SERVO DRIVES
SERIES A1100

CANopen®

Servo Drive A1100

Series A1100 drives are compact servo drives with 32-bit position resolution and integrated-power stage, for linear motors.

The drives are suitable for simplest and standard positioning tasks with point to point motions, across the entire range of the LinMot product range.

E316095
INT. CONT. EQ.
UL508C

Connection to Machine Control

The Series A1100 Servo Drives can be actuated by machine controls from any manufacturer or brand, via digital inputs, outputs; serial interface; or by CANopen interfaces.

Process and sensor interfaces

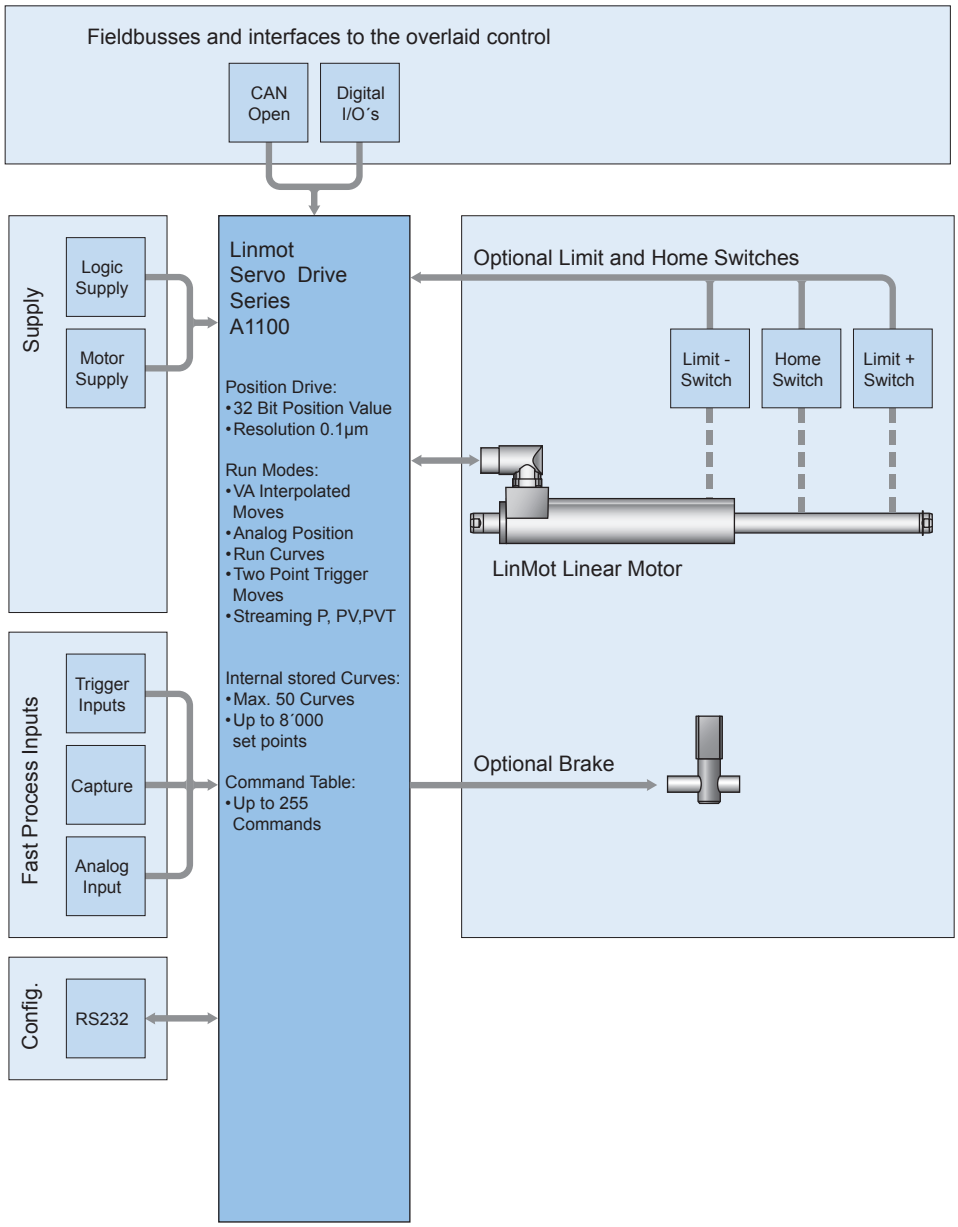
Fast process interfaces for direct processing of sensor signals are available as freely programmable analog and digital inputs and fast trigger inputs.

Logic and Power Supply

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

In an E-stop and safe stop of the drive, only the motor power 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 position of the linear motor are still up to date (as long as the logic supply is not turned off).



System Integration

Series A1100 Servo Drives have analog inputs and digital inputs and outputs, serial interfaces, and Bus connections. The user is therefore not dependent on the selection of the higher level controller.

Additionally, the drives can be equipped with optional peripherals, such as reference and end stop switches.

With flexibility and a compact form factor, LinMot Series A1100 Servo Drives provide a complete solution for a flexible drive concept in single and multiple axis applications, with linear motors.

Position Streaming

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

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.

Motor Interfaces

The series A1100 Servo Drives allow control of LinMot linear motors.

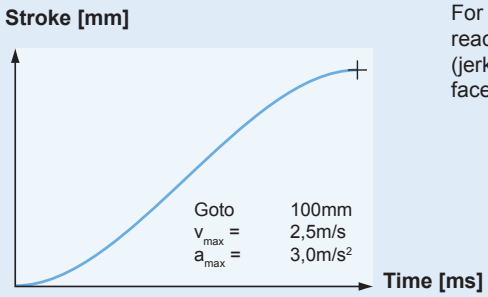
A1100 Servo Drives provide all necessary interfaces to operate linear motors with optional external peripherals, such as end position and reference switches.

Configuration

Parameterization and configuration of the Servo Drive is done via RS232.

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.

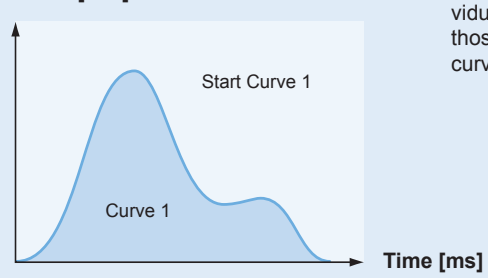
Connection to Machine Drive



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 interface, CANopen or a trigger input.

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

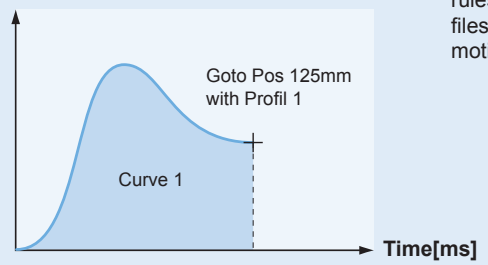
Time Curves



Up to 50 different time curves can be stored Series A1100 drives, with up to 8,000 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 or the trigger input.

Stroke range:	±100m
Position Resolution:	0.1µm (32Bit)
Motion profiles:	Max. 50 Time Curves
Curve points:	Max. 8'000 points

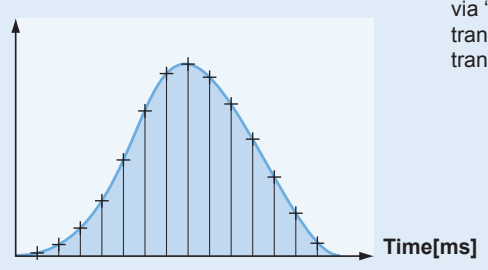
Profiled Moves



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. 50 Time Curves
Curve points:	Max. 8'000 points

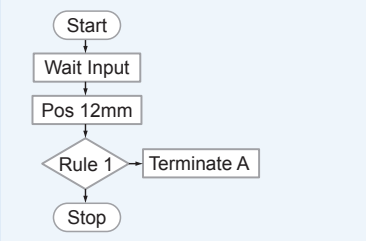
Setpoint Streaming



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:	4 kHz
Cycle times:	0.5 - 5ms

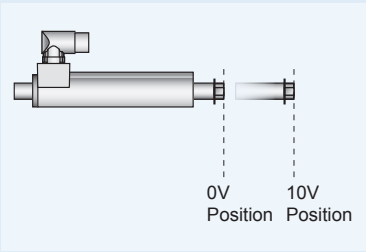
Command Table



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:	250µsec

Analog Position



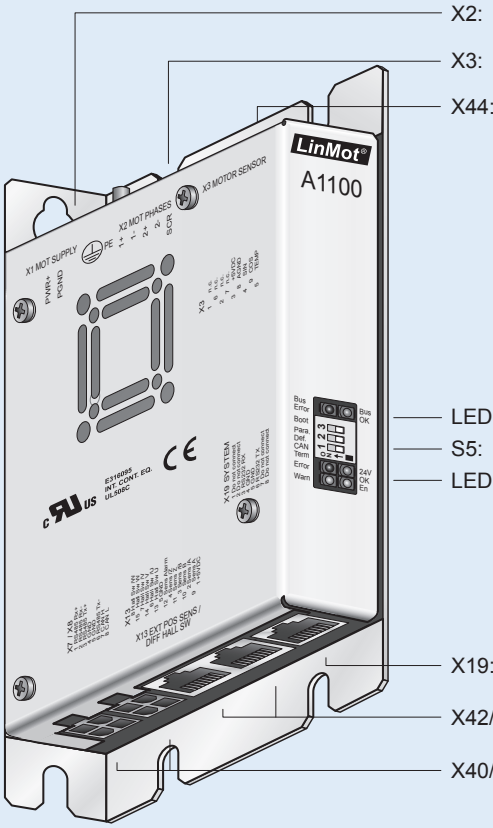
For an analog position target, the linear motor travels to a position proportional to the input voltage. The position is either scanned continuously, or only after a rising edge of the trigger signal. In order to prevent uncontrolled jumps in position, the motor travels to the positions with a programmable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

Inputs:	Analog Input X44
Voltagvte range:	0-10VDC or
Resolution:	10 Bit
Scanning rate:	250µsec

A1100-GP

- Absolute & Relative Positioning
- Time based motion profiles
- Internally stored Motion Sequences
- Position Streaming
- Analog Position Target
- Customer-Specific Functions

CANopen Point to Point



E316095 INT. CONT. EQ. UL508C

CANopen

The LinMot A1100-GP drives support the CiA DS301 communications protocol. The following resources are available:
4 T_PDO, 4 R_PDO, 1 T_SDO, 1 R_SDO

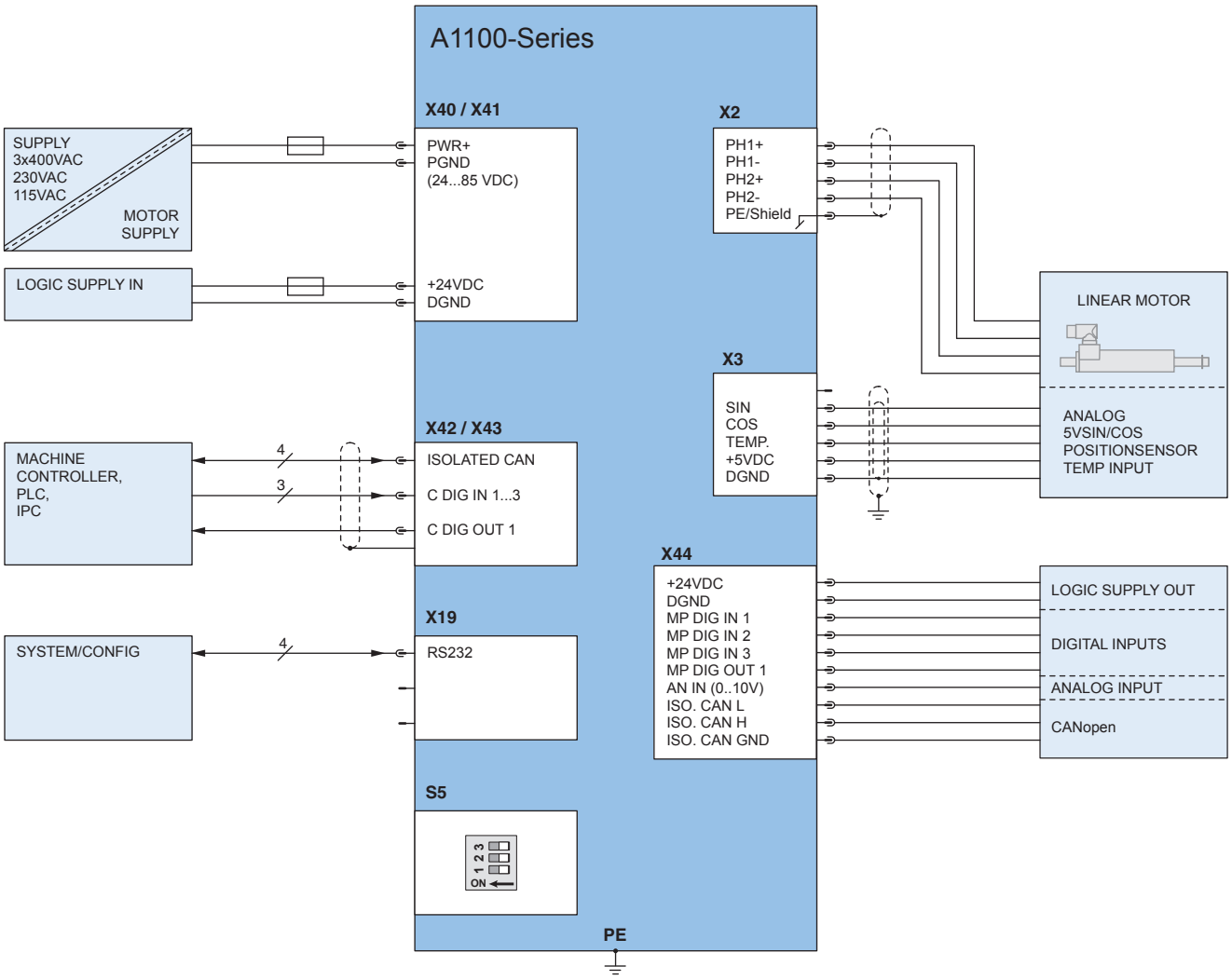
The following protocols are supported by the CO drives:
- NMT Error Control (Nodeguarding Protocol or HeartBeat Protocol)
- PDO (Transmission type 1 to 254)
- SDO Upload and Download
- NMT (Start, Stop, Enter PreOp, Reset Node, Reset Communication, Boot-Up Message)

Replacing Pneumatics

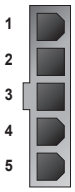
Due to their simple controls via digital inputs and outputs, A1100 drive make excellent substitutes for pneumatic cylinders.

Using digital inputs or CAN bus, the linear motor can move to programmable positions. As soon as the linear motor has reached the set position, the In-Postion output is actuated.

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


A1100-Series
X40 / X41
PWR+
PGND
(24...85 VDC)
+24VDC
DGND
X2
PH1+
PH1-
PH2+
PH2-
PE/Shield
SUPPLY
3x400VAC
230VAC
115VAC
MOTOR
SUPPLY
LOGIC SUPPLY IN
LINEAR MOTOR
ANALOG
5VSIN/COS
POSITIONSENSOR
TEMP INPUT
X3
SIN
COS
TEMP.
+5VDC
DGND
X42 / X43
ISOLATED CAN
C DIG IN 1...3
C DIG OUT 1
MACHINE
CONTROLLER,
PLC,
IPC
4
3
X44
+24VDC
DGND
MP DIG IN 1
MP DIG IN 2
MP DIG IN 3
MP DIG OUT 1
AN IN (0..10V)
ISO. CAN L
ISO. CAN H
ISO. CAN GND
LOGIC SUPPLY OUT
DIGITAL INPUTS
ANALOG INPUT
CANopen
X19
RS232
SYSTEM/CONFIG
4
S5
1 2 3
ON
PE

X2 Motor Phases

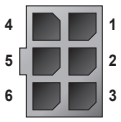


Molex
Mini-Fit Jr.™
Molex Art. Nr.:
50-36-1747

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

-Use 60/75°C copper conductors only
-Cable length <30m
-13A max. current per circuit when header is mated to a receptacle loaded with a 45750 Mini-Fit® Plus HCS Crimp Terminal crimped to a 16 AWG wire

X3 Motor Sensor

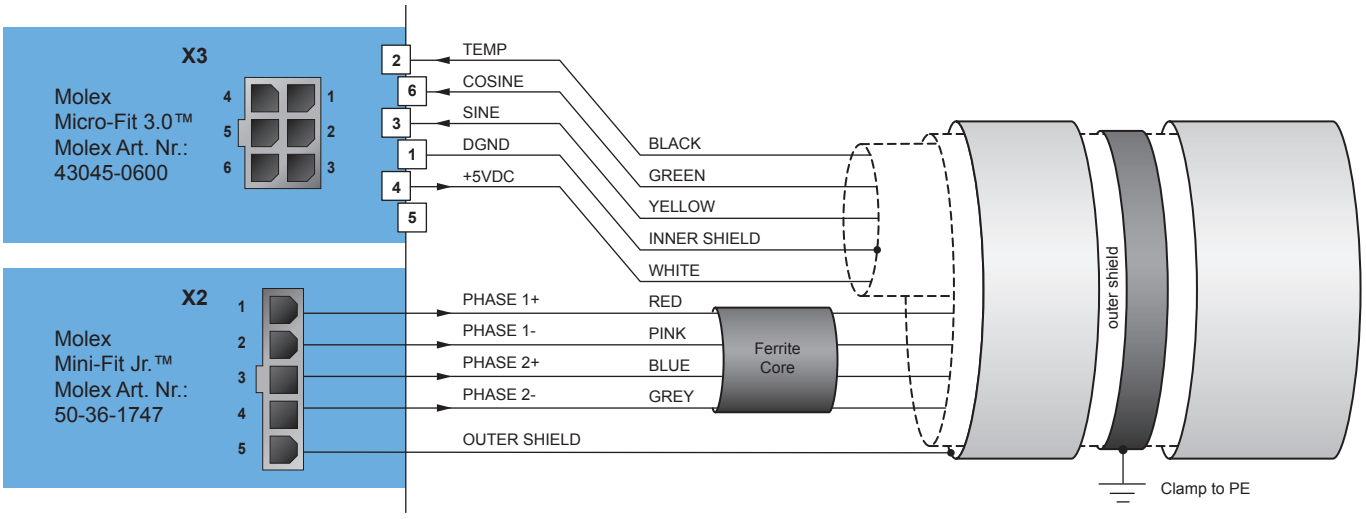


Molex
Mini-Fit 3.0™
Molex Art. Nr.:
43045-0600

Nr	LinMot Motor
1	DGND
2	Temp
3	Sensor Sine
4	+5VDC
5	(Do not connect)
6	Sensor Cosine

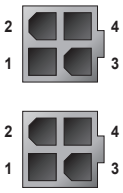
-Use +5V (X3.4) and DGND (X3.1) only for motor internal hall sensor supply (max. 100mA)
-Cable length < 30m
-Caution: Do NOT connect DGND (X3.1) to ground or earth!

Motor Linear Motor wiring with LinMot Motor cable (K-, KS- and KR-types)



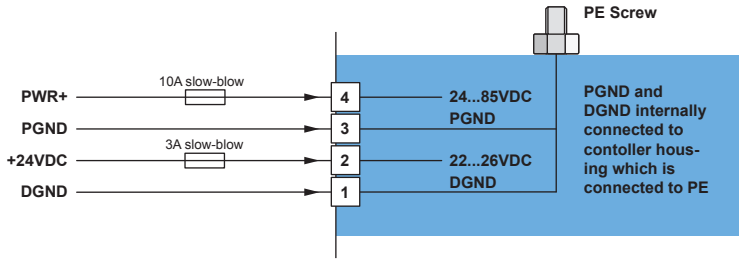
- For the connection between the linear motor and servo drive, only the specially shielded LinMot cables of type K, KS or KR should be used.
-The length of the cable can be up to 30 m between the linear motor and the servo drive.
-Motor cables fabricated by the customer are to be tested with a test voltage of 1500VDC.
-An improperly fabricated motor cable can damage both the linear motor and the servo drive.
-The minimum bend radius is to be observed for stationary cables as well as for moving motor cables
-The motor cable must not be plugged in or unplugged while voltage is still applied.
-The outer shield of the motor cable has to be clamped to PE as close as possible to the drive.
-A frrite core (5mm, 144Ohm @ 100MHz, e.g. Würth Elektronik, Art.Nr.: 7427114) has to be mounted around the motor phases as close to the drive as possible.

