

SERIES C1200



- ✓ Absolute / relative positioning commands
- ✓ Limited jerk motion commands
- ✓ Time Curves
- ✓ Real Time (Streaming)
- ✓ Synchronous control (Drive profiles)
- ✓ PLC or Stand-Alone Solutions
- ✓ Digital and Analog IO's
- ✓ Safe Torque Off
- ✓ Interface for optional incremental or absolute sensor
- ✓ Supports Plug and Play
- ✓ CE / UL / CSA

Servo Drive C1200

Series C1200 servo drives are axis controllers, with 32-bit position resolution and an integrated power stage, for linear and rotary motors. The controllers are suitable for standard and high-end positioning tasks with NC Synchronisation.



CONNECTION TO MACHINE CONTROL

The Series C1200 servo drives can be actuated by machine controls from many manufacturers or brands, via digital inputs and outputs over Industrial Ethernet.

- Bus-Interfaces:
- » ProfiNet / ProfiDrive
 - » EtherCat, SoE, CoE
 - » Ethernet IP
 - » PowerLink
 - » Sercos III

PROCESS AND SENSOR 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 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.

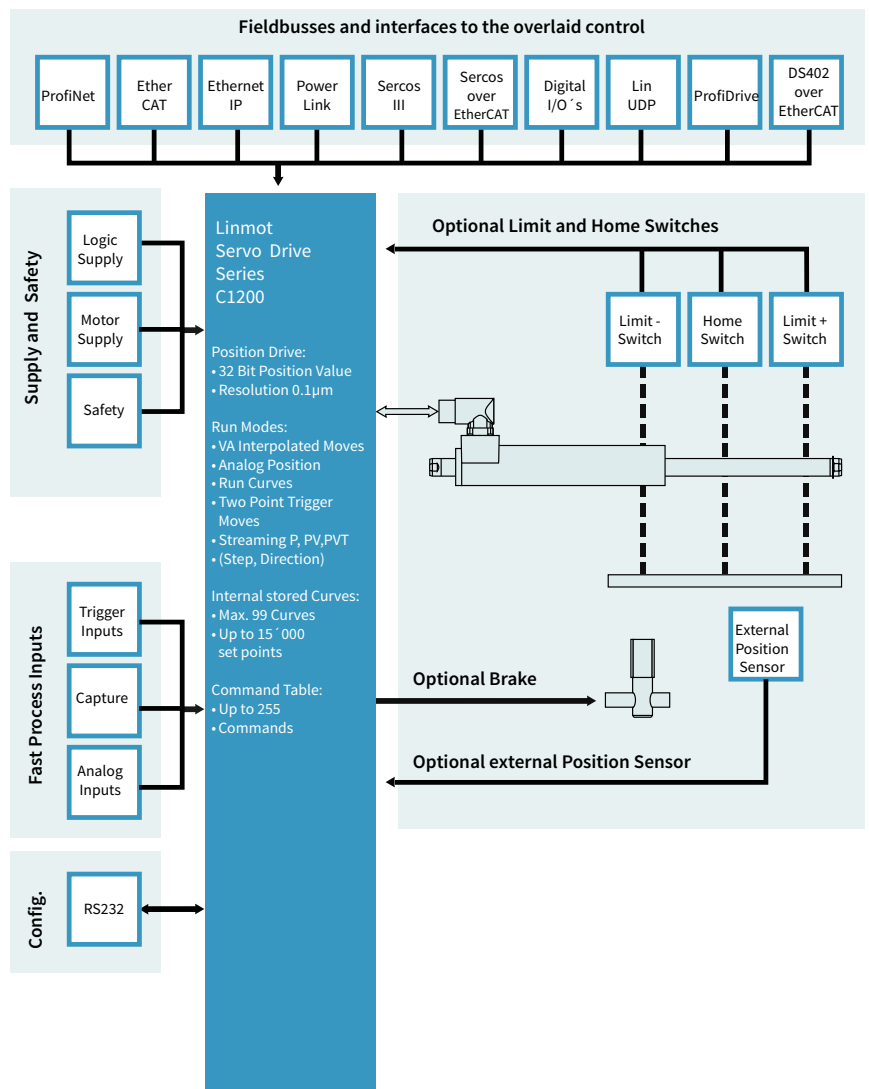
System Integration

Flexible hardware enables control of many 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 C1200 servo drives have analog and digital inputs and outputs, serial interfaces, fieldbuses, and Ethernet. The user therefore is not dependent on the selection of the overlaid controller. An appropriate interface is available, with associated protocols, for many PLC or IPC solutions.

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



HIGH-END AND NC-MOTIONS MOTOR INTERFACES CONFIGURATION

The ultra-fast control cycle together with the high resolution A/D converters of the C1200 series drives guarantee perfect motor control for demanding Positioning tasks.

