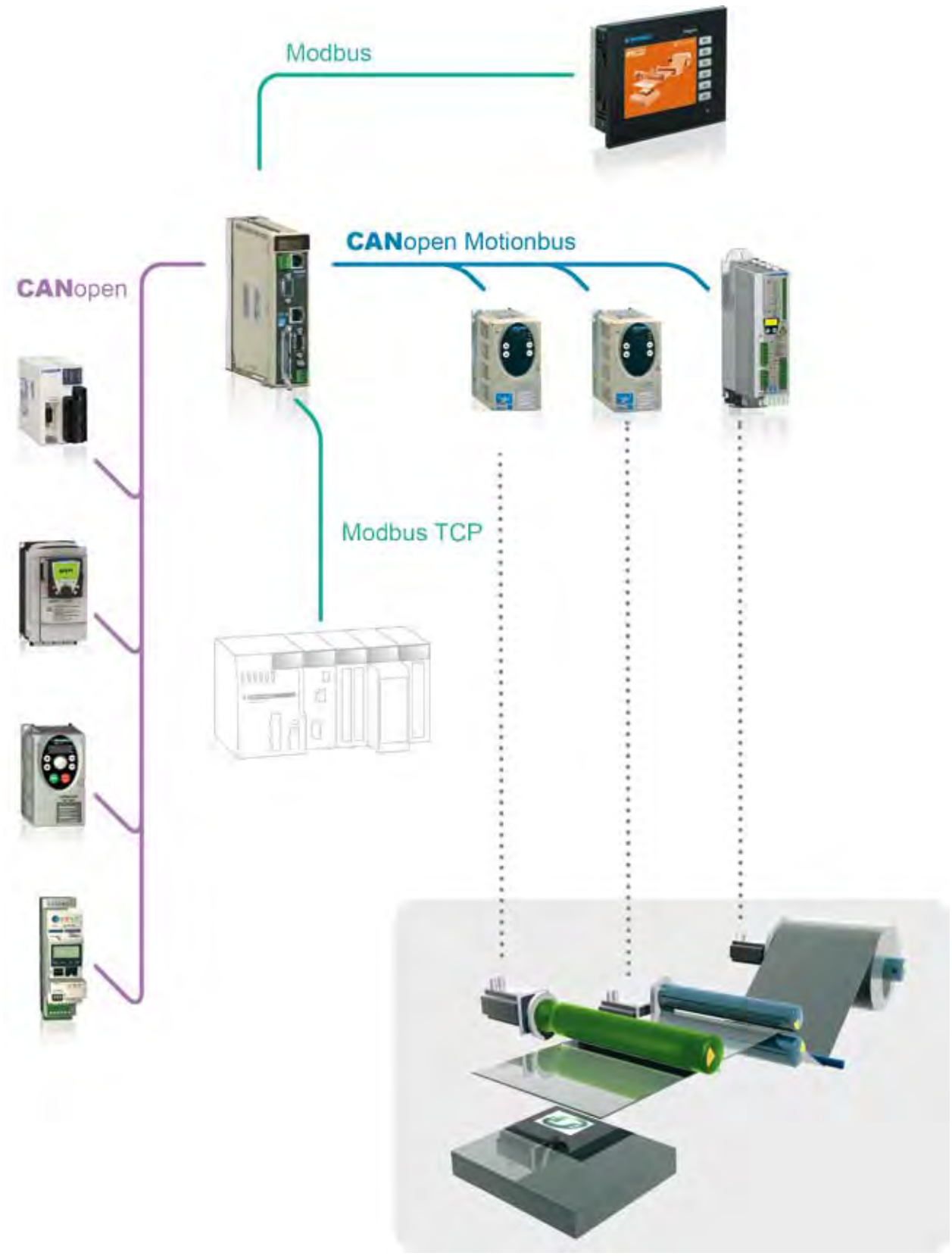
Contents

1 - Lexium Controller motion controllers

- Presentation . . . . . *page 1/2*
- Description . . . . . *page 1/6*
- Characteristics . . . . . *page 1/8*
- References
  - Lexium Controller motion controllers LMC 10, LMC 20 and LMC 20A130● . . . . . *page 1/14*
  - Graphic display terminal . . . . . *page 1/15*
- Telefast® I/O connection bases . . . . . *page 1/17*
- Communication buses and networks
  - Modbus serial link . . . . . *page 1/18*
  - CANopen Motionbus . . . . . *page 1/19*
  - CANopen machine bus . . . . . *page 1/19*
  - Examples of connections to CANopen Motionbus and to CANopen machine bus . . . . . *page 1/20*
  - Connection accessories . . . . . *page 1/21*
  - ROFIBUS DP and DeviceNet fieldbuses . . . . . *page 1/22*
  - Modbus TCP network . . . . . *page 1/23*
- Software solution
  - Easy Motion mode . . . . . *page 1/24*
  - Motion Pro mode . . . . . *page 1/26*
  - Comparative table of functions . . . . . *page 1/28*
  - Application function block library . . . . . *page 1/30*
- Dimensions . . . . . *page 1/32*
- Schemes . . . . . *page 1/34*

Lexium Controller motion controllers



Lexium Controller motion controllers

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LMC 10, LMC 20 and LMC 20A130● Lexium Controller

Presentation

The Lexium Controller range delivers optimized solutions for axis control and positioning, including automation functions. It meets the needs of a wide range of applications in all sectors of industry.

With Lexium Controller motion controllers, Lexium 05 and Lexium 15 servo drives, and BSH and BDH servo motors, Schneider Electric offers a complete, high-performance and economical solution, namely Lexium PAC.

The Lexium PAC solution can be adapted and integrated on most automation platforms - Schneider Electric or third party.

The software solution provided by Lexium Controller motion controllers offers very quick and easy start-up of the machine, thanks to the application template and function block library.

Lexium Controller motion controllers are particularly suited to small machines, thanks to:
- Their compact dimensions
- The limited number of models and the integration of function blocks
- Their ease of installation
- The fact that the application can be put into operation immediately thanks to the application template and remote graphic display terminal
- Reduced installation and start-up costs.

Furthermore, they satisfy the performance requirements of specialized and modular machines thanks to:
- Their expansion capability (input/output etc.)
- Their modular software functions
- Their ease of integration into standard automation systems thanks to the possibility of connection to buses and networks available on the market such as CANopen, Modbus, PROFIBUS DP, DeviceNet and Modbus TCP.

Applications

The Lexium Controller motion controller guarantees coordination and synchronization of axes, via a fieldbus, for applications requiring control of up to 8 synchronized axes.

It includes standard motion control functions:
- Speed and torque control
- Relative or absolute positioning
- Cam profiles for slave axes and programmable cam switch control
- Virtual axis
- Electronic gearing function for speed and position
- Linear and circular interpolations (2½ dimensions)
- Master axis via external encoder
- Distance measurement and position capture at high-speed (30µs) discrete input
- Optimized sequencing of movements (blending).

It is dedicated to the following types of application:
- Handling equipment (conveyors, palletizers, storage and retrieval systems) and transfer machines (gantry cranes etc.)
- Assembly machines (shrink fitting, clamping)
- Inspection and quality control machines
- Machines for working “on the fly” (flying shear, printing, marking, etc.).

Characteristics: page 1/8 | References: page 1/14 | Dimensions: page 1/32 | Schemes: page 1/34

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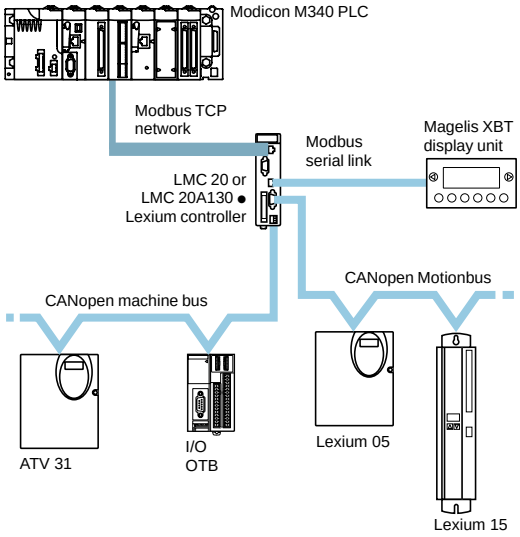


Example of integration of Lexium Controller in an automation platform

Integration in automation platforms

Lexium Controller motion controllers can easily be integrated into the standard automation architectures available on the market.