X40 / X41 Supply IN / OUT



Molex
Mini-Fit Jr.™

Molex Art. Nr.:
50-36-2306



-Motor Supply: 72VDC nominal, 24...85VDC
-Absolute max. Rating: 72VDC +20%
-External Fuse: Motor Supply = 10AT (10A slow blow) / min. 100VDC
Logic Supply = 3AT (3A slow blow) / min. 100VDC
-If motor supply voltage exceeds 90VDC, the drive will go into error state
-Use 60/75°C copper conductors only
-13A max. current per circuit when header is mated to a receptacle loaded with a 45750 Mini-Fit® Plus HCS Crimp Terminal crimped to a 16 AWG wire

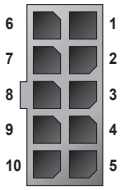
X42 / X43 Control IN / OUT

RJ-45
shielded

Nr		
1	C Dig IN 1	Input high voltage: Vin > 16VDC, Input low voltage: Vin < 8VDC
2	C Dig IN 2	Input high voltage: Vin > 16VDC, Input low voltage: Vin < 8VDC
3	C Dig IN 3	Input high voltage: Vin > 16VDC, Input low voltage: Vin < 8VDC
4	CAN GND	
5	CAN GND	
6	C Dig OUT 1	Open Collector Output, 100k Pull-Up to +24VDC
7	Isolated CAN H	
8	Isolated CAN L	
case	Shield	

-Use twisted pair (1-2, 3-6, 4-5, 7-8) cable for wiring
-X42 is internally connected to X43 (1:1 connection)
-Cable length < 30m.
-Galvanically isolated CAN transceiver meets the specifications of the ISO11898-2 standard
-Note: A termination resistor of 120 Ohm can be connected drive internally with the switch S5.1.

X44 Motor Peripheral I/O



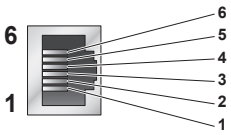
Molex
Mini-Fit 3.0™

Molex Art. Nr.:
43045-1000

Nr		
1	DGND	
2	MP Dig IN 1	Input high voltage: Vin > 16VDC, Input low voltage: Vin < 8VDC
3	MP Dig IN 2	Input high voltage: Vin > 16VDC, Input low voltage: Vin < 8VDC
4	CANGND	Use a seperate shielded twisted pair cable for the CAN connection
5	Isolated CAN H	Use a seperate shielded twisted pair cable for the CAN connection
6	+24VDC OUT	Max. Current: 2.5A
7	MP Dig OUT 1	Open Collector Output, No Pull-Up, Max. Current: 1.4A
8	MP Dig IN 3	Input high voltage: Vin > 16VDC, Input low voltage: Vin < 8VDC
9	AN IN (0...10V)	Analog Input 0V..10V
10	Isolated CAN L	Use a seperate shielded twisted pair cable for the CAN connection

-Galvanically isolated CAN transceiver meets the specifications of the ISO11898-2 standard
-The CAN bus on X44 is the same one as on X42/43
-Note: A termination resistor of 120 Ohm can be connected drive internally with the switch S5.1.
-Use a seperate shielded cable with a twisted pair for CAN L and CAN H when connecting the CAN bus to X44. Clamp the shielding of the cable as close as possible to the drive to PE.
-Cable length < 30m

X19 System



RJ-12 6P6C
unshielded

Nr	Description
1	RS232 Tx
2	GND
3	GND
4	RS232 Rx
5	(Do not connect)
6	(Do not connect)

BUS LEDs Bus State Display

Green	OK
Red	Error

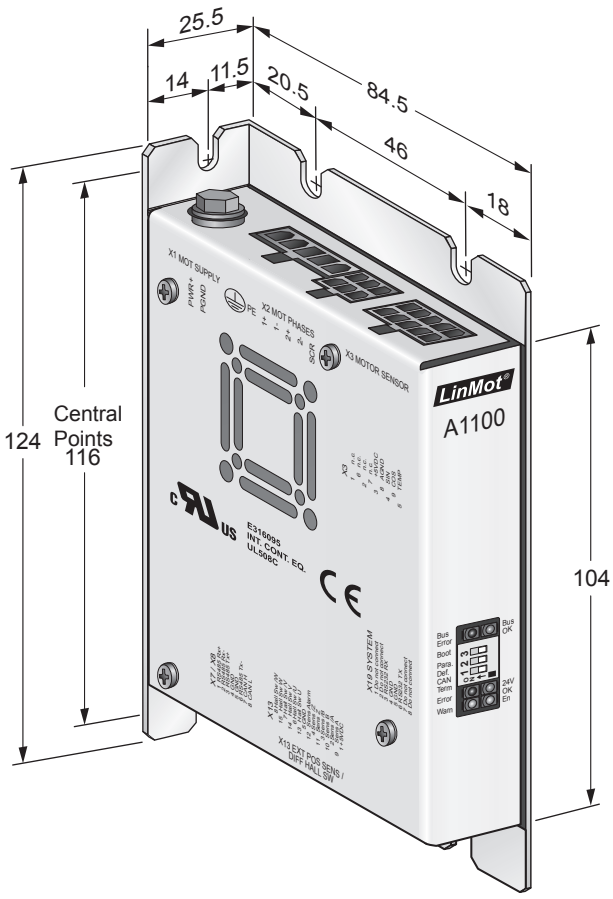
The use of these LEDs depends on the type of fieldbus which is used.
Please see the corresponding manual for further information.

S5

S5.3	Bootstrap (Default = off)
S5.2	Parameter Default (Default = off)
S5.1	CAN Termination (Default = on)

LEDs State Display

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



Dimensions in mm
Mounting points for M3 screws

A1100 Single axis drive		
Width	mm (in)	25.5 (1.0)
Height	mm (in)	124 (4.9)
Depth	mm (in)	84.5 (3.3)
Weight	g (lb)	340 (0.75)
Case	IP	20
Storage temperature	°C	-25...40
Transport temperature	°C	-25...70
Operating temperture	°C	0...40 at rated data (UL) 40...50 with power derating
Relative humidity	%	95 (non-condensing)
Pollution	IEC/EN 60664-1	Pollution degree 2
Max. case temperature	°C	70
Max. power dissipation	W	30
Min. distance between drives	mm (in)	20 (0.8) horizontal 50 (2) vertical

Ordering Information

Item	Description	Part Nummber
A1100-GP-LC-0S-000	Mini CANopen Drive (72V/8A)	0150-2499

Accessories

Item	Description	Part Nummber
DC01-X44-4m	Cable IO´s for A1100/X44, 4m flying leads	0150-3553
DC01-X40-4m	Cable Supply A1100/X40, 4m flying leads	0150-3545
DC01-X40/41-0.15m	Cable IO for A1100/X40-X41, 0.15m daisy chain	0150-3552

DRIVES SERIES C1100

PROFINET® EtherCAT® RS 232 RS 485 CANopen

Servo Drive C1100

Series C1100 servo drives are axis controllers, with 32-bit position resolution and an integrated power stage, for linear motors and rotary drives.

The controllers are suitable for simplest and standard positioning tasks with point to point motions.

Connection to Machine Control

The C1100 servo drives can be actuated by machine controls from any manufacturer or brand, via digital inputs and outputs over Industrial Ethernet.

Bus-Interfaces:
- Profinet
- EtherCat
- CANopen

Serial-Interfaces:
- RS232
- RS485

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

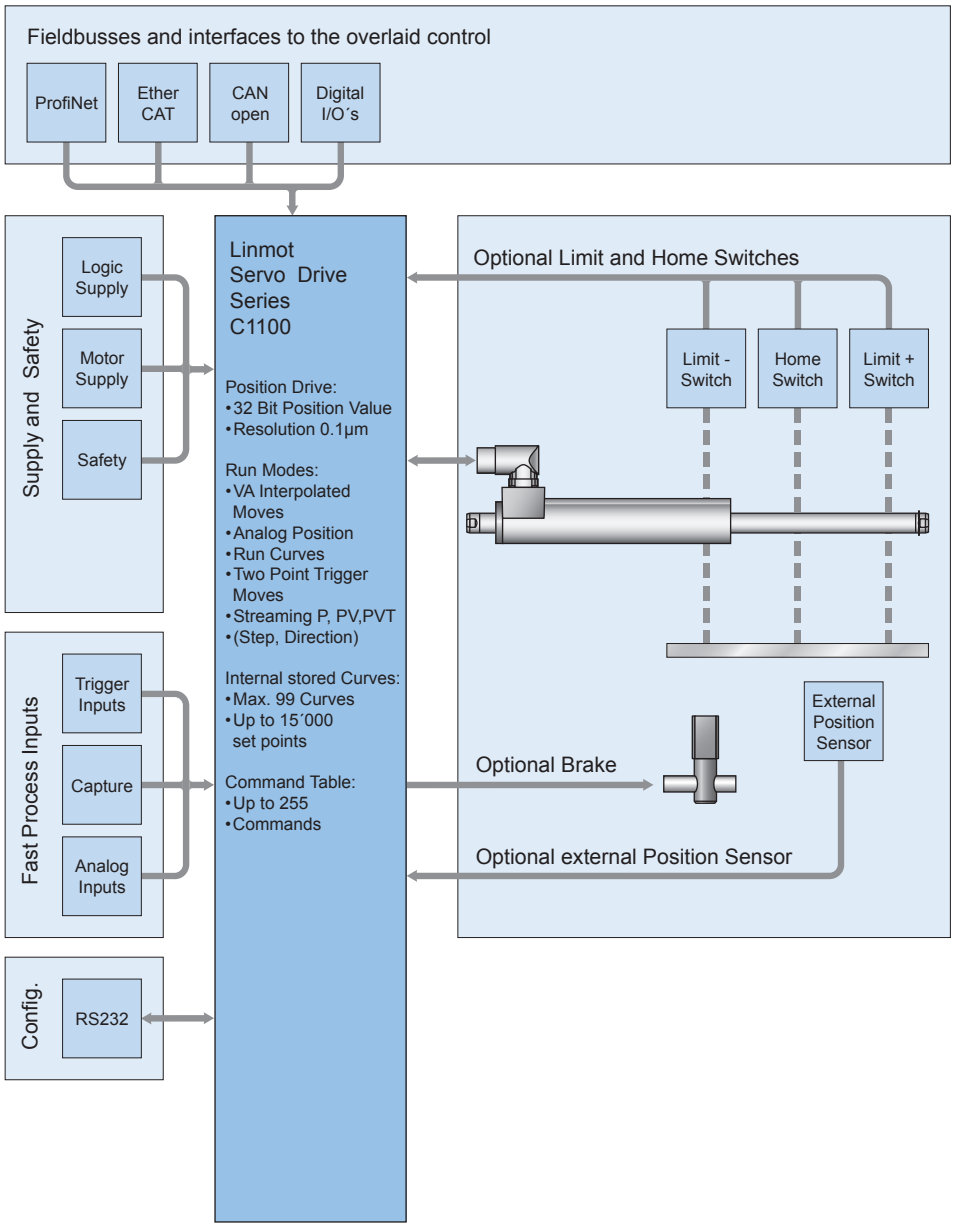
The safety IO's on Servo Drives with the -1S option with CAN or industrial ETHERNET allows safe torque off (STO) of the drives via control signals, without interrupting the power supply.

Drives with -0S option comes without safety IO's and is easier to wire in applications without safety needs.

Logic and Power Supply

The servo drives have two separate inputs for the logic and motor elements.

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 actual position of the linear motor, is 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 control 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 C1100 servo drives have analog and digital inputs and outputs, serial interfaces, fieldbusses, and Ethernet. The user therefore is 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 C1100 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.

Ideal for Point to Point Motions

Serial interfaces, CAN and industrial Ethernet guarantees flexible and fast communication

The cost optimized design of the series C1100 drives makes them the ideal drive for point to point movements in economic applications like replacement of pneumatic cylinders with higher speed and live and programmable flexibility.

Motor Interfaces

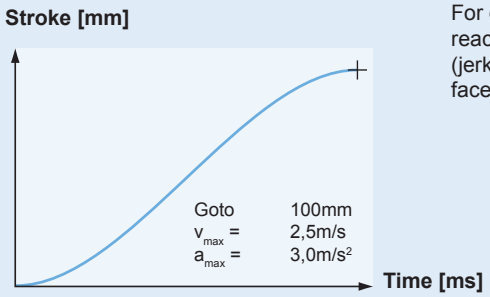
C1100 servo drives provide all necessary interfaces to operate linear or rotary motors with optional external peripherals, such as end position and reference switches, a mechanical brake, or a high-resolution external position sensor.

Configuration

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 Axis.

Fieldbus and Ethernet drives can also be configured directly by the overlaid control, by downloading the configuration parameters via Bus/Ethernet

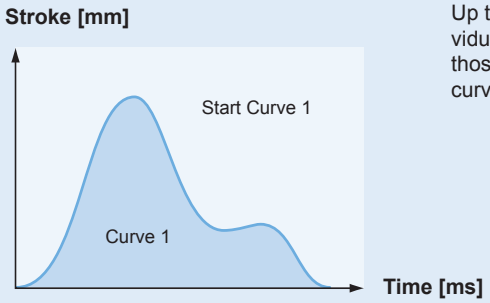
Connection to Machine Drive



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, CANopen, 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/s (32Bit)

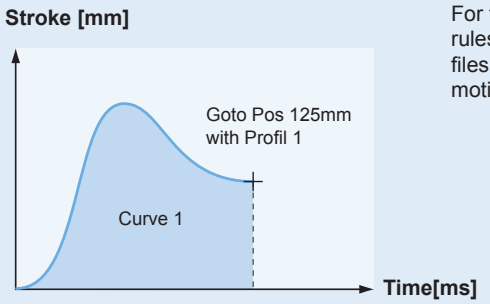
Time Curves



Up to 100 different time curves can be stored Series C1100 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. 15'000 points

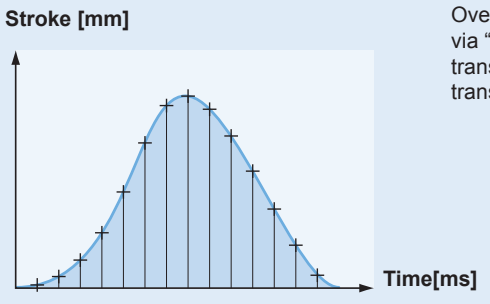
Profiled Moves



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 Time Curves
Curve points:	Max. 15'000 points

Setpoint Streaming



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:	8 kHz
Cycle times:	0.5 - 5ms

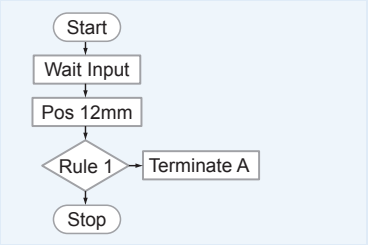
Easy Steps

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

With the Easy Steps function, up to 4 positions or independent travel commands can be stored on the drive, and addressed via 4 digital inputs or fieldbus interfaces/Ethernet.

Digital inputs:	4
Interface:	X4
Scanning rate:	250µsec

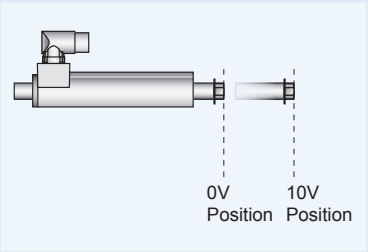
Command Table



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. 254
Cycle time:	125µsec

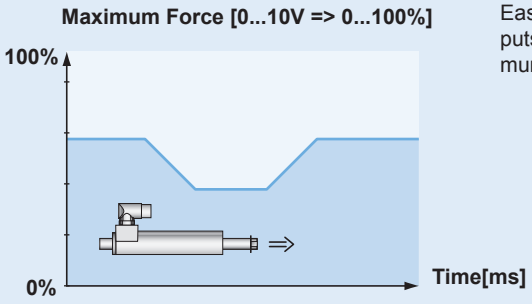
Analog Position



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
Voltagvte range:	0-10VDC or ±10V
Resolution:	12 Bit
Scanning rate:	>=125µsec (adjustable)

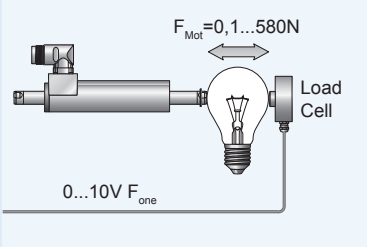
Easy Steps Parameter Scale



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.

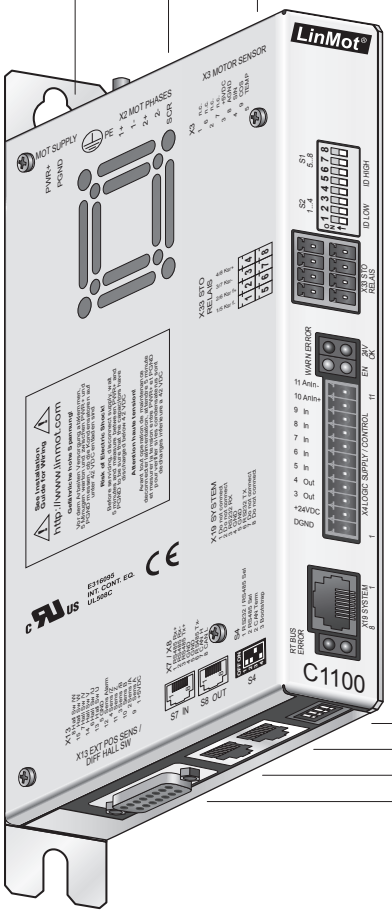
Inputs:	2 x Analog
Voltage range:	0-10VDC
Resolution:	12 Bit
Resolution	250µsec

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 or ±10V
Resolution:	12 Bit
Min. Force Resolution:	0.1N

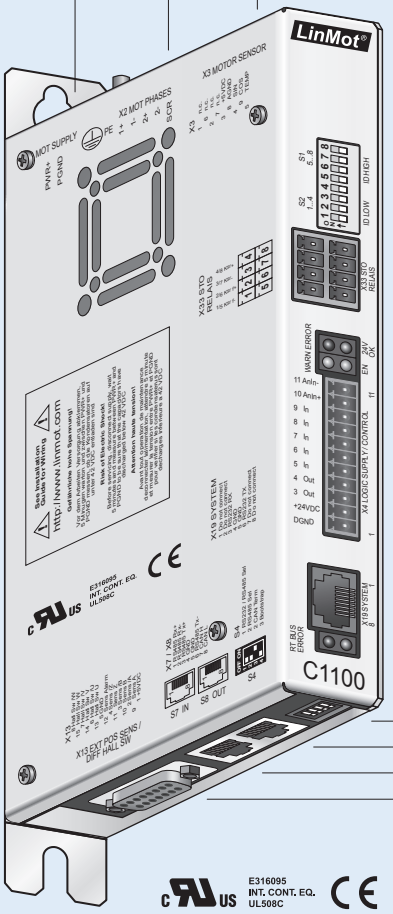


	C1100-GP-XC	C1150-EC-XC	C1150-PN-XC
Interfaces			
RS485	•		
CANOpen	•		
EtherCAT		•	
PROFINET			•
Config RS232	•	•	•

C1100-GP-XC-0S
C1100-GP-XC-1S

- Absolute & Relative Positioning
- Time based motion profiles
- Internally stored Motion Sequences
- Position Streaming
- Analog Position Target
- Analog Parameter Scaling
- Force Control Technology Function
- Customer-Specific Functions

CANopen



X1: Motor Supply
X2: Motor Phases
X3: Motor Sensor
S1-2: ID Selector
X33: STO Relais (only C1100-GP-XC-1S)
LED State Indicator
X4: Logic Supply / Control
X19: System Configuration RS232
LED RT Bus
S4
X8/18: CMD Out
X7/17: CMD In
X13: External Positionssensor / Differential Hall Switches

Industrial Ethernet

Series C1100 drives allow integration of LinMot linear motors in controls concepts with industrial Ethernet interfaces. The user can integrate Series C1100 drives regardless of the provider of the overlaid control.