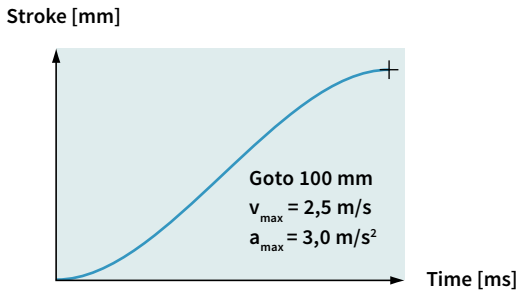
The various drive profiles available on the series C1200 drives makes it easy to integrate these drives into systems with synchronized axes and overlaid NC-position controllers with industrial Ethernet communication.

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

LinMot Talk, a 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

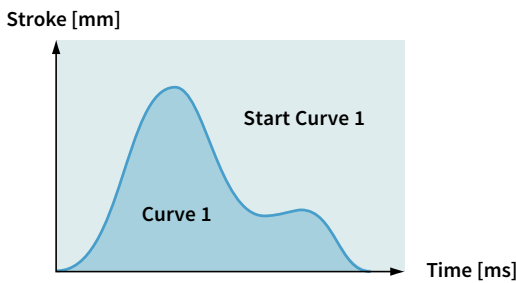
INTERPOLATED MOVES



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

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

TIME CURVES

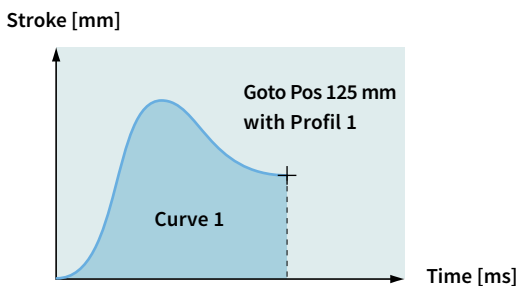


Up to 100 different time curves can be stored on Series C1200 drives, with up to 16,000 individual waypoints. The motor can thus travel along time curves of any complexity, such as those generated by CAD programs and stored in the drive (Excel CSV format). The time curves can be invoked via the serial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

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

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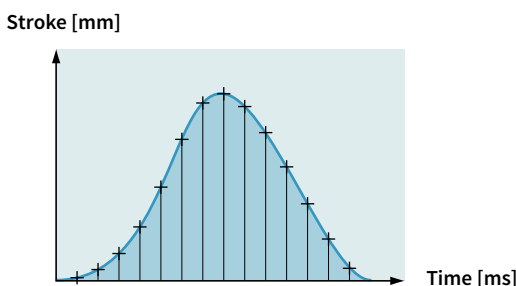
PROFILED MOVES



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:	0.1 µm (32Bit)
Motion profiles:	Max. 100 Time Curves
Curve points:	Max. 16'000 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 PVA mode is available for this transmission.

Position Resolution:	32 Bit
Velocity Resolution:	32 Bit
Interpolator:	8 kHz
Cycle times:	0.25 - 5 ms

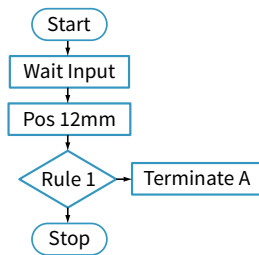
EASY STEPS

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

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: 250 µsec

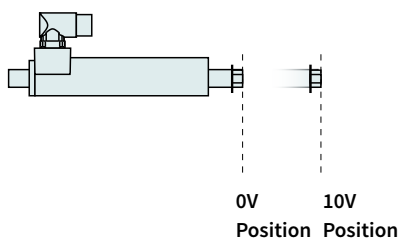
COMMAND TABLE



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

Commands: max. 255
Cycle time: 125 µsec

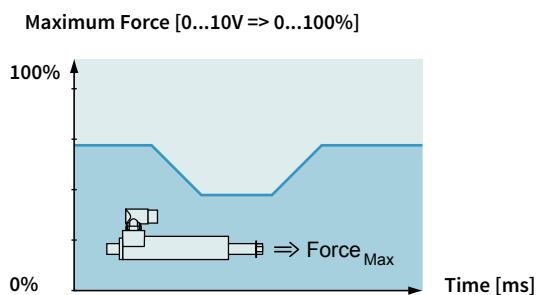
ANALOG POSITION



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).

