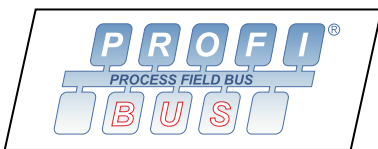
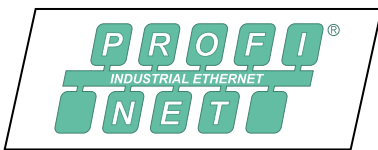


NEW

LinMot®

Servo Controller Series E1200



Servo Controller E1200

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

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



Connection to Machine Controller

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

Process and Safety Interfaces

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

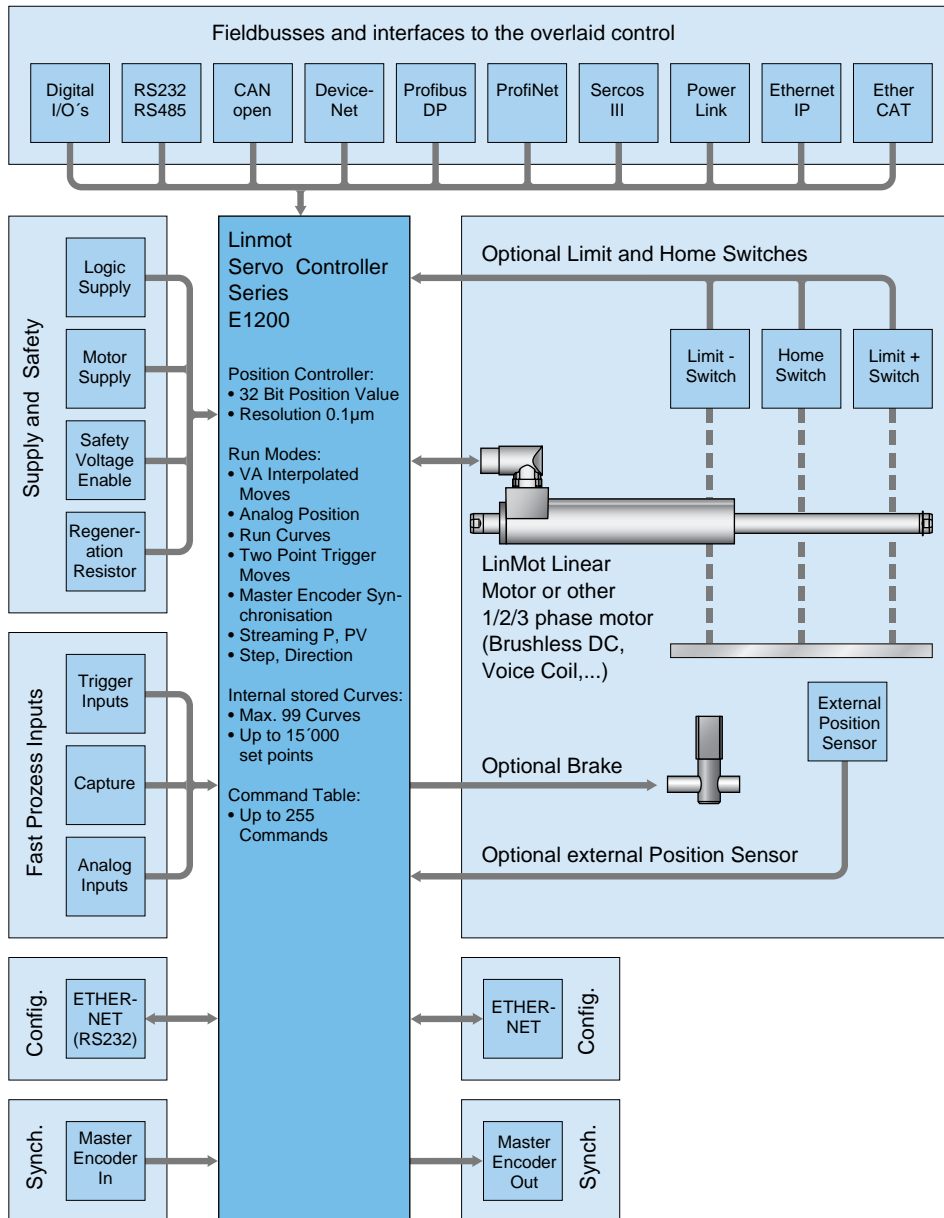
The safe pulse inhibitor on servo controller with fieldbus interfaces or industrial ETHERNET allows safe stop of the drives via control signals, per EN 954-1, without interrupting the power supply.

Logic and Power Supply

The servo controllers have two separate power supply inputs for the logic and power elements.