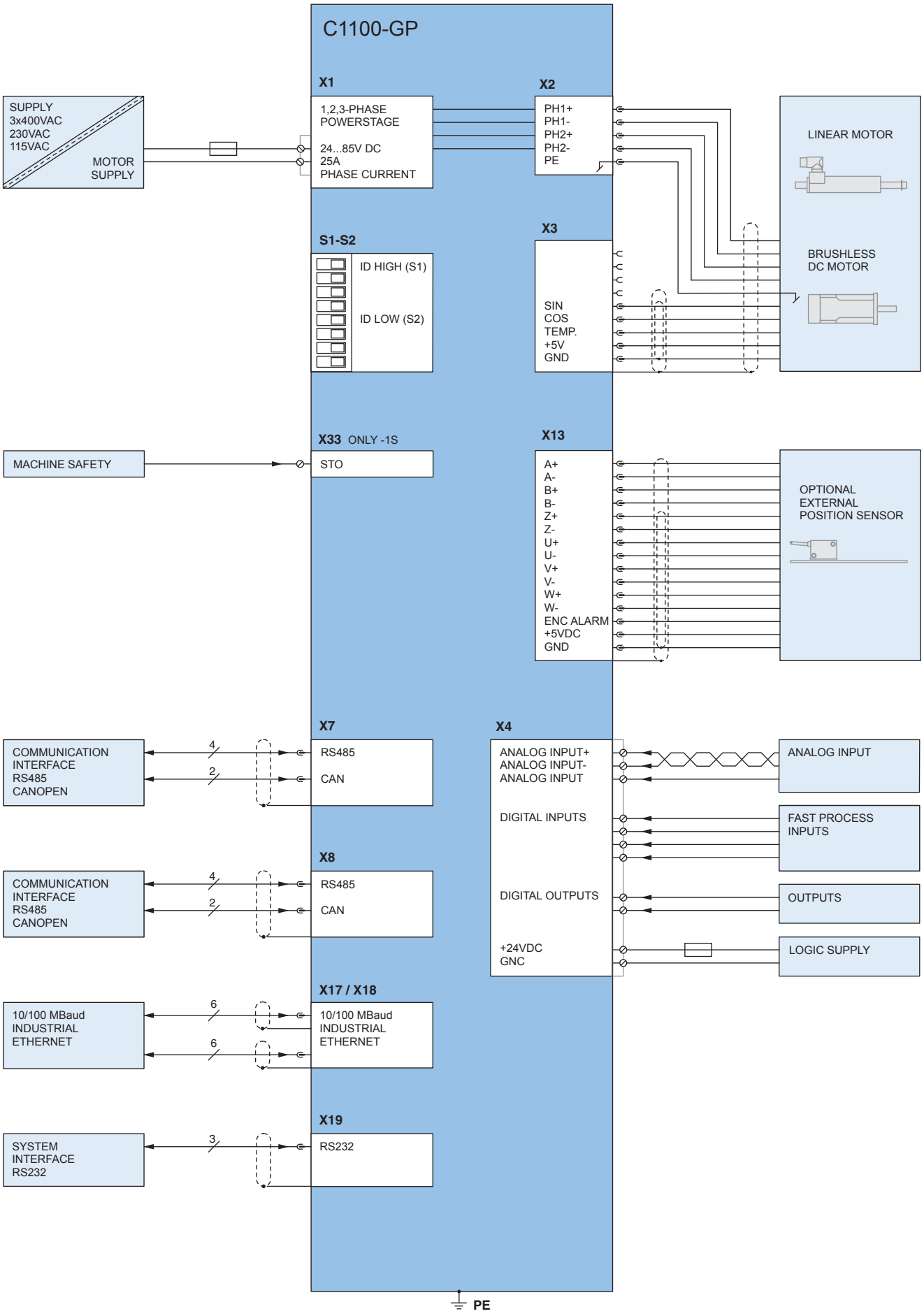
LinMot drives are available with common industrial Ethernet protocols. Since all Ethernet drives have the same motion command interface, and the control and status word are identical, software blocks that have been implemented once can be transferred to other drives without a problem.

C1100-GP servo drives support the following industrial Ethernet protocol:

-CANOpen
-RS485

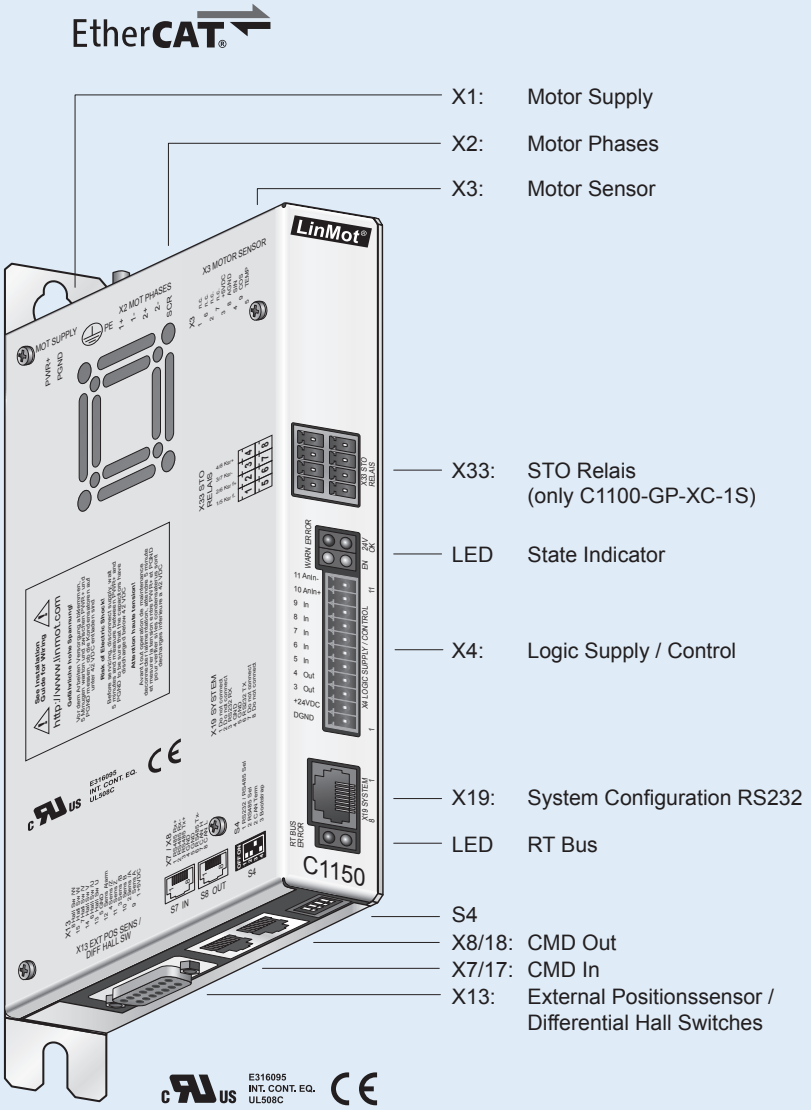
Minimal cycle times

Bus cycle:	500µs
IO update:	500µs
Trigger Input:	250µs
Position control loop:	250µs
Current controll loop:	125µs


C1100-GP
X1
1,2,3-PHASE
POWERSTAGE
24...85V DC
25A
PHASE CURRENT
SUPPLY
3x400VAC
230VAC
115VAC
MOTOR
SUPPLY
X2
PH1+
PH1-
PH2+
PH2-
PE
LINEAR MOTOR
BRUSHLESS
DC MOTOR
S1-S2
ID HIGH (S1)
ID LOW (S2)
X3
SIN
COS
TEMP.
+5V
GND
X33 ONLY -1S
STO
MACHINE SAFETY
X13
A+
A-
B+
B-
Z+
Z-
U+
U-
V+
V-
W+
W-
ENC ALARM
+5VDC
GND
OPTIONAL
EXTERNAL
POSITION SENSOR
X7
COMMUNICATION
INTERFACE
RS485
CANOPEN
RS485
CAN
X4
ANALOG INPUT+
ANALOG INPUT-
ANALOG INPUT
ANALOG INPUT
DIGITAL INPUTS
FAST PROCESS
INPUTS
DIGITAL OUTPUTS
OUTPUTS
+24VDC
GNC
LOGIC SUPPLY
X8
COMMUNICATION
INTERFACE
RS485
CANOPEN
RS485
CAN
X17 / X18
10/100 MBaud
INDUSTRIAL
ETHERNET
10/100 MBaud
INDUSTRIAL
ETHERNET
X19
SYSTEM
INTERFACE
RS232
RS232
PE

C1150-EC-XC-0S
C1150-EC-XC-1S

- Absolute & Relative Positioning
- Time based motion profiles
- Internally stored Motion Sequences
- Position Streaming
- Analog Position Target
- Analog Parameter Scaling
- Force Control Technology Function
- Customer-Specific Functions



Industrial Ethernet

Series C1150-EC drives allow integration of LinMot linear motors in controls concepts with EtherCAT. The user can integrate Series C1100 drives regardless of the provider of the overlaid control.

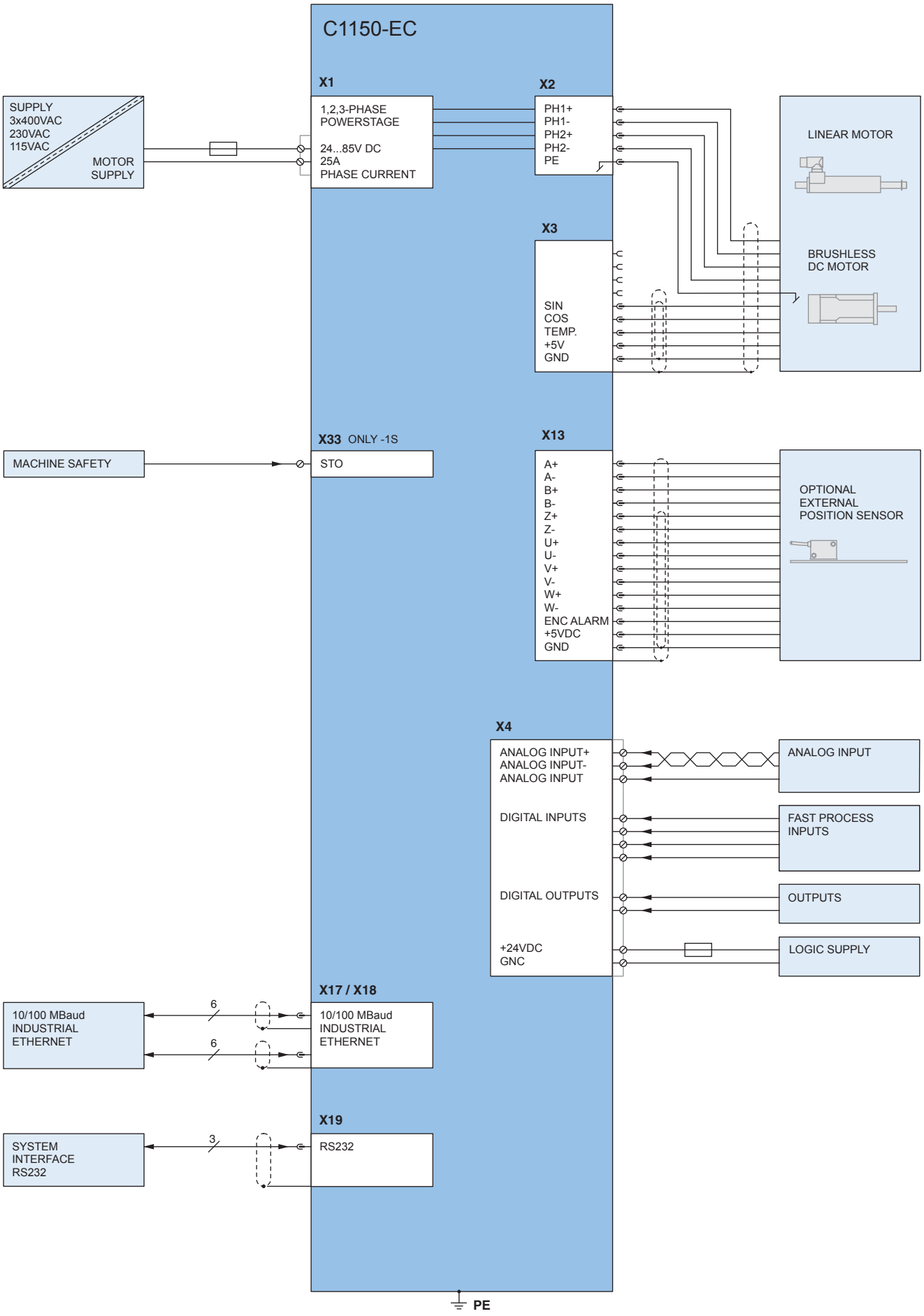
LinMot drives are available with common industrial Ethernet protocols. Since all Ethernet drives have the same motion command interface, and the control and status word are identical, software blocks that have been implemented once can be transferred to other drives without a problem.

Technical Data

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

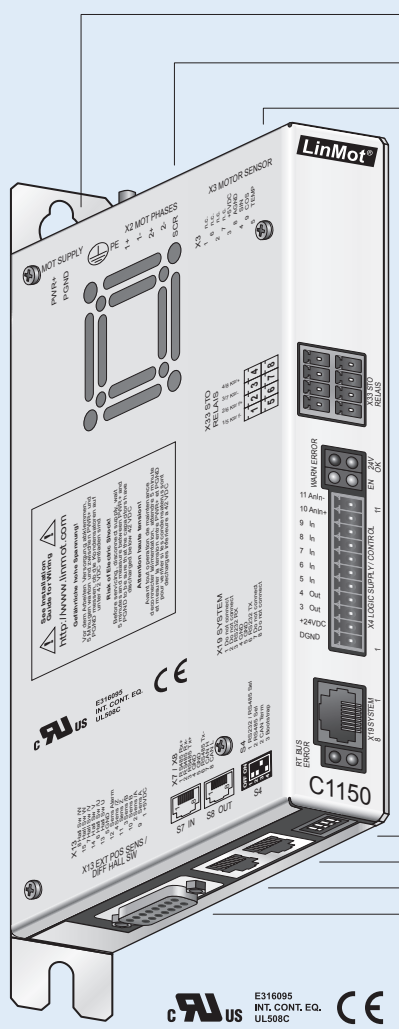
Minimal cycle times

Bus cycle:	500µs
IO update:	500µs
Trigger Input:	250µs
Position control loop:	250µs
Current controll loop:	125µs


C1150-EC
X1
1,2,3-PHASE
POWERSTAGE
24...85V DC
25A
PHASE CURRENT
SUPPLY
3x400VAC
230VAC
115VAC
MOTOR
SUPPLY
X2
PH1+
PH1-
PH2+
PH2-
PE
LINEAR MOTOR
X3
SIN
COS
TEMP.
+5V
GND
BRUSHLESS
DC MOTOR
X33 ONLY -1S
MACHINE SAFETY
STO
X13
A+
A-
B+
B-
Z+
Z-
U+
U-
V+
V-
W+
W-
ENC ALARM
+5VDC
GND
OPTIONAL
EXTERNAL
POSITION SENSOR
X4
ANALOG INPUT+
ANALOG INPUT-
ANALOG INPUT
ANALOG INPUT
DIGITAL INPUTS
FAST PROCESS
INPUTS
DIGITAL OUTPUTS
OUTPUTS
+24VDC
GNC
LOGIC SUPPLY
X17 / X18
10/100 MBaud
INDUSTRIAL
ETHERNET
6
6
10/100 MBaud
INDUSTRIAL
ETHERNET
X19
SYSTEM
INTERFACE
RS232
3
RS232
PE

C1150-PN-XC-0S
C1150-PN-XC-1S

- Absolute & Relative Positioning
- Time based motion profiles
- Internally stored Motion Sequences
- Position Streaming
- Analog Position Target
- Analog Parameter Scaling
- Force Control Technology Function
- Customer-Specific Functions



Industrial Ethernet

Series C1150-PN drives allow integration of LinMot linear motors in controls concepts with ProfiNet. The user can integrate Series C1100 drives regardless of the provider of the overlaid control.

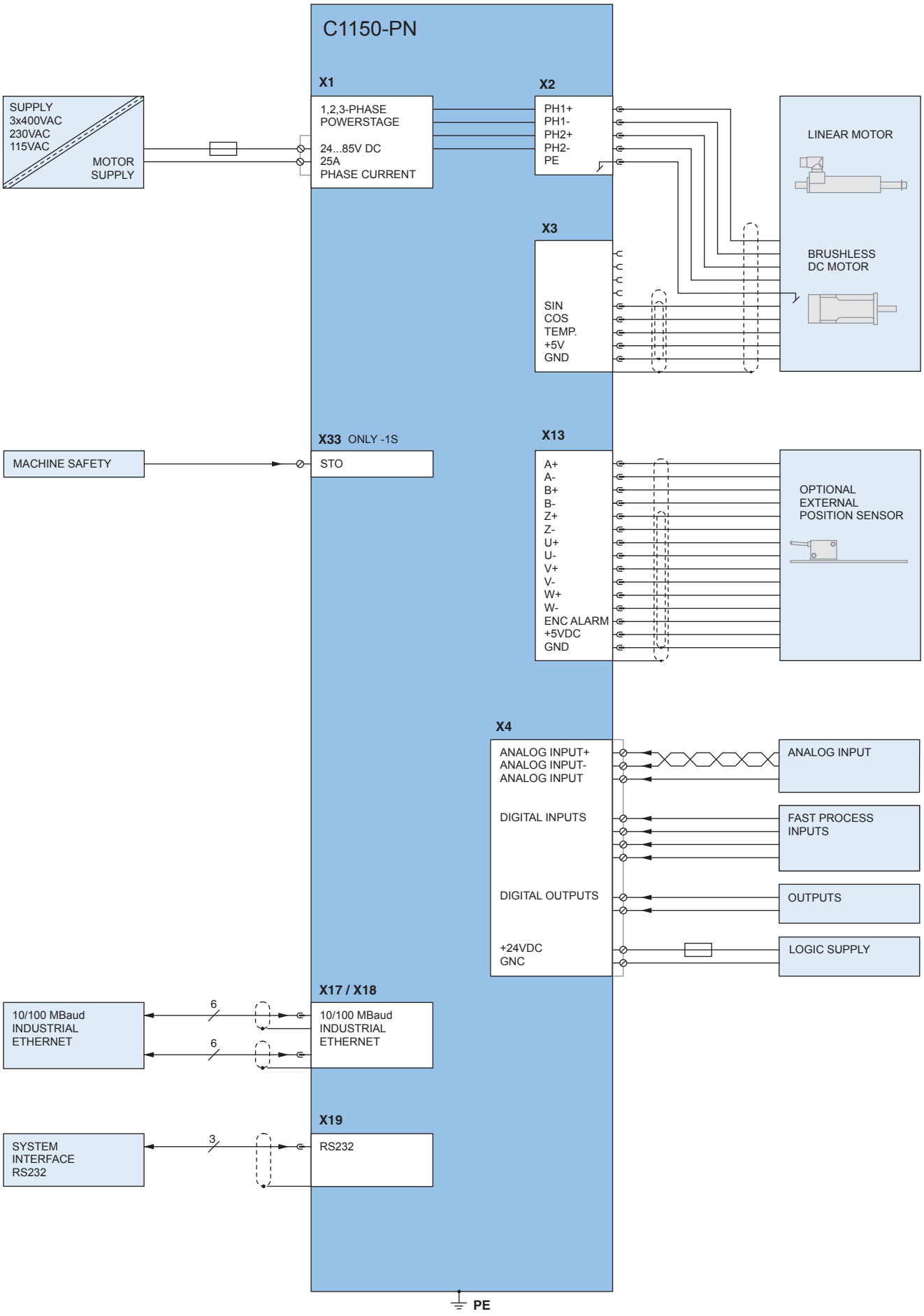
LinMot drives are available with common industrial Ethernet protocols. Since all Ethernet drives have the same motion command interface, and the control and status word are identical, software blocks that have been implemented once can be transferred to other drives without a problem.