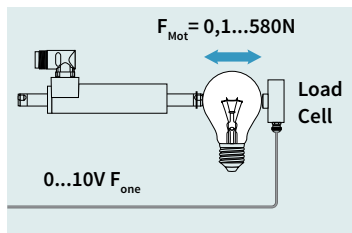
Inputs: Analog Input X4
Voltage range: 0-10VDC or ±10V
Resolution: 12 Bit
Scanning rate: >=125 µsec (adjustable)

EASY STEPS PARAMETER SCALE



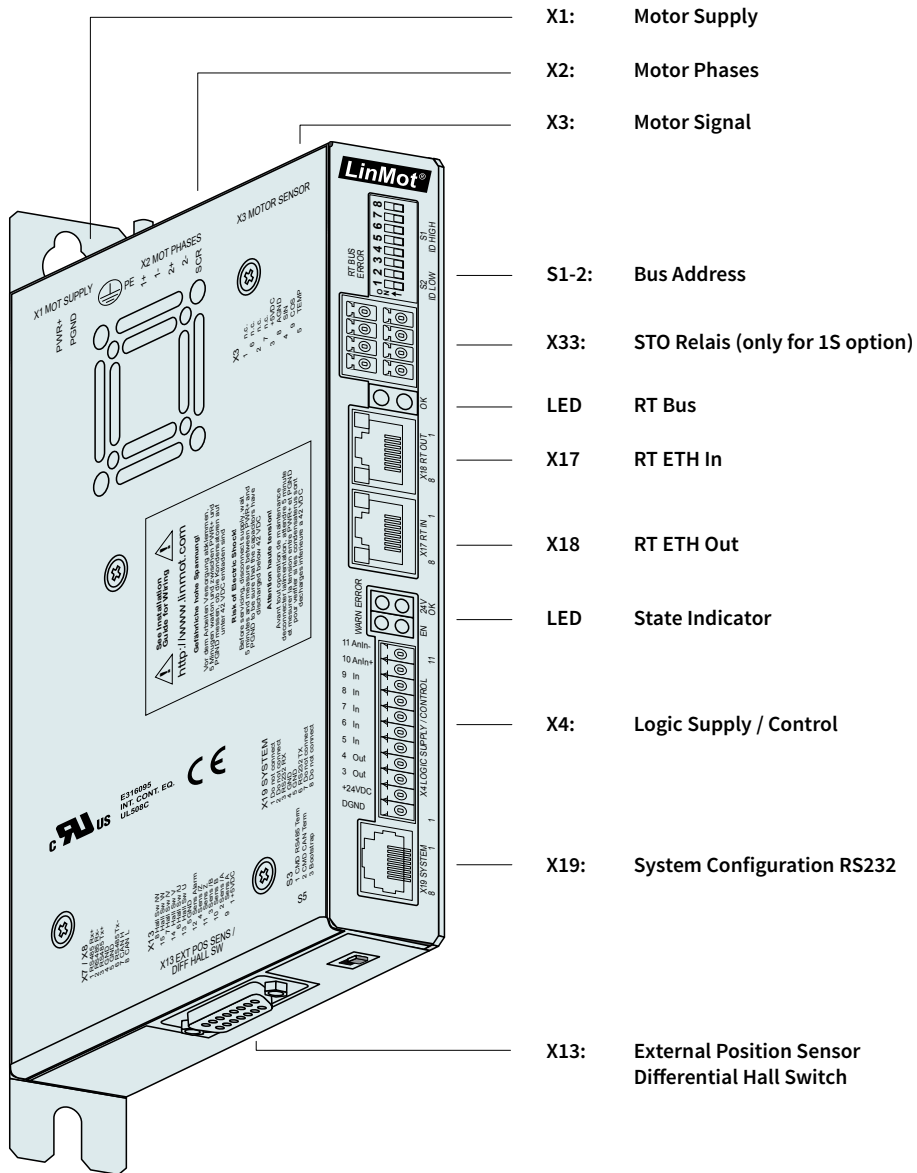
Easy Steps provide the ability to parameterize internal parameters using two analog inputs. If, for example, the maximum motor current is read at an analog input, then the maximum motor force can be provided as analog for freely programmable joining processes.

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

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.