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

This has the advantage that the controller 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 E1200 servo controllers have analog and digital inputs and outputs, serial interfaces, fieldbuses, and ETHERNET connections. The user is therefore not dependent on the selection of the overlaid controller. An appropriate interface is available, with associated protocols, for any PLC or IPC solution.

With flexibility and a compact form factor, LinMot Series E1200 servo controllers 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, handle 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 controller.

Option: Master Encoder Module

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

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

Motor Interfaces

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

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

Configuration

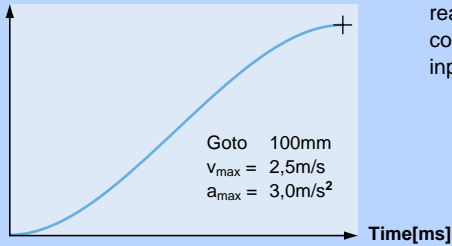
Parameterization and configuration of the servo controller is done via the Ethernet interface on the front side for simultaneous configuration of several controllers.

LinMot Talk 1100 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 controllers can also be configured directly by the overlaid control.

VA-Interpolated Moves

Stroke [mm]

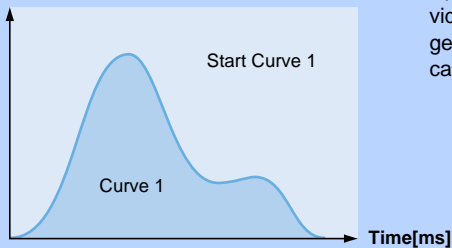


For direct position targets, using absolute or relative positioning, the desired position is reached using an acceleration and velocity-limited motion profile (VA interpolator). Positioning commands can be invoked via the serial interface, fieldbuses, ETHERNET, or the trigger input.

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

Time Curves

Stroke [mm]

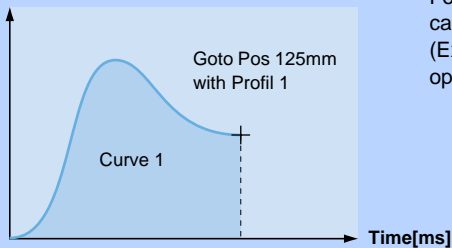


Up to 100 different time curves can be stored Series E1200 controllers, with up to 16,000 individual waypoints. The motor can thus travel along time curves of any complexity, such as those generated by CAD programs and stored in the controller (Excel CSV format). The time curves can be invoked via the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

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

Profiled Moves

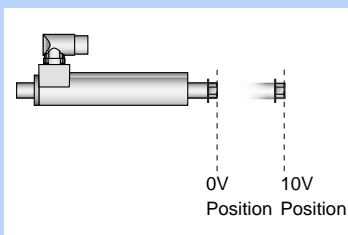
Stroke [mm]



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 controller as motion profiles (Excel CSV format). The positions can be approached, for example, with a sinusoidal motion to optimize power loss, or special reverse optimized motion profiles.

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

Analog Position



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

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

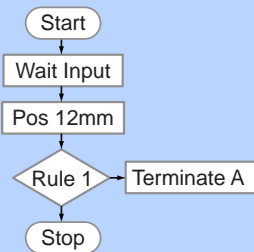
Easy Steps

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 controller, and addressed via 8 digital inputs or fieldbus interfaces/ETHERNET.

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

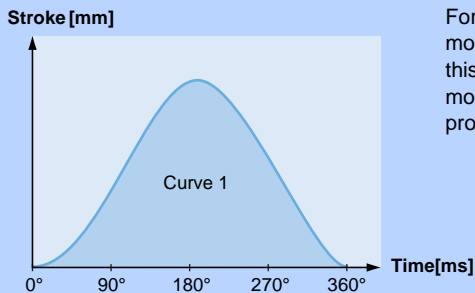
Command Table



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 controller. In the Command Table, the programmer has access to all motion commands, internal parameters, and digital inputs and outputs.

Commands:	max. 255
Cycle time:	100µsec

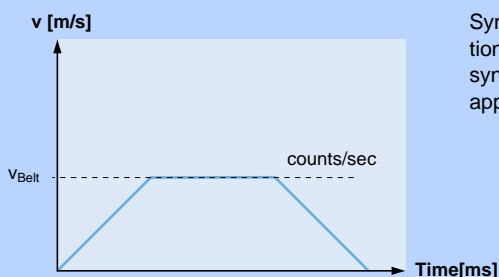
Master Encoder Synchronization (MT)



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

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

Belt Synchronization

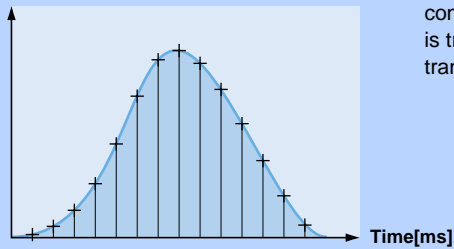


Synchronization to a belt speed can be done using the Master Encoder Interface or Step/Direction/Zero interface. Applications such as the "flying saw", synchronous loading or unloading, synchronous filling or labeling of bottles or containers on a conveyor belt, and many other applications can be implemented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

