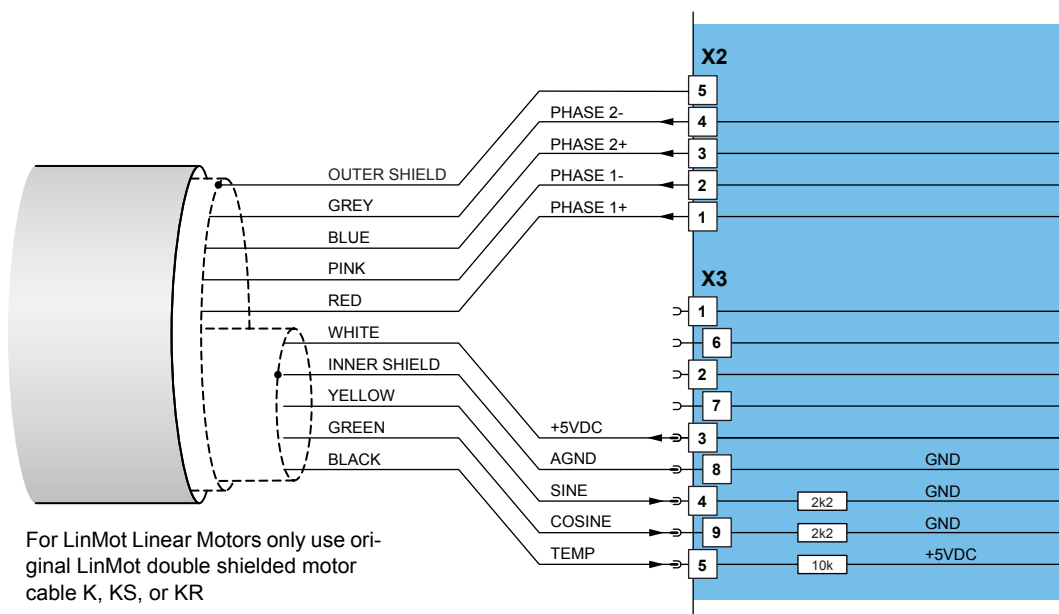- Do NOT connect AGND (X3.8) to ground or earth!

Motor | Motor wiring

1+ u		1
1- v		2
2+ w		3
2- x		4
SCRN		5

X2: Screw Terminals

X3: DSUB-9 (f)

OUTER SHIELD
GREY — PHASE 2-
BLUE — PHASE 2+
PINK — PHASE 1-
RED — PHASE 1+
WHITE
INNER SHIELD
YELLOW
GREEN — +5VDC
BLACK — AGND
SINE
COSINE
TEMP

X2
5
4 PHASE 2-
3 PHASE 2+
2 PHASE 1-
1 PHASE 1+

X3
1
6
2
7
3 +5VDC
8 AGND — GND
4 SINE — GND — 2k2
9 COSINE — GND — 2k2
5 TEMP — +5VDC — 10k

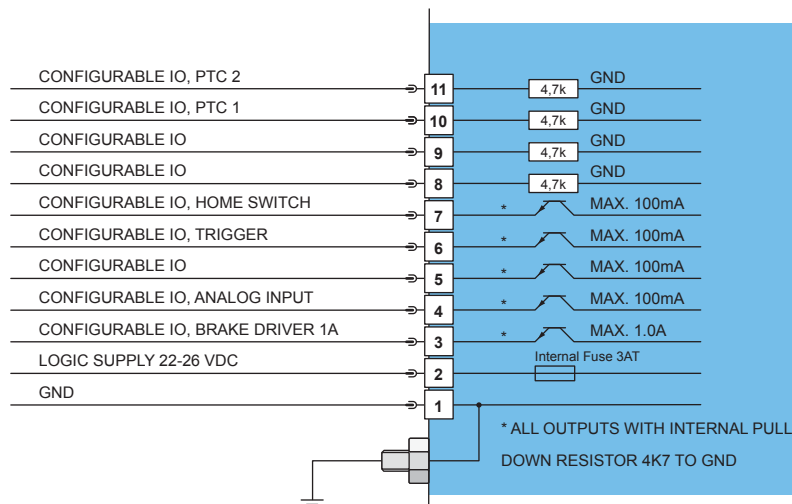For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR
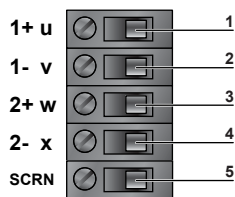
X4: 11pin | Control / Supply

X4. 11 QuickStop, PTC2
X4. 10 IO, PTC1
X4. 9 IO, LIM+
X4. 8 IO, LIM-
X4. 7 IO, HSW
X4. 6 IO, TRIG
X4. 5 IO, CAP
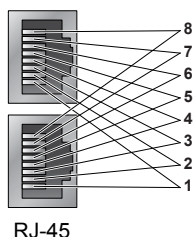X4. 4 IO, AN
X4. 3 IO, /BRK
X4. 2 +24VDC
X4. 1 DGND

X14 LOGIC SUPPLY / IO CONNECTION

Phoenix MC1,5/12-STF-3,5
0.25-1.5mm² (AWG24-16)

CONFIGURABLE IO, PTC 2	11	4,7k GND
CONFIGURABLE IO, PTC 1	10	4,7k GND
CONFIGURABLE IO	9	4,7k GND
CONFIGURABLE IO	8	4,7k GND
CONFIGURABLE IO, HOME SWITCH	7	* MAX. 100mA
CONFIGURABLE IO, TRIGGER	6	* MAX. 100mA
CONFIGURABLE IO	5	* MAX. 100mA
CONFIGURABLE IO, ANALOG INPUT	4	* MAX. 100mA
CONFIGURABLE IO, BRAKE DRIVER 1A	3	* MAX. 1.0A
LOGIC SUPPLY 22-26 VDC	2	Internal Fuse 3AT
GND	1	

* ALL OUTPUTS WITH INTERNAL PULL
DOWN RESISTOR 4K7 TO GND

X7-X8   RS485/CAN

RJ-45

Nr		
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	

- X7 internally connected to X8 (1:1 connection)
- 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 S5.
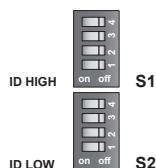
X9   Profibus DP
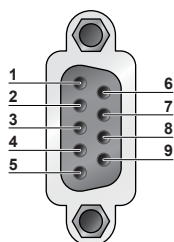
DSUB-9

Nr		
1	-	
2	-	
3	RxD/TxD-P	
4	CNTR-P	
5	GND	(galvanically seperated)
6	+5V	(galvanically seperated)
7	-	
8	RxD/TxD-N	
9	-	
Case	Shield	

Max. Baud rate: 12 Mbaud

S1-2 — Address Selectors / Bus Termination

Switch		
S1	Bus ID High (0…F)	HEX-Switches for Bus ID
S2	Bus ID Low(0…F)	address range 0.255

ID HIGH S1

ID LOW S2

S3 — Bus Termination

S3

Switch	C1200
S5	Switch 1: Termination Resistor for RS485 on CMD (120R between pin 1 and 2 on X7/X8) on/off
	Switch 2: CAN Termination on CMD (120R between pin 7 and 8 on X7/X8) on/off
	Switch 3: Beostrap
	Factory settings: all switches "off"
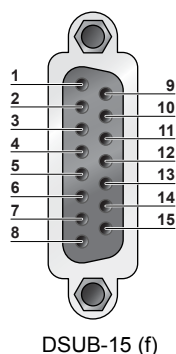
X13 — External Position Sensor Commutation

DSUB-15 (f)

Nr	Description	
1	+5V DC	
9	A+	Encoder
2	A-	Encoder
10	B+	Encoder
3	B-	Encoder
11	Z+	Encoder
4	Z-	Encoder
12	Encoder Alarm	
5	GND	
13	U+	Commutation (Hall Switch)
6	U-	Commutation (Hall Switch)
14	V+	Commutation (Hall Switch)
7	V-	Commutation (Hall Switch)
15	W+	Commutation (Hall Switch)
8	W-	Commutation (Hall Switch)
case	Shield	

Max. Input Frequency:	12MHz (RS422 inkrementell), 40ns edge separation
Sensor Supply Current:	max. 100mA
Position Encoder Inputs:	RS422, Max Input Frequency: 2.5MHz, 5 M counts/s with quadrature decoding, 40ns edge separation
Encoder Simulated Outputs:	RS422, Max Output Frequency: 2.5MHz, 5 M counts/s with quadrature decoding, 200ns edge separation
Differential Hall Switch Inputs:	RS422, Max Input Frequency: <1kHz
Enc. Alarm In:	5V / 1mA
Sensor Supply:	5VDC, max 100mA

X33: 8pin | Safety Relays (only for -1S)

X33. 4/8 Ksr+
X33. 3/7 Ksr-
X33. 2/6 Ksr f+
X33. 1/5 Ksr f-

X33 STO RELAYS

Edition 16

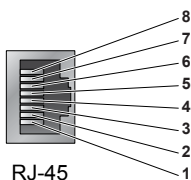| Nr	Bez.	
4 / 8	Ksr +	Safety Relay 1 / 2 Input possitive
3 / 7	Ksr -	Safety Relay 1 / 2 Input negative
2 / 6	Ksr f+	Safety Relay 1 / 2 feedback positive
1 / 5	Ksr f-	Safety Relay 1 / 2 feedback negative

X17-X18 | Ethernet RealTime

RJ-45

Nr	Bez.
X17	Specification depends on RT-Bus Type. Please refer to according documentation.
X18	

X19 | RS232 Configuration

RJ-45

Nr	Bez.
1	Reserved, do not connect
2	Reserved, do not connect
3	RS232 RX
4	GND
5	GND
6	RS232 TX
7	Reserved, do not connect
8	Reserved, do not connect
case	Shield

Dimensions
C1200-XX-XC-0S
in mm
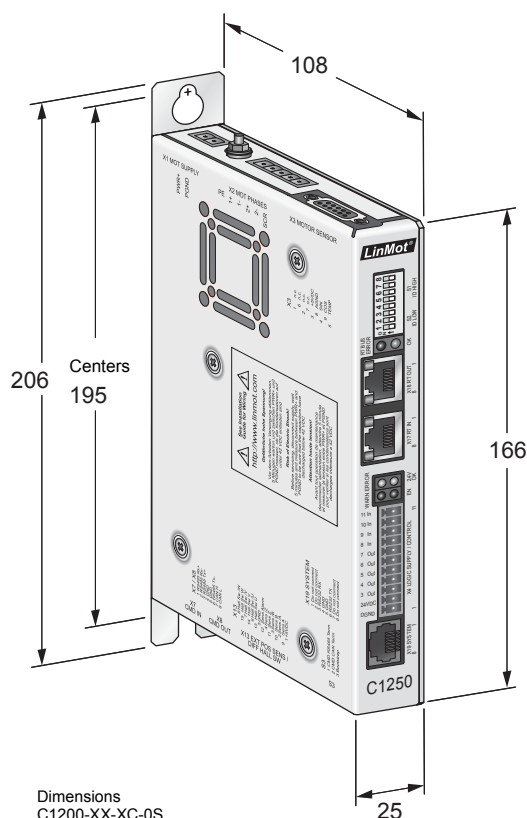
Servo Drives Series		C1200	
Width	mm (in)	25	(1.0)
Height	mm (in)	206	(8.1)
Height without fixings	mm (in)	166	(6.5)
Depth	mm (in)	108	(4.2)
Weight	kg (lb)	1.5	(3.3)
IP Protection class	IP	20	
Storage temperature	°C	-25...40	
Transport temperature	°C	-25...70	
Operating temperture	°C	0...40 at rated date 40...50 with power derating	
Max. case temperature	°C	65	
Max. power dissipation	W	30	
Min. distance between drives	mm (in)	20 (0.8) left/right 50 (2) top/bottom	

Item	Description	Part Nummber
C1200-GP-XC-0S	General Purpose Drive (72V/25A)	0150-1882
C1230-SE-XC-0S	Sercos over EtherCAT Drive(72V/25A)	0150-1897
C1250-EC-XC-0S	EtherCAT Drive (72V/25A)	0150-1884
C1250-PL-XC-0S	PowerLink Drive (72V/25A)	0150-1885
C1250-IP-XC-0S	Ethernet IP Drive (72V/25A)	0150-1886
C1250-PN-XC-0S	Profinet Drive (72V/25A)	0150-1888
C1250-SC-XC-0S	Sercos III Drive (72V/25A)	0150-1887
C1200-GP-XC-1S	General Purpose Drive (72V/25A), STO	0150-2344
C1230-SE-XC-1S	Sercos over EtherCAT Drive(72V/25A), STO	0150-2350
C1250-EC-XC-1S	EtherCAT Drive (72V/25A), STO	0150-2345
C1250-PL-XC-1S	PowerLink Drive (72V/25A), STO	0150-2347
C1250-IP-XC-1S	Ethernet IP Drive (72V/25A), STO	0150-2346
C1250-PN-XC-1S	Profinet Drive (72V/25A), STO	0150-2348
C1250-SC-XC-1S	Sercos III Drive (72V/25A), STO	0150-2349

Servo Drive B1100

Servo Drives B1100

Series B1100 Servo Drives are compact axis drives, with 32-bit position resolution and an integrated power element, for linear motors and rotary drives.

The drives are suitable for simplest and standard positioning tasks, across the entire force range of the LinMot product range.

Connection to Machine Drive

The Series B1100 Servo Drives can be actuated by machine controls from any manufacturer or brand, via digital inputs and outputs; by RS232 or RS485 serial interface; or by CanBus CANopen and DeviceNet interfaces.

Fro complex motion sequences that run in an overarching positioning drive, the motor can be controlled by means of analog speed or force targets. The position signal from the measurement system integrated in the linear motor can be accessed at the encoder output to control position.

Process and sensor interfaces

Fast process interfaces for direct processing of sensor signals are available as freely programmable analog and digital inputs and fast trigger inputs.
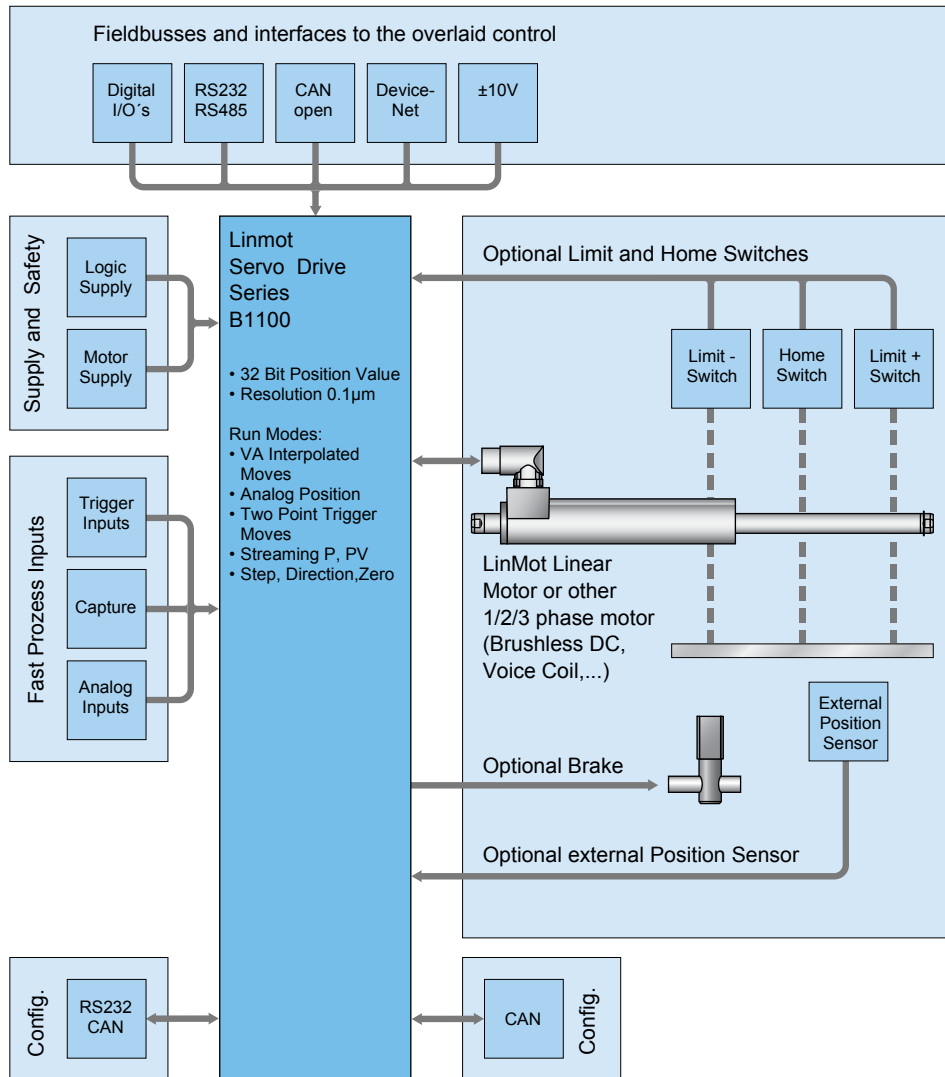
For high-accuracy applications, a freely configurable encoder interface is available. It analyzes the commutation signals from brushless, rotary servomotors as well.