Technical Data

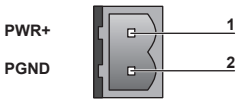
Type:	Realtime Ethernet
Switch/Hub:	Integrated 2-Port Hub/Switch
Transfer rate:	10/100MBit/sec

Minimal cycle times

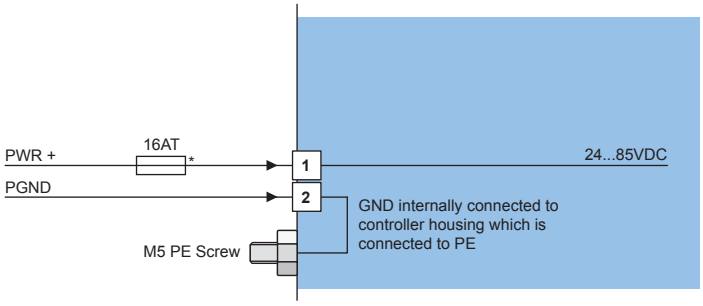
Bus cycle:	500µs
IO update:	500µs
Trigger Input:	250µs
Position control loop:	250µs
Current controll loop:	125µs


C1150-PN
X1
1,2,3-PHASE POWERSTAGE
24...85V DC
25A
PHASE CURRENT
SUPPLY
3x400VAC
230VAC
115VAC
MOTOR SUPPLY
X2
PH1+
PH1-
PH2+
PH2-
PE
LINEAR MOTOR
X3
SIN
COS
TEMP.
+5V
GND
BRUSHLESS DC MOTOR
X33 ONLY -1S
MACHINE SAFETY
STO
X13
A+
A-
B+
B-
Z+
Z-
U+
U-
V+
V-
W+
W-
ENC ALARM
+5VDC
GND
OPTIONAL EXTERNAL POSITION SENSOR
X4
ANALOG INPUT+
ANALOG INPUT-
ANALOG INPUT
ANALOG INPUT
DIGITAL INPUTS
FAST PROCESS INPUTS
DIGITAL OUTPUTS
OUTPUTS
+24VDC
GNC
LOGIC SUPPLY
X17 / X18
10/100 MBaud INDUSTRIAL ETHERNET
6
6
10/100 MBaud INDUSTRIAL ETHERNET
X19
SYSTEM INTERFACE RS232
3
RS232
PE

X1 Motor Phases



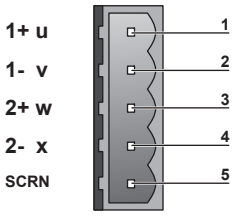
Connector has to be ordered separetely



Motor Supply:

Motor Supply: 72VDC nominal, 24...85VDC
Absolute max. Rating: 72VDC +20%.
External Fuse: 16AT (16A slow blow) / min. 100VDC
If motor supply voltage exceeds 90VDC, the drive will go into error state.
– Use 60/75°C copper conductors only
– Conductor Cross-Section 2.5mm2 (AWG14) max Length 4m

X2 Motor Phases

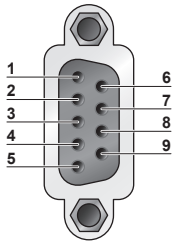


Conductor Cross-Section max.2.5mm² (AWG21 - 14)

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

- Use 60/75°C copper conductors only
- Conductor cross-section: 0.5 – 2.5mm2 (depends on Motor current) / AWG 21 -14

X3 Motor

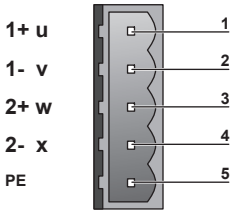


DSUB-9

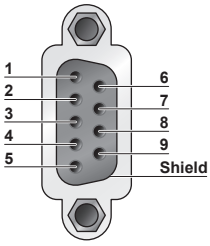
Nr	LinMot Linear Motor
1	Do not connect
2	Do not connect
3	+5VDC
4	Sine
5	Temperature
6	Do not connect
7	Do not connect
8	AGND
9	Cosine
Case	Shield

- 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!

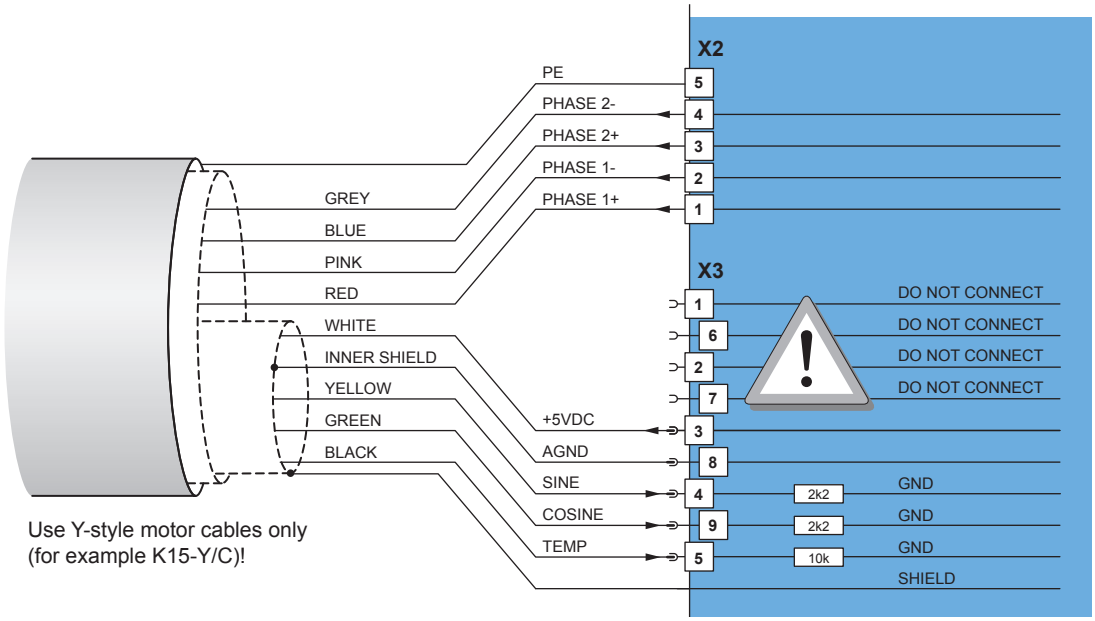
Motor Linear Motor wiring



X2

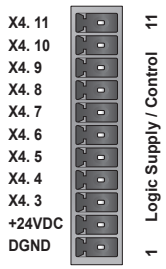


X3: DSUB-9 (f)



Use Y-style motor cables only (for example K15-Y/C)!

X4 Logic Supply / IO Connection

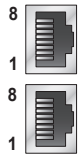


Spring cage connector (has to be ordered separetely)

Nr			
11	AnIn-	X4.11	Configurable Analog Input differential (with X4.10)
10	AnIn+	X4.10	Configurable Analog Input differential (with X4.11)
9	AnIn	X4.9	Configurable Analog Input single ended
8	In	X4.8	Configurable Input
7	In	X4.7	Configurable Input
6	In	X4.6	Configurable Input
5	In	X4.5	Configurable Input
4	Out	X4.4	Configurable Output
3	Out	X4.3	Configurable Output
2	+24VDC	Supply	Logic Supply 22-26 VDC
1	GND	Supply	Ground

Inputs: (X4.5...X4.8)	24V / 5mA (Low Level: –0.5 to 5VDC, High Level: 15 to 30VDC)
Outputs: (X4.3 & 4.4)	24V / max. 100mA, Peak 370mA (will shut down if exceeded)
Analog inputs:	12 bit A/D converted.
X4.9:	Single ended analog input to GND, 0..10V
X4.10/X4.11:	Differential analog input, +/- 10V. Common mode range: +/- 5VDC to GND.
Supply 24V:	typically 500mA / max. 2.5A (if all outputs “on” with max. load.) - Use 60/75°C copper conductors only - Conductor cross-section max. 1.5mm^2 - Stripping length: 10mm

X7 - X8 RS485 / CAN (on GP drives only)

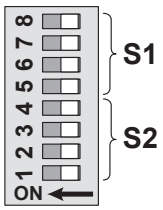


RJ-45

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)

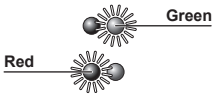
S1 - S2 Adress Selectors (on GP drives only)



S1 (5...8)	Bus ID High (0 … F). Bit 5 is the LSB, bit 8 the MSB.
S2 (1...4)	Bus ID Low (0 … F). Bit 1 is the LSB, bit 4 the MSB

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

RT BUS LEDs



Green	OK
Red	Error

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

S4 Bus Termination (on GP drives only)

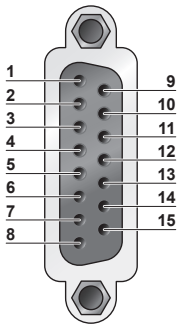
Switch 4	Bootstrap
Switch 3	Termination CAN on/off
Switch 2	Termination RS485 on/off
Switch 2	RS232 (switch “off” / RS485 “on”). Selection for RS232 or RS485

Factory settings: Switch 3 “on”, all other switches “off”

S5 Bus Termination (on EC and PN drives only)

S5	Bootstrap, set to position OFF (Default)

X13 External Position Sensor Commutation Differential Hall Switches

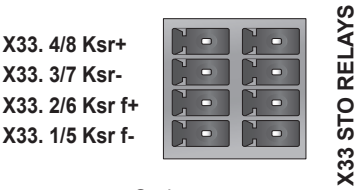


DSUB-15 (f)

Nr		Description			
1		+5V DC			
	9	A+	Encoder		
2		A-	Encoder		
	10	B+	Encoder		
3		B-	Encoder		
	11	Z+	Encoder	SS1	data +
4		Z-	Encoder	SS1	data -
	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)	SS1	Clk +
8		W-	Commutation (Hall Switch)	SS1	Clk -
case		Shield			

Position Encoder Inputs (RS422):	Max. counting frequency: 10 Mcounts/s with quadrature decoding, 100ns edge separation
Differential Hall Switch Inputs (RS422):	Input Frequency: <1kHz
Enc. Alarm In:	5V / 1mA
Sensor Supply:	5VDC, max 100mA

X33 Safety Relays (only for -1S)



Spring cage connector (has to be ordered separetely)

Nr		
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

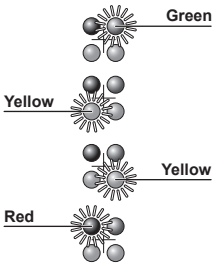
- Use 60/75°C copper conductors only
- Conductor cross section max. 1.5mm2
- Stripping length: 10mm
- Never connect the safety relays to the logic supply of the drive!

X17 - X18 RealTime Ethernet 10/100 Mbit/s (on EC and PN drives only)

RJ-45

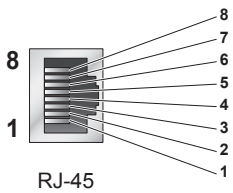
Nr		
X17	RT ETH In	Specification depends on RT-Bus Type. Please refer to according documentation.
X18	RT ETH Out	

LEDs State Display



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

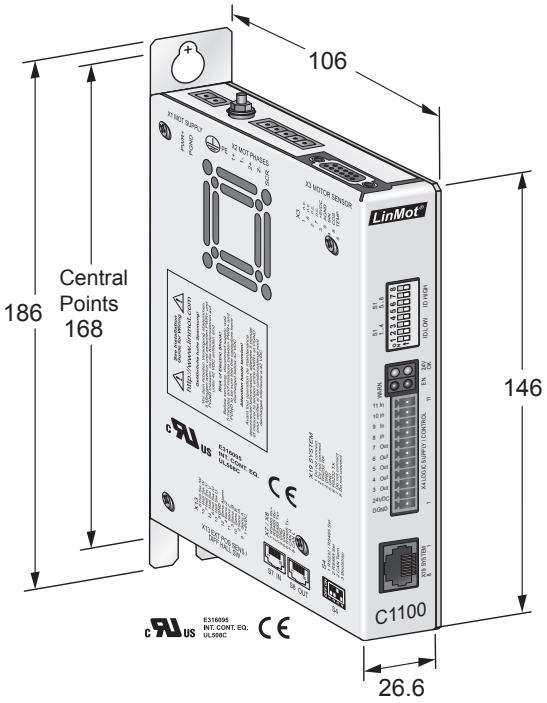
X19 System



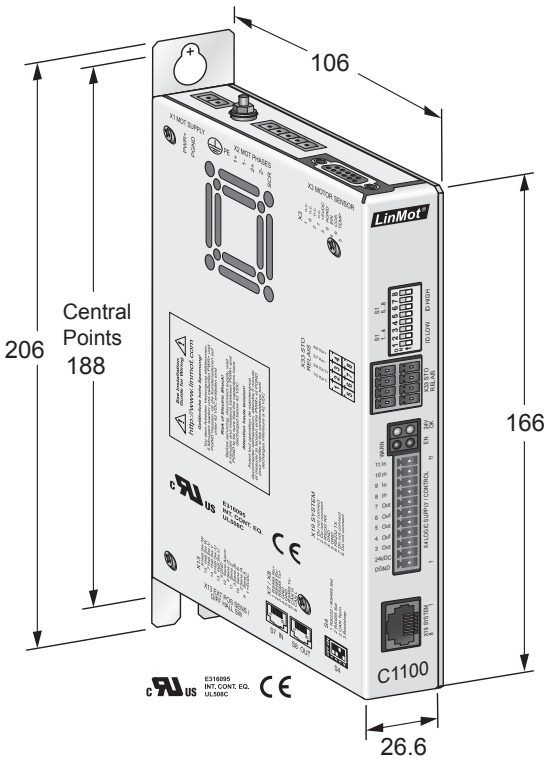
RJ-45

Nr	Description
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 Adapter cable AC01-RJ45/Df-2.5-RS1 (Art.-No. 0150-2143) for Configuration over RS232.



C11x0-...-0S



C11x0-...-1S

Dimensions in mm
Mounting points for M5 screws

servo drives Serie		C11x0-...-0S	C11x0-...-1S
Width	mm (in)	26.6 (1.05)	
Height	mm (in)	146 (5.8)	166 (6.5)
Height without fixings	mm (in)	186 (7.3)	206 (8.1)
Depth	mm (in)	106 (4.2)	
Weight	kg (lb)		
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	90	
Shock resistance (16ms)	-0S Option	-	3.5g
	-1S Option	-	1g
Max. power dissipation	W	30	30
Min. distance between drives	mm (in)		
Without Power Derating:		20 (0.8) left/right / 50 (2) top/bottom	
With Power Derating:		5 (0.2) left/right / 20 (0.8) top/bottom	

Ordering Information

Item	Description	Part Nummber
C1100-GP-XC-0S-000	General Purpose Drive (72VDC/25)	0150-2380
C1150-PN-XC-0S-000	ProfiNet Drive (72V/25A)	0150-2384
C1150-EC-XC-0S-000	EtherCAT Drive (72VDC/25A)	0150-2382
C1150-DS-XC-0S-000	EtherCAT CoE Drive (72VDC/25A)	0150-2417
C1150-SE-XC-0S-000	EtherCAT SoE Drive (72VDC/25A)	0150-2625
C1100-GP-XC-1S-000	General Purpose Drive (72VDC/25), STO	0150-2381
C1150-PN-XC-1S-000	ProfiNet Drive (72V/25A), STO	0150-2385
C1150-EC-XC-1S-000	EtherCAT Drive (72VDC/25A), STO	0150-2383
C1150-DS-XC-1S-000	EtherCAT CoE Drive (72VDC/25A), STO	0150-2418
C1150-SE-XC-1S-000	EtherCAT SoE Drive (72VDC/25A), STO	0150-2626
DC01-C1X00-0S/X1/X4	Drive Connector Set for C1X00-0S	0150-3527
DC01-C1X00-1S/X1/X4/X33	Drive Connector Set for C1X00-1S	0150-3528
DC01-C1X00/X1	Drive Connector for PWR 72VDC Input	0150-3525
DC01-C1X00/X2	Drive Connector Motor Phases	0150-3526
DC01-Signal/X4	Drive Connector 24VDC & Logic	0150-3447
DC01-Safety/X33	Drive Connector Safety	0150-3451
RS232 PC config. Cable 2.5m	For C1100/C1250/E1200/E1400/M8000	0150-2143

Accessories

Item	Description	Part Nummber
SWITCHED MODE POWER SUPPLIES		
S01-72/500	Power Supply 72V/500W, 1x120/230VAC	0150-1874
S01-72/1000	Power Supply 72V/1000W, 3x340-550VAC	0150-1872
TRANSFORMATOR SUPPLIES		
T01-72/420-Multi	T-Supply 420VA, 3x230/400/480VAC	0150-1869
T01-72/900-Multi	T-Supply 900VA, 3x230/400/480 VAC	0150-1870
T01-72/1500-Multi	T-Supply 1500VA, 3x230/400/480 VAC	0150-1871
T01-72/420-1ph	T-Supply 420VA, 1x208/220/230/240VAC	0150-1859
ACCESSORIES FOR SERVO DRIVES		
RS232 PC config. cable 2.5m	for C1100/C1200/E1200/E1400	0150-2143
USB-Serial Converter (isolated)	For C1100, C1200	0150-2473
B01-C1x00 24VDC	control box for C1x00 (incl. cables)	0150-2130
OPTION: EXTERNAL POSITION SENSOR		
MS01-1/D	Linear Encoder 1um, A/B(for incremental strip)	0150-1840
MB01-1000	Magnetic incremental strip, 1mm pitch, per cm	0150-1963
MS01-1/D-SSI	Linear Encoder 1um, SSI absolute (for absolute strip)	0150-2095
MB01-1000-ABS	Magnetic absolute strip, 1mm pitch, per cm	0150-2096

Motor cables

Item	Description	Part Nummber
MOTOR CABLE FOR LINEAR MOTORS R-CONNECTOR		
K05-Y/R-2	motor cable Y/R, 2 m	0150-2421
K05-Y/R-4	motor cable Y/R, 4 m	0150-2422
K05-Y/R-6	motor cable Y/R, 6 m	0150-2423
K05-Y/R-8	motor cable Y/R, 8 m	0150-2424
K05-Y/R-…	motor cable Y/R, custom length	0150-3501
KS05-Y/R-4	trailing chain cable Y/R, 4 m	0150-2433
KS05-Y/R-6	trailing chain cable Y/R, 6 m	0150-2434
KS05-Y/R-8	trailing chain cable Y/R, 8 m	0150-2435
KS05-Y/R-…	trailing chain cable Y/R, custom legth	0150-3507
KR05-Y/R-…	robotic cable Y/R, custom legth	0150-3512
MOTOR CABLE FOR LINEAR MOTORS WITH C-CONNECTOR		
K05-Y/C-2	motor cable Y/C, 2 m	0150-2425
K05-Y/C-4	motor cable Y/C, 4 m	0150-2426
K05-Y/C-6	motor cable Y/C, 6 m	0150-2427
K05-Y/C-8	motor cable Y/C, 8 m	0150-2428
K05-Y/C-…	motor cable Y/C, custom length	0150-3502
K15-Y/C-2	motor cable Y/C, 2 m	0150-2429
K15-Y/C-4	motor cable Y/C, 4 m	0150-2430
K15-Y/C-6	motor cable Y/C, 6 m	0150-2431
K15-Y/C-8	motor cable Y/C, 8 m	0150-2432
K15-Y/C-…	motor cable Y/C, custom length	0150-3506
KS05-Y/C-4	trailing chain cable Y/C, 4 m	0150-2436
KS05-Y/C-6	trailing chain cable Y/C, 6 m	0150-2437
KS05-Y/C-8	trailing chain cable Y/C, 8 m	0150-2438
KS05-Y/C-…	trailing chain cable Y/C, custom length	0150-3508
KS10-Y/C-4	trailing chain cable Y/C, 4 m	0150-2439
KS10-Y/C-6	trailing chain cable Y/C, 6 m	0150-2440
KS10-Y/C-8	trailing chain cable Y/C, 8 m	0150-2441
KS10-Y/C-…	trailing chain cable Y/C, custom length	0150-3511
KR05-Y/C-…	robotic cable Y/C, custom legth	0150-3513
KR10-Y/C-…	robotic cable Y/C, custom legth	0150-3515
MOTOR CABLE FOR SHORT MOTOR P02-23Sx80F-HP-K		
KS03-Y-Fe/K-2	trailing chain cable Y-Fe/K, 2 m	0150-2446
KS03-Y-Fe/K-4	trailing chain cable Y-Fe/K, 4 m	0150-2447
KS03-Y-Fe/K-6	trailing chain cable Y-Fe/K, 6 m	0150-2448
KS03-Y-Fe/K-…	trailing chain cable Y-Fe/K, custom length	0150-3516
MOTOR CABLE FOR SHORT MOTORS P01-37Sx...-HP-N		
KS05-Y/N-2	trailing chain cable Y/N, 2 m	0150-2442
KS05-Y/N-4	trailing chain cable Y/N, 4 m	0150-2443
KS05-Y/N-6	trailing chain cable Y/N, 6 m	0150-2444
KS05-Y/N-8	trailing chain cable Y/N, 8 m	0150-2445
KS05-Y/N-…	trailing chain cable Y/N, custom length	0150-3509
KR05-Y/N-…	robotic cable Y/C, custom legth	0150-3514

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.