It can be connected directly via the communication ports on the front panel to the following buses and networks:
Modbus, PROFIBUS DP, DeviceNet and Modbus TCP.

In this way, the Lexium Controller motion controller makes all the axis data which it controls accessible to PLCs, Magelis HMI terminals or any other client.

CANopen machine bus and CANopen Motionbus

The CANopen machine bus is now very widely used in industry because of its high performance. In accordance with international standard ISO 11898 promoted by the "CAN in Automation" association of users and manufacturers, it guarantees a high level of openness and interoperability thanks to its standardized communication and equipment profiles.

Two CANopen machine buses are directly accessible via two integrated communication ports conforming to standard CiA DSP 301 V4.0:
- CANopen Motionbus:
for coordination and synchronization of the drives, conforming to standard CiA DSP 402, "Device Profile Drives & Motion Control".
It is available for all the Lexium Controllers.
- CANopen machine bus:
for expansion of the automation capabilities, such as I/O, servo drives, encoders, etc.
It is available for the LMC 20 and LMC 20A130● motion controllers.
(See characteristics page 1/11).



Remote graphic display terminal

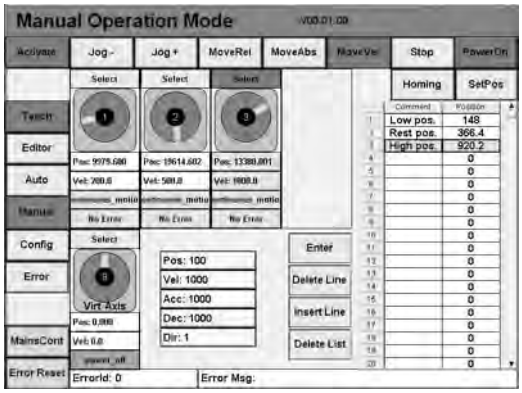
Remote graphic display terminal

The optional remote diagnostic and debugging terminal, used in conjunction with the Easy Motion application template, allows you to:
- Carry out diagnostics on the Lexium Controller motion controllers or servo drives
- Adjust the Lexium Controller motion controller or the servo drive parameters
- Perform debugging
- Back up and restore the application data.

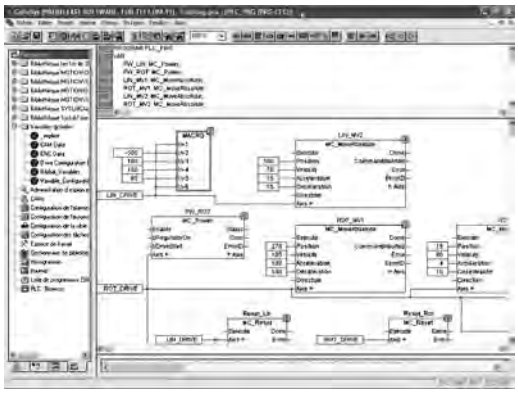
The user is closer to the machine, resulting in better performance and higher efficiency.

Ergonomically designed, the navigation button gives direct access to drop-down menus.

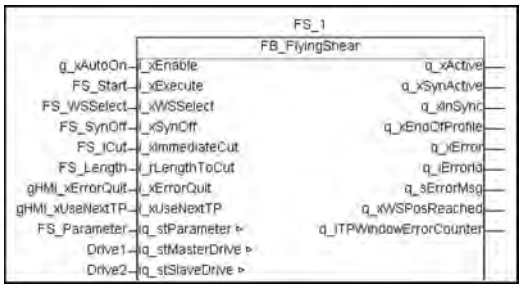
This graphic terminal offers two configurable levels of access:
- Maintenance (limited access)
- Design (allowing access to configurable data)



Example of application template screen



Example of IEC 61131-3 compliant programming editor



Example of application function block

Software solution

The Lexium Controller range offers two application development modes depending on the requirements:

- Easy Motion mode which relies on an application template and integrated graphic interface to configure the motion control functions
- Motion Pro mode to configure and program motion control and automation functions using a language conforming to standard IEC 31161-3.

