

**BERGER LAHR**

Modular Positioning Technology  
With Stepping Motor  
Or Servo Motor



**Twin Line**



**Twin Line – the complete solution with stepping motor or servo motor**

Twin Line controls, drives and positions. For all driving systems up to 8 kW, you only need a single partner. We offer you an individual and complete concept with the motors that meet your requirements. And if you need support, our engineering specialists provide consulting and project design.

**Twin Line – with uniform software for all applications**

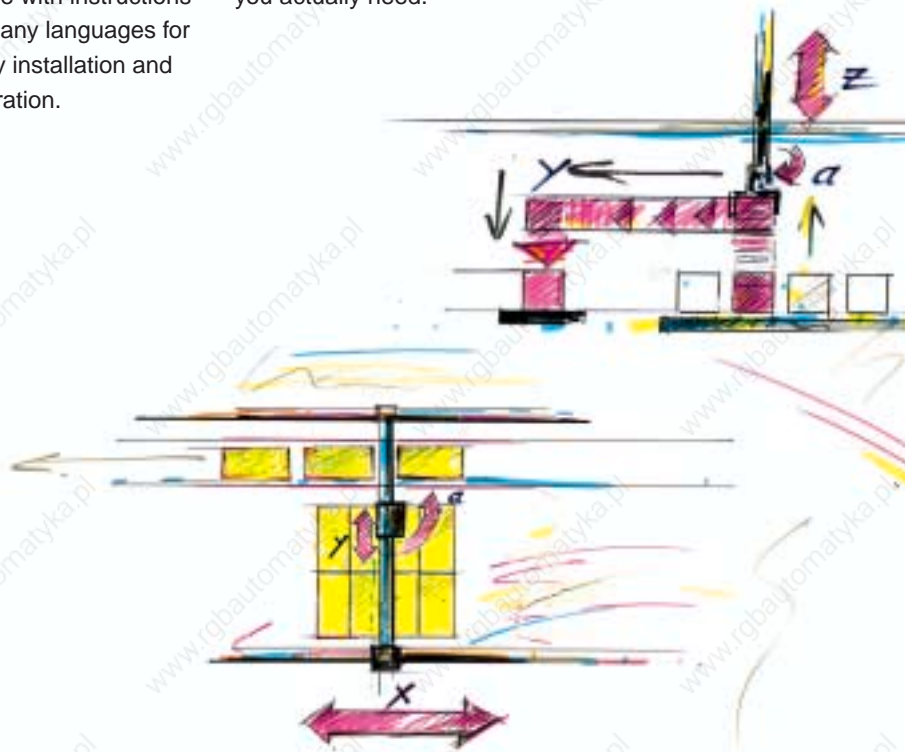
Designing and commissioning a system with Twin Line is fast and easy. The consistent user interface results in a self-learning effect – this reduces the training expenses dramatically. And easy reprogramming allows you to reuse your software components.

**Twin Line – fully integrated and ready for your requirements**

With Twin Line you have everything you need: mains filter, heat sink, intelligent brake system and all the required modules are all integrated. Of course, Twin Line devices are CE certified, and come with instructions in many languages for easy installation and operation.

**Twin Line – with compact dimensions and modular design**

Twin Line adapts to your specific driving task both in performance and functionality. The modular design ensures that Twin Line meets the requirements of your application. You pay only for as much Twin Line as you actually need.





### Identical operation, parameter assignment and error handling for stepping motors and servo motors

The Twin Line devices are operated via the HMI (Human Machine Interface), a plug-in input module with LCD display. It can be used for all devices from the Twin Line family of products: just plug this control unit into the Twin Line device or connect it to the communication port by means of a serial cable.

### Starting up with the “Twin Line Control Tool” software

The graphical TLCT user interface allows you to

- read and write controller and motor parameters
- set and reset input and output signals
- trace signal curves on screen, and
- optimise the controller behaviour in interactive or Auto-tuning modes

### Programming with the CoDeSys software

All devices are programmed via an integrated PLC and motion control with the CoDeSys software according to IEC 61131-3. All IEC 61131-3 languages can be used.