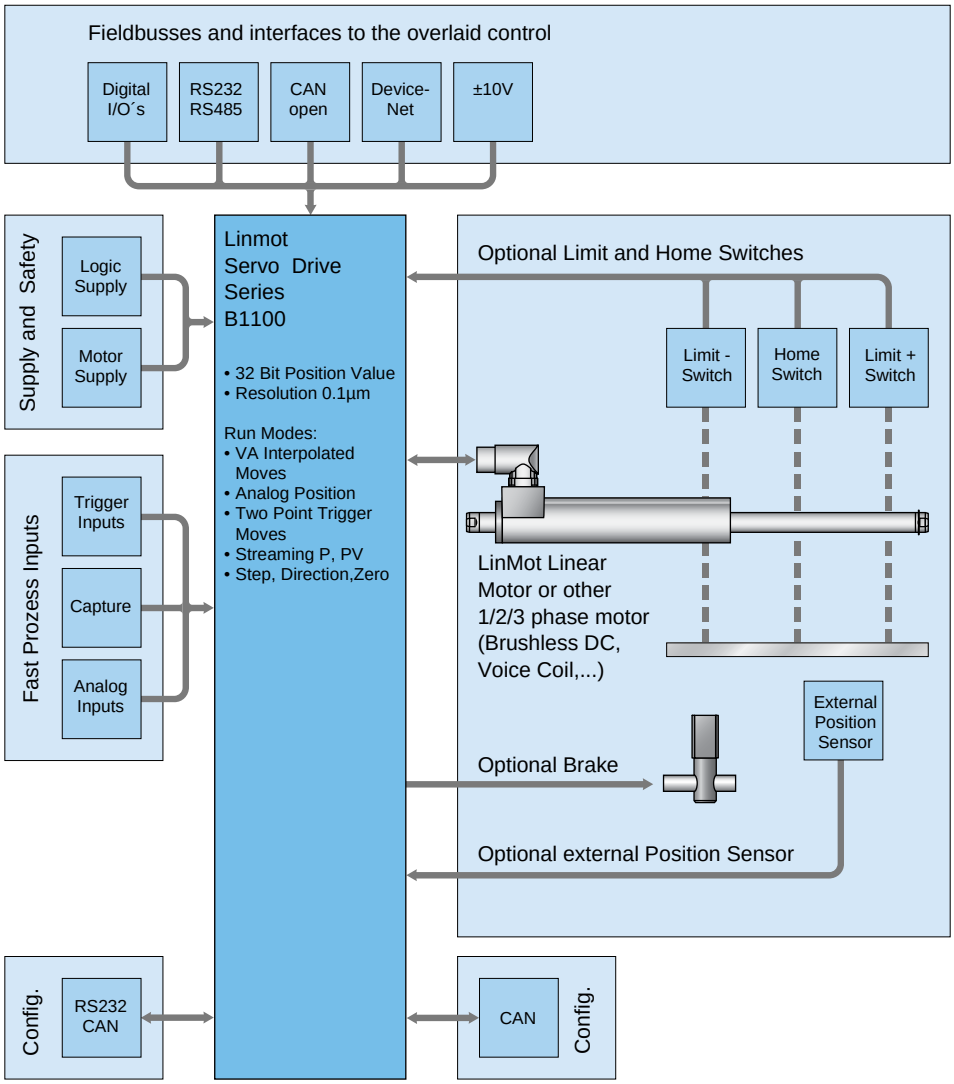
For high-accuracy applications, a freely configurable encoder interface is available. It analyzes the commutation signals from brushless, rotary servomotors as well.

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.



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.

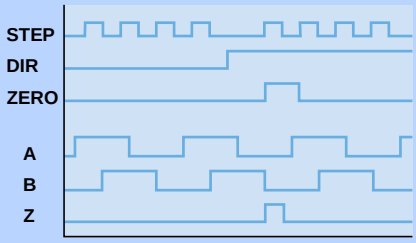
Configuration

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 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.

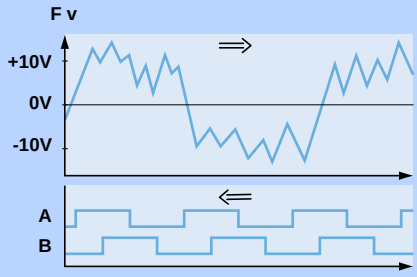
Position Indexing



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

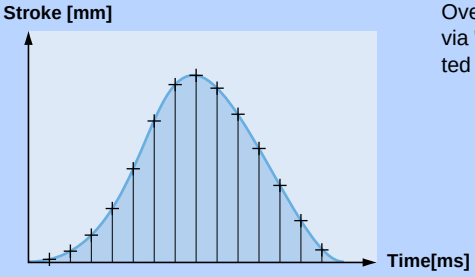
+/- 10V Analog Force / Velocity Control



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

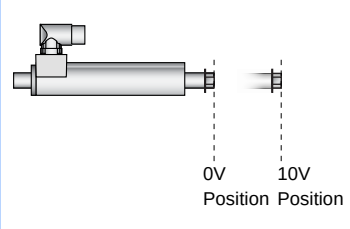
Setpoint Streaming



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

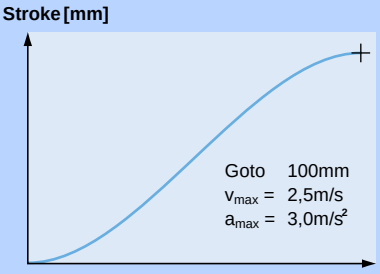
Analog Position



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).

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



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)

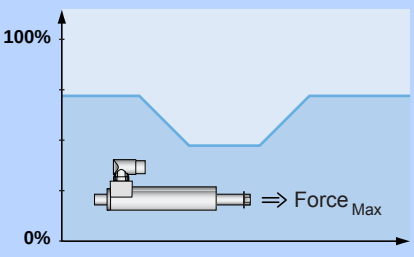
Easy Steps

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



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

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.

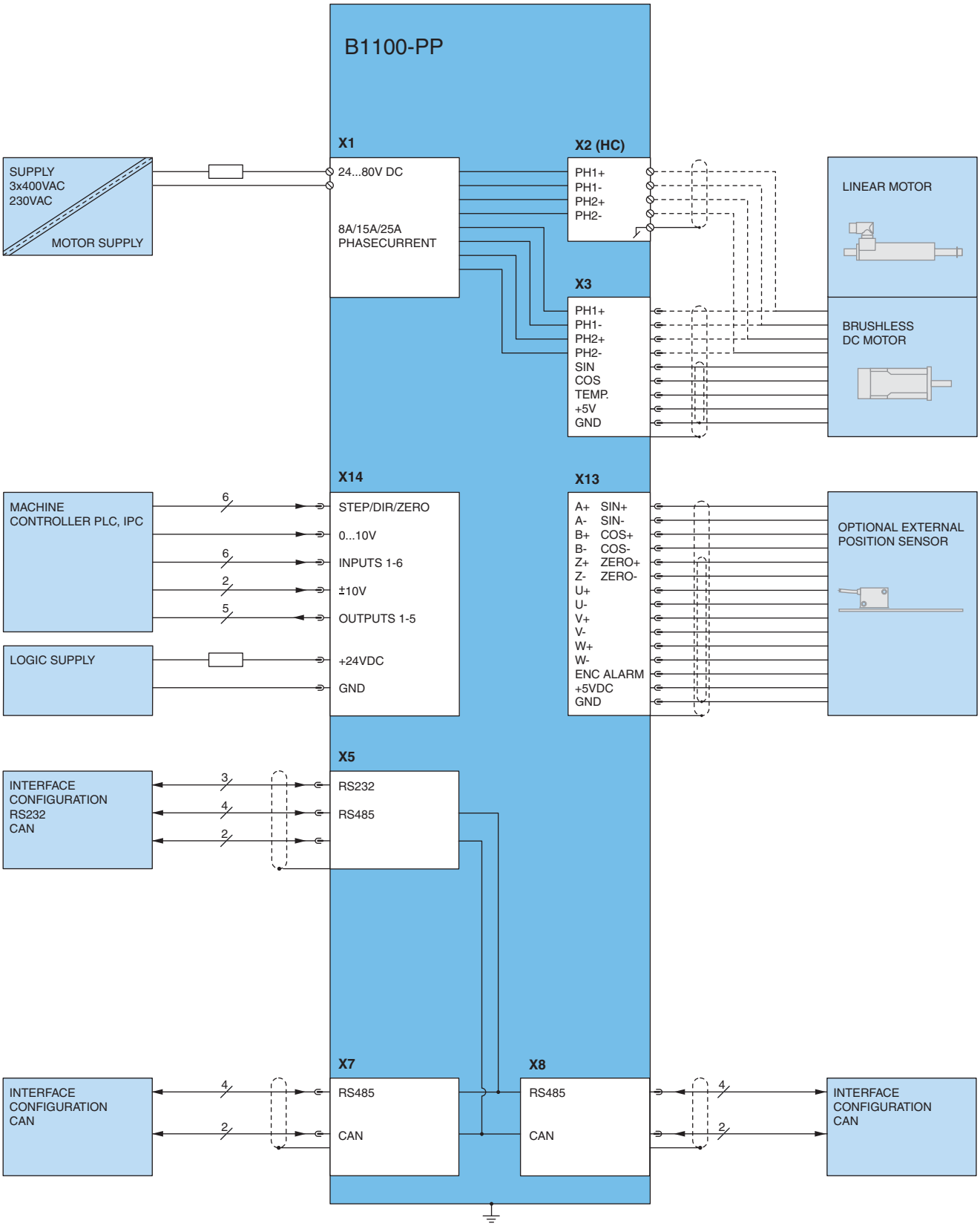
Easy Steps also provide the ability to parameterize internal parameters using two analog inputs. If, for example, the maximum motor current is read at an analog input, then the maximum motor force can be provided as analog for freely programmable joining processes.

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.

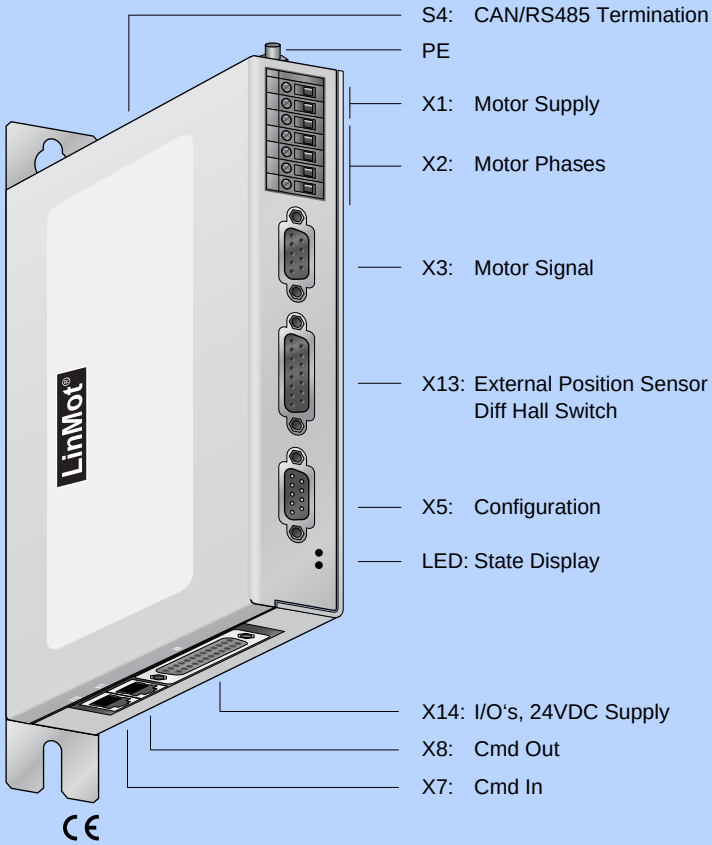


Item	Description	Part Number
B1100-PP	Point to Point Drive (72V/8A)	0150-1735
B1100-PP-HC	Point to Point Drive (72V/15A)	0150-1736
B1100-PP-XC	Point to Point Drive (72V/25A)	0150-1740

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

- ✓ 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

±10V Force Velocity STEP DIRECTION Point to Point



±10V 10V Force or Velocity Control,

The B1100-VF servo amplifier allows LinMot 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.

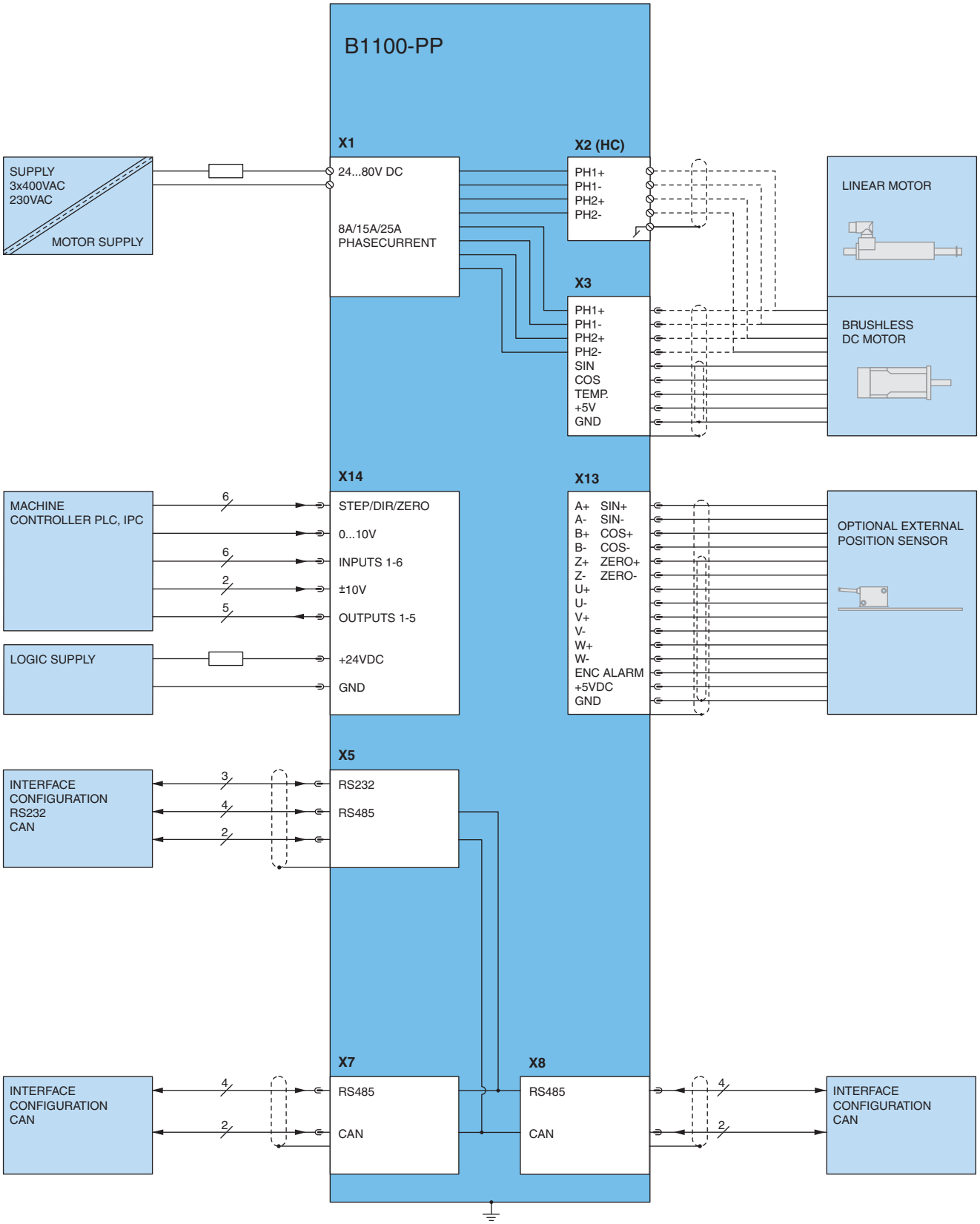
Encoder Simulation

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.



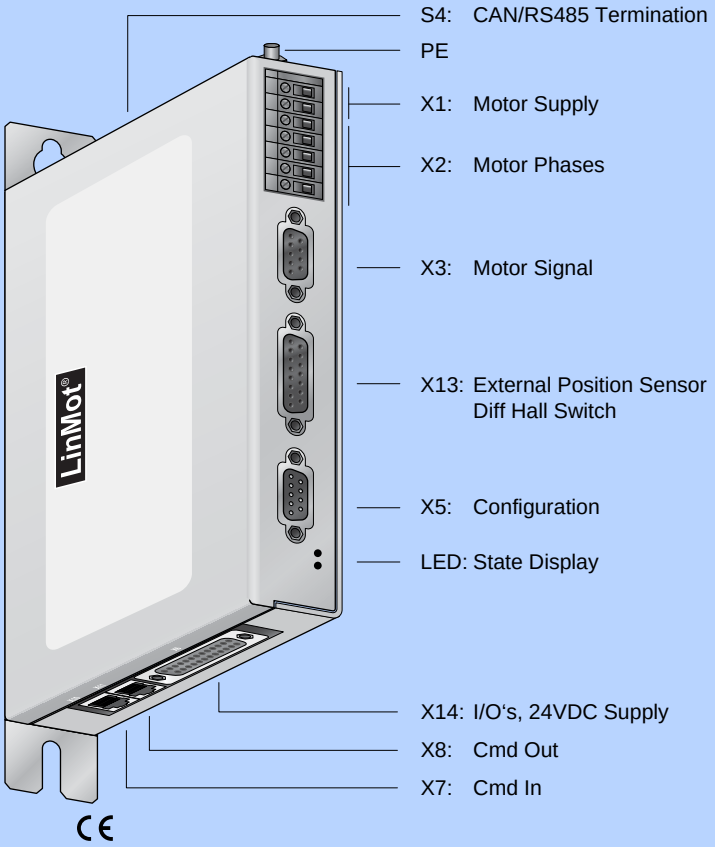
Item	Description	Part Number
B1100-VF	Force Velocity Drive (72V/4A)	0150-1685
B1100-VF-HC	Force Velocity Drive (72V/15A)	0150-1686
B1100-VF-XC	Force Velocity Drive (72V/25A)	0150-1739

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 | CANopen | DeviceNet

±10V Force Velocity | STEP DIRECTION | Point to Point



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:

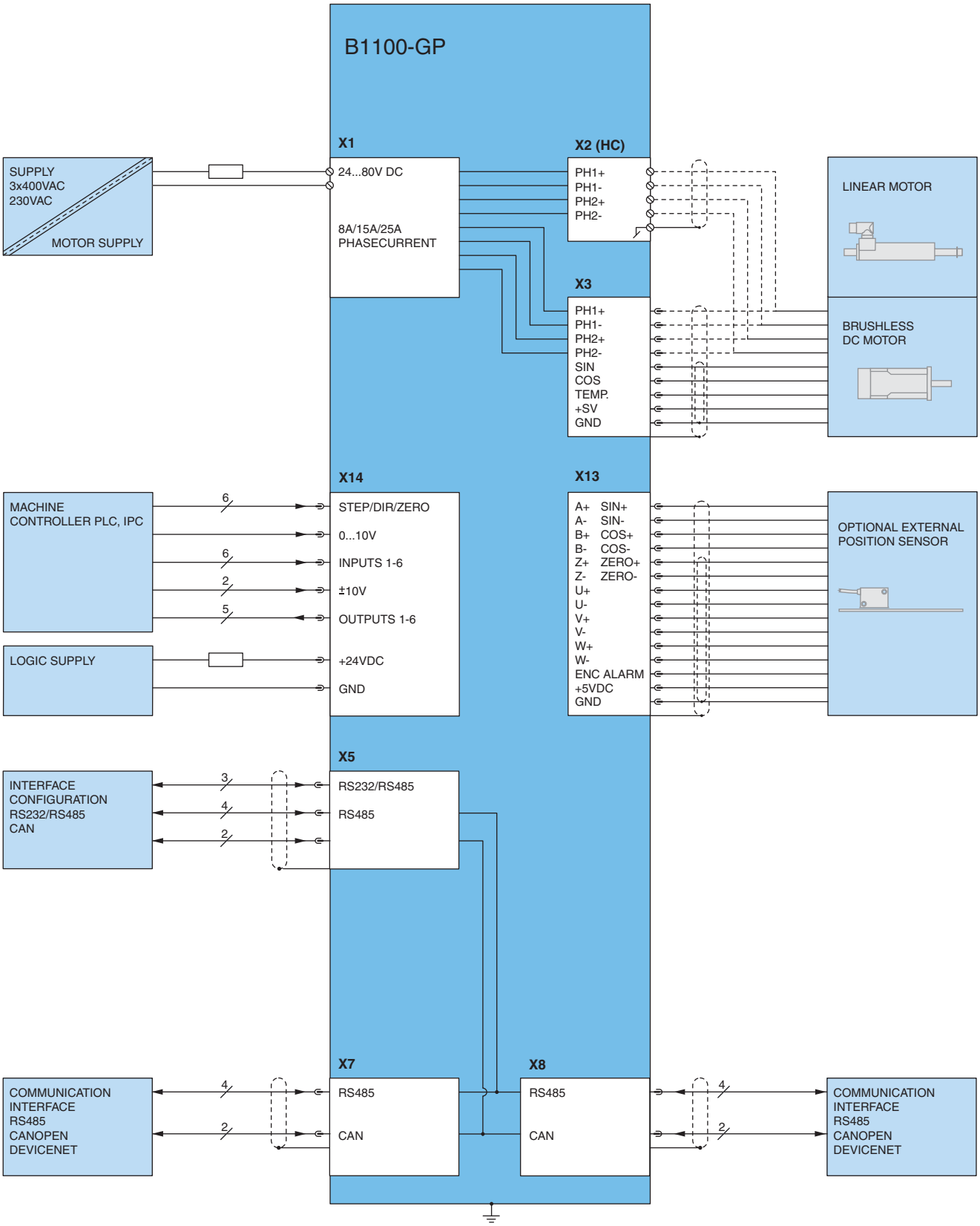
- NMT Error Control (Nodeguarding Protocol or HeartBeat Protocol)
- PDO (Transmission type 254 and 1)
- SDO Upload and Download
- NMT (Start, Stop, Enter PreOp, Reset Node, Reset Communication) Boot-Up Message

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.