The Lexium Controller range also offers a function block library so that you can start to use your application immediately.

Easy Motion mode

The Lexium Controller motion controller is supplied with an application template pre-installed. It allows immediate start-up of the whole Lexium PAC system (motion controller, servo drive and motor) and automatic execution of the configured function.

The following services are available:

- Configuration of axes
- Adjustment and diagnostics of drives
- Adjustment and diagnostics of the motion controller
- Creation of position registers via teach function
- Management of axis operating modes (Auto-Man.)
- Manual axis control
- Configuration of positioning tasks (Motion Tasks)
- Editing of cam profiles (8 profiles of 16 points of type XYVA)
- Backup and recovery of the application.

EasyMotion See page 1/24.

Motion Pro mode

Motion Pro mode gives the user complete freedom to develop the application.

While retaining the benefits offered by Easy Motion mode for motion control, it allows you to add automation functions using the integrated programming editor.

The entire application, motion control functions and automation functions can be realized with this editor.

MotionPro See page 1/26.

Application function block library

To simplify application programming and improve machine performance, the Easy Motion and Motion Pro modes have an application function block library.

These functions considerably reduce the time taken to program and debug the whole installation.

The available function blocks are very widely used in the industrial world:

- Flying shear
- Rotary knife
- Grouping/ungrouping
- Clamping with torque control.

With its ergonomic, PLCopen design, this library has been developed so as to accommodate many different mechanical variants and application types.

See page 1/30.

Lexium Controller motion controllers

Description

The Lexium Controller range offers three levels of integration in automation systems depending on the available references:

■ LMC 10 : This is an economical product with a dedicated CANopen Motionbus,

■ LMC 20 : In addition to the characteristics of the LMC 10, it offers a connection to the Modbus TCP network for integration in automation architectures; its CANopen connection extends its capabilities in terms of I/O and the control of other devices,

■ LMC 20A130● : In addition to the characteristics of the LMC 20, it offers a connection to the PROFIBUS DP and DeviceNet fieldbuses.

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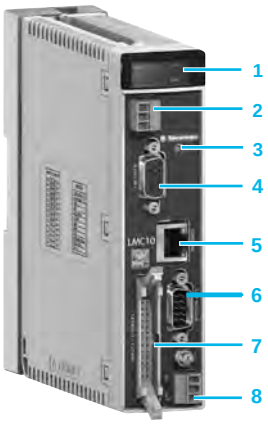

LMC 10

Lexium Controller LMC 10

1 Front display unit with status LED:
■ Indication of status of the Lexium Controller
■ Indication of communication status of the CANopen machine bus and of the CANopen Motionbus
2 3-pin connector for power supply of master encoder
3 Lexium Controller reinitialize button
4 High-Density 15-way female SUB-D connector for connection of incremental encoder or SSI serial absolute encoder
5 RJ45 connector for connection of Modbus or RS 485 serial link, with status LED
6 9-way male SUB-D connector for connection to the CANopen Motionbus
7 HE 10 connector (26-way) for connection of I/O via Telefast® connection bases or via a supplied female connector
8 24 V ⎓ power supply of the Lexium Controller via 3-pin connector

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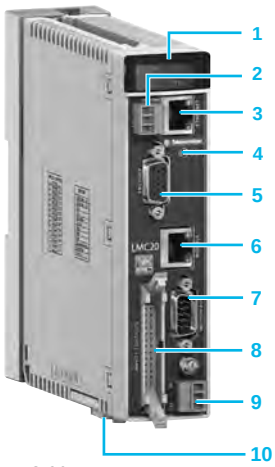