Logic and power supply

The Servo Drives have two separate power supplies for the logic and power elements.

In an E-stop and safe stop of the drive, only the power element supply is cut off from the drive. The logic supply and the drive continue to run.

This has the advantage that the drive and linear motor do not need to be reinitialized when the machine is restarted, since all process data, including the current position of the linear motor, are still up to date.

Fieldbusses and interfaces to the overlaid control

| Digital I/O´s | RS232 RS485 | CAN open | Device-Net | ±10V |

Supply and Safety

- Logic Supply
- Motor Supply

Fast Prozess Inputs

- Trigger Inputs
- Capture
- Analog Inputs

Linmot Servo Drive Series B1100

- 32 Bit Position Value
- Resolution 0.1µm

Run Modes:
- VA Interpolated Moves
- Analog Position
- Two Point Trigger Moves
- Streaming P, PV
- Step, Direction, Zero

Optional Limit and Home Switches

| Limit - Switch | Home Switch | Limit + Switch |

LinMot Linear Motor or other 1/2/3 phase motor (Brushless DC, Voice Coil,...)

Optional Brake

External Position Sensor

Optional external Position Sensor

Config.

- RS232 CAN
- CAN Config.

System Integration

Flexible hardware enables control of any 1/2/3-phase motors. Thus, low-power rotary servomotors, such as brushless DC motors, can be integrated in the same controls concept.

Additionally, the drives can be equipped with optional peripherals, such as reference and end stop switches, high-precision external position sensors, or a mechanical holding brake.

Series B1100 Servo Drives have analog inputs and digital inputs and outputs, serial interfaces, and fieldbus connections. The user is therefore not dependent on the selection of the overarching drive.

With flexibility and a compact form factor, LinMot Series B1100 Servo Drives provide a complete solution for a flexible drive concept in single and multiple axis applications, with linear motors and other actuators.

Position Streaming

With a cyclical target value, or "position streaming," the overarching NC or CNC drive communicates with the Servo Drive through CanOpen or DeviceNet.

The position and velocity calculated in the overarching drive is transmitted to the Servo Drive cyclically. The P, PV, or PVT mode is available for this transmission.

Using the cyclical target value, complex motions and interpolating multi-axis applications can be implemented.

Motor Interfaces

The series B1100 Servo Drives allow control of 1, 2, or 3 phase linear motors and brushless rotary servomotors.

B1100 Servo Drives provide all necessary interfaces to operate linear or rotary motors with optional external peripherals, such as end position and reference switches, a mechanical brake, or a high-resolution external position sensor.

Configuration

Parameterization and configuration of the Servo Drive is done via the RS232 interface on the front side, or CANBus for simultaneous configuration of several drives..

LinMot Talk user-friendly PC software is available for configuration. In addition to on-line documentation, LinMot Talk provides extensive debugging tools, such as an oscilloscope and an error inspector, for simple and rapid start-up of the axes.

Fieldbus and Ethernet drives can also be configured directly by the overarching drive.

Position Indexing
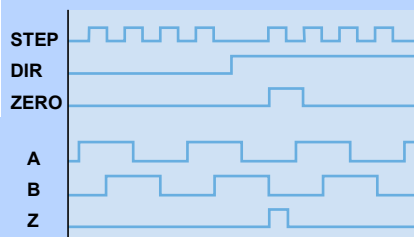
STEP
DIR
ZERO

A
B
Z

In position indexing, the linear motor is controlled like a stepper motor, using Step/Dir/Zero, or A/B signals. The step distance is freely programmable from 1.5x10^{-6}µm to 3.275mm/step. The input signal can be used directly as the target position, or it can be filtered by the VA interpolator.

Operating Modes:	Step/Dir/Zero, A/B
Inputs:	differential RS422 (X13/14)
Step distance:	1.5x10^{-6}µm....3.275mm, 32 Bit
Max Input Frequency:	2 MHz

+/- 10V Analog Force / Velocity Control

F v

+10V
0V
-10V

A
B

Time[ms]
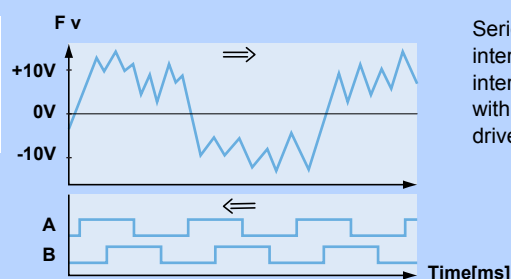
Series B1100 drives allow analog force (torque) or velocity targets to be set, via the +/- 10V interface, by an overlaid position drive. The current actual position is output via the encoder interface, with adjustable resolution, as positioning feedback. In high-precision applications with high-resolution external position sensors, the sensor signals can be passed through in the drive.

Analog Input:	-10...+10V, differential
Resolution:	Max. 12 Bit
Scanning rate:	Max. 10 kHz
Encoder Simulation:	1,2,5,10,20µm Resolution

Setpoint Streaming

Stroke [mm]
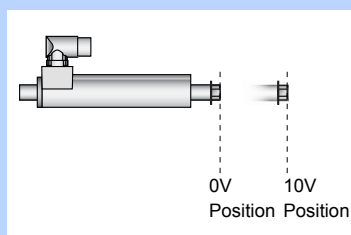
Time[ms]
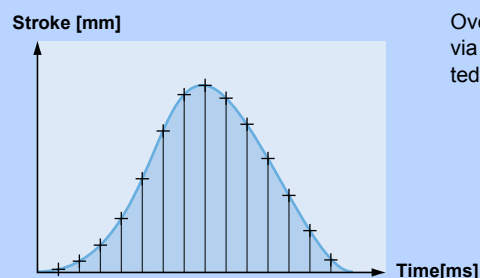
Overlaid NC drives with CANopen or DeviceNet interfaces communicate with the Servo Drives via "Position Streaming". The position and velocity calculated in the overlaid control is transmitted to the Servo Drive cyclically. The P, PV, or PVT mode is available for this transmission.

|	
Position Resolution:	32 Bit
Velocity Resolution	32 Bit
Interpolator:	5 kHz
cycle times:	2-5ms

Analog Position

For an analog position target, the linear motor travels to a position proportional to the input voltage. The position is either scanned continuously, or only after a rising edge of the trigger signal. In order to prevent uncontrolled jumps in position, the motor travels to the positions with a programmable maximum acceleration and velocity (VA interpolator).

0V   10V
Position Position

Inputs:	Analog Inputs (X14.20, X14.8/X14.21)
Voltagvte range:	0 - 10VDC (X14.20)
	-10 - +10VDC (X14.18/X14.21)
Resolution:	10 Bit
Scanning rate:	400µsec

Interpolated Moves
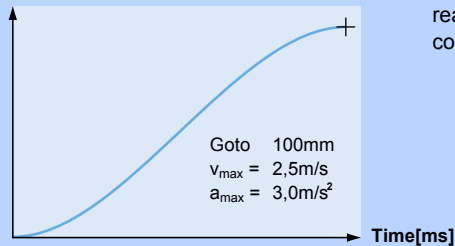
Stroke [mm]

Goto   100mm
v_{max} = 2,5m/s
a_{max} = 3,0m/s²

Time[ms]

For direct position targets, using absolute or relative positioning, the desired position is reached using an acceleration and velocity-limited motion profile (VA interpolator). Positioning commands can be invoked via the serial interfaces, CANopen, DeviceNet, or a trigger input.

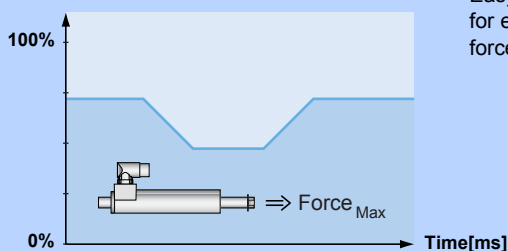|	
Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Velocity Resolution:	1.0µm/s (32Bit)
Velocity Resolution:	10.0µm/s² (32Bit)

Easy Steps

Input 1	Pos 125mm
Input 2	Pos 250mm
Input 3	Pos 50mm
Input 4	Pos -30mm

With the Easy Steps function, up to 6 positions or independent travel commands can be stored on the drive, and addressed via 6 serial interfaces, CANopen or DeviceNet.

Digital inputs:	max. 6
Interface:	X14
Scanning rate:	400µsec

Easy Steps Parameter Scale

Maximum Force [0...10V => 0...100%]

100%

$\Rightarrow$ Force$_{Max}$

0%

Time[ms]

Easy Steps provide the ability to parameterize internal parameters using two analog inputs. If, for example, the maximum motor current is read at an analog input, then the maximum motor force can be provided as analog for freely programmable joining processes.

Inputs:	Analog Inputs (X14.20, X14.8/X14.21)
Voltagvte range:	0 - 10VDC (X14.20)
	-10 - +10VDC (X14.18/X14.21)
Resolution:	10 Bit
Scanning rate:	400µsec

B1100-PP
B1100-PP-HC
B1100-PP-HC-XC

✗ Position Indexing

✗ ±10V Force or Velocity Control

✗ Setpoint Streaming (CAN)

✓ Analog Position Target

✓ MPC Commands

✓ Easy Step

✓ Easy Steps Parameter Scale

✗ Serial Infaces RS232/RS485

✗ CANopen

✗ DeviceNet

✗ Encoder Simulation

Point to Point ● ●

S4: CAN/RS485 Termination
PE
X1: Motor Supply
X2: Motor Phases
X3: Motor Signal
X13: External Position Sensor Diff Hall Switch
X5: Configuration
LED: State Display
X14: I/O's, 24VDC Supply
X8: Cmd Out
X7: Cmd In

CE

Replacing Pneumatics

Due to their simple controls via digital inputs and outputs, B1100-PP drive make excellent substitutes for pneumatic cylinders.

Using digital inputs, the linear motor can move to up to six freely programmable positions. As soon as the linear motor has reached the position, the corresponding In-Postion output is actuated.

The linear motor can thus be controlled like a pneumatic cylinder with end position switches.

Easy Steps positioning commands

Using the Easy Steps function, up to six absolute or relative move commands can be stored in the drive, and invoked via six digital inputs.
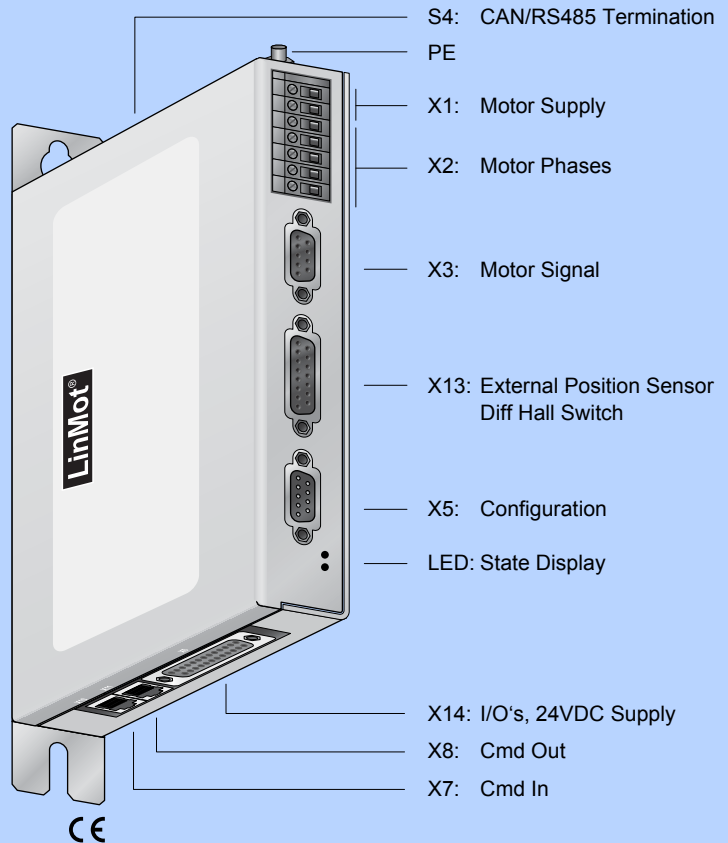
Easy Steps also provide the ability to parameterize internal parameters using two analog inputs. If, for example, the maximum motor current is read at an analog input, then the maximum motor force can be provided as analog for freely programmable joining processes.

Analog Position Target

Any position can be set, using an analog 0…10V signal.

During configuration, for each position value, one input signal of 0V and 10V is programmed. Any intermediate position can then be set via the analog input signal during operation.

The dynamics can be constrained by limits on speed and acceleration.
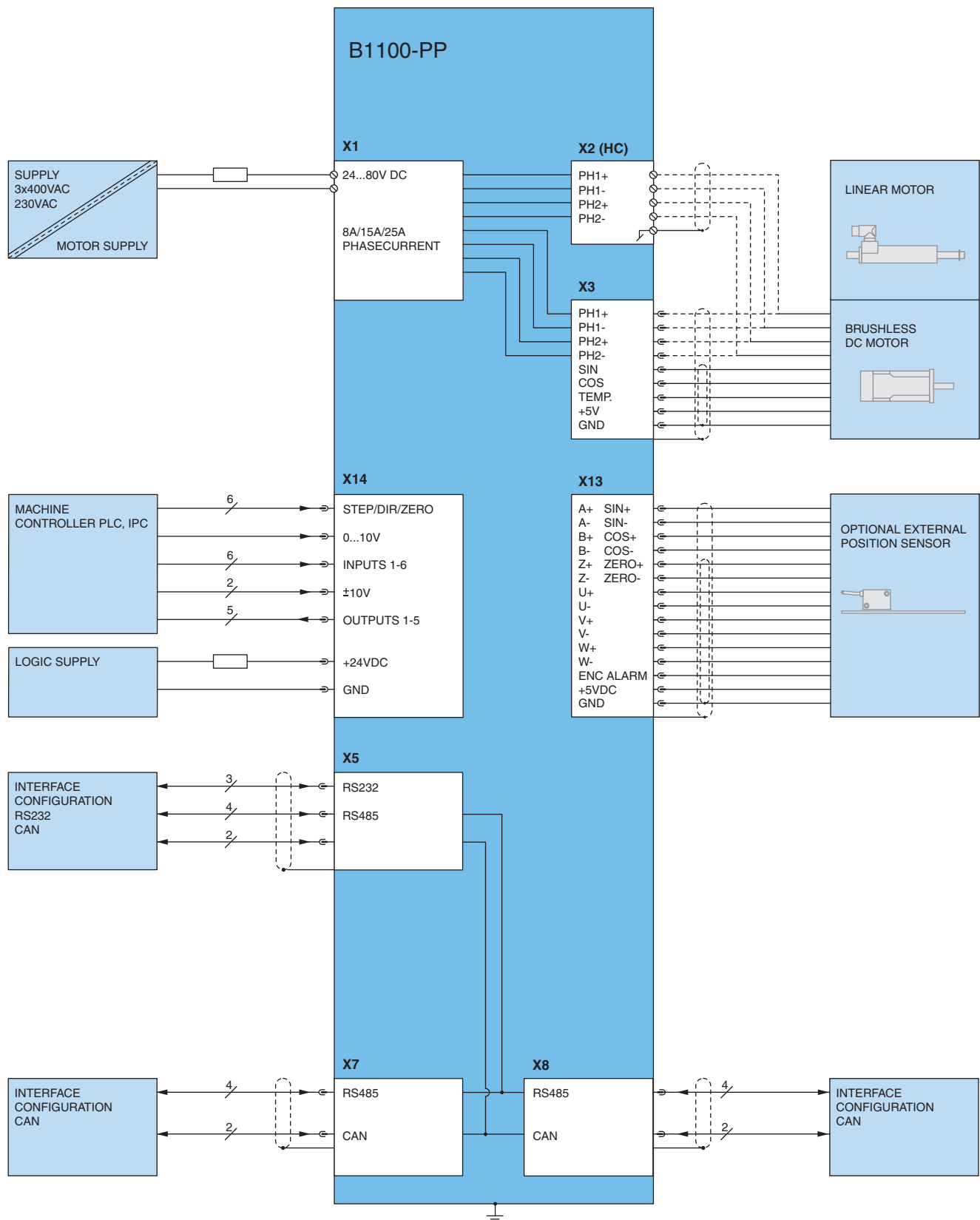
B1100-PP