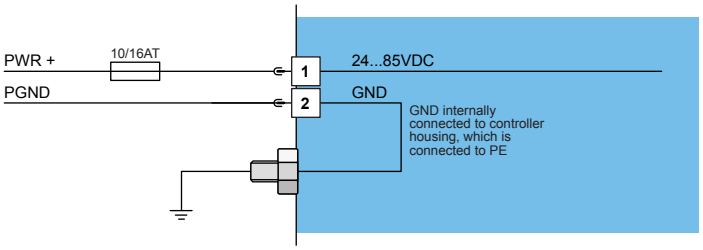
B1100-GP are UCMM Group 3-capable slaves, and support polled IO runtime data transfer.



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

X1 Motor Supply

Screw Terminals
2.5 mm² (AWG14)



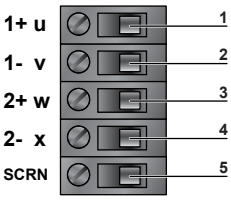
Motor Supply:

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

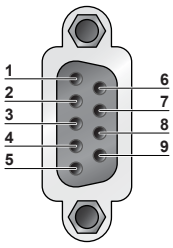


Screw Terminals
1.5-2.5mm²
(AWG16-14)

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

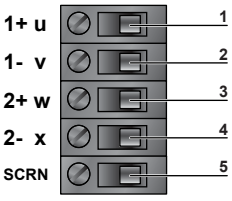


DSUB-9

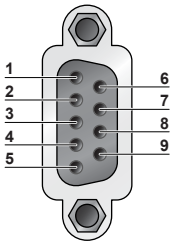
Nr	LinMot Linear Motor	3-Phase-Motor
1	Motor Phase 1+	Motor Phase U
2	Motor Phase 2+	Motor Phase W
3	+5VDC	
4	Sine	Hall U
5	Temperature	Hall W
6	Motor Phase 1-	Motor Phase V
7	Motor Phase 2-	
8	AGND	
9	Cosine	Hall V
Case	Shield	

- Use 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

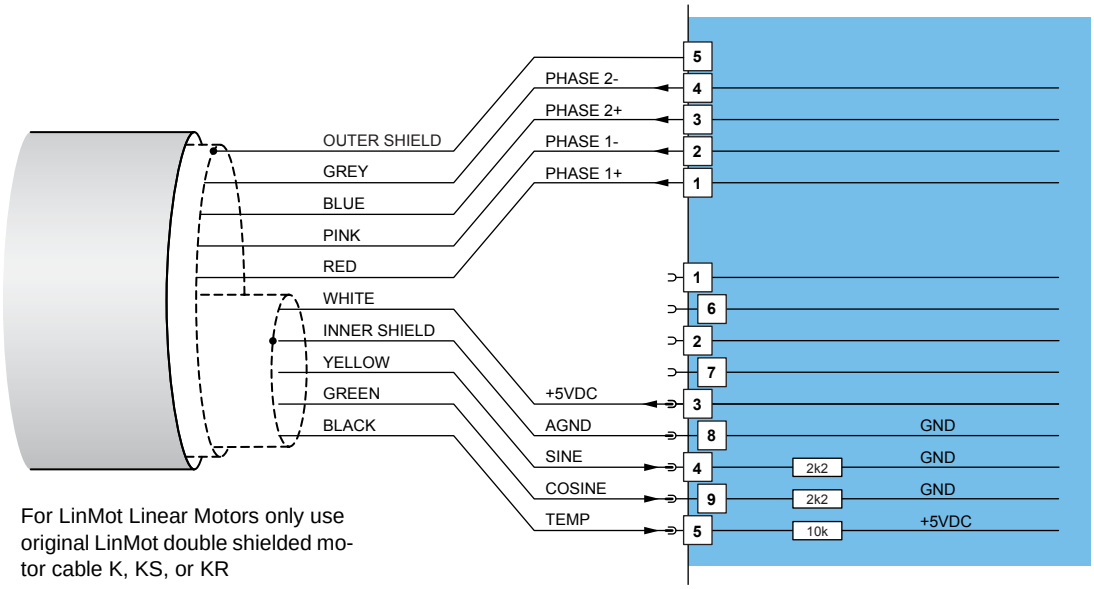
Motor | Motor wiring



X2: Screw Terminals

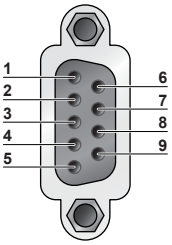


X3: DSUB-9 (f)

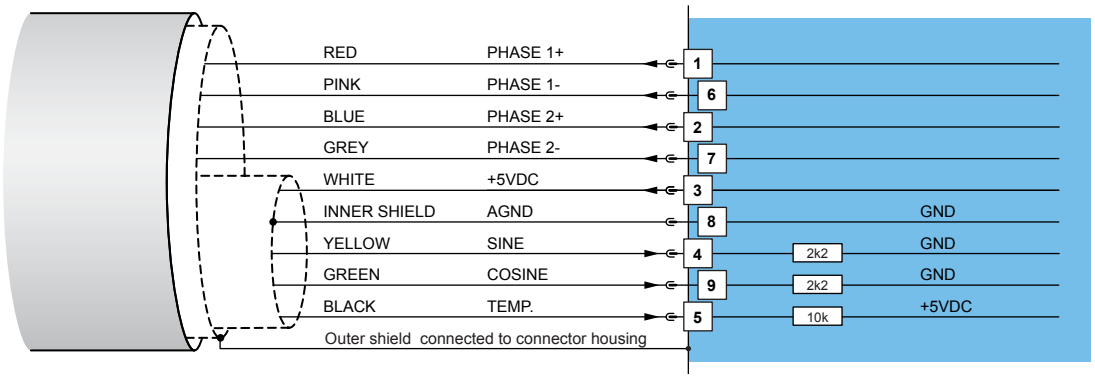


For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR

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



X3: DSUB-9 (f)

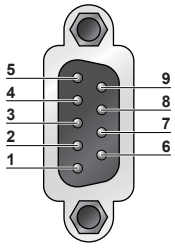


For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR

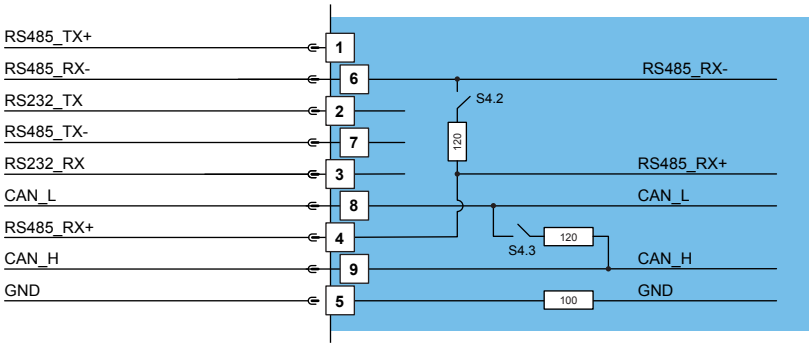
S4 | Bus Termination

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



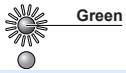
X5: DSUB-9 (m)



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

LED | State Display

Green:

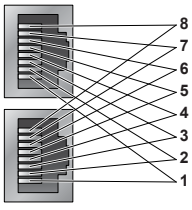


24VDC Logic Supply OK

Red:

State: Error
Blinking: Fatal Error

X7-X8 | RS485/CAN

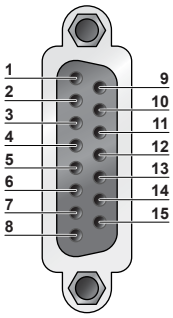


RJ-45

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

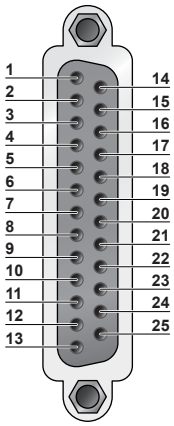
Encoder Simulated Outputs:RS422, Max Output Frequency: 2.5MHz, 5 M counts/s with quadrature decoding, 200ns edge separation

Differential Hall Switch Inputs: RS422, Max Input Frequency: <1kHz

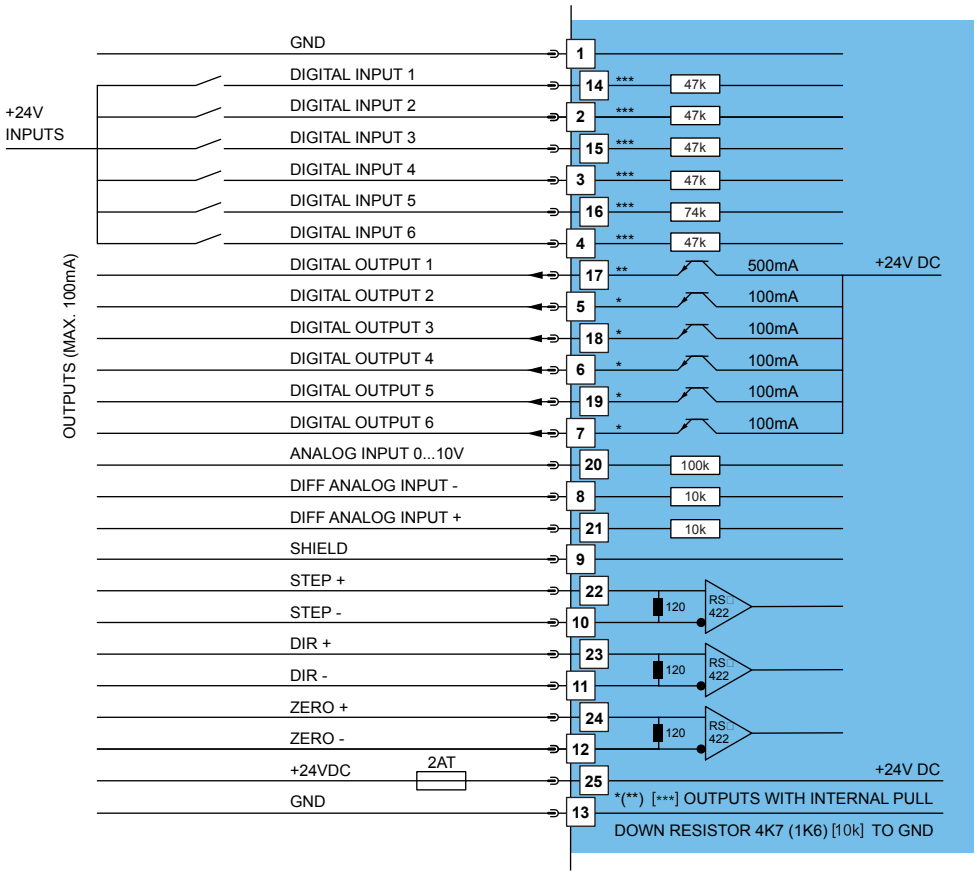
Enc. Alarm In: 5V / 1mA

Sensor Supply: 5VDC, max 100mA

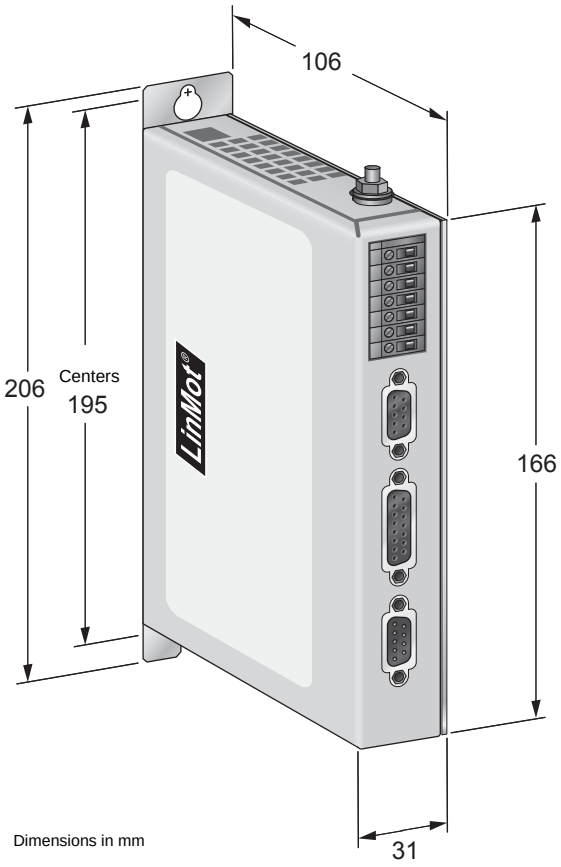
X14 | Digital I/O



X14: DSUB-25 (f)



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	



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 534

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

Servo Drive E1100

Servo Drive E1100

Series E1100 Servo Drives are modular axis drives, with 32-bit position resolution and an integrated 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 interface, 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 encoder simulation.

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.

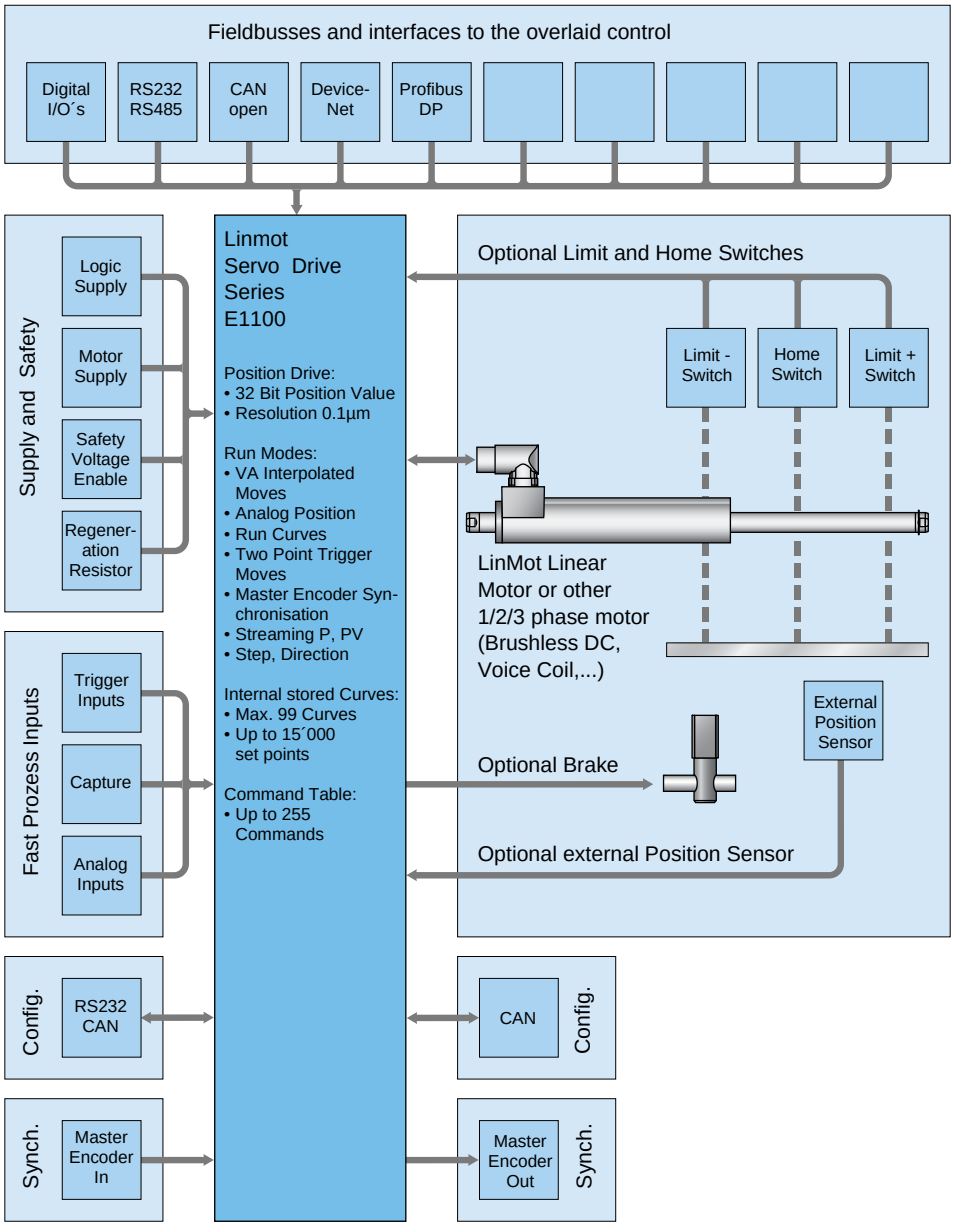
The safe pulse inhibitor on Servo Drive with fieldbus interfaces allows safe stoppage of the drives via control signals, per EN 954-1, without interrupting the power supply.

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 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 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.

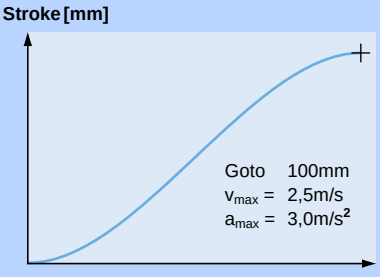
Configuration

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 online 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.

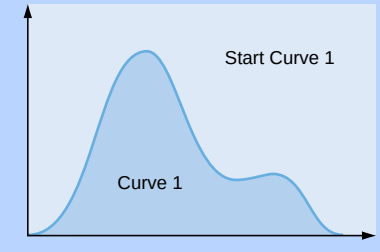
Interpolated Moves



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/s² (32Bit)

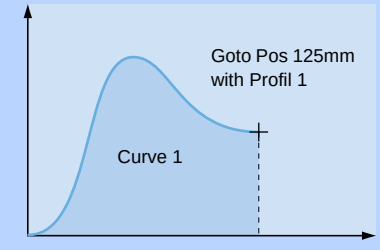
Time Curves



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

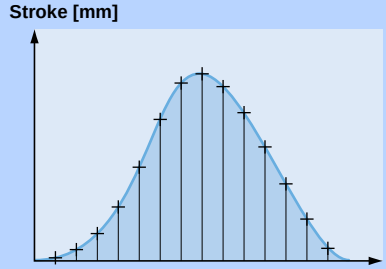
Profiled Moves



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



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

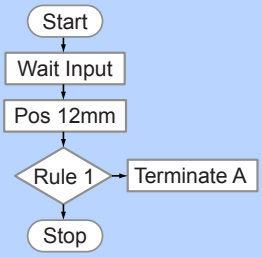
Easy Steps

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

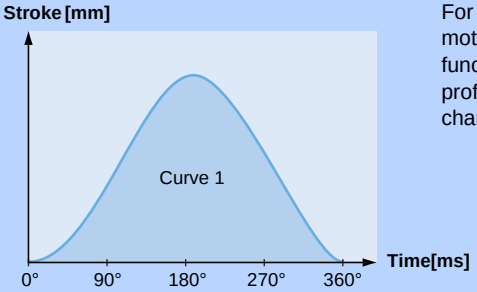
Command Table



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

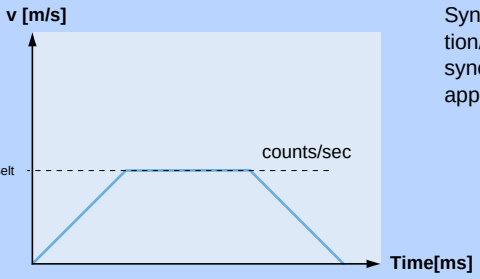
Master Encoder Synchronization (MT)



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

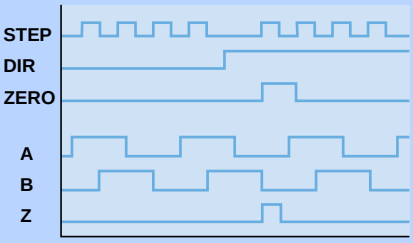
Belt Synchronization



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

Position Indexing

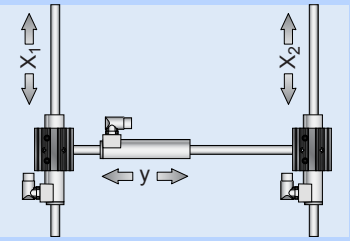


In position indexing, the linear motor is controlled like a stepper motor, using Step/Dir/Zero, or A/B/Z signals. The step distance is freely programmable from 1.5x10-6µm to 3.275mm./ step. The input signal can be used directly as the target position, or it can be filtered by the VA interpolator.