Berger Lahr is a member of the system partner concept of 3S, the “CoDeSys Automation Alliance”. This ensures that the user can program the components of all system partners with just a single installed software system. Comprehen-

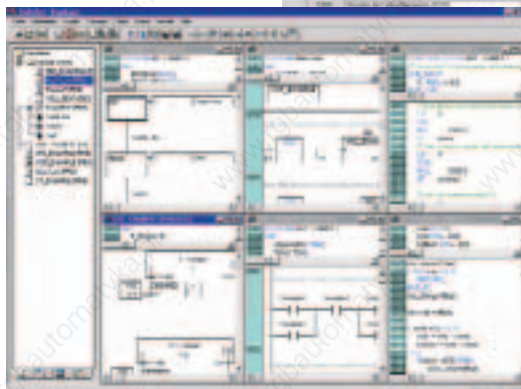
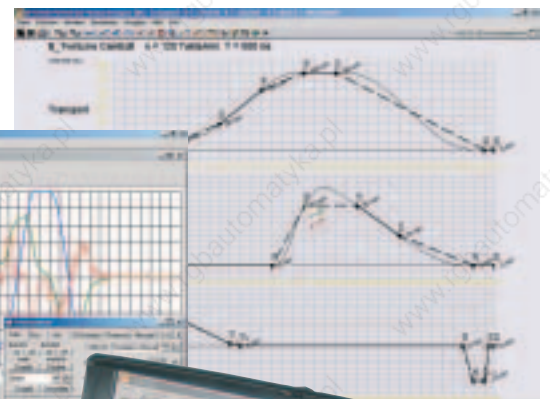
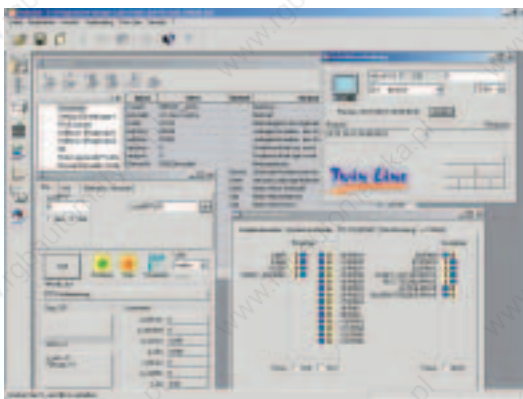
ve library functions are provided for user-friendly programming, e.g. predefined functions for

- point-to-point positioning
- referencing,
- manual or speed mode,
- electronic gear mode,
- electronic cam disk.

The motion curves are controlled via a real or a virtual master, as required.

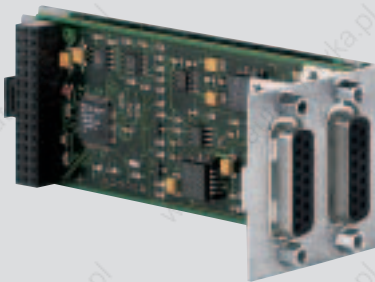
### Free design of motion curves with cam editor

Jerk-free motion curves can be created with the Nolte “Optimus Motus” cam editor. The editor provides numerous motion algorithms such as 5th degree polynomials. Curves generated this way can be transmitted to the positioning controller by means of TLCT via a standardised data interface.





**Twin Line micro-modules for application-specific configuration**



**Module RS 422-C**

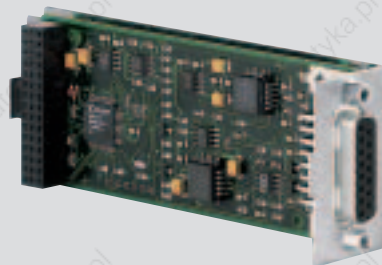
Detects encoder signals which are provided as A/B signals in “Electronic Gear” mode.