LMC 20

Lexium Controller LMC 20

1 Front display unit with status LED:
■ Indication of status of the Lexium Controller
■ Indication of communication status of the CANopen machine bus and of the CANopen Motionbus
2 3-pin connector for power supply of master encoder
3 RJ45 connector for connection to the Modbus TCP network
4 Lexium Controller reinitialize button
5 High-Density 15-way female SUB-D connector for connection of incremental encoder or SSI serial absolute encoder
6 CRJ45 connector for connection of Modbus or RS 485 serial link, with status LED
7 9-way male SUB-D connector for connection to the CANopen Motionbus
8 HE 10 connector (26-way) for connection of I/O via Telefast® connection bases or via a supplied female connector
9 24 V ⎓ power supply of the Lexium Controller via 3-pin connector
10 CANopen 9-way male SUB-D communication port for extending the configuration (discrete or analogue I/O, drives, encoders, other equipment)

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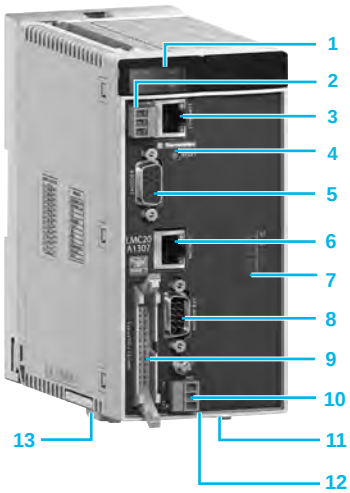

LMC 20A130●

Lexium Controller LMC 20A1307 and LCM 20A1309

1 Front display unit with status LED:
■ Indication of status of the Lexium Controller
■ Indication of communication status of the CANopen machine bus and of the CANopen Motionbus
2 3-pin connector for power supply of master encoder
3 RJ45 connector for connection to the Modbus TCP network
4 Lexium Controller reinitialize button
5 High-Density 15-way female SUB-D connector for connection of incremental encoder or SSI serial absolute encoder
6 RJ45 connector for connection of Modbus or RS 485 serial link, with status LED
7 Diagnostic LEDs for the PROFIBUS DP or DeviceNet communication card
8 9-way male SUB-D connector for connection to the CANopen Motionbus
9 HE 10 connector (26-way) for connection of I/O via Telefast® connection bases or via a supplied female connector.
10 24 V ⎓ power supply of the Lexium Controller via 3-pin connector
11 9-way male SUB-D connector for connection of PROFIBUS DP bus or removable 5-way screw terminal for connection to the DeviceNet bus
12 Terminal with 8 microswitches for configuration of slave address on the PROFIBUS DP or DeviceNet bus
13 CANopen 9-way male SUB-D communication port for extending the configuration (discrete or analogue I/O, drives, encoders, other equipment)

Lexium Controller motion controllers

Environmental characteristics

Controller type			LMC 10	LMC 20	LMC 20A130●
Conforming to standards			Lexium Controllers have been developed to conform to the strictest international standards and the recommendations relating to electrical industrial control devices (IEC, EN), in particular: low voltage, IEC/EN 61800-5-1, IEC/EN 61800-3 (conducted and radiated EMC immunity and emissions).		
	EMC immunity		IEC/EN 61800-3, environments 1 and 2 IEC/EN 61000-4-2 level 3 IEC/EN 61000-4-3 level 3 IEC/EN 61000-4-4 level 4 IEC/EN 61000-4-5 level 3		
CE marking			The motion controllers have CE marking in accordance with the European directives on low voltage (2006/95/EC) and EMC (89/336/EEC).		
Product certifications			UL, CSA, C-Tick, GOST and CCC (pending)		
Degree of protection			IP 20		
Withstand to vibrations			1.5 mm peak to peak from 5…13 Hz, 1 gn from 13…200 Hz, conforming to IEC/EN 60068-2-6		
Shock resistance			15 gn for 11 ms conforming to IEC/EN 60068-2-27		
Withstand to electrostatic discharge	Immunity to electrostatic discharge		Conforming to standard EN 61000-4-2, level 3		
Withstand to HF interference	Immunity to radiated electromagnetic fields		Conforming to standard EN 61000-4-3, level 3		
	Immunity to fast transients/ bursts		Conforming to standard EN 61000-4-4, level 4		
	Surge immunity		Conforming to standard EN 61000-4-5, level 3		
Relative humidity	Operation		10…95 % without condensation		
	Storage		5…95 % without condensation, conforming to IEC 61131-2		
Ambient air temperature around the unit	Operation	**°C**	0…60	0…50	
	Storage	**C**	- 25…+ 70, conforming to IEC 61131-2		
Maximum altitude	Operation	**m**	0…2000		

Electrical characteristics

Power supply *(1)*	Nominal voltage	**V**	⎓ 24		
	Limit values	**V**	⎓ 19…30 (including ripple)		
	Nominal input current	**mA**	300	400	500
	Maximum inrush current	**A**	< 10 for 0,2 ms		

(1) Use of a regulated switch mode power supply, such as Phaseo ABL 7, is recommended.