Setpoint Streaming

Stroke [mm]

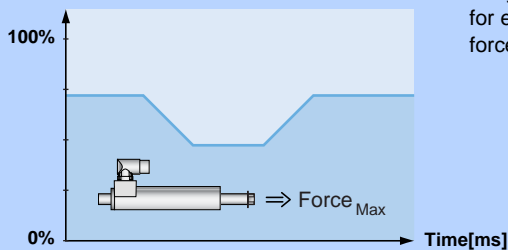


Overlaid NC controllers with fieldbus or ETHERNET interfaces communicate with the servo controllers via "Position Streaming". The position and velocity calculated in the overlaid control is transmitted to the servo controller cyclically. The P, PV, or PVT mode is available for this transmission.

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

Easy Steps Parameter Scale

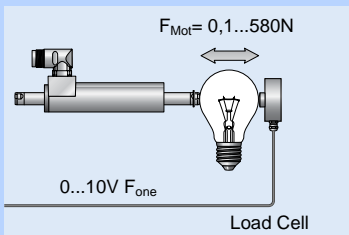
Maximum Force [0...10V => 0...100%]



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

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

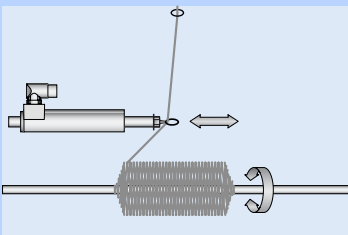
Closed Loop Force Control



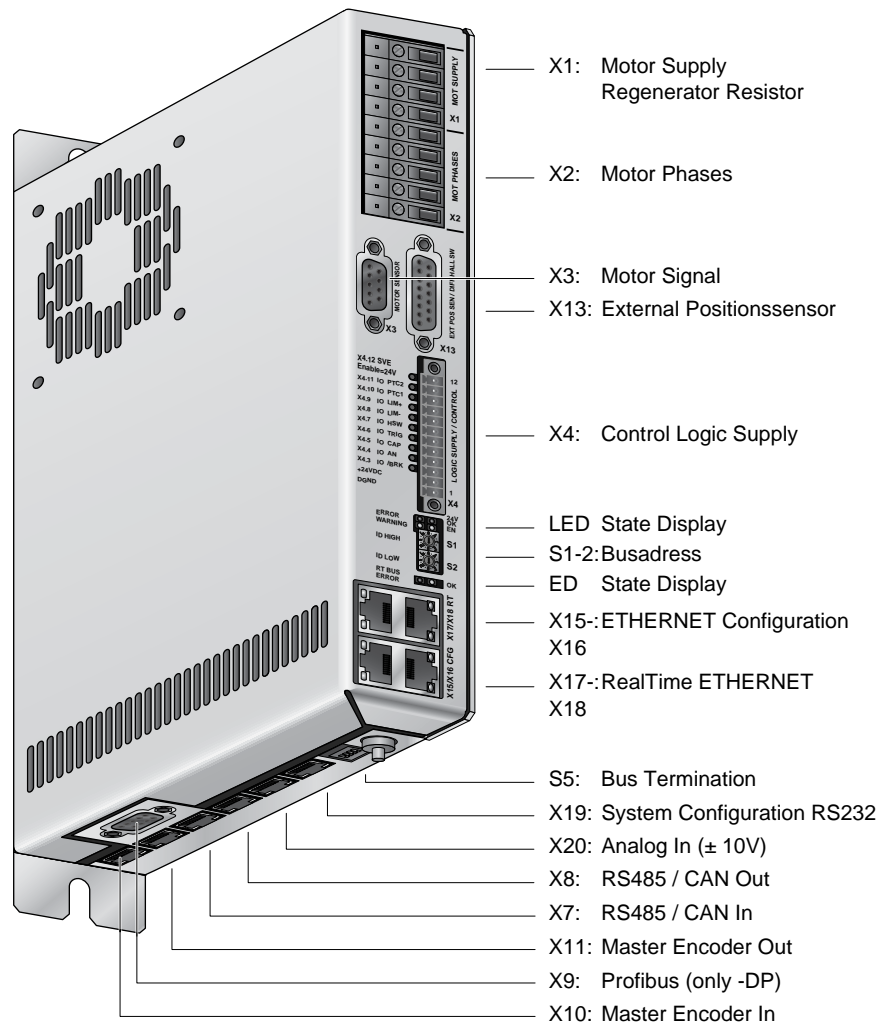
Using the force control technology function, precise joining processes can be implemented reliably and reproducibly with high-precision force control. For force control, the current motor force is measured with a load cell and controlled in the controller. Joining process or quality checks with high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