**Module PULSE-C**

Detects the positioning data as pulse/direction signal or as pulse-forward/pulse-backward signal.

**Module IOM-C**

Extension module with digital analogue inputs and outputs which can be used as required. It is possible to assign predefined functions to the inputs and outputs.



**Module HIFA-C**

Detects the motor position of AC synchronous servo motors which are equipped with a SinCoder® encoder (single-turn or multi-turn).

**Modul RM-C**

For rotation monitoring of stepping motor motion.

**Synchronous serial interface SSI-C**

For encoder simulation with serial transmission of absolute position information to master NC controllers.

**Encoder simulation ESIM1-C / ESIM2-C / ESIM3-C**

Provides the position data of the AC synchronous servo motor as incremental A/B signal with index pulse. These signals can be evaluated by an NC master controller, or they can be used to drive an additional controller.

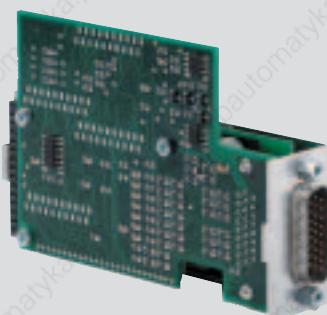
**Communication modules**

The following modules are available for communication with a Twin Line controller:

- **RS 485-C**, serial interface RS485.
- **CAN-C**, CAN field bus module. The user can configure the Berger Lahr profile, the CANopen DS-402 profile or DeviceNet.
- **IBS-C**, Interbus-S module.
- **PBDP-C**, Profibus-DP module, 12 MBit.
- **MODB-C**, ModBus module. Serial interface RS485. The user can configure ModBus ASCII or ModBus RTU.

**Integrated safety technology for Twin Line**

The SAM-C Safety Monitor module extends the series TLCxxx devices using integrated functions for operator safety, e.g. safe stop and reduced speed functions. These safety functions allow the power supply to the motor to remain on even when the protective door is open. In the case of Emergency Stop situations, SAM-C offers safe deceleration and switching off of the power supply for the motor by means of internal safe blocking of the power stage controller. The power supply does not need to be switched off by means of power contactors. All functions conform to safety category 3 according to EN 954-1. SAM-C features a 24 V I/O interface for the connection of protective door contacts, Emergency Stop devices, etc.