X1
24...80V DC

8A/15A/25A
PHASECURRENT

X2 (HC)
PH1+
PH1-
PH2+
PH2-

X3
PH1+
PH1-
PH2+
PH2-
SIN
COS
TEMP.
+5V
GND

SUPPLY
3x400VAC
230VAC

MOTOR SUPPLY

LINEAR MOTOR

BRUSHLESS
DC MOTOR

X14
STEP/DIR/ZERO
0...10V
INPUTS 1-6
±10V
OUTPUTS 1-5

+24VDC

GND

X13
A+   SIN+
A-   SIN-
B+   COS+
B-   COS-
Z+   ZERO+
Z-   ZERO-
U+
U-
V+
V-
W+
W-
ENC ALARM
+5VDC
GND

MACHINE
CONTROLLER PLC, IPC

6
6
2
5

LOGIC SUPPLY

OPTIONAL EXTERNAL
POSITION SENSOR

X5
RS232
RS485

INTERFACE
CONFIGURATION
RS232
CAN

3
4
2

X7
RS485

CAN

X8
RS485

CAN

INTERFACE
CONFIGURATION
CAN

4
2

INTERFACE
CONFIGURATION
CAN

4
2

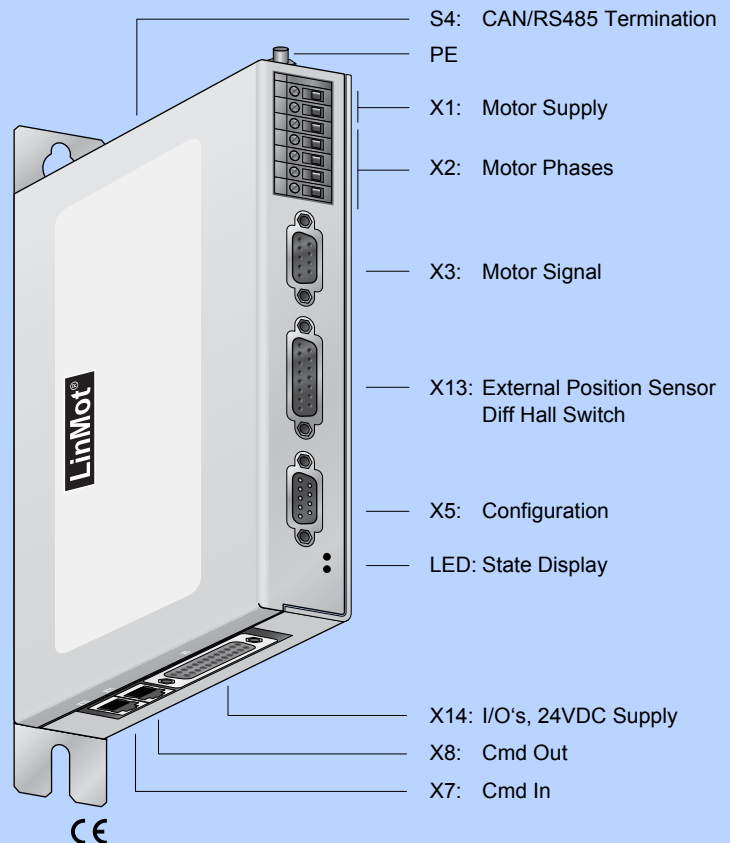| Item	Description	Part Number
B1100-PP	Point to Point Drive (72V/8A)	0150-1735
B1100-PP-HC	Point to Point Drive (72V/15A)	0150-1736
B1100-PP-XC	Point to Point Drive (72V/25A)	0150-1740

B1100-VF
B1100-VF-HC
B1100-VF-XC

±10V Force Velocity   STEP DIRECTION   Point to Point

✓ Position Indexing

✓ ±10V Force or Velocity Control

✗ Setpoint Streaming (CAN)

✓ Analog Position Target

✓ MPC Commands

✓ Easy Step

✓ Easy Steps Parameter Scale

✗ Serial Infaces RS232/RS485

✗ CANopen

✗ DeviceNet

✓ Encoder Simulation

S4: CAN/RS485 Termination
PE
X1: Motor Supply
X2: Motor Phases
X3: Motor Signal
X13: External Position Sensor Diff Hall Switch
X5: Configuration
LED: State Display
X14: I/O's, 24VDC Supply
X8: Cmd Out
X7: Cmd In

±10V 10V Force or Velocity Control,

The B1100-VF servo amplifier allows Lin-Mot linear motors to be integrated in systems an overlaid axis drive with analog velocity (RPM) or force target (torque).

In velocity mode, the analog input voltage is used as a velocity target for the connected linear motor. The velocity control loop is closed via a PI drive in the amplifier.

In force mode, the amplifier works like a torque amplifier for rotary motors. The analog control signal is converted to a current that the VF amplifier applies to the connected motor.

Step and Direction Interface

Motor force is proportional to the current motor current (see motor data sheets for force constant cf).

For step-direction targets, the target position is provided by the overlaid drive via STEP, DIRECTION, and ZERO signals.

The maximum motor current (force) can be limited via a digital input.
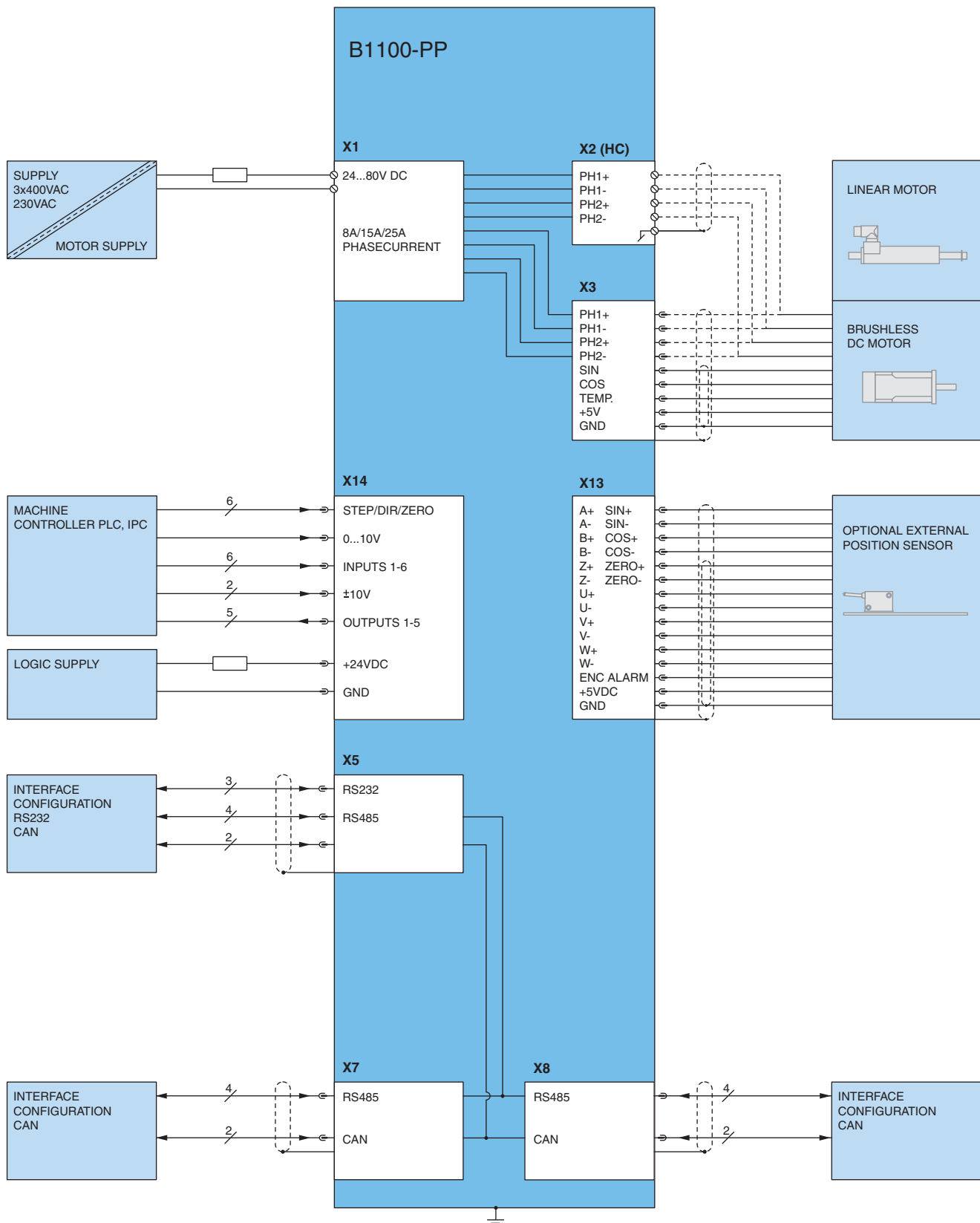
Encoder Simulation

No additional external sensors are needed for position measurement. The current actual position of the linear motor is captured by the integrated position measurement, and is available to the overlaid position drive as an encoder signal.

The resolution of the differential A/B encoder signals (RS422) is adjustable in the following ranges:

1µm, 2µm, 5µm, 10µm, 20µm, 50µm

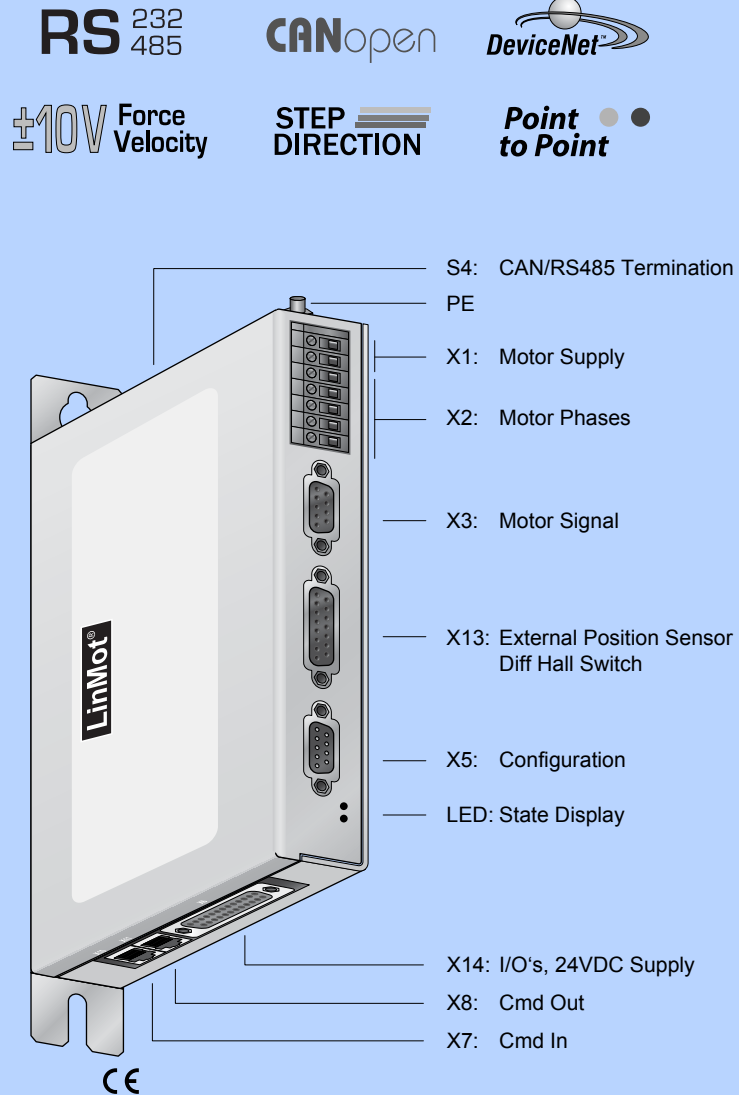If an external position sensor is used, it can be read by the B1100 amplifier.

B1100-PP

X1
SUPPLY
3x400VAC
230VAC

MOTOR SUPPLY

24...80V DC

8A/15A/25A
PHASECURRENT

X2 (HC)
PH1+
PH1-
PH2+
PH2-

LINEAR MOTOR

X3
PH1+
PH1-
PH2+
PH2-
SIN
COS
TEMP.
+5V
GND

BRUSHLESS
DC MOTOR

X14
MACHINE
CONTROLLER PLC, IPC

STEP/DIR/ZERO
0...10V
INPUTS 1-6
±10V
OUTPUTS 1-5

LOGIC SUPPLY

+24VDC
GND

X13
A+   SIN+
A-   SIN-
B+   COS+
B-   COS-
Z+   ZERO+
Z-   ZERO-
U+
U-
V+
V-
W+
W-
ENC ALARM
+5VDC
GND

OPTIONAL EXTERNAL
POSITION SENSOR

X5
INTERFACE
CONFIGURATION
RS232
CAN

RS232
RS485

X7
INTERFACE
CONFIGURATION
CAN

RS485
CAN

X8
RS485
CAN

INTERFACE
CONFIGURATION
CAN

Item	Description	Part Number
B1100-VF	Force Velocity Drive (72V/4A)	0150-1685
B1100-VF-HC	Force Velocity Drive (72V/15A)	0150-1686
B1100-VF-XC	Force Velocity Drive (72V/25A)	0150-1739

B1100-GP
B1100-GP-HC
B1100-GP-XC

✓ Position Indexing

✓ ±10V Force or Velocity Control

✓ Setpoint Streaming (CAN)

✓ Analog Position Target

✓ MPC Commands

✓ Easy Step

✓ Easy Steps Parameter Scale

✓ Serial Infaces RS232/RS485

✓ CANopen

✓ DeviceNet

✓ Encoder Simulation

RS 232 485   **CAN**open   *DeviceNet™*

±10V Force Velocity   **STEP DIRECTION**   **Point to Point** ● ●

S4:	CAN/RS485 Termination
PE	
X1:	Motor Supply
X2:	Motor Phases
X3:	Motor Signal
X13:	External Position Sensor Diff Hall Switch
X5:	Configuration
LED:	State Display
X14:	I/O's, 24VDC Supply
X8:	Cmd Out
X7:	Cmd In

CE

RS232 / RS485

The LinMot B1100-GP series Servo Drives support the LinRS serial communications protocol. LinRS is a proprietary protocol for actuating LinMot Servo Drives via the RS 232, RS 422, and RS 485 interfaces.

If the drive is actuated by the overarching drive via the serial interface, then this is configured from the PC via CanBus. The USBSCAN converter (item no. 0150-3134), supported by LinMot Talk, is used for this.

Adjustable baud rates: 9.6 - 115.2kBaud

CANopen

The LinMot B1100-GP drives support the CiA DS301 communications protocol.