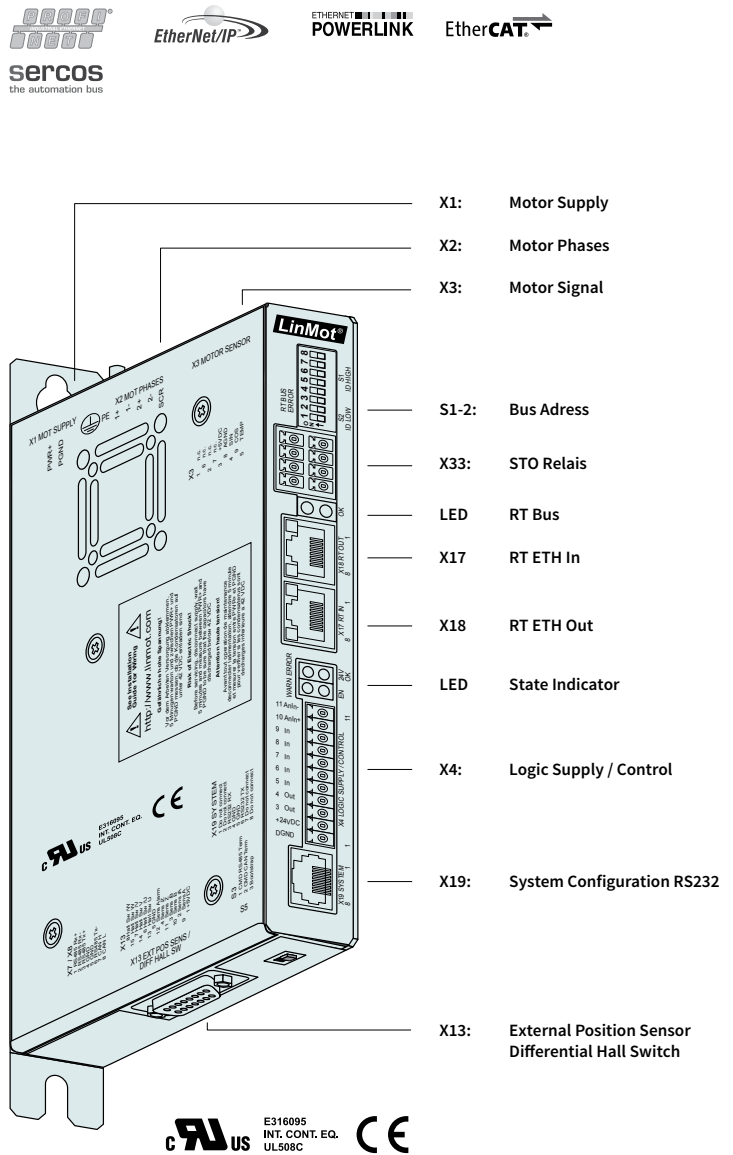
Analog input:	0-10V or $\pm 10V$
Resolution:	12 Bit
Min. Force Resolution:	0.1N



Interfaces	C1250-PN-XC	C1250-PD-XC	C1250-EC-XC	C1250-DS-XC	C1250-SE-XC	C1250-IP-XC	C1250-PL-XC	C1250-SC-XC	C1250-LU-XC
PROFINET	•								
PROFINET ProfiDrive		•							
ETHERCAT			•						
ETHERCAT CiA402				•					
ETHERCAT SoE					•				
ETHERNET IP						•			
POWERLINK							•		
SERCOS III								•	
LinUDP									•

- C1250-PN-XC
- C1250-EC-XC
- C1250-IP-XC
- C1250-PL-XC
- C1250-SC-XC
- C1250-SE-XC
- C1250-PD-XC
- C1250-DS-XC
- C1250-LU-XC