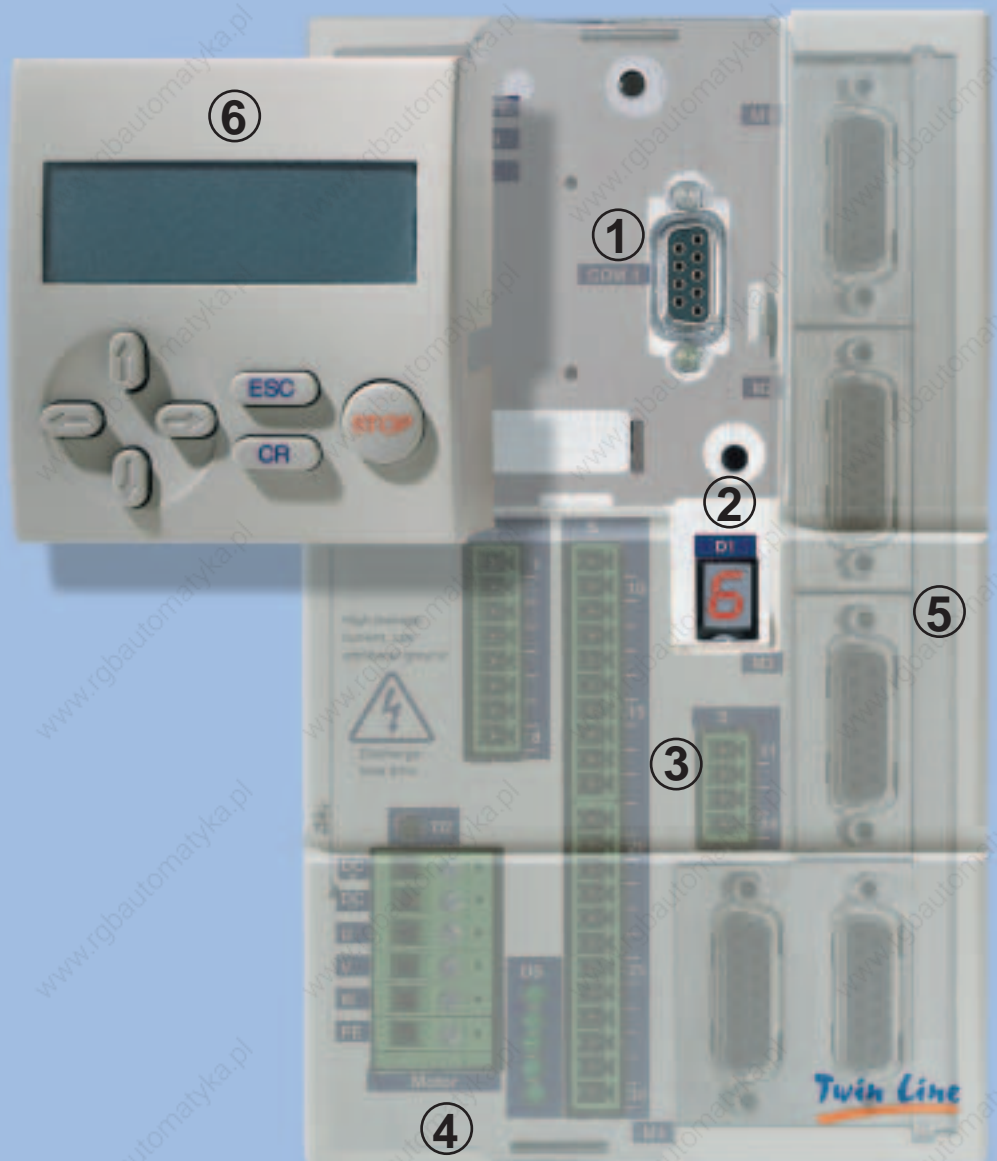
IP 54 protection, available for the positioning controller for stepping motors and AC synchronous motors up to 1.5 kW, offers protection against dust and water which may splash against the device from all directions. Equipped this way, the decentralised positioning controllers can be mounted close to the motor – no control cabinet required.

## Menu-controlled operation with the plug-on control unit

The menu structures and parameter values displayed are automa-

tically adapted. You will only see those parameters and menu levels relevant to the connected device. The Twin Line Control-Tool running under

Windows 95, 98, NT, 2000 or XP Professional.