The following resources are available:
3 T_PDO, 3 R_PDO, 1 T_SDO, 1 R_SDO

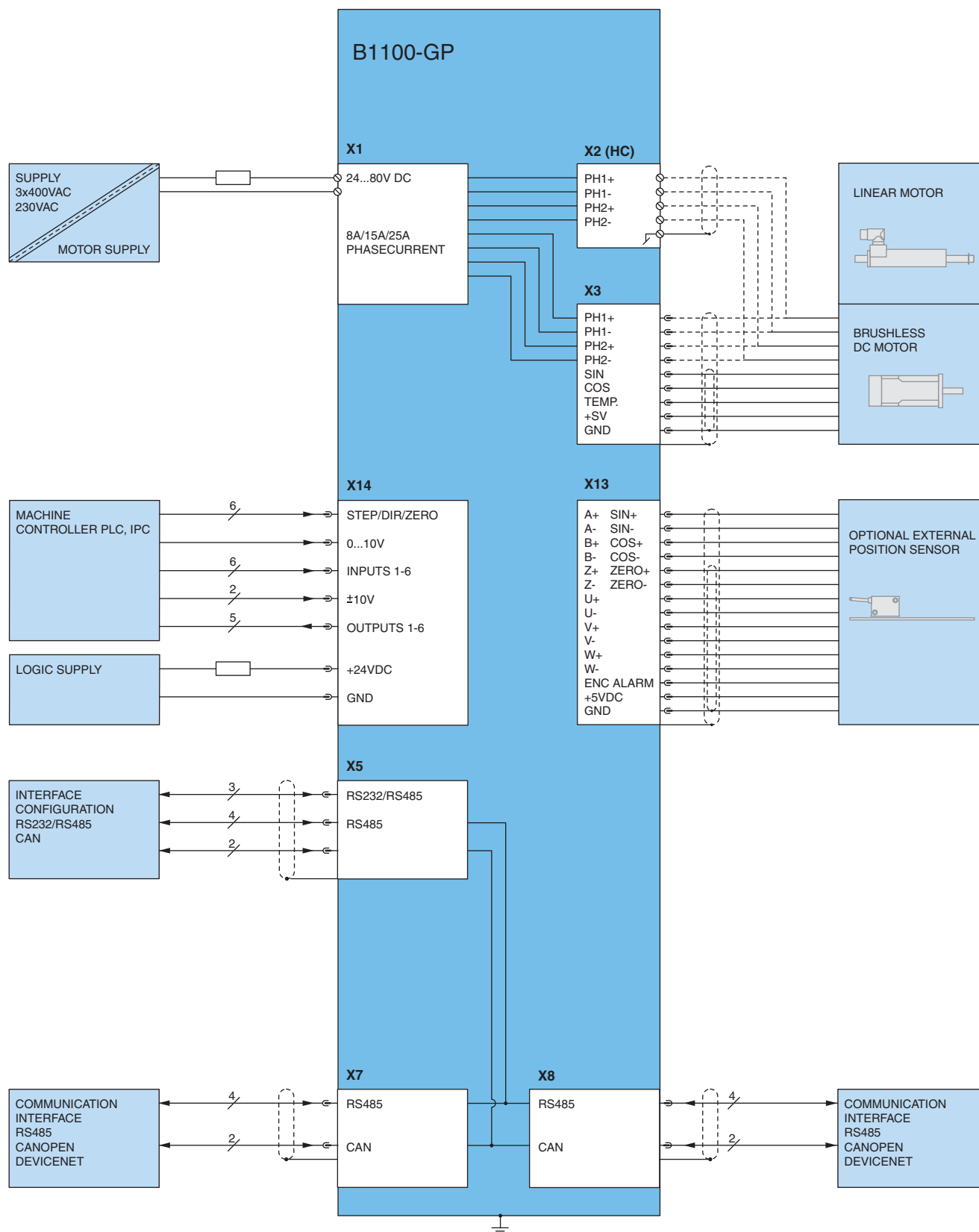The following protocols are supported by the CO drives:

• NMT Error Control (Nodeguarding Protocol or HeartBeat Protocol)
• PDO (Transmission type 254 and 1)
• SDO Upload and Download
• NMT (Start, Stop, Enter PreOp, Reset Node, Reset Communication) Boot-Up Message

DeviceNet

With the DeviceNet protocol, even complicated motion sequences can be realized with the highest possible flexibility.

The drive can be actuated and monitored via the DeviceNet connection.

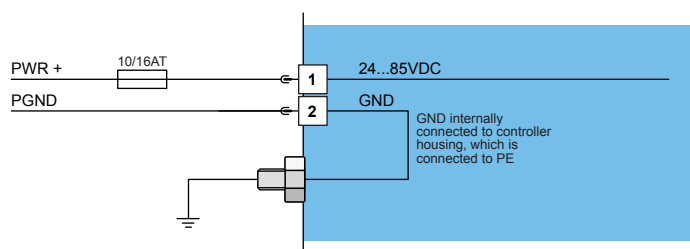B1100-GP are UCMM Group 3-capable slaves, and support polled IO runtime data transfer.

B1100-GP

X1

24...80V DC

8A/15A/25A
PHASECURRENT

SUPPLY
3x400VAC
230VAC

MOTOR SUPPLY

X2 (HC)

PH1+
PH1-
PH2+
PH2-

X3

PH1+
PH1-
PH2+
PH2-
SIN
COS
TEMP.
+SV
GND

LINEAR MOTOR

BRUSHLESS
DC MOTOR

X14

STEP/DIR/ZERO

0...10V

INPUTS 1-6

±10V

OUTPUTS 1-6

+24VDC

GND

MACHINE
CONTROLLER PLC, IPC

6

6

2

5

LOGIC SUPPLY

X13

A+   SIN+
A-   SIN-
B+   COS+
B-   COS-
Z+   ZERO+
Z-   ZERO-
U+
U-
V+
V-
W+
W-
ENC ALARM
+5VDC
GND

OPTIONAL EXTERNAL
POSITION SENSOR

X5

RS232/RS485

RS485

INTERFACE
CONFIGURATION
RS232/RS485
CAN

3

4

2

X7

RS485

CAN

X8

RS485

CAN

COMMUNICATION
INTERFACE
RS485
CANOPEN
DEVICENET

4

2

COMMUNICATION
INTERFACE
RS485
CANOPEN
DEVICENET

4

2

Item	Description	Part Number
B1100-GP	Point to Point Drive (72V/8A)	0150-1737
B1100-GP-HC	Point to Point Drive (72V/15A)	0150-1738
B1100-GP-XC	Point to Point Drive (72V/25A)	0150-1741

LinMot®

X1 — Motor Supply

PWR+   1
PGND   2

Screw Terminals
2.5 mm² (AWG14)

PWR +   10/16AT   1   24...85VDC
PGND   2   GND

GND internally
connected to controller
housing, which is
connected to PE

Motor Supply:

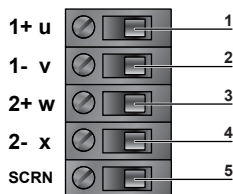Motor Supply Voltage 24...85VDC.
Absolute max. Rating 72VDC + 20%

External fusing: 10AT for LC (8Apeak Servos), 16AT for HC and XC (15/25Apeak) Servos

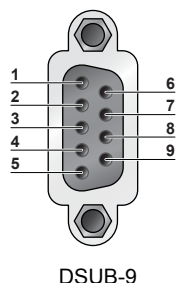⚠ If motor supply voltage is exceeding 90VDC, the drive will go into error state

X2 — Motor Phases

1+ u   1
1- v   2
2+ w   3
2- x   4
SCRN   5

Screw Terminals
1.5-2.5mm²
(AWG16-14)

Nr.	Designation	LinMot Linear Motor	Color	3-Phase-Motor
1	PH1+ /U	Motor Phase 1+	red	Motor Phase U
2	PH1- /V	Motor Phase 1-	pink	Motor Phase V
3	PH2+ /W	Motor Phase 2+	blue	Motor Phase W
4	PH2-	Motor Phase 2-	grey	
5	SCRN	Shield		

The motor phases on X2 and X3 are internally connected.
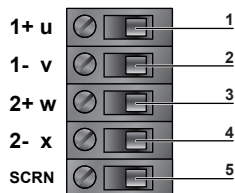If the RMS current is higher than 5A RMS, the phases must be connected to X2 and not to X3.

X3 — Motor

1   6
2   7
3   8
4   9
5

DSUB-9

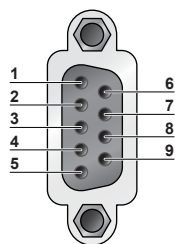| Nr	LinMot Linear Motor	3-Phase-Motor
1	Motor Phase 1+	Motor Phase U
2	Motor Phase 2+	Motor Phase W
3	+5VDC	
4	Sine	Hall U
5	Temperature	Hall W
6	Motor Phase 1-	Motor Phase V
7	Motor Phase 2-	
8	AGND	
9	Cosine	Hall V
Case	Shield	

- Use X3 for motor phase wiring if phase current does not exceed 2Arms or 4Apeak
- X3.3 (+5VDC) may be used only to supply motor hall-effect sensors (max. 100mA).
- X3.8 (AGND) may be used only to supply motor hall-effect sensors, and must not be connected to GND externally
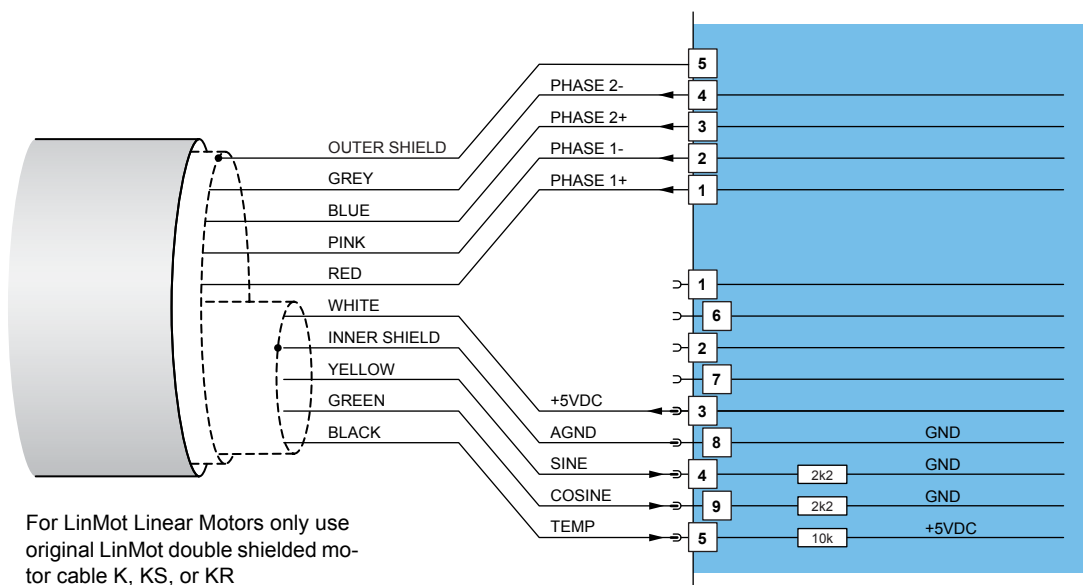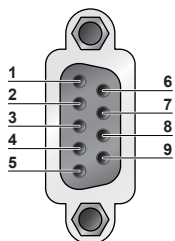
Motor | Motor wiring

1+ u — 1
1- v — 2
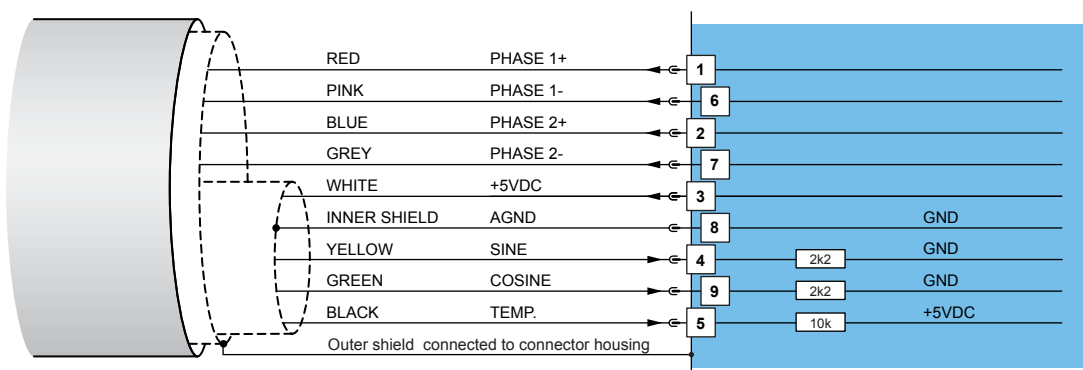**2+ w** — 3
2- x — 4
SCRN — 5

X2: Screw Terminals

X3: DSUB-9 (f)

Cable	Signal	Pin
	PHASE 2-	5
	PHASE 2-	4
	PHASE 2+	3
OUTER SHIELD	PHASE 1-	2
GREY	PHASE 1+	1
BLUE		
PINK		
RED		1
WHITE		6
INNER SHIELD		2
YELLOW		7
GREEN	+5VDC	3
BLACK	AGND	8 — GND
	SINE	4 — 2k2 — GND
	COSINE	9 — 2k2 — GND
	TEMP	5 — 10k — +5VDC

For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR

Motor | Motor wiring for phase current below 2Arms and below 4Apeak

X3: DSUB-9 (f)

Cable	Signal	Pin
RED	PHASE 1+	1
PINK	PHASE 1-	6
BLUE	PHASE 2+	2
GREY	PHASE 2-	7
WHITE	+5VDC	3
INNER SHIELD	AGND	8 — GND
YELLOW	SINE	4 — 2k2 — GND
GREEN	COSINE	9 — 2k2 — GND
BLACK	TEMP.	5 — 10k — +5VDC
	Outer shield connected to connector housing	

For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR

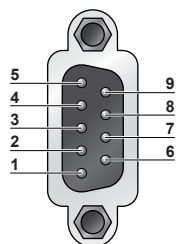## S4 | Bus Termination

S4

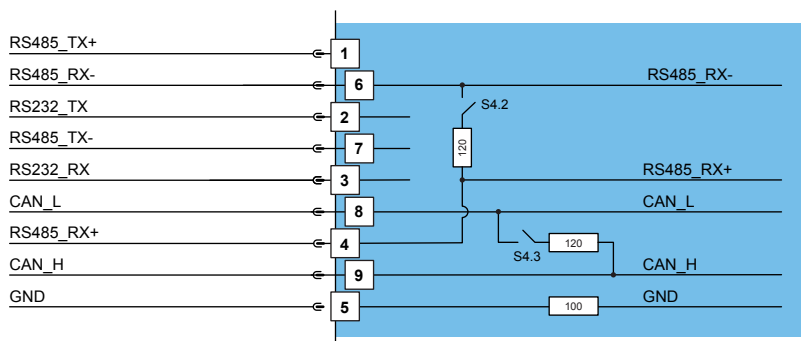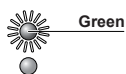| Switch		
S4	Switch 1: RS232 (switch "off" / RS485 "on")	Select serial RS23 or RS485
	Switch 2: Termination RS485 on/off	
	Switch 3: Termination CAN on/off	
	Switch 4: Bootstrap	Factory settings: all switches "off"

X5 COM | COM Schnittstelle

X5: DSUB-9 (m)

Pin	Signal
1	RS485_TX+
6	RS485_RX-
2	RS232_TX
7	RS485_TX-
3	RS232_RX
8	CAN_L
4	RS485_RX+
9	CAN_H
5	GND

RS485_RX-
S4.2
120
RS485_RX+
CAN_L
S4.3
120
CAN_H
GND
100

RS232: Configuration on all Drives: use 1:1 connection cable to PC

LED | State Display

Green:

Green

24VDC Logic Supply OK

Red:

Red
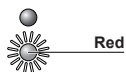
State: Error
Blinking: Fatal Error

X7-X8 | RS485/CAN
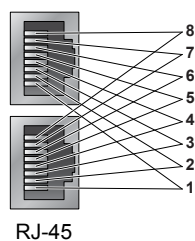
RJ-45

Nr		
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	

- X7 internally connected to X8 (1:1 connection)
- 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 S3.2 and S3.3.