Characteristics of discrete and event-triggered inputs

Number of input channels	Discrete		8 positive logic (Source)
	Event-triggered		2
Power supply	Nominal input voltage	**V**	24 ⎓
	Nominal input current	**mA**	7
Connection			1 HE 10 connector
Common			1
Input limit values		**V**	19…30 ⎓ (including ripple)
Input impedance for nominal U		**kΩ**	3
Filtering time	At state1	**µs**	15
	At state 0	**µs**	70
Isolation	Between channels		None Isolation with internal logic via optical coupler

Characteristics of Touch Probe inputs

Number of input channels			2
Power supply	Nominal input voltage	**V**	24 ⎓
	Nominal input current	**mA**	7
Connection			1 HE 10 connector
Common			1
Input limit values		**V**	19…30 ⎓ (including ripple)
Input impedance for nominal U		**kΩ**	3
Filtering time	At state1	**µs**	1
	At state 0	**µs**	0,5
Isolation	Between channels		None Isolation with internal logic via optical coupler

Characteristics of the master encoder input

Type of compatible encoders			Encoder with RS 422 compatible differential outputs, 5 or 24 V power supplied Encoder with push-pull output, 5 V power supplied Encoder with open collector output, 5 V power supplied Universal encoder with SSI output, 24 V power supplied
Power supply	Nominal voltage	**V**	5 ⎓ or 24 ⎓
	Nominal current	**mA**	500
Connection			One High-Density 15-way female SUB-D connector for the encoder input and one stripped end
Input limit values	Voltage	**V**	5,5 ⎓
	Current	**mA**	12
Input impedance for nominal U		**kΩ**	2
Isolation		**V**	2500
Incremental encoder	Signal type		A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$
	Maximum operating frequency		250 kHz as input x 4, or 1 MHz as counter
SSI serial absolute encoder	Number of bits		32, with configurable frame (number of revolutions, number of bits/revolution, binary or gray format, parity, etc)
	Clock frequency	**kHz**	200
	Clock voltage	**V**	5

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Output characteristics

Number of output channels			8
Output logic			2 positive logic outputs (Source)
Power supply	Nominal voltage	**V**	24 ⎓
	Nominal current	**mA**	200
Common			1
Output limit values	Voltage	**V**	19…30 ⎓ (including ripple)
Response time	At state1	**µs**	150
	At state 0	**µs**	250
Short-circuit current limiting		**A**	1
Isolation	Between channels		None Isolation with internal logic via optical coupler

Processor characteristics

Memory	Data storage (NV/RAM)	**kb**	60
	Application in RAM	**MB**	1
	Application in Flash EPROM	**MB**	1
RTC	Autonomy	**days**	20
Application structure	Master task		1
	Auxiliary task		1
	Event-triggered tasks		2
Cycle time		**ms**	2 for 4 synchronized axes 4 for 8 synchronized axes
Typical program code execution time	For 1000 lines, in structured language: 60 % Boolean, 20 % numerical, 20 % floating point	**µs**	< 120

Communication port characteristics

Modbus protocol

Structure	Connector		RJ45 type
	Physical interface		2-wire RS 485
	Transmission mode		RTU
	Transmission speed		Can be configured at 19.6 kbps or 38.4 kbps using Motion Pro software
	Access method		Slave
	Isolation between the internal circuit and serial port		–
	Format		8 bits, no parity, 1 stop
	Polarization	**kΩ**	10
	Address		1 to 247, can be configured by the graphic display terminal or using Easy Motion and Motion Pro software
Services	Messaging		Read Holding Registers (03), 121 words maximum Write Single Register (06) Write Multiple Registers (16), 121 words maximum Read Device Identifi cation (43) Diagnostics (08)
	Communication monitoring		Configurable time out
Diagnostics	Using LEDs		An activity LED on the front panel relating to the RJ45 connector