1 **Communication port for Twin Line Control-Tool or Twin Line HMI**

2 **7 segment status and error display**

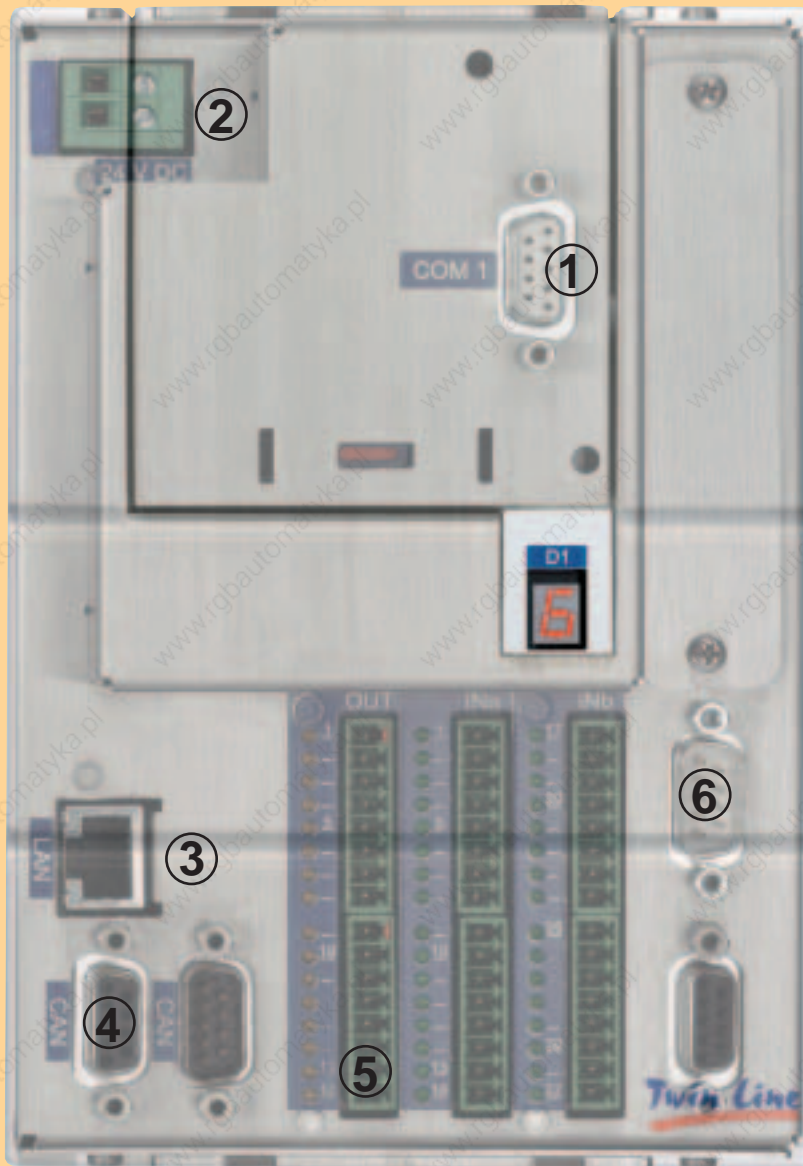
3 **Signal connections**

4 **Motor and DC bus connections**

5 **Plug-in modules (see descriptions, page 4)**

6 **Twin Line HMI (control unit)**

## Twin Line Cell Controller TLCC multi-axis controller



- 4 Drive bus
- 5 32 digital inputs and 16 digital outputs
- 6 Field bus in/out (option)

## Twin Line Cell Controller (TLCC) – the multi-axis controller with integrated soft PLC

The Twin Line Cell Controller is a motion controller with an integrated high-performance soft PLC in a Twin Line housing. The device features an Ethernet connection so that it is fully Web-enabled. The CoDeSys PLC libraries, the drive library and the user interface are the same as in the TLC 6xx Twin Line positioning and sequence controller. This makes it very easy to switch from a programmable single-axis controller to a multi-axis controller.

## Typical application areas for the Twin Line Cell Controller TLCC

- In autonomous production cells requiring motion and PLC functionality, TLCC can replace conventional PLCs.
- TLCC is also suitable for all applications requiring co-ordinated and independent motion such as pick & place, handling, assembly, testing, measuring, material supply, feeding, stacking, palletising and format adjustments.
- TLCC can also be used for axis portals, XY stages and

customer-specific applications if interpolation is not required.

- TLCC is also the perfect solution in applications requiring a connection to the company network.