X13 — External Position Sensor Commutation

DSUB-15 (f)

Nr		Description	
1		+5V DC	
	9	A+	Encoder
2		A-	Encoder
	10	B+	Encoder
3		B-	Encoder
	11	Z+	Encoder
4		Z-	Encoder
	12	Encoder Alarm	
5		GND	
	13	U+	Commutation
6		U-	Commutation
	14	V+	Commutation
7		V-	Commutation
	15	W+	Commutation
8		W-	Commutation
case		Shield	

Max. Input Frequency: 2MHz (incremental RS422), 240ns edge separation

Sensor Supply Current: max. 100mA

Position Encoder Inputs: RS422, Max Input Frequency: 2MHz, 4 M counts/s with quadrature decoding, 240ns edge separation

Encoder Simulated Outputs:RS422, Max Output Frequency: 2.5MHz, 5 M counts/s with quadrature decoding, 200ns edge separation
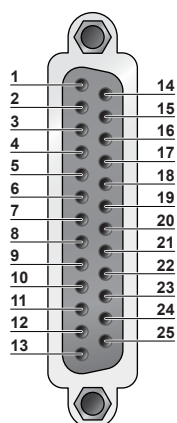
Differential Hall Switch Inputs: RS422, Max Input Frequency: <1kHz
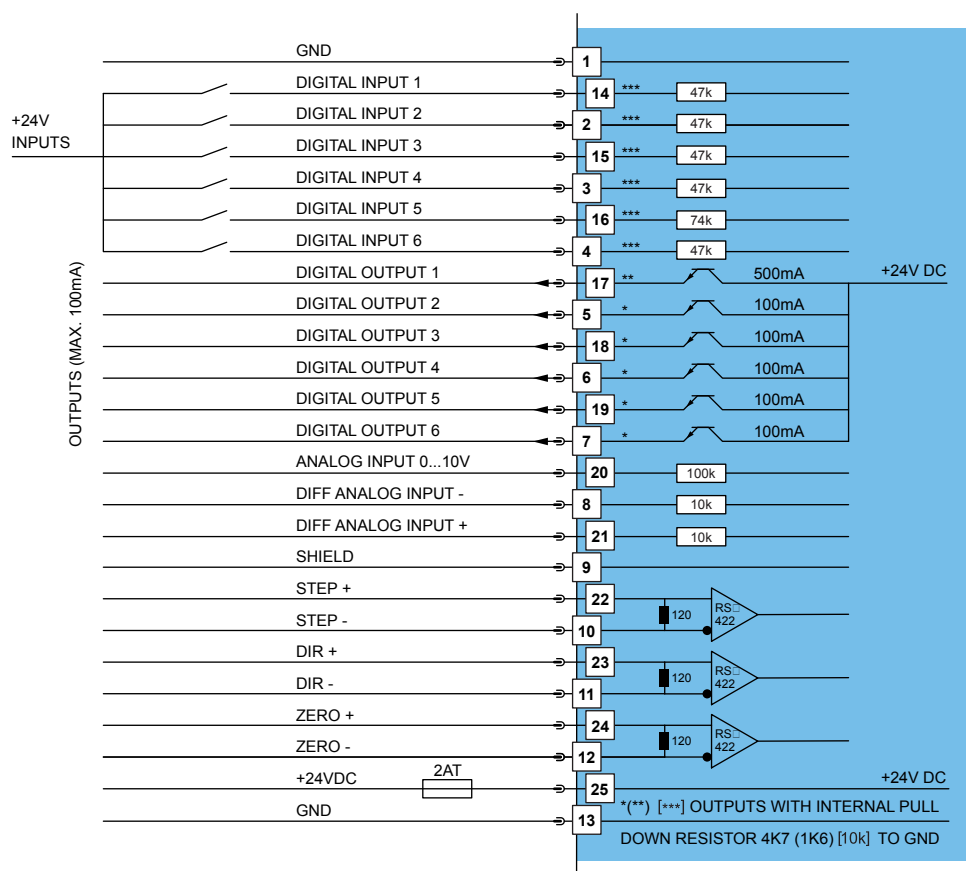
Enc. Alarm In: 5V / 1mA

Sensor Supply: 5VDC, max 100mA

| X14 | Digital I/O |

X14: DSUB-25 (f)

Pin	Signal		
1	GND	1	
	DIGITAL INPUT 1	14	*** 47k
+24V INPUTS	DIGITAL INPUT 2	2	*** 47k
	DIGITAL INPUT 3	15	*** 47k
	DIGITAL INPUT 4	3	*** 47k
	DIGITAL INPUT 5	16	*** 74k
	DIGITAL INPUT 6	4	*** 47k
OUTPUTS (MAX. 100mA)	DIGITAL OUTPUT 1	17	** 500mA +24V DC
	DIGITAL OUTPUT 2	5	* 100mA
	DIGITAL OUTPUT 3	18	* 100mA
	DIGITAL OUTPUT 4	6	* 100mA
	DIGITAL OUTPUT 5	19	* 100mA
	DIGITAL OUTPUT 6	7	* 100mA
	ANALOG INPUT 0...10V	20	100k
	DIFF ANALOG INPUT -	8	10k
	DIFF ANALOG INPUT +	21	10k
	SHIELD	9	
	STEP +	22	120 RS-422
	STEP -	10	
	DIR +	23	120 RS-422
	DIR -	11	
	ZERO +	24	120 RS-422
	ZERO -	12	
	+24VDC 2AT	25	+24V DC
	GND	13	

*(**) [***] OUTPUTS WITH INTERNAL PULL DOWN RESISTOR 4K7 (1K6) [10k] TO GND

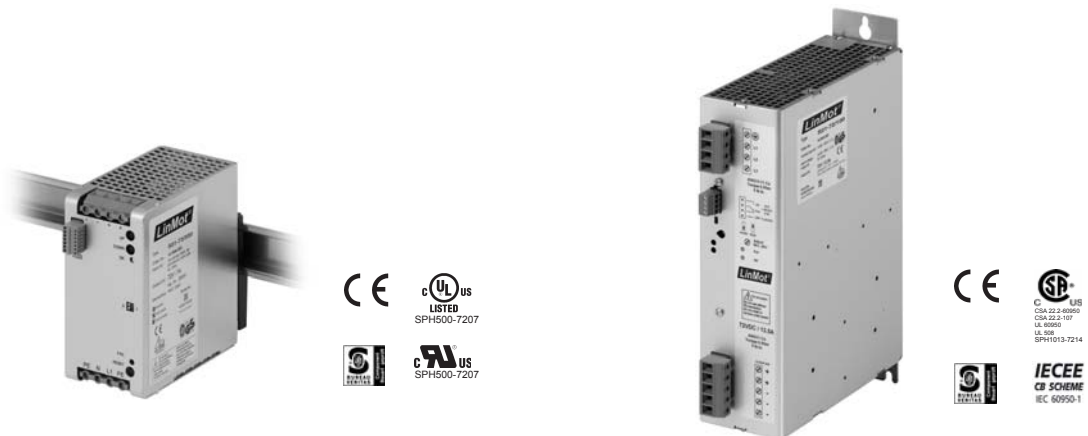|		
Logic Supply:	Switch Mode Power Supply:24VDC (22...26VDC)	
	External Fuse:	2AT
All Digital Inputs:	Direct interfacing to digital 24VDC PLC outputs.	
	Input Current:	1mA
	Logic Levels:	Low Level: guaranteed: -5 to 5VDC, typically < 8VDC
		High Level: guaranteed: 20...30VDC, typically > 16VDC
	Sample Rate:	400us
All Digital Outputs:	Short circuit and overload protected high side switches	
	Voltage:	24VDC
	Sample Rate:	400us
	Max. Current:	100mA / 500mA (X14.17)
	Peak Current:	370mA / 1100mA (X14.17)
	Outputs may directly drive inductive loads.	
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	

106

206 Centers 195

166

31

Dimensions in mm
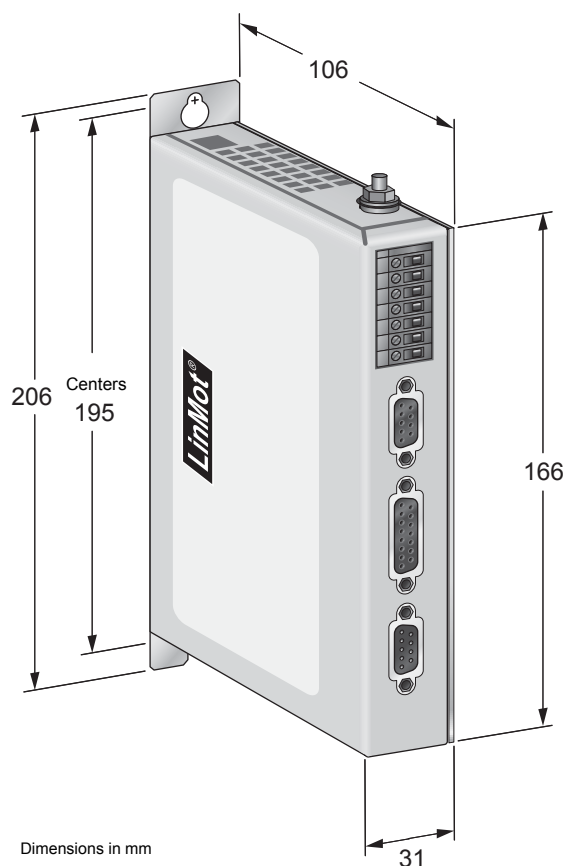
Servo Drive Series B1100		
Width	mm (in)	31 (1.3)
Hight	mm (in)	166 (6.6)
Hight without fixings	mm (in)	206 (8.1)
Depth	mm (in)	106 (4.2)
Weight	g (lb)	700 (1.6)
IP Protection class	IP	20
Storage temperature	°C	-25...40
Transport temperature	°C	-25...70
Operating temperture	°C	0...40 at rated date 40...50 with power derating
Max. case temperature	°C	70
Max. power dissipation	W	30
Min. distance between drives	mm (in)	20 (0.8) left/right 50 (2) top/bottom

Item	Description	Part Number
B1100-PP	Point to Point Drive (72V/8A)	0150-1735
B1100-PP-HC	Point to Point Drive (72V/15A)	0150-1736
B1100-PP-XC	Point to Point Drive (72V/25A)	0150-1740
B1100-VF	Force Velocity Drive (72V/8A)	0150-1685
B1100-VF-HC	Force Velocity Drive (72V/15A)	0150-1686
B1100-VF-XC	Force Velocity Drive (72V/25A)	0150-1739
B1100-GP	Point to Point Drive (72V/8A)	0150-1737
B1100-GP-HC	Point to Point Drive (72V/15A)	0150-1738
B1100-GP-XC	Point to Point Drive (72V/25A)	0150-1741

Switched-Mode Power Supplies | 115VAC / 230VAC

Item	Description	Part Number
S01-72/500	Switched-Mode Power Supply 72V/500W	0150-1874
S01-72/1000	Switched-Mode Power Supply 72V/1000W	0150-1872

Transformer Supply T01 | 3x230/280/400/480VAC

Item	Description	Part Number
T01-72/420...1500-Multi	Transformer Supply 3x230/280/400/480VAC, 50/60Hz, 420...1500W	see page 536

Control Box B01-E1100

Item	Description	Part Number
B01-E1100	Control Box for E1100 (incl. cable and connectors)	0150-1970
B01-B1100	Control Box for B1100 (incl. cable and connectors)	0150-2110

Connector Cable and USB-Converter

| 0150-3009 | 0150-3110 | **0150-3134** | 0150-2143 | 0150-1852 | 0150-1853 |

Item	Description	Part Number
RS232 PC config. cabel 2m	for E100/E1001/E1100/B1100	0150-3307
USB-Serial Converter	USB to 9-pin Serial Converter	0150-3110
USB-CAN Converter	USB to CAN Converter for E1100/B1100	0150-3134
RJ45-08/0.3	RJ45 patch cable 0.3m for E1100/B1100	0150-1852
RJ45-08/0.6	RJ45 crossover patch cable 0.6m	0150-1853

Option: External High Resolution Encoder

Item	Description	Part Number
MS01-1/D	Linear Encoder 1um, A/B (for 1mm magnetic band)	0150-1840
MB01-1000	Magnetic Band 1mm pitch, per cm	0150-1963

Multi Axes System B1150 / B8050

Multi-Axes System
B1150 / B8050

Series B1150 Servo Drives are compact axis drives, with 32-bit position resolution and an integrated power element, for LinMot P01 linear motors and rotary servo motors.

B1150 drives together with the bus modules B8050 are designed for cost optimized, modular multi axes systems with the industrial Ethernet interfaces EtherCAT, Profinet, EthernetIP, Sercos III and Powerlink.

Connection to Machine Drive

The Series B1150 Servo Drives can be actuated by machine controls from any manufacturer or brand, via industrial Ethernet.

Fro complex motion sequences that run in an overarching positioning drive, the motor can be controlled by means of analog speed or force targets. The position signal from the measurement system integrated in the linear motor can be accessed at the encoder output to control position.

Process and sensor interfaces

Fast process interfaces for direct processing of sensor signals are available as freely programmable analog and digital inputs and fast trigger inputs.
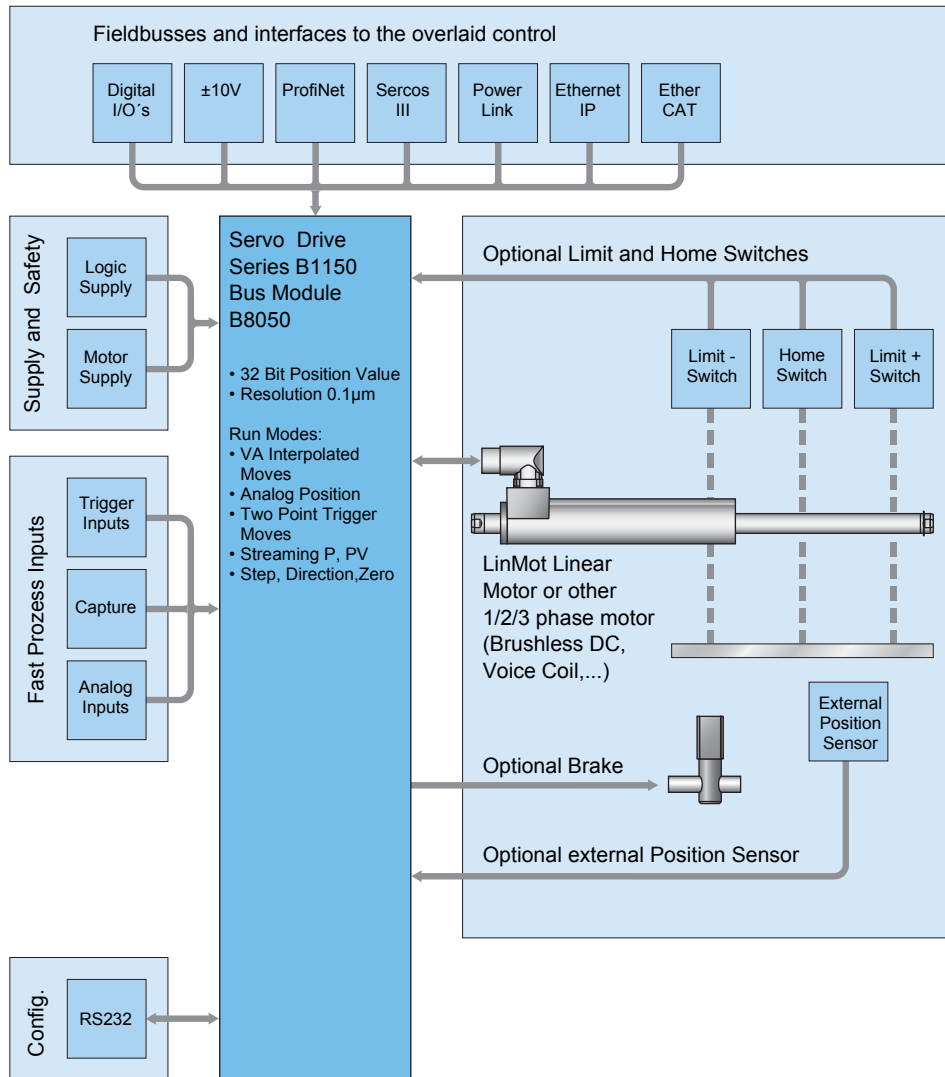
For high-accuracy applications, a freely configurable encoder interface is available. It analyzes the commutation signals from brushless, rotary servomotors as well.