Presentation: page 1/2 | References: page 1/14 | Dimensions: page 1/32 | Schemes: page 1/34

Communication port characteristics (continued)

CANopen Motionbus		
Structure	Connector	9-way male SUB-D
	Transmission speed	Can be configured using Easy Motion and Motion Pro software: at 250 kbps for a maximum bus length of 250 m, at 500 kbps for a maximum bus length of 80 m, at 1 Mbps for a maximum bus length of 15 m
	Access method	Master
	Address (Node ID)	8 Lexium 05 or Lexium 15 servo drives or SD3 28A stepper drives
Services	Number of PDOs	2 PDOs per slave (1 transmit and 1 receive)
	Number of SDOs	2 SDOs per cycle (1 read and 1 write)
	Emergency	Yes
	CANopen application layer	CiA DSP 301 V4.02
	Device profile	CiA DSP 405 Control of devices with CiA DSP 402 profile (Device Profile for Drives and Motion Control)
	Communication monitoring	Node Guarding, Heartbeat
	Length of bus	15 m maximum at 1 Mbps (the bus must always be wired in a daisy-chain)
Diagnostics	Using DELs	An activity LED on the front panel
CANopen machine bus for I/O extensions, servo drives, etc		
Structure	Connector	9-way male SUB-D
	Transmission speed	Can be configured using Motion Pro software from 50 kbps for a maximum bus length of 1000 m to 1 Mbps for a maximum bus length of 15 m
	Access method	Master
	Address (Node ID)	1 to 32, can be configured using Motion Pro software
Services	Number of PDOs	10 PDOs per slave (5 transmit and 5 receive, 6 transmit and 4 receive, …)
	Number of SDOs	2 SDOs per cycle (1 read and 1 write)
	CANopen application layer	CiA DSP 301 V4.02
	Device profile	CiA DSP 405
	Communication monitoring	Note Guarding, Heartbeat
Diagnostics	Using LEDs	An activity LED on the front panel

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Communication port characteristics (continued)

PROFIBUS DP fieldbus

Structure	Connector	9-way male SUB-D
	Transmission speed	Autodetected by the Lexium Controller
	Address	1 to 126, can be configured using a microswitch
Services	Periodic exchanges	Type 5 PPO format cyclic frame ■ PZD service: Communication scanner exchanging 8 input words and 8 output words periodically ■ PKW service: Read/write access to the whole Lexium Controller %MW zone
	Communication monitoring	Can be inhibited Time out can be set via the PROFIBUS DP network configurator
Diagnostics	Using LEDs	An activity LED on the front panel
Description file		A gsd file is supplied on the documentation CD-ROM for the whole range or can be downloaded from the Internet at “www.schneider-electric.com”. This file does not contain a description of the motion controller parameters.

DeviceNet fieldbus

Structure	Connector	Screw-type, 5 contacts, 5.08 pitch
	Transmission speed	Can be configured at 125 kbps, 250 kbps or 500 kbps by a microswitch
	Address	1 to 63, can be configured by a microswitch
Services	Periodic variables	Communication scanner assemblies 100 and 101
	Periodic exchange mode	Inputs: Polled, Change of state, Cyclic Outputs: Polled
	Auto Device Replacement	No
	Communication monitoring	Can be inhibited Time out can be set via the DeviceNet network configurator
Diagnostics	Using LEDs	An activity LED on the front panel
Description file		A eds file is supplied on the documentation CD-ROM for the whole range or can be downloaded from the Internet at “www.schneider-electric.com”. This file contains a description of the motion controller parameters.