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

Winding Application



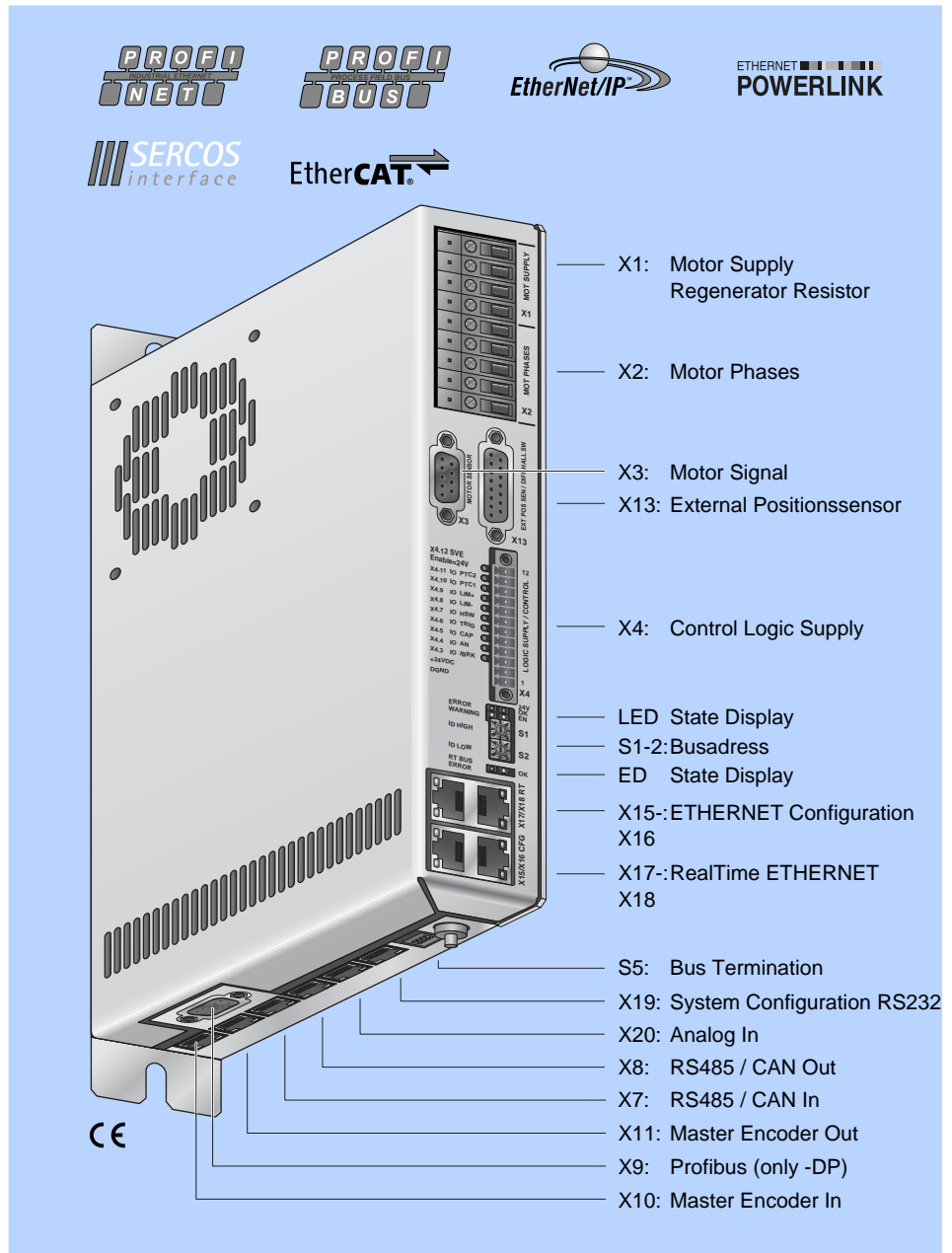
For winding textile yarns, glass fiber optics, or wires, a complete functional block is available that controls the entire sequence of a complete winding process.