Logic and power supply

The Servo Drives have two separate power supplies for the logic and power elements.

In an E-stop and safe stop of the drive, only the power element supply is cut off from the drive. The logic supply and the drive continue to run.

This has the advantage that the drive and linear motor do not need to be reinitialized when the machine is restarted, since all process data, including the current position of the linear motor, are still up to date.

System Integration

Flexible hardware enables control of any 1/2/3-phase motors. Thus, low-power rotary servomotors, such as brushless DC motors, can be integrated in the same controls concept.

Additionally, the drives can be equipped with optional peripherals, such as reference and end stop switches, high-precision external position sensors, or a mechanical holding brake.

Series B1150 Servo Drives have analog inputs and digital inputs and outputs, serial interfaces, and fieldbus connections. The user is therefore not dependent on the selection of the overarching drive.

With flexibility and a compact form factor, LinMot Series B1150 Servo Drives provide a complete solution for a flexible drive concept in single and multiple axis applications, with linear motors and other actuators.
Diverse Korrekturen im Deutschen, siehe Korrekturen von Dani

Diagram labels

Fieldbusses and interfaces to the overlaid control

Digital I/O´s | ±10V | ProfiNet | Sercos III | Power Link | Ethernet IP | Ether CAT

Supply and Safety
- Logic Supply
- Motor Supply

Servo Drive Series B1150 Bus Module B8050
- 32 Bit Position Value
- Resolution 0.1µm

Run Modes:
- VA Interpolated Moves
- Analog Position
- Two Point Trigger Moves
- Streaming P, PV
- Step, Direction, Zero

Fast Prozess Inputs
- Trigger Inputs
- Capture
- Analog Inputs

Optional Limit and Home Switches
- Limit - Switch
- Home Switch
- Limit + Switch

LinMot Linear Motor or other 1/2/3 phase motor (Brushless DC, Voice Coil,...)

Optional Brake

External Position Sensor

Optional external Position Sensor

Config.
- RS232

Position Streaming

With a cyclical target value, or "position streaming," the overarching NC or CNC drive communicates with the Servo Drive via industrial Ethernet.

The position and velocity calculated in the overarching drive is transmitted to the Servo Drive cyclically. The P, PV, or PVT mode is available for this transmission.

Using the cyclical target value, complex motions and interpolating multi-axis applications can be implemented.

Motor Interfaces

The series B1150 Servo Drives allow control of 1, 2, or 3 phase linear motors and brushless rotary servomotors.

B1150 Servo Drives provide all necessary interfaces to operate linear or rotary motors with optional external peripherals, such as end position and reference switches, a mechanical brake, or a high-resolution external position sensor.

Configuration

Parameterization and configuration of the Servo Drive is done via the RS232 interface on the front side.

LinMot Talk user-friendly PC software is available for configuration. In addition to online documentation, LinMot Talk provides extensive debugging tools, such as an oscilloscope and an error inspector, for simple and rapid start-up of the axes.

Fieldbus and Ethernet drives can also be configured directly by the overarching drive.

Interpolated Moves
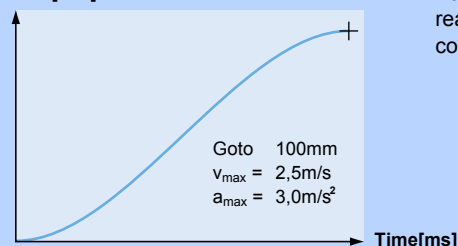
Stroke [mm]

Goto   100mm
v_{max} = 2,5m/s
a_{max} = 3,0m/s^2

Time[ms]

For direct position targets, using absolute or relative positioning, the desired position is reached using an acceleration and velocity-limited motion profile (VA interpolator). Positioning commands can be invoked via industrial Ethernet, or a trigger input.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Velocity Resolution:	1.0µm/s (32Bit)
Velocity Resolution:	10.0µm/s^2 (32Bit)

Setpoint Streaming

Stroke [mm]

Time[ms]
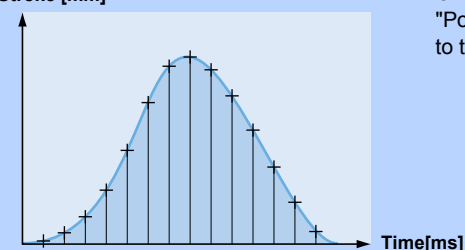
Overlaid NC drives with industrial Ethernet interfaces communicate with the Servo Drives via "Position Streaming". The position and velocity calculated in the overlaid control is transmitted to the Servo Drive cyclically. The P, PV, or PVT mode is available for this transmission.

Position Resolution:	32 Bit
Velocity Resolution	32 Bit
Interpolator:	5 kHz
cycle times:	2-5ms

Easy Steps

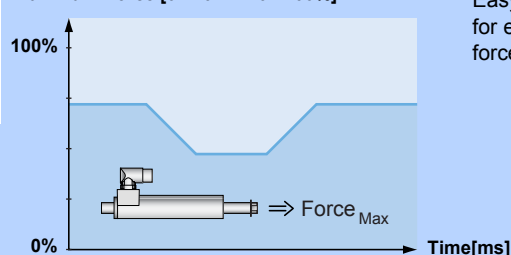| Input 1	Pos 125mm
Input 2	Pos 250mm
Input 3	Pos 50mm
Input 4	Pos -30mm

With the Easy Steps function, up to 6 positions or independent travel commands can be stored on the drive, and addressed via 6 serial interfaces or industrial Ethernet.

Digital inputs:	max. 6
Interface:	X14
Scanning rate:	400µsec / 2µsec with Ethernet

Easy Steps Parameter Scale

Maximum Force [0...10V => 0...100%]

100%

$\Rightarrow$ Force$_{Max}$

0%

Time[ms]

Easy Steps provide the ability to parameterize internal parameters using two analog inputs. If, for example, the maximum motor current is read at an analog input, then the maximum motor force can be provided as analog for freely programmable joining processes.

Inputs:	Analog Inputs (X14.20, X14.8/X14.21)
Voltagvte range:	0 - 10VDC (X14.20)
	-10 - +10VDC (X14.18/X14.21)
Resolution:	10 Bit
Scanning rate:	400µsec

1-Axes

2-Axes

3-Axes
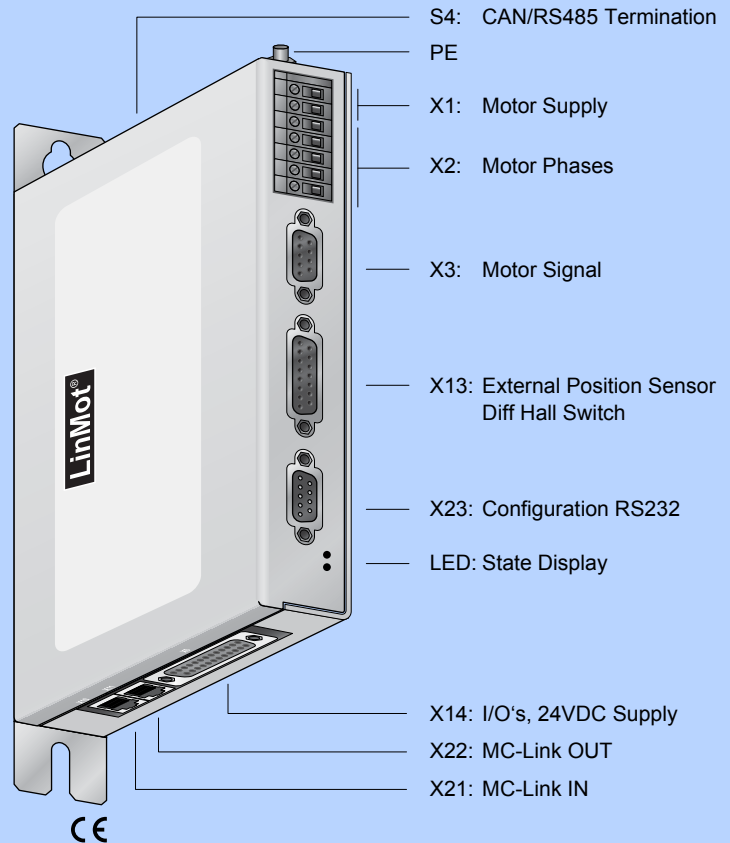
4-Axes

5-Axes

6-Axes

7-Axes

8-Axes

B1150-ML
B1150-ML-HC
B1150-ML-XC

✗ Interpolated Moves

✗ Setpoint Streaming P

✓ Setpoint Streaming PV

✗ Setpoint Streaming PVT

✓ Easy Step

✓ Easy Steps Parameter Scale

✓ Encoder Simulation

S4: CAN/RS485 Termination

PE

X1: Motor Supply

X2: Motor Phases

X3: Motor Signal

X13: External Position Sensor
       Diff Hall Switch

X23: Configuration RS232

LED: State Display

X14: I/O's, 24VDC Supply

X22: MC-Link OUT

X21: MC-Link IN

CE

Industrial Ethernet

LinMot B1150-ML series Servo Drives to-gether with the bus modules B8050-ML support the following industrial Ethernet Interfaces:

• EtherCat
• Ethernet IP
• Powerlink
• Profinet
• Sercos III

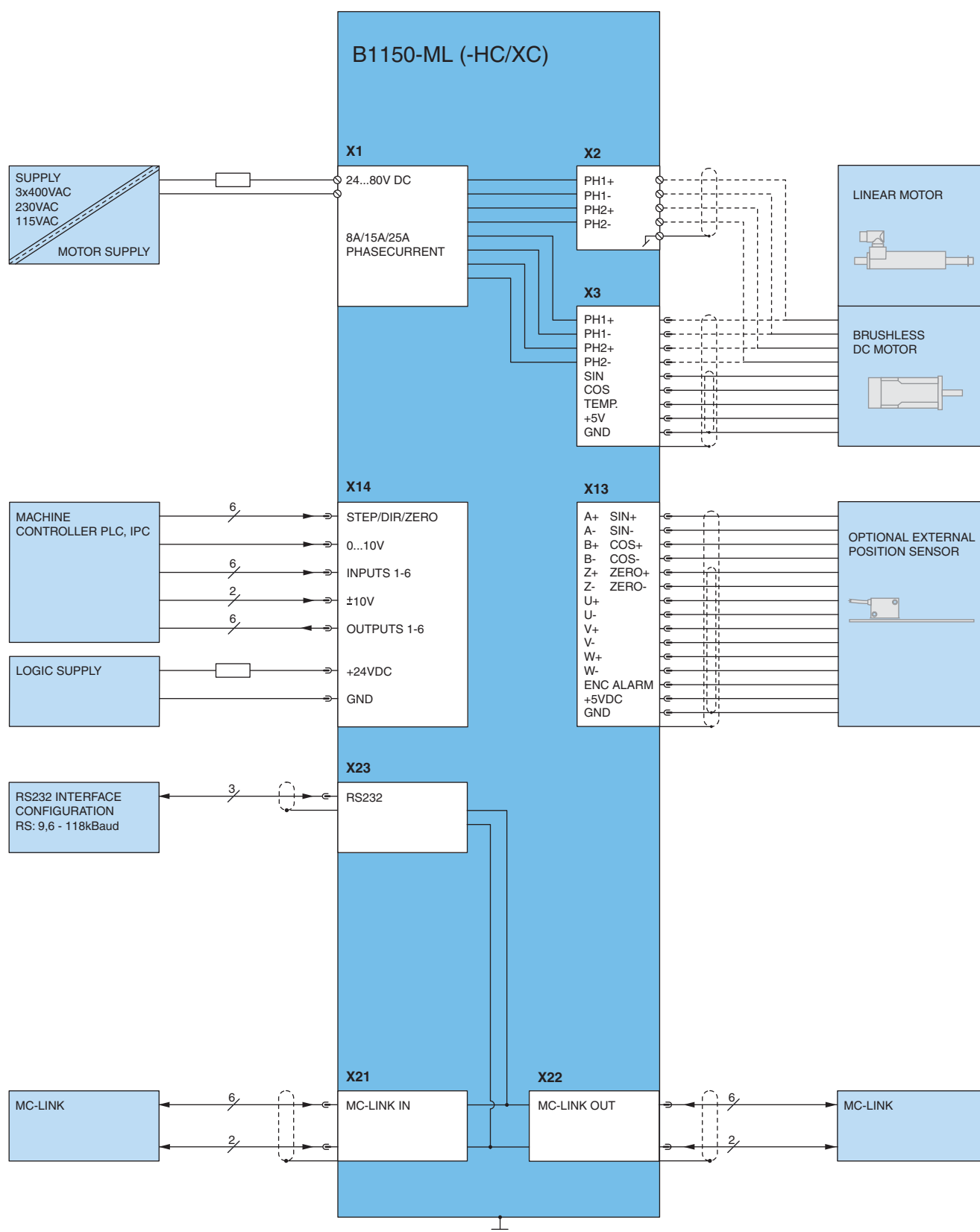## Modular Multi Axes Systems

The modular B1150/B8050 system is designed for multi axes applications and integration in industrial Ethernet communication from different PLC or NC manufacturers over a single bus node.

Up to 8 B1150-ML drives may be connected to a bus module B8050 and controlled over industrial Ethernet interfaces.

Interfaces

B1100 Servo Drives provide all necessary interfaces to operate linear or rotary motors with optional external peripherals, such as end position and reference switches or a mechanical brake.
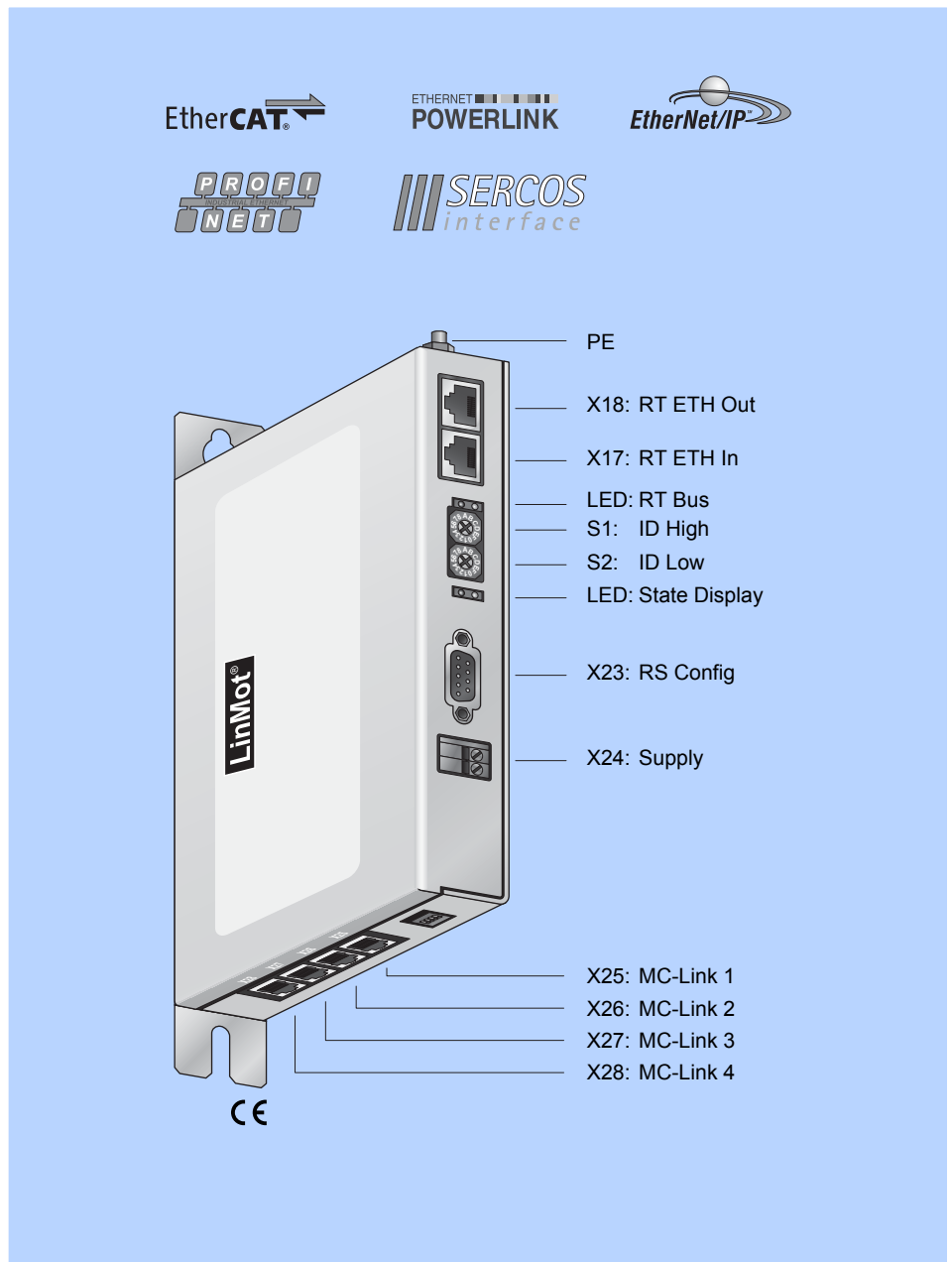
Using digital inputs, the linear motor can move to up to six freely programmable positions. The resolution of the high resolution A/B/Z encoder input or A/B encoder simulation output is adjustable.