## The available TLCC communication interfaces

- CANopen is used to control axes.
- Ethernet allows for remote operation of the device, i.e. programming of the application with CoDeSys V2.2, update of the operating system, transfer of application programs and documentation via



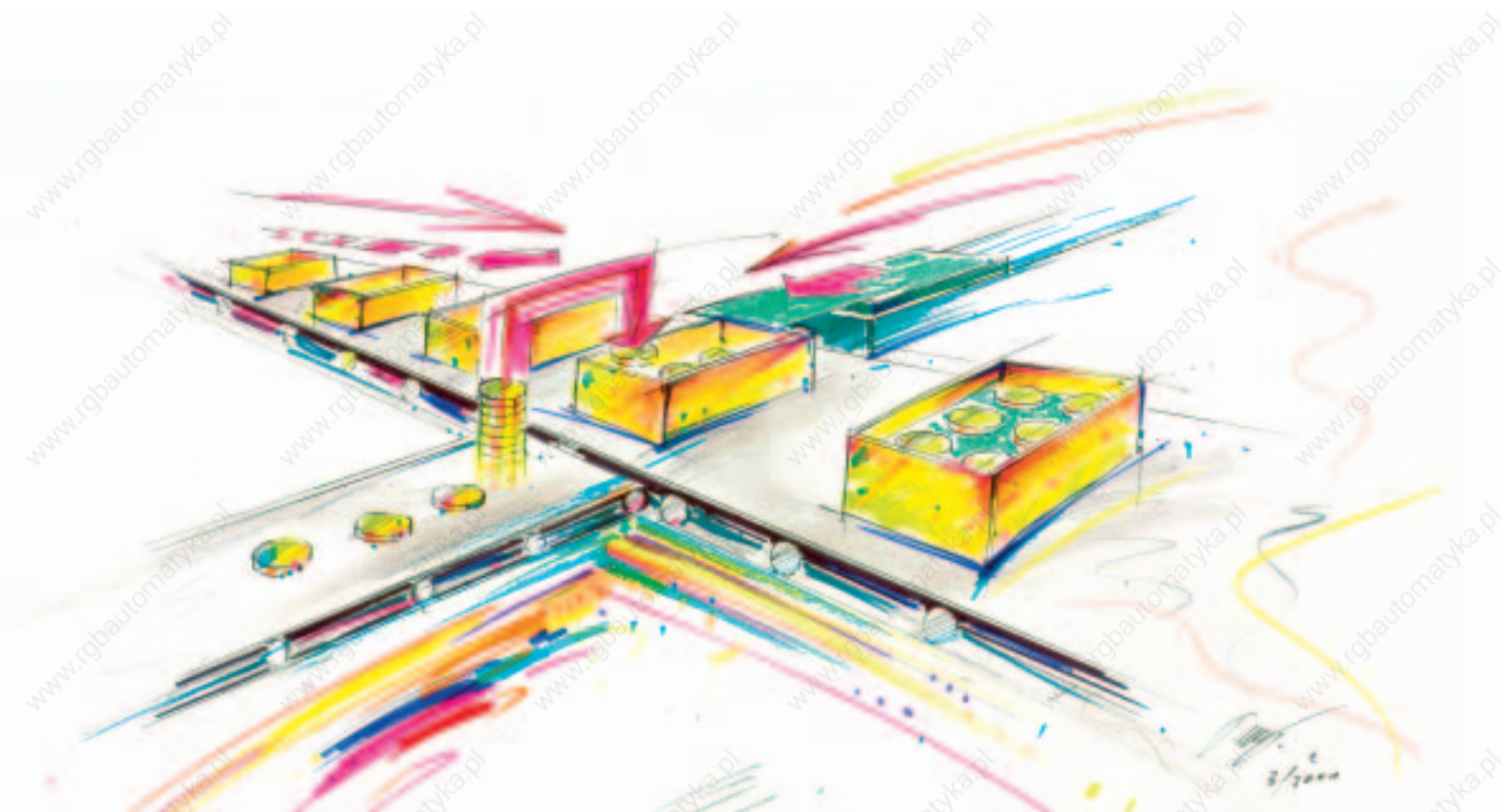
TCP/IP. It is also possible to monitor all program variables via a standard Web browser and a dynamic HTML page.

- RS 232 is provided for application programming with CoDeSys V2.2.