	E1200-GP-UC	E1230-DP-UC	E1250-PL-UC	E1250-EC-UC	E1250-PN-UC	E1250-IP-UC	E1250-SC-UC
Interfaces							
CANopen	•	•	•	•	•	•	•
DeviceNet	•	•	•	•	•	•	•
LinRS	•	•	•	•	•	•	•
PROFIBUS-DP		•					
POWERLINK			•				
ETHERCAT				•			
PROFINET					•		
ETHERNET IP						•	
SERCOS III							•
Config. ETHERNET	•	•	•	•	•	•	•

E1200-GP-UC
 E1230-DP-UC
 E1250-PL-UC
 E1250-EC-UC
 E1250-PN-UC
 E1250-IP-UC
 E1250-SC-UC

- ✓ Absolute & Relative Positioning
- ✓ Travel Along Time Curves
- ✓ Positioning using Motion Profiles
- ✓ Internally stored Motion Commands
- ✓ Internally stored Motion Sequences
- ✓ Master Encoder Synchronization
- ✓ Synchronization to Belt Speed
- ✓ Position Streaming
- ✓ Analog Position Target
- ✓ Analog Parameter Scaling
- ✓ Winding Function Block
- ✓ Force Control Technology Function
- ✓ Customer-Specific Functions



Industrial ETHERNET

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

LinMot controllers are available with common industrial ETHERNET protocols. Since all ETHERNET controllers 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 controllers without a problem.

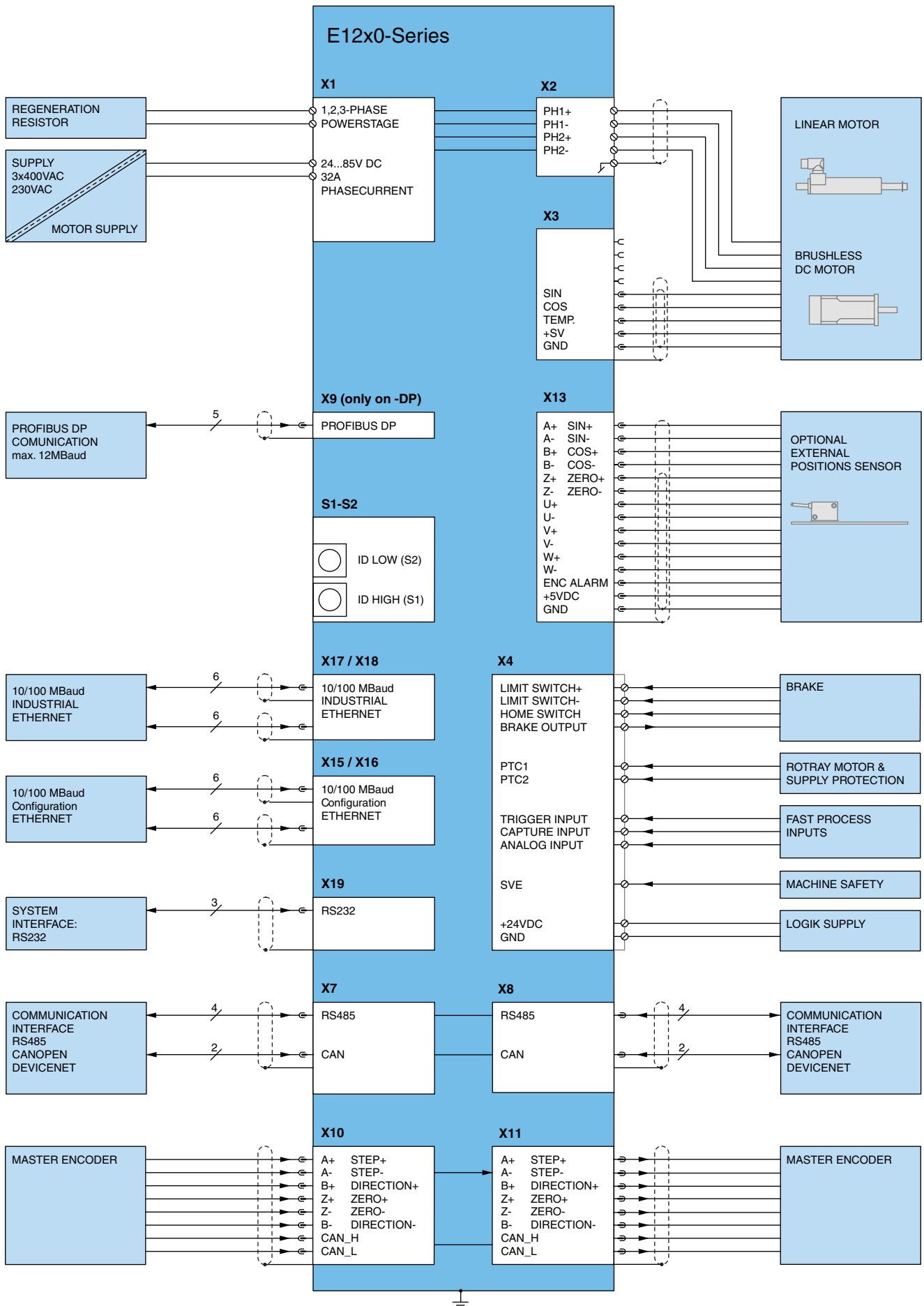
Series 1200 servo controllers support the following industrial ETHERNET protocols:

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

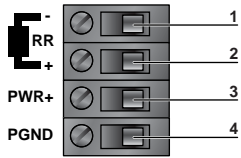
The appropriate controller is available for each protocol.