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

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

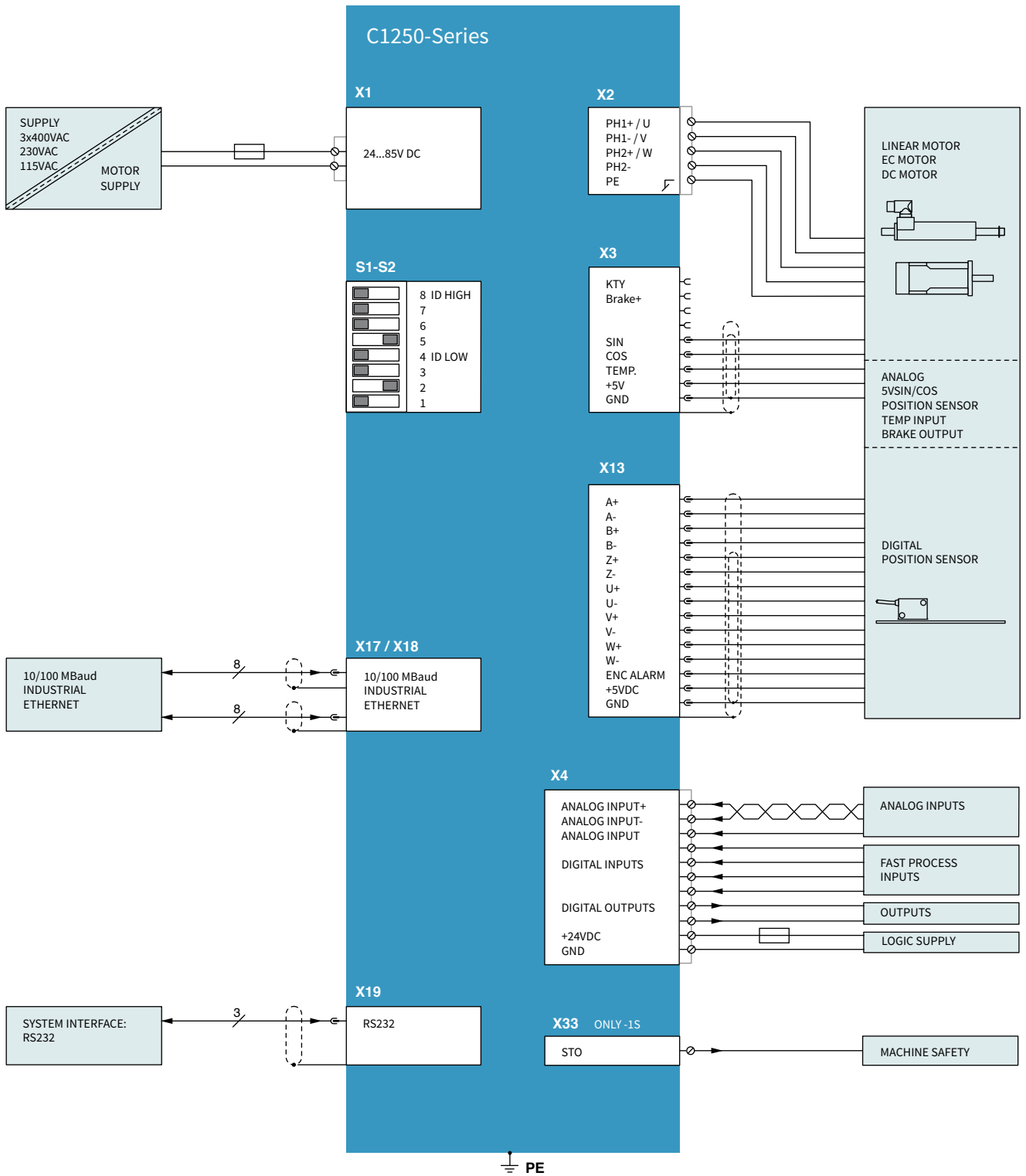
The series C1200 servo drives support the following industrial Ethernet protocols:

- » Profinet
- » EtherCAT
- » Ethernet IP
- » PowerLink
- » Sercos III
- » Sercos over EtherCAT
- » ProfiDrive
- » CiA 402
- » LinUDP

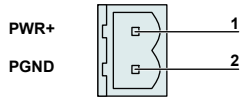
The appropriate drive is available for each protocol.

TECHNICAL DATA

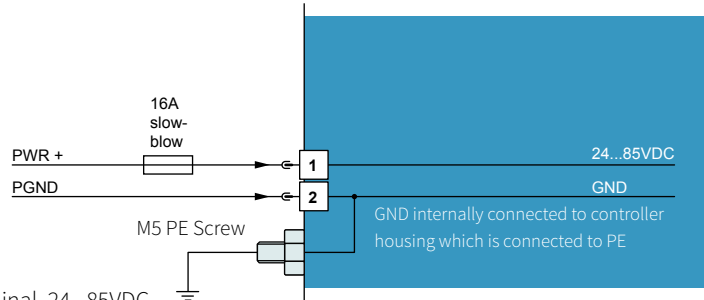
Type:	Realtime ETHERNET
Switch/Hub:	Integrated 2-Port Hub/Switch
Transfer rate:	10/100MBit/sec
Minimal cycle times:	
Bus cycle:	250 µs
IO update:	250 µs
Trigger Input:	125 µs
Position control loop:	125 µs
Current control loop:	62.5 µs



X1 + PE MOTOR SUPPLY / REGENERATION RESISTOR

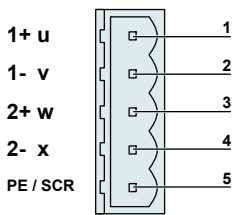


Connector has to be ordered separately



Motor Supply: 72VDC nominal, 24...85VDC
 Absolute max. Rating: 72VDC +20%.
 External Fuse: 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 3 m