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

Master-Booster Synchronisation

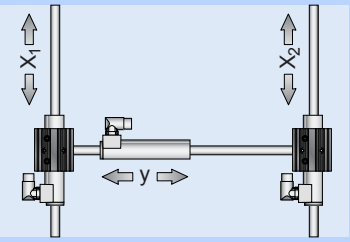


Using master-slave synchronization, two linear motors can be synchronized via a serial communications connection between two drives, so that the overlaid drive can control them as a single axis.

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

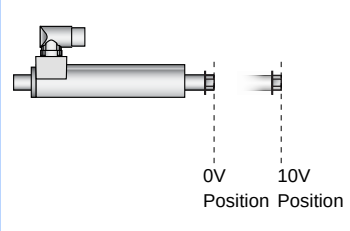
Master-Gantry Synchronisation



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.

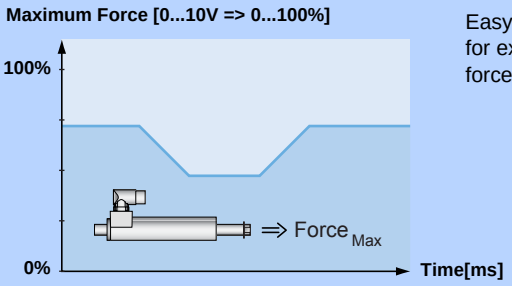
Analog Position



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

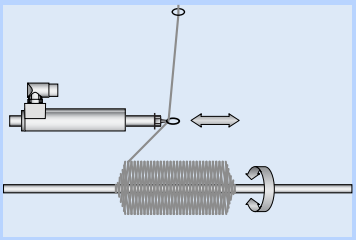
Easy Steps Parameter Scale



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.

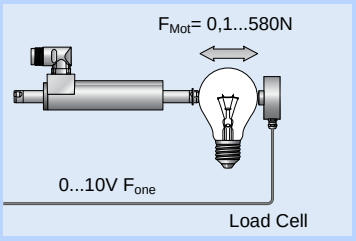
Inputs:	2 x Analog (X4.4, X4.7)
Voltage range:	0-10VDC
Resolution:	10 Bit
Resolution	330µsec

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



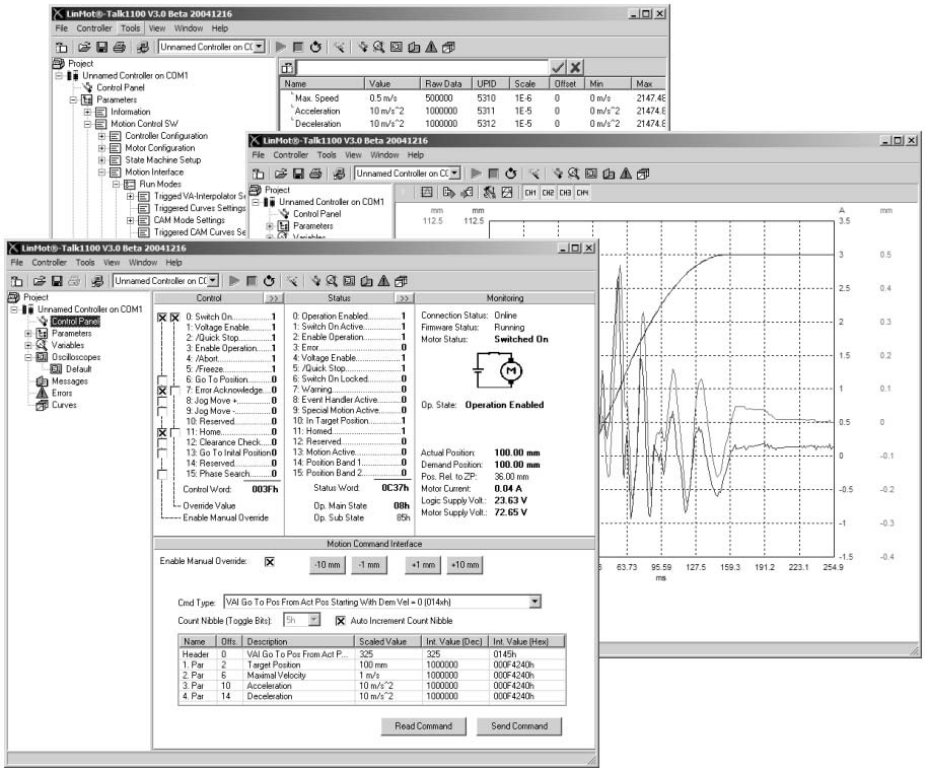
Using the Force Control technology function, precise joining processes can be implemented reliably and reproducibly with high-precision force control. For force control, the current motor force is measured with a load cell and controlled in the drive. Joining process or quality checks with high requirements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

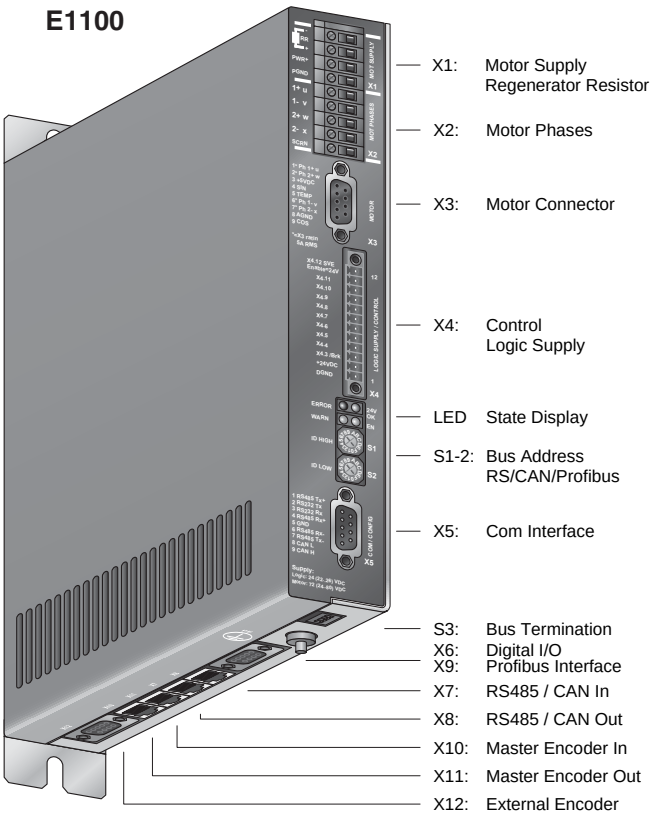
The integrated 8-channel oscilloscope helps the user during start-up and optimization of the drive system. Internal variables, such as the target and actual position, can be shown in real time on the screen, and then printed out. The displayed data can be stored in CSV format for further processing in 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-RS	E1100-CO	E1100-DN	E1100-DP	E1100-GP
	Interfaces						
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-RS-HC
E1100-RS-XC

E1100-DN
E1100-DN-HC
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

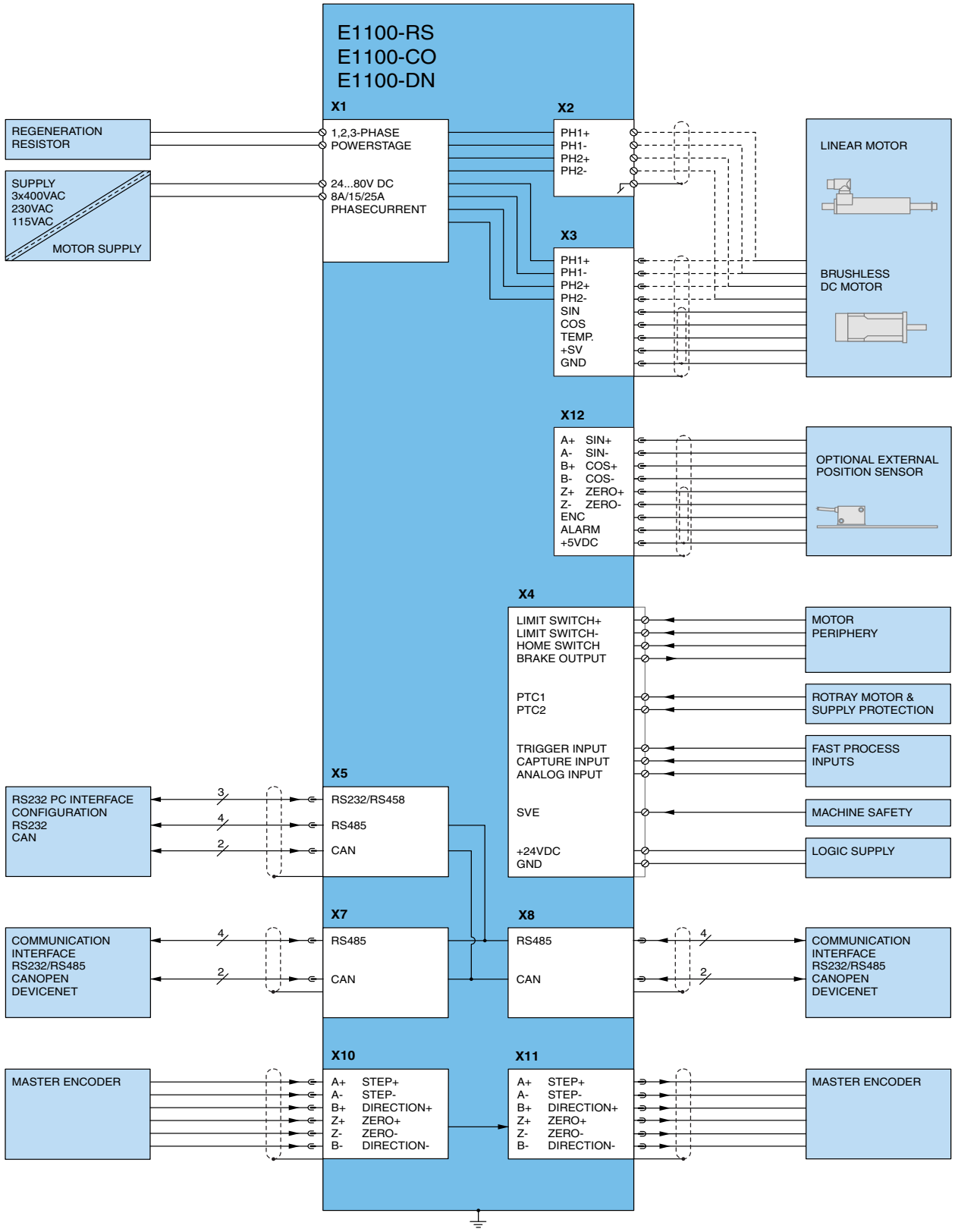
The following protocols are supported by the CO drives:
- NMT Error Control (Nodeguarding Protocol or HeartBeat Protocol)
- PDO (Transmission type 254 and 1)
- SDO Upload and Download - NMT (Start, Stop, Enter PreOp, Reset Node, Reset Communication)
- Boot-Up Message

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

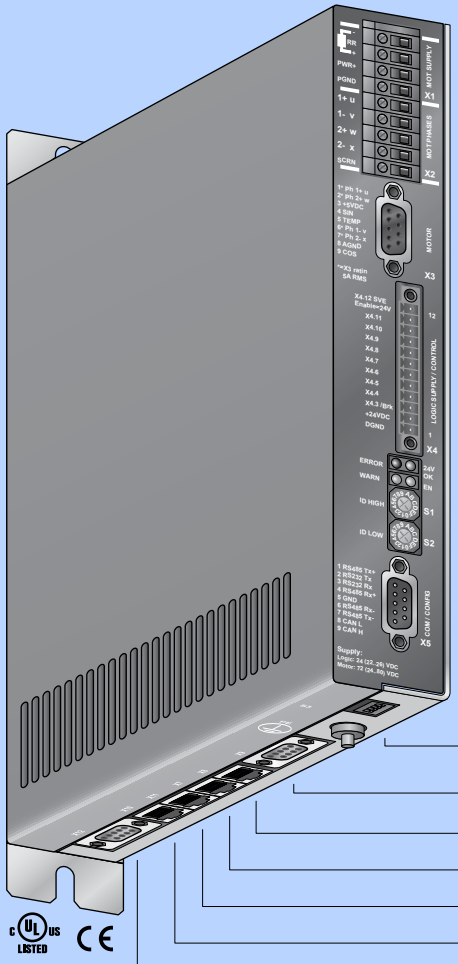


Item	Description	Part Number
E1100-RS	RS232/485 Drive (72V/8A)	0150-1677
E1100-RS-HC	RS232/485 Drive (72V/15A)	0150-1678
E1100-RS-XC	RS232/485 Drive (72V/25A)	0150-1862
E1100-CO	CANopen Drive (72V/8A)	0150-1681
E1100-CO-HC	CANopen Drive (72V/15A)	0150-1682
E1100-CO-XC	CANopen Drive (72V/25A)	0150-1683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

- 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

PROFIBUS RS232 RS485 CANopen DeviceNet



Profibus DP

DP Servo Drives feature an integrated PROFIBUS-DP interface. PROFIBUS-DP provides the user with a standardized field-bus 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.

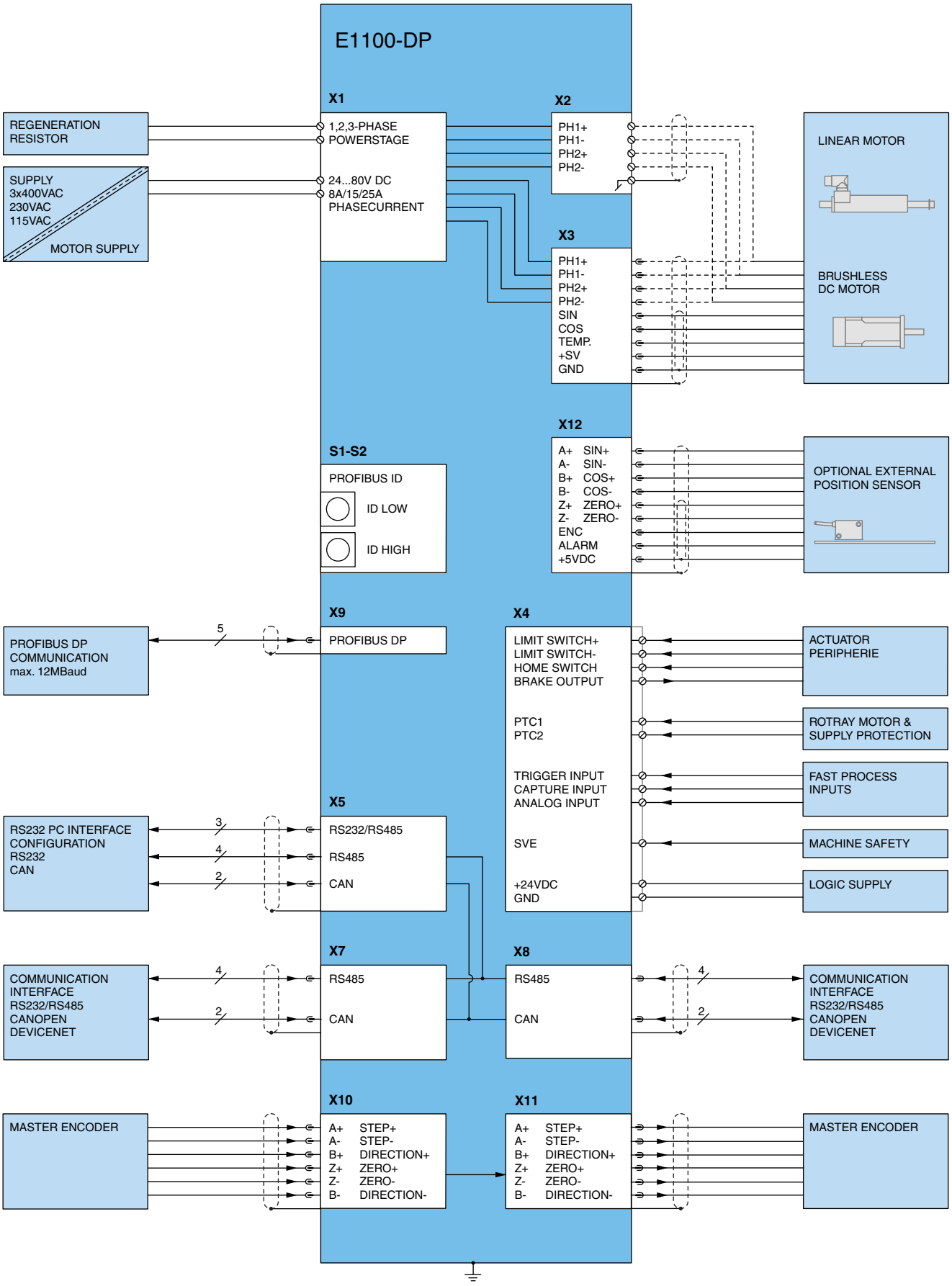
A GSD device master file is provided for open planning in conformance with the PROFIBUS-DP standard.

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).

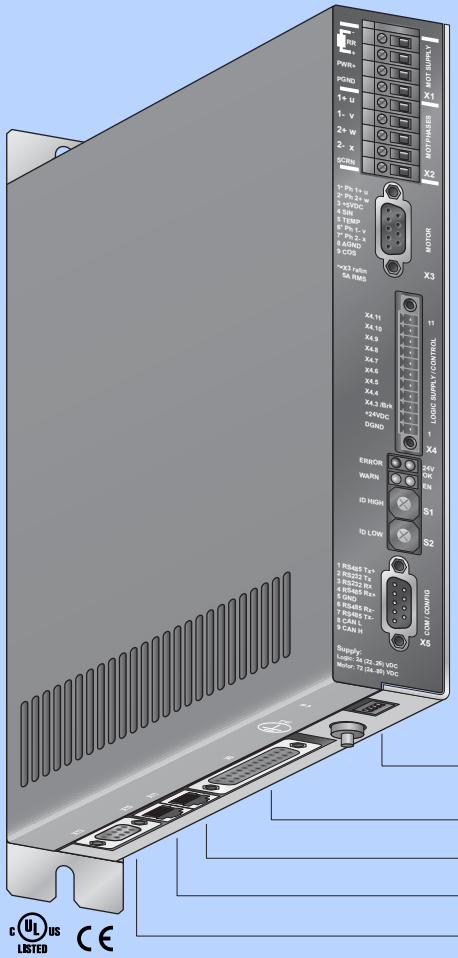


Item	Description	Part Number
E1130-DP	Profibus DP Drive, (72V/8A)	0150-1667
E1130-DP-HC	Profibus DP Drive, (72V/15A)	0150-1668
E1130-DP-XC	Profibus DP Drive, (72V/25A)	0150-1861

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

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



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

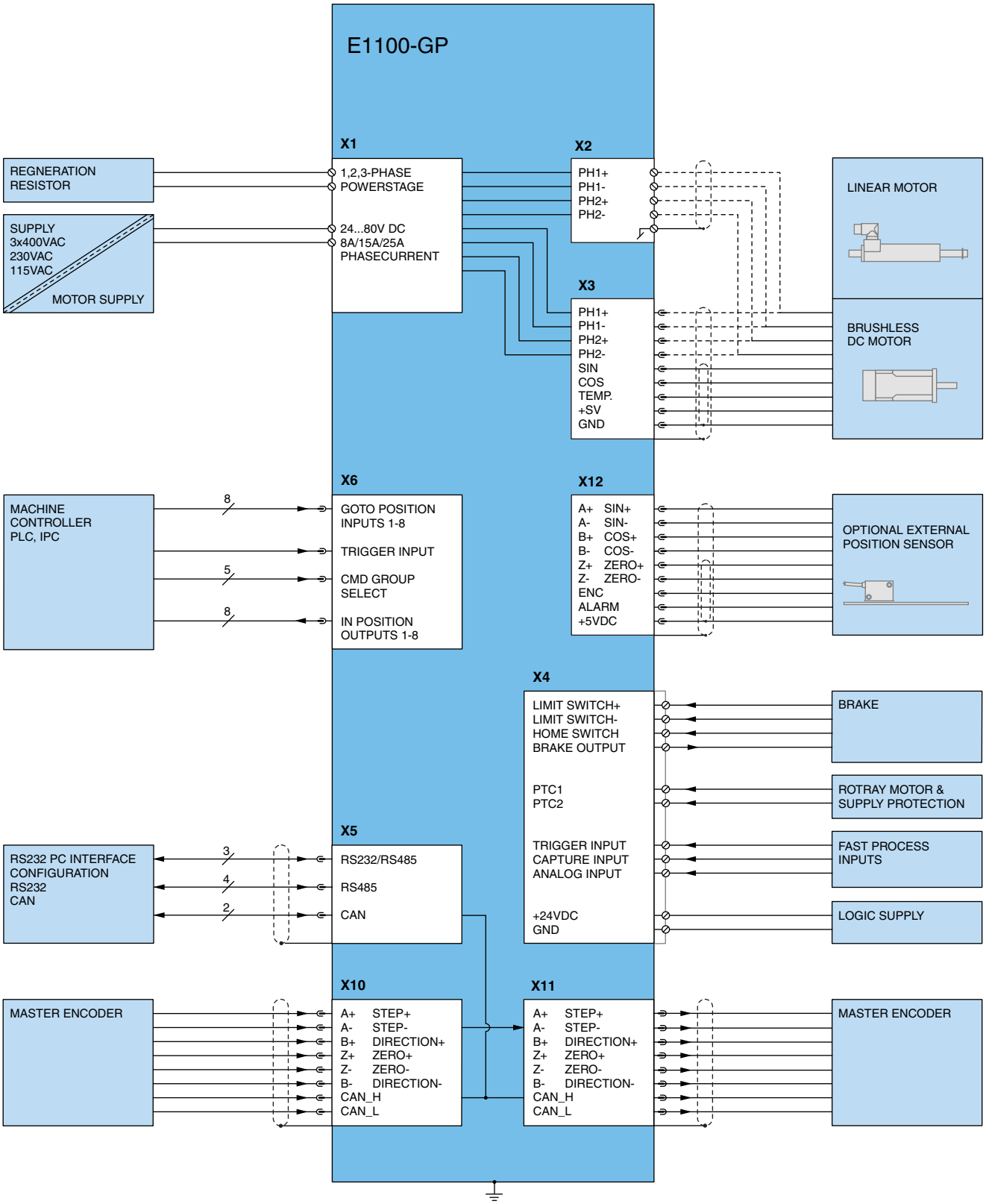
All functions of the drives listed above, except for safe pulse inhibitors (X4.12) are available in the Series E1100-GP Servo Drives.