Technical Data

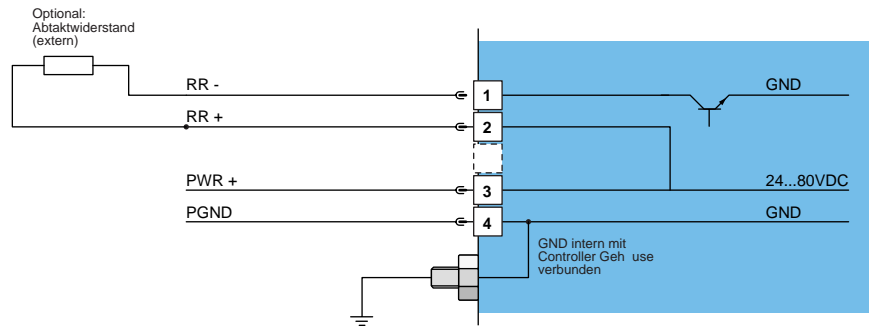
Type:	Realtime ETHERNET
Switch/Hub:	Integrated 2-Port Hub/Switch
Transfer rate:	10/100MBit/sec



X1 Motor Supply / Regeneration Resistor



Screw Terminals
2.5 mm² (AWG14)



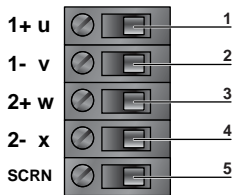
Motor Supply:

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



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

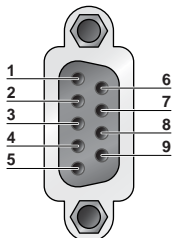
X2 Motor Phases



Screw Terminals
1.5-4mm²
(AWG16-14)

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

X3 Motor



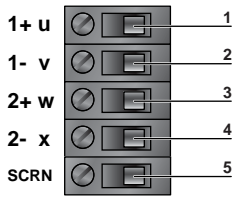
DSUB-9

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	

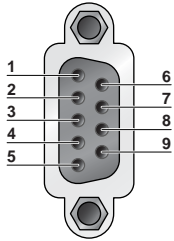
- Use X2 for motor phase wiring if phase current exceeds 5Arms or 7.5Apeak
- Use +5V (X3.3) and AGND (X3.8) only for motor internal Hall Sensor supply (max. 100mA)
- Do NOT connect AGND (X3.8) to ground or earth!