B1150-ML (-HC/XC)

X1
24...80V DC

8A/15A/25A
PHASECURRENT

SUPPLY
3x400VAC
230VAC
115VAC

MOTOR SUPPLY

X2
PH1+
PH1-
PH2+
PH2-

LINEAR MOTOR

X3
PH1+
PH1-
PH2+
PH2-
SIN
COS
TEMP.
+5V
GND

BRUSHLESS
DC MOTOR

X14
STEP/DIR/ZERO
0...10V
INPUTS 1-6
±10V
OUTPUTS 1-6

+24VDC
GND

MACHINE
CONTROLLER PLC, IPC

LOGIC SUPPLY

X13
A+   SIN+
A-   SIN-
B+   COS+
B-   COS-
Z+   ZERO+
Z-   ZERO-
U+
U-
V+
V-
W+
W-
ENC ALARM
+5VDC
GND

OPTIONAL EXTERNAL
POSITION SENSOR

X23
RS232

RS232 INTERFACE
CONFIGURATION
RS: 9,6 - 118kBaud

X21
MC-LINK IN

MC-LINK

X22
MC-LINK OUT

MC-LINK

Item	Description	Part Number
B1150-ML	MC-Link Drive (72V/8A)	0150-1796
B1150-ML-HC	MC-Link Drive (72V/15A)	0150-1797
B1150-ML-XC	MC-Link Drive (72V/25A)	0150-1798

B8050-ML-EC
B8050-ML-IP
B8050-ML-PL
B8050-ML-PN
B8050-ML-SC

✓ Industrial Ethernet Interfacing

✓ Multi Axes Interfacing

✓ EtherCAT

✓ Ethernet IP

✓ Powerlink

✓ Profnet

✓ Sercos III

- PE
- X18: RT ETH Out
- X17: RT ETH In
- LED: RT Bus
- S1: ID High
- S2: ID Low
- LED: State Display
- X23: RS Config
- X24: Supply
- X25: MC-Link 1
- X26: MC-Link 2
- X27: MC-Link 3
- X28: MC-Link 4

Modular Multi Axes Systems

The modular B1150/B8050 system is designed for multi axes applications and integration in industrial Ethernet communication from different PLC or NC manufacturers over a single bus node.

Up to 8 B1150-ML drives may be connected to a bus module B8050 and controlled over industrial Ethernet interfaces.

Industrial Ethernet

LinMot B8050-ML bus modules support the following industrial Ethernet Interfaces:

- EtherCat
- Ethernet IP
- Powerlink
- Profinet
- Sercos III

Motion Commands

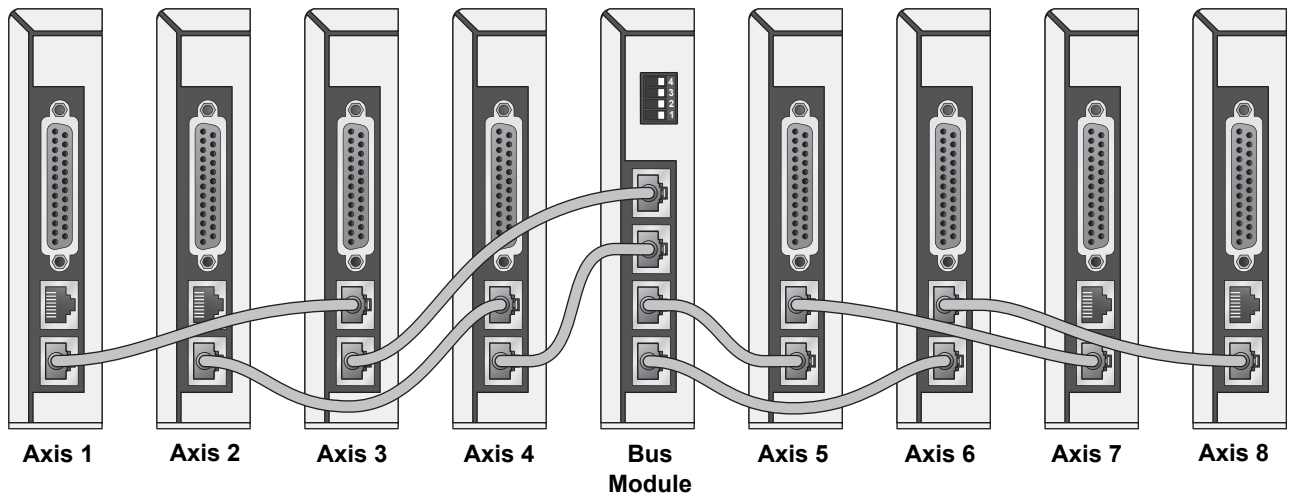Motion commands for the B1150/B8050 multi axes systems are identical to the B1100 motion commands.

For simple positioning tasks, relative and absolute position commands with velocity and acceleration limitation are available. For more complex motions or synchronization, the motion profiles are calculated in the overlaid drive and transmitted via setpoint streaming.

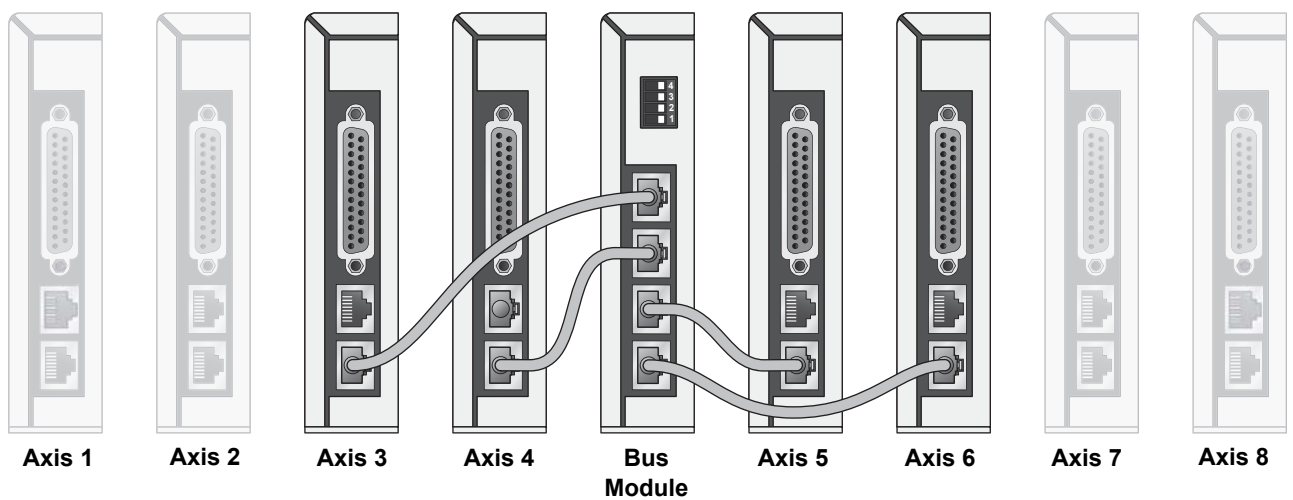## 8 Axes System

TOP
Termination Settings

BOTTOM

| Axis 1 | Axis 2 | Axis 3 | Axis 4 | Bus Module | Axis 5 | Axis 6 | Axis 7 | Axis 8 |

4 Axes System

TOP
Termination Settings

BOTTOM

| Axis 1 | Axis 2 | Axis 3 | Axis 4 | Bus Module | Axis 5 | Axis 6 | Axis 7 | Axis 8 |

Item	Description	Part Number
B8050-ML-EC	8-Axes Bus Module Etercat	0150-1878
B8050-ML-IP	8-Axes Bus Module Ethernet IP	0150-1879
B8050-ML-PL	8-Axes Bus Module Powerlink	0150-1877
B8050-ML-PN	8-Axes Bus Module Profinet	0150-1880
B8050-ML-SC	8-Axes Bus Module Sercos III	0150-1881

X1 — Motor Supply

PWR+   1
PGND   2

Screw Terminals
2.5 mm² (AWG14)

PWR +   10/16AT   1   24...85VDC
PGND   2   GND

GND internally
connected to controller
housing, which is
connected to PE

Motor Supply:

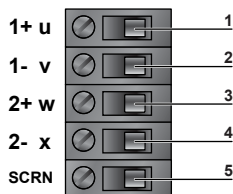Motor Supply Voltage 24...85VDC.
Absolute max. Rating 72VDC + 20%

External fusing: 10AT for LC (8A$_{peak}$ Servos), 16AT for HC and XC (15/25A$_{peak}$) Servos

⚠ If motor supply voltage is exceeding 90VDC, the drive will go into error state
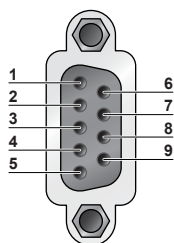
X2 — Motor Phases

1+ u   1
1- v   2
2+ w   3
2- x   4
SCRN   5

Screw Terminals
1.5-2.5mm²
(AWG16-14)

Nr.	Designation	LinMot Linear Motor	Color	3-Phase-Motor
1	PH1+ /U	Motor Phase 1+	red	Motor Phase U
2	PH1- /V	Motor Phase 1-	pink	Motor Phase V
3	PH2+ /W	Motor Phase 2+	blue	Motor Phase W
4	PH2-	Motor Phase 2-	grey	
5	SCRN	Shield		

The motor phases on X2 and X3 are internally connected.
If the RMS current is higher than 5A RMS, the phases must be connected to X2 and not to X3.
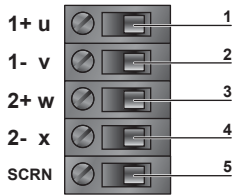
X3 — Motor

DSUB-9

Nr	LinMot Linear Motor	3-Phase-Motor
1	Motor Phase 1+	Motor Phase U
2	Motor Phase 2+	Motor Phase W
3	+5VDC	
4	Sine	Hall U
5	Temperature	Hall W
6	Motor Phase 1-	Motor Phase V
7	Motor Phase 2-	
8	AGND	
9	Cosine	Hall V
Case	Shield	

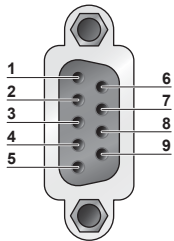- Use +5V (X3.3) and AGND (X3.8) only for motor internal hall sensor supply (max. 100mA)

Caution: - 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.
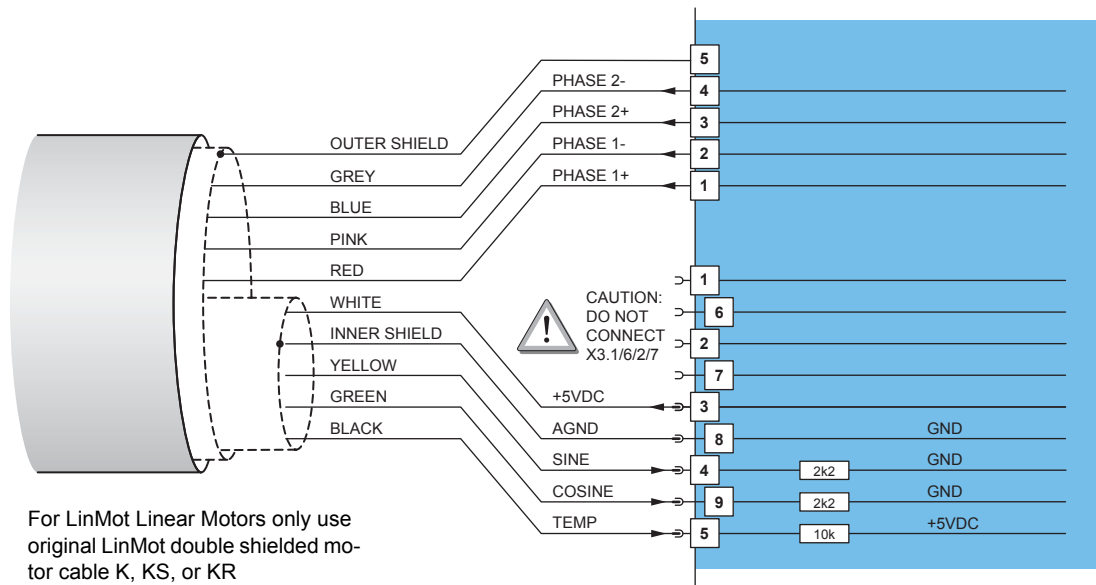
Motor | Motor wiring

1+ u 1
1- v 2
2+ w 3
2- x 4
SCRN 5

X2: Screw Terminals

X3: DSUB-9 (f)

PHASE 2-	5		
PHASE 2+	4		
PHASE 1-	3		
PHASE 1+	2		
	1		

OUTER SHIELD
GREY
BLUE
PINK
RED
WHITE
INNER SHIELD
YELLOW
GREEN
BLACK

CAUTION: DO NOT CONNECT X3.1/6/2/7

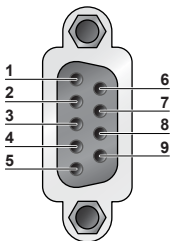|		
1		
6		
2		
7		
+5VDC	3	
AGND	8	GND
SINE	4	2k2 GND
COSINE	9	2k2 GND
TEMP	5	10k +5VDC

For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR
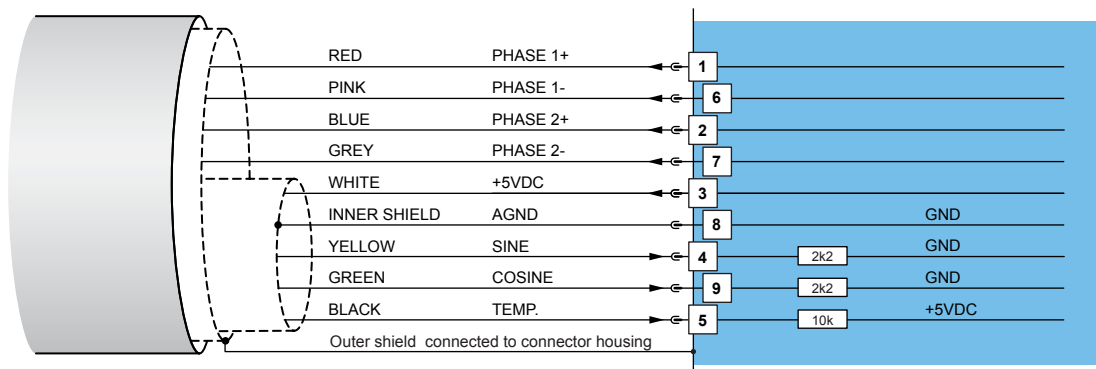
Important:
If motor phase current exceeds $2A_{RMS}$ or $4A_{peak}$, motor phases must be wired to X2!