X2 MOTOR PHASES

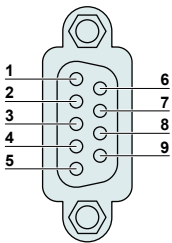


Connector has to be ordered separately

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

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

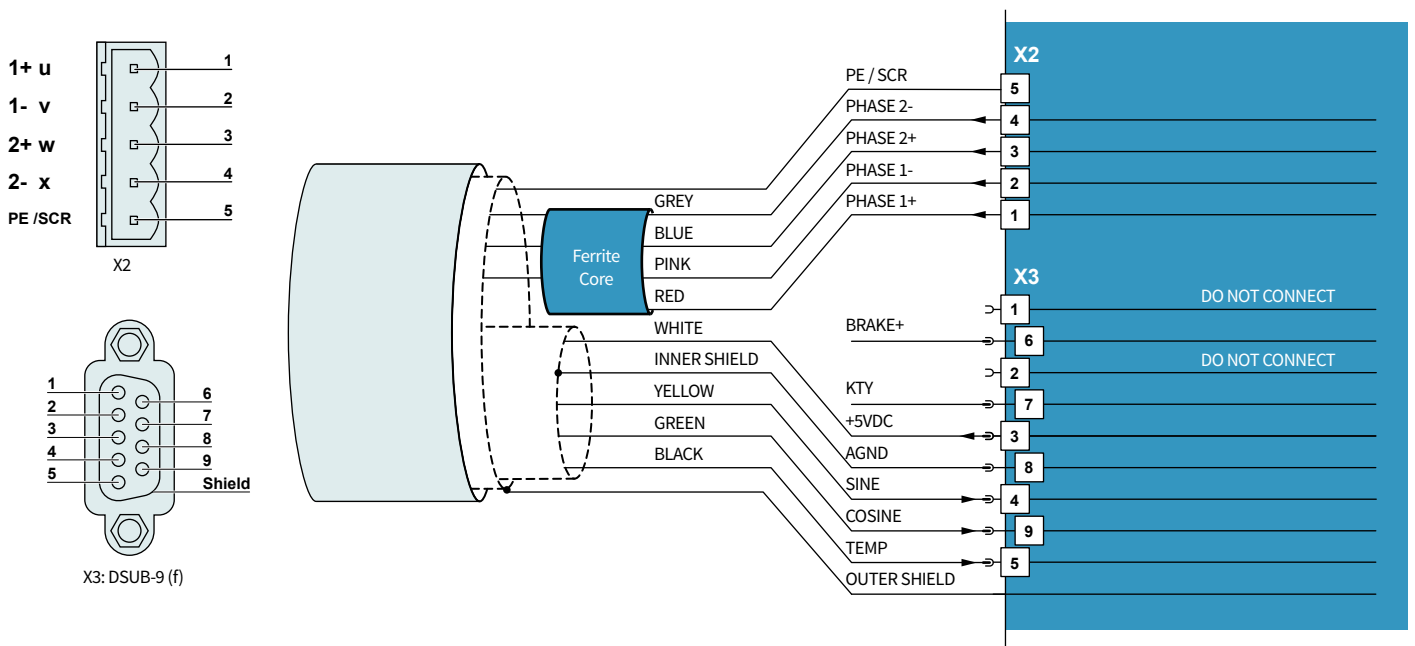
X3 MOTOR SENSOR / BRAKE



DSUB-9

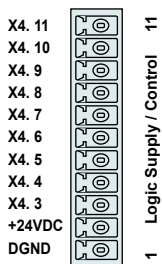
Nr		LinMot Motor	EC Motor
1		Do not connect	Do not connect
	6	Brake+	Brake+
2		Do not connect	Do not connect
	7	Do not connect	KTY
3		+5VDC	+5VDC
	8	AGND	AGND
4		Sensor Sine	Sensor Sine / Hall Switch U
	9	Sensor Cosine	Sensor Cosine / Hall Switch V
5		Temp In	Hall Switch W
	Case	Shield	Shield

- » Use +5V (X3.3) and AGND (X3.8) only for motor internal hall sensor supply (max. 100mA)
- » Cable length < 30 m
- » Brake+: 24V / max. 500mA, Peak 1.4mA (will shut down if exceeded)
- » Caution: Do NOT connect AGND (X3.8) to ground or earth!



Use Y-style motor cables only (for example K15-Y/C)!
A W-style cable has a different shielding, so it cannot be modified to a Y-style cable!

X4 LOGIC SUPPLY / IO CONNECTION



DSUB-9 (f)
Spring cage connector
(has to be ordered separately)

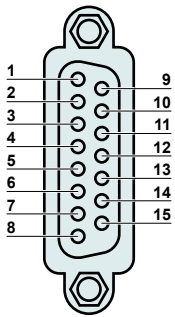
Nr			
11	AnIn-	X4.11	Configurable Analog Input differential (with X4.10)
10	AnIn+	X4.10	Configurable Analog Input differential (with X4.11)
9	AnIn	X4.9	Configurable Analog Input single ended
8	In	X4.8	Configurable Input
7	In	X4.7	Configurable Input
6	In	X4.6	Configurable Input
5	In	X4.5	Configurable 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)
Outputs: (X4.3 & 4.4)
Analog inputs:
X4.9:
X4.10/X4.11:

Supply 24V:

24V / 5mA (Low Level: -0.5 to 5VDC, High Level: 15 to 30VDC)
24V / max. 500mA, Peak 1.4mA (will shut down if exceeded)
12 bit A/D converted.
Single ended analog input to GND, 0..10V, Input Resistance: 51kΩ to GND
Differential analog input, +/- 10V. Common mode range: +/- 5VDC to GND.
Input Resistance: 11.4kΩ for each signal to GND
typically 500mA / max. 2.5A (if all outputs "on" with max. load.)
» Use 60/75°C copper conductors only
» Conductor cross-section max. 1.5 mm²
» Stripping length: 10 mm
» The 24VDC supply for the control circuit (X4.2) must be protected with an external fuse (3A slow blow)

X13 EXTERNAL POSITION SENSOR PIN CONFIGURATION



DSUB-15 (f)

Nr	ABZ with Hall Switches	SSI / BiSS / EnDat
1	+5V DC	+5V DC
9	A+	A+
2	A-	A-
10	B+	B+
3	B-	B-
11	Z+	Data+
4	Z-	Data-
12	Encoder Alarm	Encoder Alarm
5	GND	GND
13	U+	nc
6	U-	nc
14	V+	nc
7	V-	nc
15	W+	Clk+
8	W-	Clk-
Case	Shield	Shield

Position Encoder Inputs (RS422):

Max. counting frequency: 25 M counts/s with quadrature decoding. A minimum of 40ns edge separation must be guaranteed by the encoder under any circumstances! The maximal frequency of each signal is 6.25 MHz.

Differential Hall Switch Inputs (RS422):

Input Frequency: <1kHz

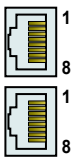
Enc. Alarm In:

5V / 1mA

Sensor Supply:

5VDC, max 100mA

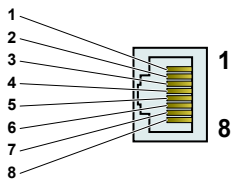
X17 - X18 REALTIME ETHERNET 10/100 MBIT/S



RJ-45

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

X19 SYSTEM



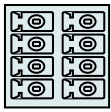
RJ-45

Nr	
1	(do not connect)
2	(do not connect)
3	RS232 RX
4	GND
5	GND
6	RS232 TX
7	(do not connect)
8	(do not connect)
case	Shield

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

X33 SAFETY RELAYS (ONLY FOR -1S)

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



X33 STO RELAYS

Spring cage connector

Nr		
4 / 8	Ksr +	Safety Relay 1 / 2 Input positive
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. 1.5 mm²
- » Stripping length: 10 mm
- » Never connect the safety relays to the logic supply of the drive!

S1 - S2 ADDRESS SELECTORS



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

Setting the ID high & low to FF resets the drive to manufacturer settings!

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

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S5 BUS TERMINATION



Default position
 View: X13 Connector is left next to S5 switch.

S5	Bootstrap (Internal use only)
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LEDS STATE DISPLAY



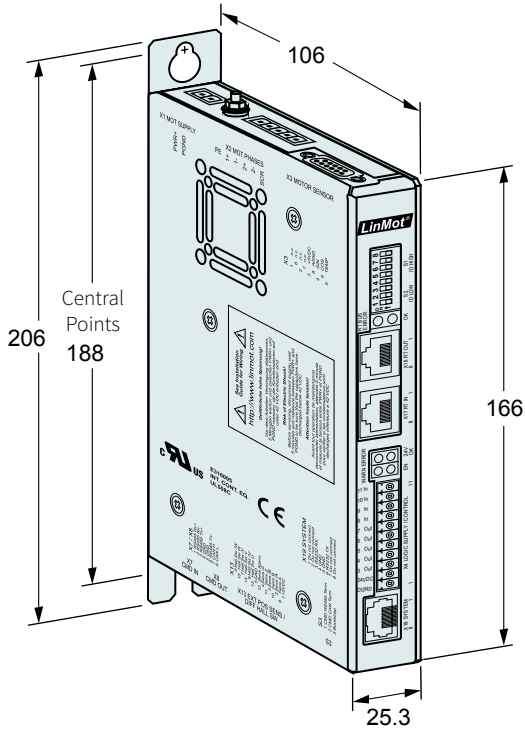
24VOK	Green	24V Logic Supply OK
En	Yellow	Motor Enabled / Error Code Low Nibble
Warn	Yellow	Warning / Error Code High Nibble
Error	Red	Error