Motor

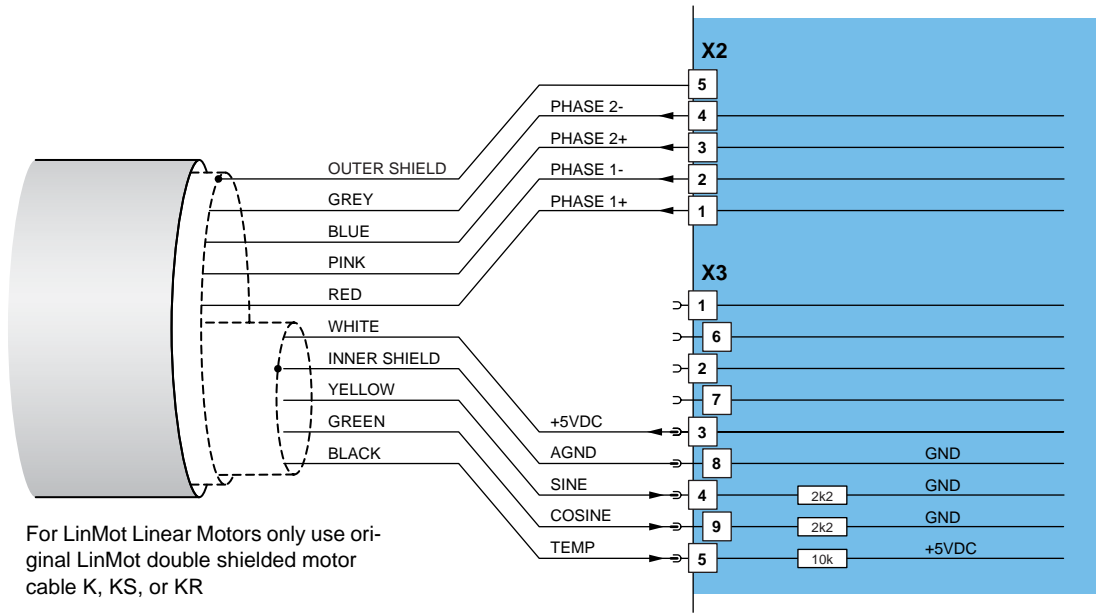
Motor wiring



X2: Screw Terminals

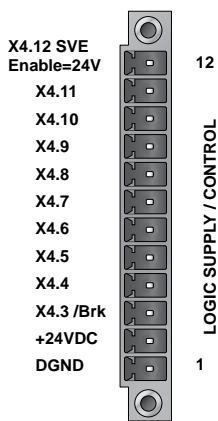


X3: DSUB-9 (f)

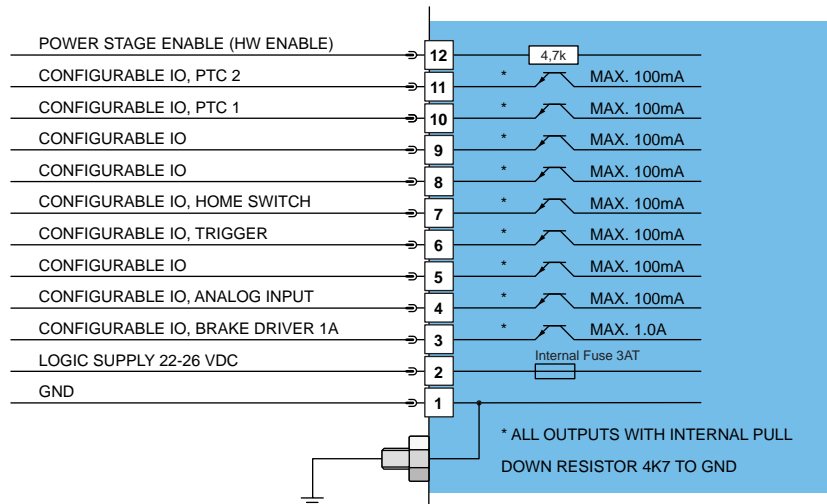


X4: 12pin

Control / Supply

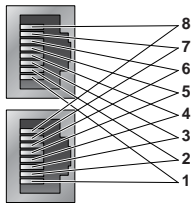


Phoenix MC1,5/12-STF-3,5
0.25-1.5mm² (AWG24-16)



X7-X8

RS485/CAN



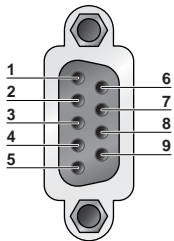
RJ-45

Nr		
1	RS485_Rx+	A
2	RS485_Rx-	B
3	RS485_Tx+	Y
4	GND	
5	GND	
6	RS485_Tx-	Z
7	CAN_H	
8	CAN_L	
Case	Shield	

- X7 internally connected to X8 (1:1 connection)
- Use twisted pair (1-2, 3-6, 4-5, 7-8) cable for wiring.
- The built in CAN and RS485 terminations can be activated by S5.

X9

Profibus DP



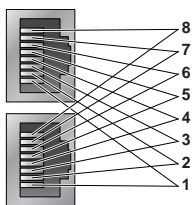
DSUB-9

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

Max. Baud rate: 12 Mbaud

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 E1200-GP

- CAN Bus X10 and X11 in internally connected.
- CAN und RS485 Termination can be turned on by S5.
- 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
- X11 Master Encoder Outputs: Amplified RS422 differential signals from Master Encoder IN (X10)

S1-3 Address Selectors / Bus Termination



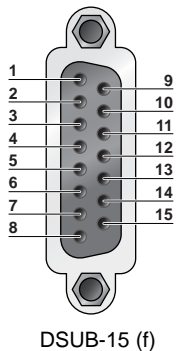
Switch		
S1	Bus ID High (0...F)	HEX-Switches for Bus ID address range 0.255
S2	Bus ID Low(0...F)	

S5 Bus Termination



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

X13 External Position Sensor Commutation



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

Max. Input Frequency: 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

X15-X16 Ethernet Configuration 10/100Mbit/s



RJ-45

Nr	Bez.
X15	Internal 2-Port 10BASE-T and 100BASE-TX Ethernet Switch
X16	HP Auto MDIX