Motor | Motor wiring for phase current below 2Arms and below 4Apeak

X3: DSUB-9 (f)

RED	PHASE 1+	1	
PINK	PHASE 1-	6	
BLUE	PHASE 2+	2	
GREY	PHASE 2-	7	
WHITE	+5VDC	3	
INNER SHIELD	AGND	8	GND
YELLOW	SINE	4	2k2 GND
GREEN	COSINE	9	2k2 GND
BLACK	TEMP.	5	10k +5VDC

Outer shield connected to connector housing

For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR

Important:
Motor phases may only be connected to X3 if RMS current is below 2A and peak current is below 4A!
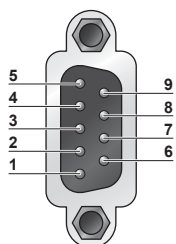
S6 | MC-Link Termination

S6

Switch		
S6	Switch 4: Bootstrap	
	Switch 3: Termination A on/off	Factory settings: Switch 3 "on"
	Switch 2: Termination B on/off	all other switches "off"
	Switch 1: Not used	

X23 — Motor

Nr		
1	(Do not connect)	
2	RS232_Tx	
3	RS232_Rx	
4	(Do not connect)	
5	GND	
6	(Do not connect)	
7	(Do not connect)	
8	(Do not connect)	
9	(Do not connect)	
Case	Shield	

DSUB-9 (m)
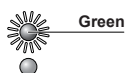
RS232:
Configuration on all drives: use 1:1 connection cable to PC with only 2,3 and 5 connected.
Use LinMot RS Config Cable (Art.-No. 0150-3307)

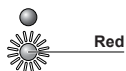## LED — State Display

Green:

Green

24VDC Logic Supply OK

Red:

Red

State: Error
Blinking: Fatal Error

X21-X22 — MC-Link
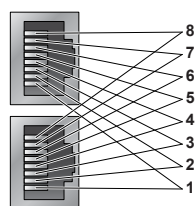
Nr		
1	ML1+	
2	ML1-	
3	ML2+	
4	Cable Select	
5	GND	
6	ML2-	
7	ML3+	
8	ML3-	
Case	Shield	

RJ-45

Use MC-Link cables (Art.-No. 0150-3308)

X13 — External Position Sensor Commutation

DSUB-15 (f)

Nr	Description	
1	+5V DC	
9	A+	Encoder
2	A-	Encoder
10	B+	Encoder
3	B-	Encoder
11	Z+	Encoder
4	Z-	Encoder
12	Encoder Alarm	
5	GND	
13	U+	Commutation
6	U-	Commutation
14	V+	Commutation
7	V-	Commutation
15	W+	Commutation
8	W-	Commutation
case	Shield	

Position Encoder Inputs:	RS422, Max Input Frequency: 2MHz, 4 M counts/s with quadrature decoding, 240ns edge separation
Encoder Simulated Outputs:	RS422, Max Output Frequency: 2.5MHz, 5 M counts/s with quadrature decoding, 200ns edge separation
Differential Hall Switch Inputs:	RS422, Max Input Frequency: <1kHz
Enc. Alarm In:	5V / 1mA
Sensor Supply:	5VDC, max 100mA

X17-X18 — RealTime Ethernet 10/100 Mbit/s

X17 in

X18 out

RJ-45

Nr	Bez.
X17	RT ETH In
X18	RT ETH Out

Specification depends on RT-Bus Type. Please refer to according documentation

X24 — Supply
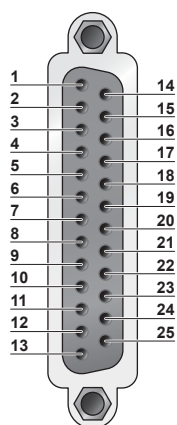
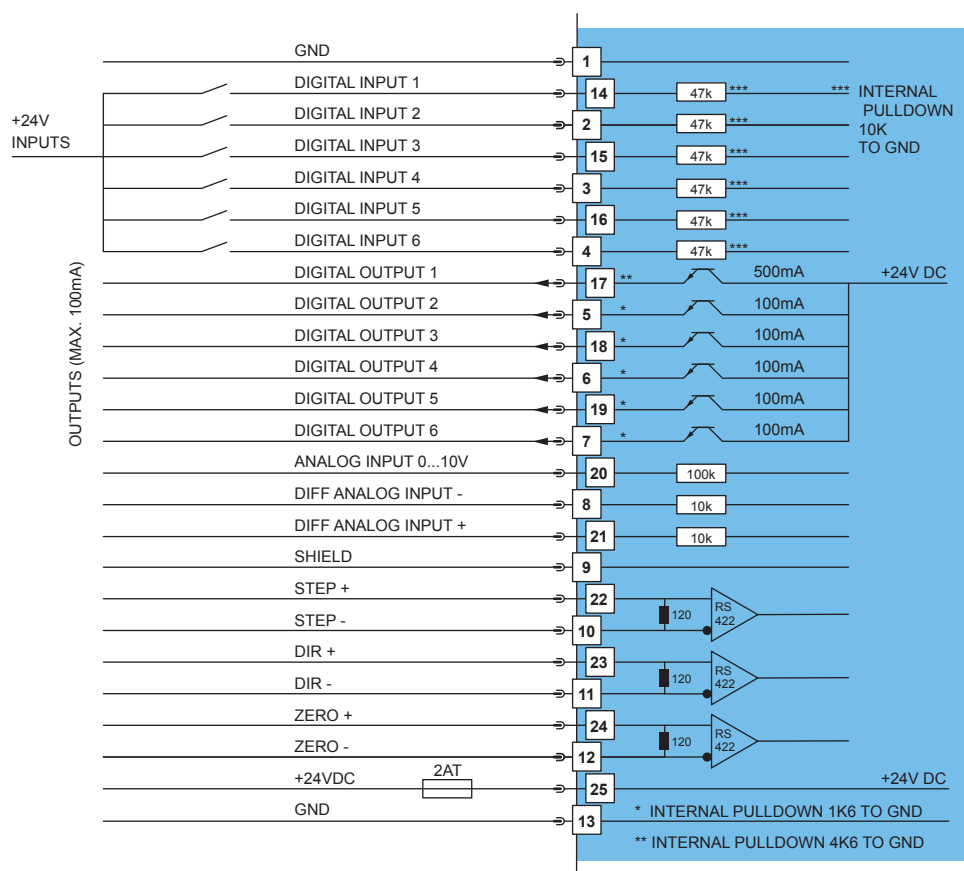| Nr	Bez.
2	+24VDC Supply (22-26VDC).
1	GND Supply

Supply 24V / typ. 150mA
Stripping Length: 10mm, Connection in acc. with standard:EN-VDE,
Use 60/75°C Copper Conductors only, Conductor cross-section max. 1.5mm²

X14	24VDC Supply and IOs

X14: DSUB-25 (f)

GND — 1
DIGITAL INPUT 1 — 14 — 47k *** — *** INTERNAL
DIGITAL INPUT 2 — 2 — 47k *** — PULLDOWN
+24V INPUTS
DIGITAL INPUT 3 — 15 — 47k *** — 10K TO GND
DIGITAL INPUT 4 — 3 — 47k ***
DIGITAL INPUT 5 — 16 — 47k ***
DIGITAL INPUT 6 — 4 — 47k ***
DIGITAL OUTPUT 1 — 17 — ** — 500mA — +24V DC
DIGITAL OUTPUT 2 — 5 — * — 100mA
DIGITAL OUTPUT 3 — 18 — * — 100mA
DIGITAL OUTPUT 4 — 6 — * — 100mA
DIGITAL OUTPUT 5 — 19 — * — 100mA
DIGITAL OUTPUT 6 — 7 — * — 100mA
ANALOG INPUT 0...10V — 20 — 100k
DIFF ANALOG INPUT - — 8 — 10k
DIFF ANALOG INPUT + — 21 — 10k
SHIELD — 9
STEP + — 22 — 120 — RS 422
STEP - — 10
DIR + — 23 — 120 — RS 422
DIR - — 11
ZERO + — 24 — 120 — RS 422
ZERO - — 12
+24VDC — 2AT — 25 — +24V DC
GND — 13

OUTPUTS (MAX. 100mA)

* INTERNAL PULLDOWN 1K6 TO GND
** INTERNAL PULLDOWN 4K6 TO GND

|		
Logic Supply:	Switch Mode Power Supply:24VDC (22...26VDC)	
	External Fuse: 2AT	
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 (X14.17)	
	Peak Current: 370mA/1100mA (X14.17)	

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

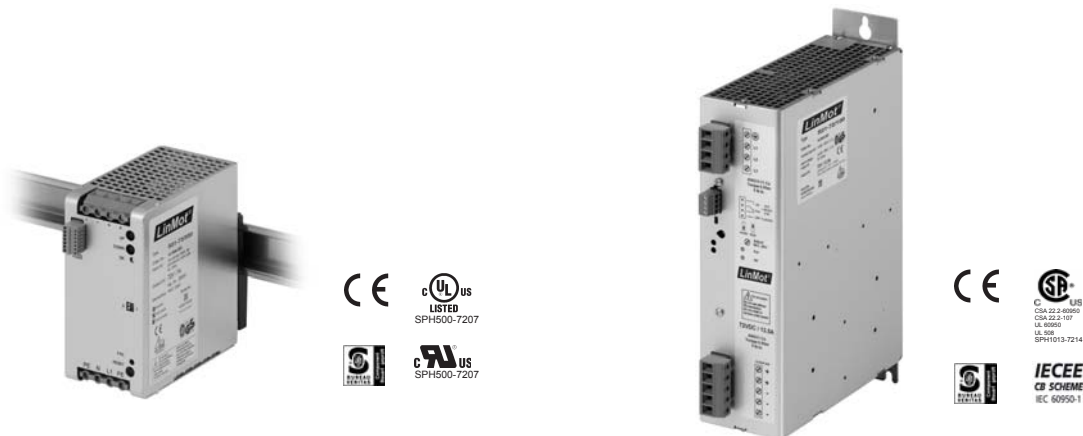|		
Analog Input on X14.20:	Range:	0V..+10V 10Bit ADC
	Sample Rate:	400us
Differential Analog Input on X14.8 X14.21 X14.9 Shield:	Range:	-10V..+10V 10Bit ADC
	Sample Rate:	400us
Differential Step Dir Zero:	Indexer Inputs: RS422	
	Max. Input Frequency:	2MHz
	4 M counts/s with quadrature decoding, 240ns edge separation	

Dimensions in mm
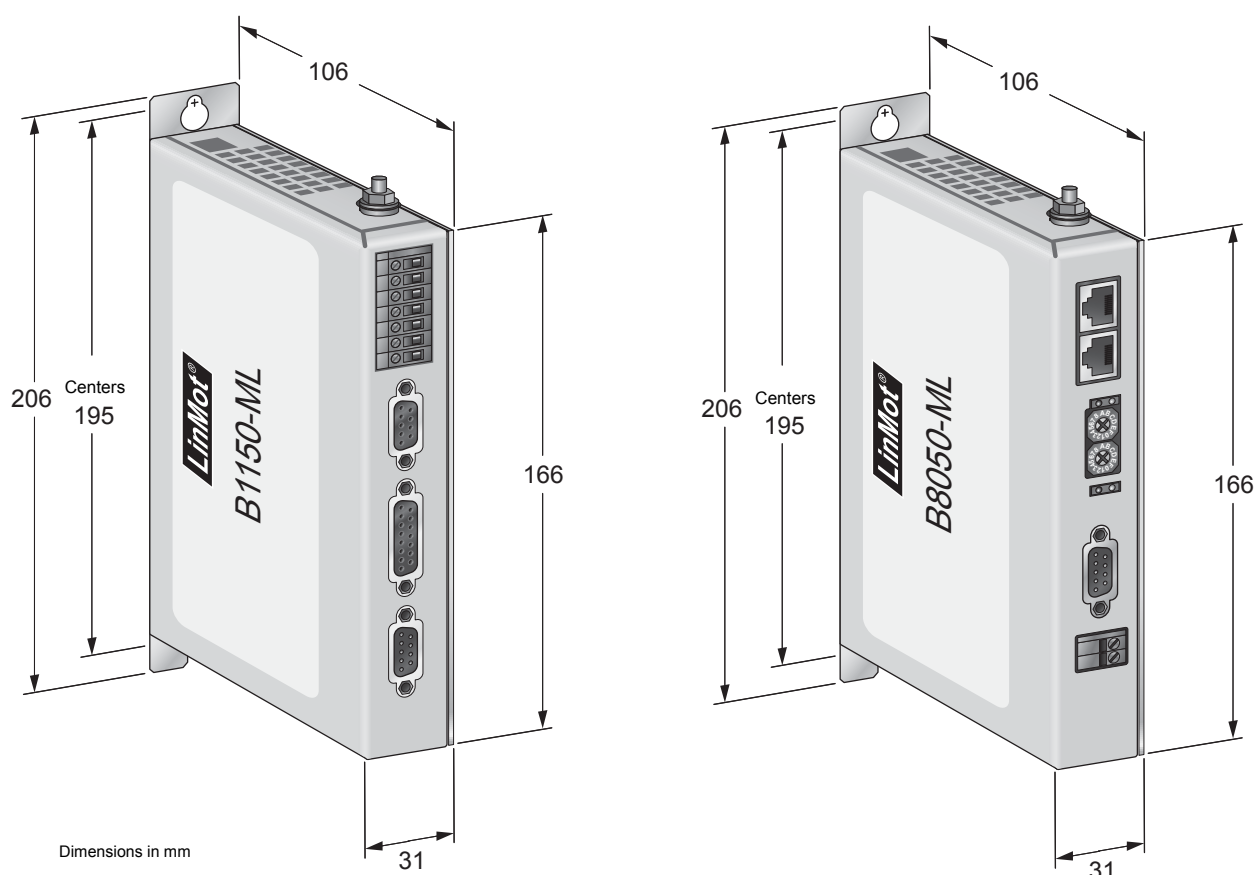
Servo Drive Series B1150/8050

Width	mm (in)	31 (1.3)
Hight	mm (in)	166 (6.6)
Hight without fixings	mm (in)	206 (8.1)
Depth	mm (in)	106 (4.2)
Weight	g (lb)	700 (1.6)
IP Protection class	IP	20
Storage temperature	°C	-25...40
Transport temperature	°C	-25...70
Operating temperture	°C	0...40 at rated date 40...50 with power derating
Max. case temperature	°C	70
Max. power dissipation	W	30
Clearance around Drives	mm (in)	15 (0.8) left/right 50 (2) top 100 (4) bottom 90 (3.5) front

Item	Description	Part Number
B1150-ML	MC-Link Drive (72V/8A)	0150-1796
B1150-ML-HC	MC-Link Drive (72V/15A)	0150-1797
B1150-ML-XC	MC-Link Drive (72V/25A)	0150-1798
B8050-ML-EC	8-Axes Bus Module EtherCAT	0150-1878
B8050-ML-IP	8-Axes Bus Module Ethernet IP	0150-1879
B8050-ML-PL	8-Axes Bus Module Powerlink	0150-1877
B8050-ML-PN	8-Axes Bus Module Profinet	0150-1880
B8050-ML-SC	8-Axes Bus Module Sercos III	0150-1881

Switched-Mode Power Supplies — 115VAC / 230VAC

Item	Description	Part Number
S01-72/500	Switched-Mode Power Supply 72V/500W	0150-1874
S01-72/1000	Switched-Mode Power Supply 72V/1000W	0150-1872

Transformer Supply T01 — 3x230/280/400/480VAC

Item	Description	Part Number
T01-72/420...1500-Multi	Transformer Supply 3x230/280/400/480VAC, 50/60Hz, 420...1500W	see page 536

Control Box B01-E1100

Item	Description	Part Number
B01-E1100	Control Box for E1100 (incl. cable and connectors)	0150-1970
B01-B1150	Control Box for B1150 (incl. cable and connectors)	0150-2110

Connector Cable and USB-Converter

0150-3009   0150-3110   0150-3134   0150-2143   0150-3308   0150-1853

Item	Description	Part Number
RS232 PC config. cabel 2m	for E100/E1001/E1100/B1150	0150-3307
USB-Serial Converter	USB to 9-pin Serial Converter	0150-3110
RJ45/RJ45-0.2-ML1	MC-Link Cable, 0.2m	0150-3308

Option: External High Resolution Encoder

Item	Description	Part Number
MS01-1/D	Linear Encoder 1um, A/B (for 1mm magnetic band)	0150-1840
MB01-1000	Magnetic Band 1mm pitch, per cm	0150-1963