- In addition, the device can be equipped with one of the following field buses: CANopen, DeviceNet, Profibus or Modbus.










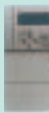
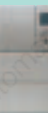




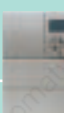





## Programming with CoDeSys

The integrated PLC and motion functionality is programmed via RS 232 or the Internet with all IEC 61131-3-compliant languages such as AWL, KOP, FUP, ST, AS, and CFC.





**Twin Line – custom positioning technology with standard components**

Twin Line stepping motors				Twin Line AC synchronous servo motors						
<b>Standard motor programme</b>										
Torque [Nm] <sup>1)</sup>	1.5	2–6	12–16.5	0.32–0.9	1.1–3.6	4.6–13.4				
										
Motor series	VRDM	VRDM	VRDM	SER	SER	SER	SER			
Motor type	368	397 3910 3913	31117 31122	364 366 368 3610	397 3910 3913 3916	31112 31117	31117 31122 31127			
<b>Twin Line drive/controller</b>				<b>Twin Line drive/controller</b>						
Power range	3 A / 350 W / 1~		7 A / 750 W / 1~	3 A / 750 W / 1~	3 A / 1.5 kW / 3~	6 A / 3 kW / 3~				
<b>Twin Line drives</b>										
Power electronics for stepping motors	TLD 011		TLD 012							
Power electronics for AC synchronous motors				TLD 132		TLD 134		TLD 136		
<b>Twin Line controllers</b>										
Positioning controller with record processing	TLC 411		TLC 412		TLC 432		TLC 434		TLC 436	
Positioning controller with field bus interface	TLC 511		TLC 512		TLC 532		TLC 534		TLC 536	
Positioning and sequence controller, programmable	TLC 611	TLC 612		TLC 612	TLC 632	TLC 634	TLC 636			

<sup>1)</sup> AC synchronous servo: permanent idle torque  $M_{d0}$   
Stepping motors: max. torque  $M_{max}$

**motors** **Twin Line AC synchronous servo motors**

**High-performance motor programme**

4.3–11.25	17.8–25.6	25.6–38.8	0.34–2.3	0.95–6	4.2–12	8.5–27	25–50
RIG	RIG	RIG	DSM 4-	DSM 4-	DSM 4-	DSM 4-	DSM 4-
397 3910 3913	31112 31117	31117 31122	4-05.1-4 4-07.1-2 09.1-2	07.1-3 09.1-3	07.1-3 09.1-4 11.1-2		11.1-4 14.1-4 19.1-2

**controller** **Twin Line drive/controller**

3 A / 750 W / 1~	3 A / 1.5 kW / 3~	6 A / 3 kW / 3~	3 A / 750 W / 1~	3 A / 1.5 kW / 3~	6 A / 3 kW / 3~	16 A / 8 kW / 3~
TLD 132	TLD 134	TLD 136	TLD 132	TLD 134	TLD 136	TLD 138

TLC 432	TLC 434	TLC 436	TLC 432	TLC 434	TLC 436	TLC 438
TLC 532	TLC 534	TLC 536	TLC 532	TLC 534	TLC 536	TLC 538
TLC 632	TLC 634	TLC 636	TLC 632	TLC 634	TLC 636	TLC 638

## we control **motion**

Berger Lahr offers you the positioning and automation solutions you need, based on our tried and proven series of products. Our comprehensive engineering and consulting service

is ready to support and advise you every step of the way. Berger Lahr is a member company of the Schneider Electric Group. With its Merlin Gerlin, Modicon, Square D

and Telemecanique brands, Schneider Electric is one of the leading providers of electrical and automation-engineering solutions.



# BERGER LAHR

Berger Lahr GmbH & Co. KG  
Breslauer Straße 7, D-77933 Lahr  
Telefon: +49 (0) 7821 946-01  
Telefax: +49 (0) 7821 946-313  
[www.berger-lahr.de](http://www.berger-lahr.de)