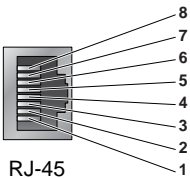
X17-X18 Ethernet RealTime



RJ-45

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

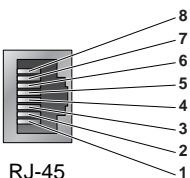
X19 RS232 Configuration



RJ-45

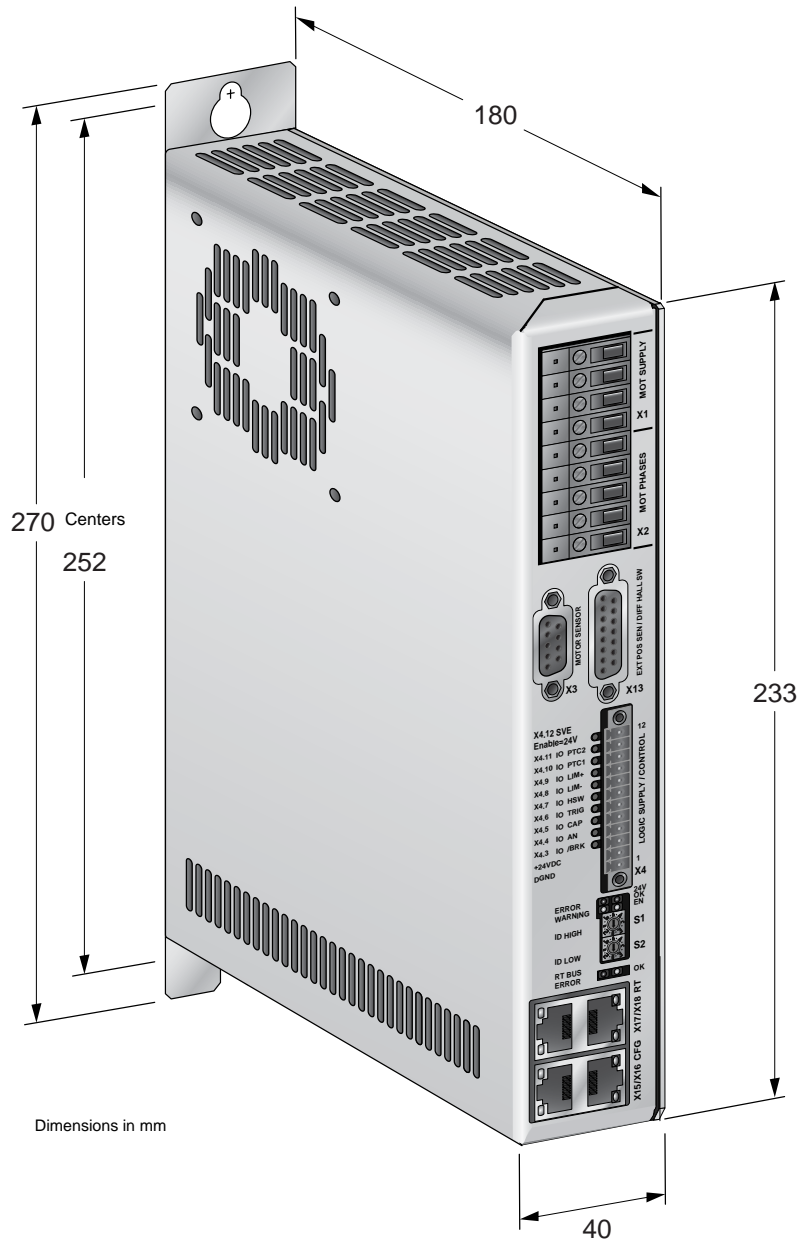
Nr	Bez.
1	Reserved, do not connect
2	Reserved, do not connect
3	RS232 RX
4	GND
5	GND
6	RS232 TX
7	Reserved, do not connect
8	Reserved, do not connect
case	Shield

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



RJ-45

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



Servo Controllers Series		E1200	
Width	mm (in)	40	(1.6)
Height	mm (in)	270	(10.6)
Height without fixings	mm (in)	233	(9.2)
Depth	mm (in)	180	(7.1)
Weight	kg (lb)	1.5	(3.3)
IP Protection class	IP	20	
Storage temperature	°C	-25...40	
Transport temperature	°C	-25...70	
Operating temperature	°C	0...40 at rated date	
		40...50 with power derating	
Max. case temperature	°C	65	
Max. power dissipation	W	30	
Min. distance between controllers	mm (in)	20	(0.8) left/right
		50	(2) top/bottom

Item	Description	Part Number
E1200-GP-UC	General Purpose Controller (72V/32A)	0150-1771
E1230-DP-UC	Profibus DP Controller(72V/32A)	0150-1766
E1250-EC-UC	EtherCAT Controller (72V/32A)	0150-1763
E1250-PL-UC	PowerLink Controller (72V/32A)	0150-1760
E1250-IP-UC	Ethernet IP Controller (72V/32A)	0150-1761
E1250-PN-UC	Profinet Controller (72V/32A)	0150-1762
E1250-SC-UC	Sercos III Controller (72V/32A)	0150-1764