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

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

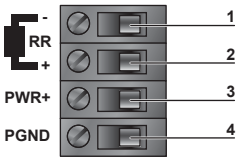
In addition to actuation via serial interfaces and fieldbusses, Series E1100-GP drives can use direct addressing of up to 256 commands in the Command Table, via 8 digital inputs (X6).

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

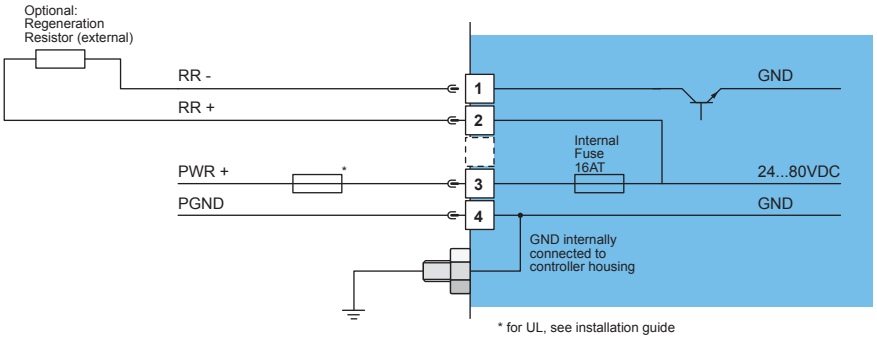


Item	Description	Part Number
E1100-GP	General Pupose (72V/8A)	0150-1665
E1100-GP-HC	General Pupose (72V/15A)	0150-1666
E1100-GP-XC	General Pupose (72V/25A)	0150-1864

X1 Motor Supply / Regeneration Resistor



Screw Terminals
2.5 mm² (AWG14)

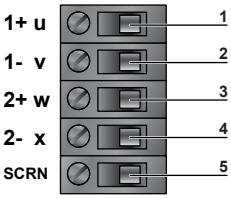


Motor Supply:

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

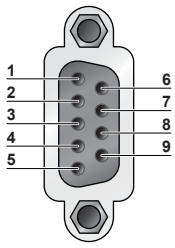


Screw Terminals
1.5-2.5mm²
(AWG16-14)

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

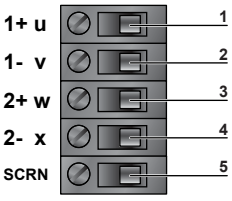


DSUB-9

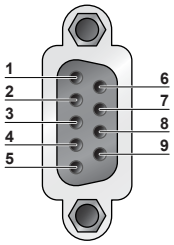
Nr	LinMot Linear Motor	3-Phase-Motor
1	Motor Phase 1+	Motor Phase U
2	Motor Phase 2+	Motor Phase W
3	+5VDC	
4	Sine	Hall U
5	Temperature	Hall W
6	Motor Phase 1-	Motor Phase V
7	Motor Phase 2-	
8	AGND	
9	Cosine	Hall V
Case	Shield	

- 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!

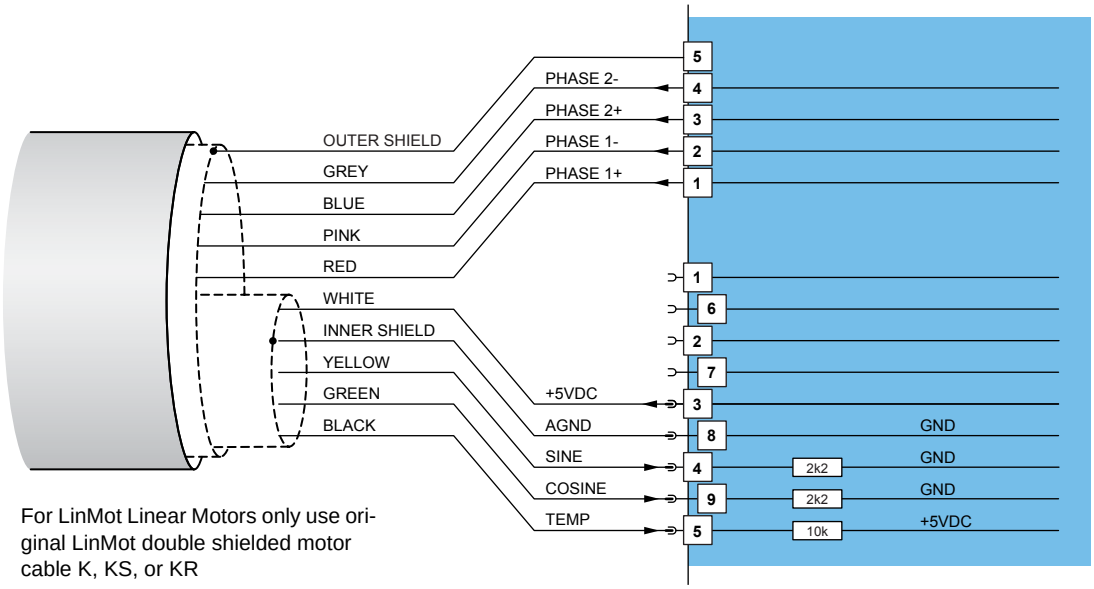
Motor | Motor wiring



X2: Screw Terminals

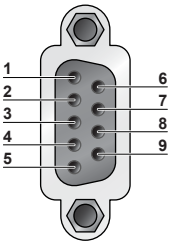


X3: DSUB-9 (f)

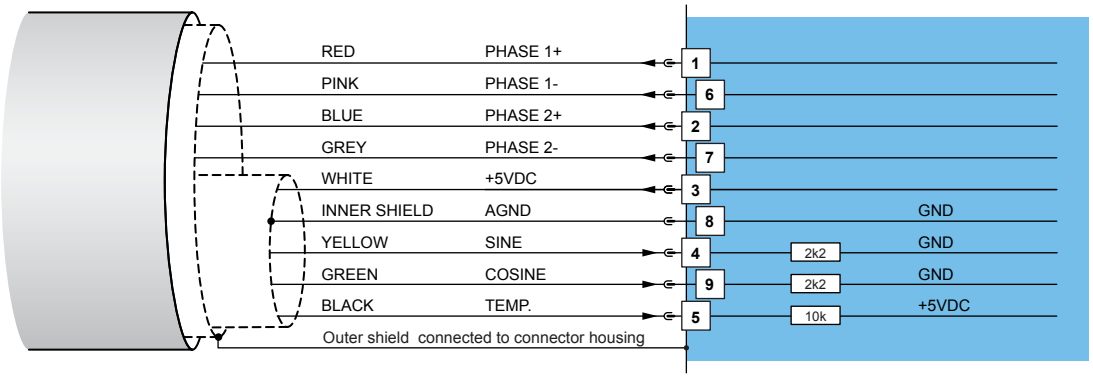


For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR

Motor | Motor wiring for phase current below 5Arms and below 7.5Apeak



X3: DSUB-9 (f)



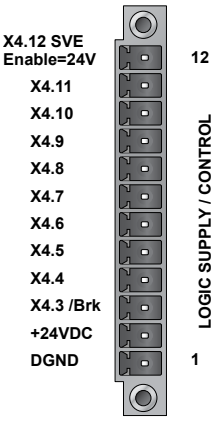
For LinMot Linear Motors only use original LinMot double shielded motor cable K, KS, or KR

S1-3 | Address Selectors / Bus Termination

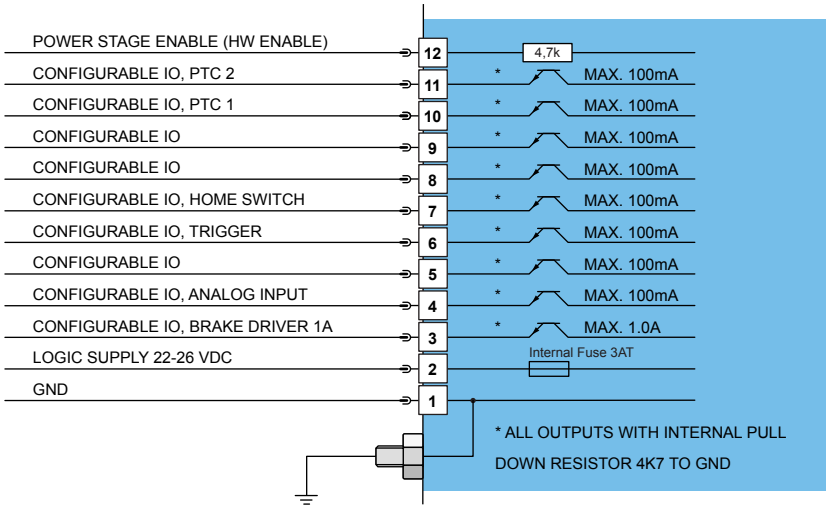
Switch		
S1	Bus ID High (0…F)	HEX-Switches for Bus ID address range 0.255
S2	Bus ID Low(0…F)	

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”

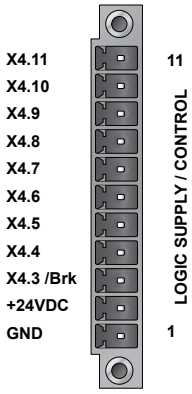
X4: 12pin | Control / Supply E1130-DP, E1100-CO, E1100-DN, E1100-RS



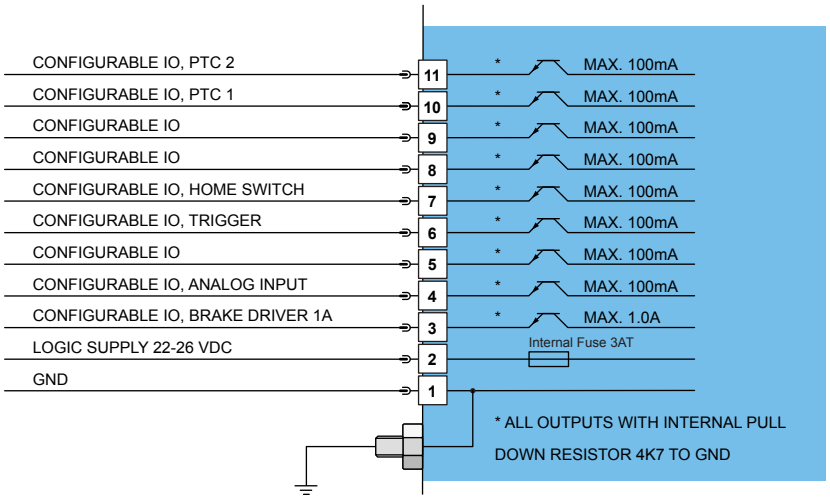
Phoenix MC1,5/12-STF-3,5
0.25-1.5mm² (AWG24-16)



X4: 11pin | Control / Supply E1100-GP



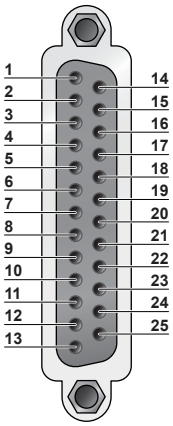
Phoenix MC1,5/11-STF-3,5
0.25-1.5mm² (AWG24-16)



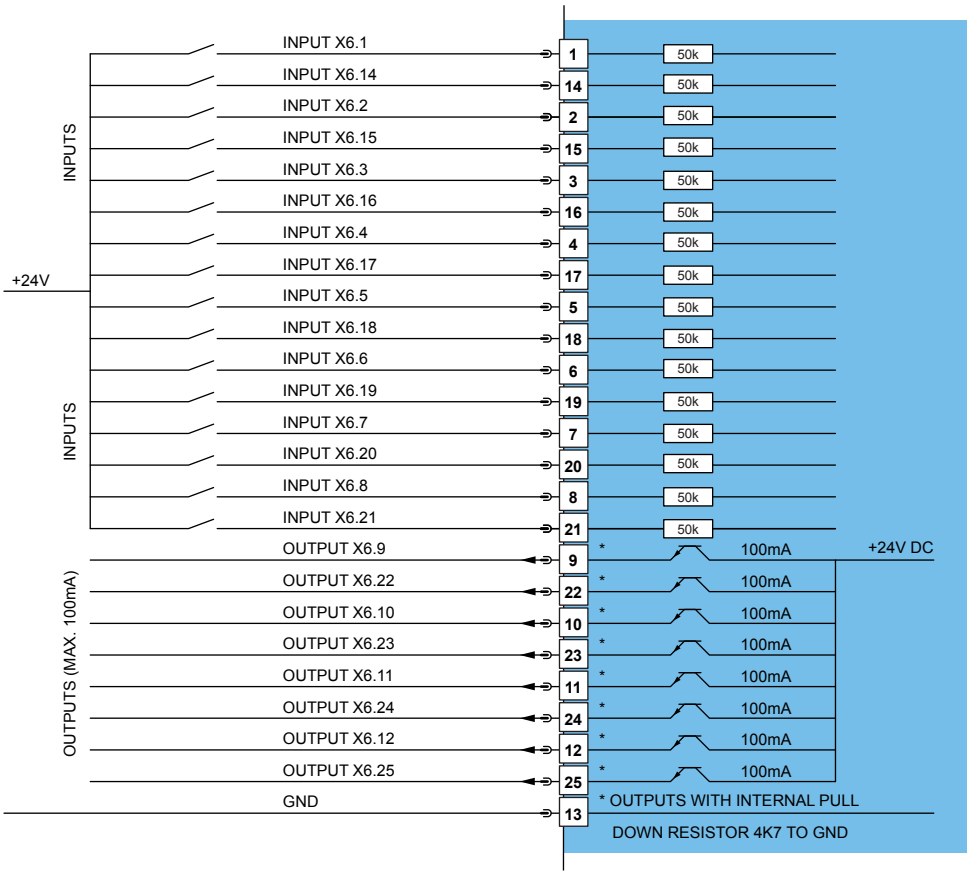
No		Description	
12	Input	Safety Voltage Enable	Power Stage Enable (HW Enable)
11	I/O	X4.11	Configurable IO, PTC 2
10	I/O	X4.10	Configurable IO, PTC 1
9	I/O	X4.9	Configurable IO
8	I/O	X4.8	Configurable IO
7	I/O	X4.7	Configurable IO, Home Switch
6	I/O	X4.6	Configurable IO, Trigger
5	I/O	X4.5	Configurable 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



X6: DSUB-25 (f)



All Inputs: Direct interfacing to digital 24VDC PLC outputs.

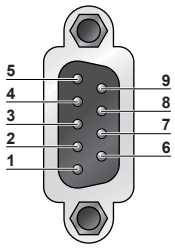
Input current:	1mA
low level:	-0.5…5VDC
high level:	15…30VDC
Sample rate:	625µs

All Outputs: Short circuit and overload protected high side switches

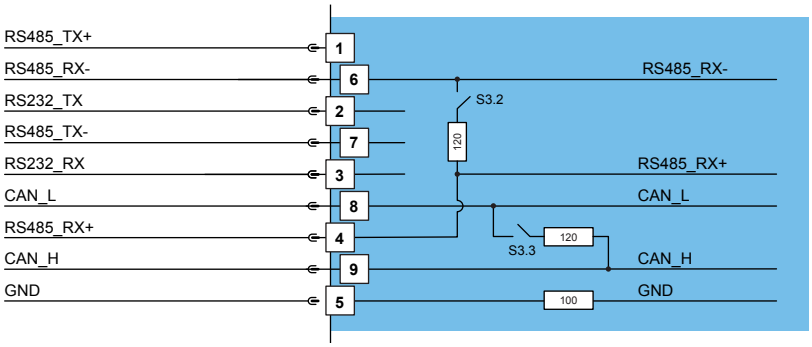
Voltage:	24VDC
Max. current:	100mA
High Level:	15…30VDC
Update rate:	625µs

Outputs may directly drive inductive loads

X5 COM | COM Interface



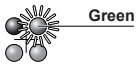
X5: DSUB-9 (m)



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

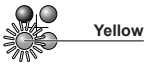
LED | State Display

Green:



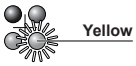
24VDC Logic Supply OK

Stat A Yellow:



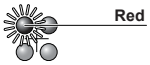
Motor Enabled

Stat B Yelllow:



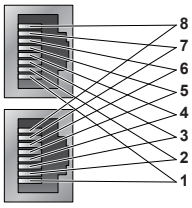
Warning

Red:



Error

X7-X8 | RS485/CAN

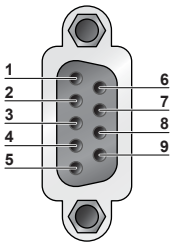


RJ-45

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

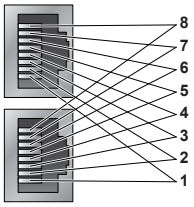


DSUB-9

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)



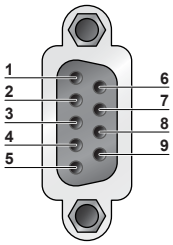
RJ-45

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)

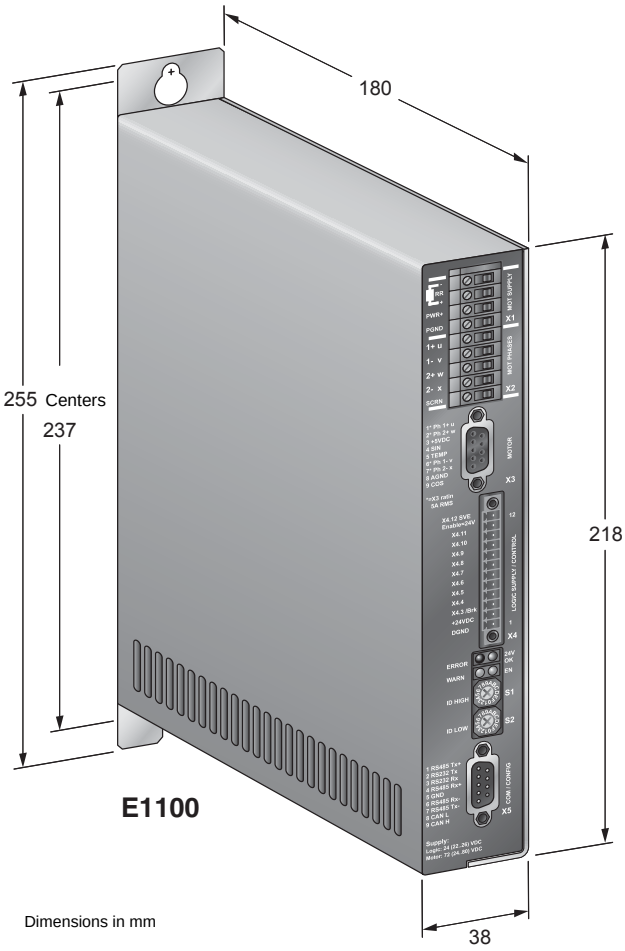
X12 External Positions Sensor



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



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 50	(0.8) left/right (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 532

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