RT BUS LEDS

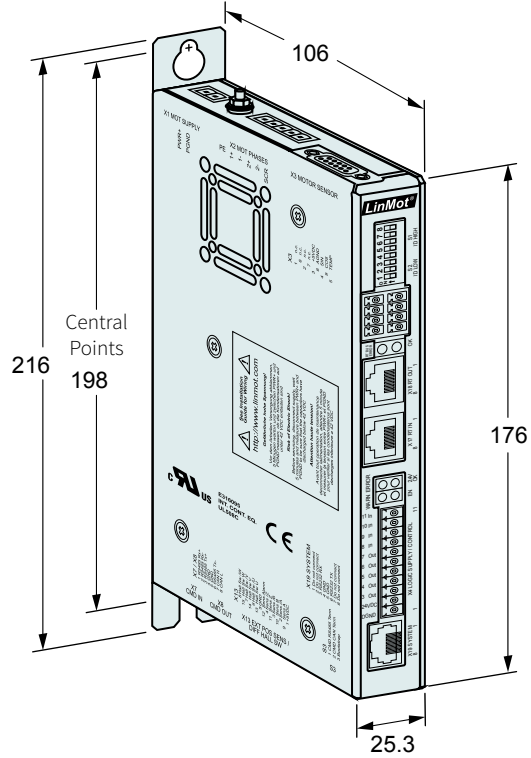


BUS OK	Green	OK
BUS Error	Red	Error

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



C1250-...-0S



C1250-...-1S

Dimensions in mm
Mounting points for M5 screws

Servo Drive Series		C1250-...-0S	C1250-...-1S
Width	mm (in)	25.3 (1.0)	
Height	mm (in)	166 (6.5)	176 (6.9)
Height with fixings	mm (in)	206 (8.1)	216 (8.5)
Depth	mm (in)	106 (4.2)	
Weight	g (lb)	630 (1.4)	700 (1.54)
Mounting Screws		2 x M5	2 x M5
Mounting Distance between screw holes	mm (in)	168 (6.61)	188 (7.4)
Case IP Code	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	
Relative humidity		95% (non-condensing)	
Pollution	IEC/EN 60664-1	Pollution degree 2	
Shock resistance (16 ms)	-1S option		3.5g
Vibration resistance (10-200Hz)	-1S option		1g
Max. case temperature	°C	70	
Max. power dissipation	W	30	
Mounting place		in the control cabinet	
Mounting position		vertical	
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	

Servo Drives		
Item	Description	Part Number
C1250-PN-XC-0S-000	ProfiNet Drive (72V/25A)	0150-1888
C1250-PD-XC-0S-000	ProfiNet ProfiDrive (72V/25A)	0150-2618
C1250-EC-XC-0S-000	EtherCAT Drive (72V/25A)	0150-1884
C1250-DS-XC-0S-000	EtherCAT CoE Drive (72V/25A)	0150-2415
C1250-SE-XC-0S-000	EtherCAT SoE Drive (72V/25A)	0150-1897
C1250-IP-XC-0S-000	Ethernet/IP Drive (72V/25A)	0150-1886
C1250-PL-XC-0S-000	Powerlink Drive (72V/25A)	0150-1885
C1250-SC-XC-0S-000	Sercos III Drive (72V/25A)	0150-1887
C1250-LU-XC-0S-000	ETHERNET LinUDP Drive (72V/25A)	0150-2491
C1250-PN-XC-1S-000	Profinet Drive (72V/25A), STO	0150-2348
C1250-PD-XC-1S-000	ProfiNet ProfiDrive (72V/25A), STO	0150-2619
C1250-EC-XC-1S-000	EtherCAT Drive (72V/25A), STO	0150-2345
C1250-DS-XC-1S-000	EtherCAT CoE Drive (72V/25A), STO	0150-2416
C1250-SE-XC-1S-000	EtherCAT SoE Drive (72V/25A), STO	0150-2350
C1250-IP-XC-1S-000	Ethernet/IP Drive (72V/25A), STO	0150-2346
C1250-PL-XC-1S-000	Powerlink Drive (72V/25A), STO	0150-2347
C1250-SC-XC-1S-000	Sercos III Drive (72V/25A), STO	0150-2349
C1250-LU-XC-1S-000	ETHERNET LinUDP Drive (72V/25A), STO	0150-2492

Accessories		
Item	Description	Part Number
DC01-CX000-0S/X1/X4	Connector set C1250-...-0S (X1, X4)	0150-3527
DC01-CX000-1S/X1/X4/X33	Connector set C1250-...-1S (X1, X4, X33)	0150-3528
DC01-C1X00/X1	Drive Connector for PWR 72DC Input	0150-3525
DC01-CX000-X2	Motor connector (X2)	0150-3526
DC01-Signal/X4	Drive Connector 24VDC & Logic	0150-3447
DC01-Safety/X33	Drive Connector Safety	0150-3451