Communication port characteristics (continued)

Modbus TCP network

Structure	Connector	RJ45 type
	Physical interface	2-wire RS 485
	Transmission mode	Half duplex and full duplex
	Transmission speed	10/100 Mbps, autodetected by the Lexium Controller
	IP addressing	■ Manual assignment via the display terminal or Motion Pro software ■ BOOTP (dynamic IP address server depending on the IEEE address) ■ DHCP (dynamic address server depending on the Device Name) with automatic reiteration
	Physical	Ethernet 2
	Link	LLC: IEEE 802.2 MAC: IEEE 802.3
	Network	IP (RFC791) ICMP client for supporting certain IP services such as the “ping” command
	Transport	TCP (RFC793), UDP The maximum number of connections is 8 (port 502)
Services	Transparent Ready class *(1)*	C20
	Web server	Simultaneous access via three Web browsers (more, depending on the number of connections used) Server is factory-configured and modifiable The factory-configured server contains the following pages: ■ Lexium Controller viewer: display of the Lexium Controller status and the state of its I/O ■ Data viewer: display and password-protected modification of the Lexium Controller parameters, arranged in order of %MW words ■ Lexium Controller chart: oscilloscope type display ■ Security: configuration of passwords for viewing and modification ■ I/O scanner: configuration for exchanging periodic data (10 input words, 10 output words) ■ Ethernet statistics: identification of the Lexium Controller and communication statistics
	Messaging	Read Holding Registers (03), 121 words maximum Write Single Register (06) Write Multiple Registers (16), 121 words maximum Read Device Identification (43) Diagnostics (08)
	Network management	SNMP
	File transfer	FTP for Web server
	Communication monitoring	Can be inhibited Time out adjustable from 0.5…60 s via the embedded Web server
Diagnostics	Using LEDs	An activity LED on the front panel relating to the RJ45 connector
	Via the Web server	Number of frames received Number of incorrect frames

(1) Please consult our “Ethernet TCP/IP Transparent Ready” catalogue.

Lexium Controller motion controllers
LMC 10, LMC 20 and LMC 20A130●



LMC 20

Lexium Controller motion controllers *(1)*

Power supply	Number of I/O	Max. nb of synchronized axes (via CANopen Motionbus) *(2)*	Integrated communication				Reference	Weight
			Bus machine CANopen *(3)*	Modbus serial link	Ethernet network	Third party bus		
V								kg
24 ⎓	8/8 24 V ⎓	8	–	Yes	–	–	**LMC 10**	0.666
			Yes	Yes	Yes	–	**LMC 20**	0.697
			Yes	Yes	Yes	PROFIBUS DP	**LMC 20A1307**	1.076
			Yes	Yes	Yes	DeviceNet	**LMC 20A1309**	1.079

Software and documentation pack

Désignation	Composition	Reference	Weight kg
Software and documentation pack	The pack consists of: ■ Easy Motion software ■ Motion Pro software ■ application function blocks library ■ technical documentation for setting up hardware and software	**VW3 M8 702**	–

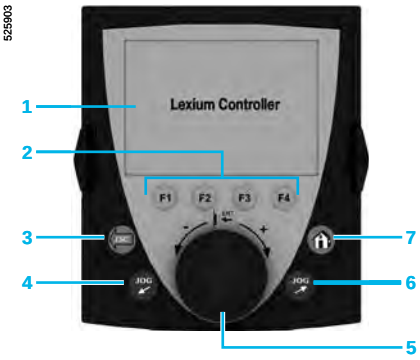
Connection accessories

Désignation	Description	Length m	Reference	Weight kg
For SSI serial incremental encoders or absolute encoders *(4)*				
Cable for master encoder input	1 High Density 15-way male SUB-D connector 1 stripped end	1	**VW3 M4 701**	–
For display units and Magelis graphic terminals *(5)*				
Cable for display unit or Magelis graphic terminal input	One 25-way male SUB-D connector 1 RJ45 connector	3	**XBT Z938**	–
For PC serial port				
Cable for PC serial port via serial link	1 RJ45 connector One 9-way female SUB-D connector	3	**VW3 M8 701 R030**	–
Crossed shielded twisted pair cables	2 RJ45 connectors	3	**490 NTC 00003**	–
		5	**490 NTC 00005**	–

(1) Lexium Controller motion controllers are supplied as standard with an HE 10 female connector for connection of I/O and with two 3-pin female connectors for the power supply of the Lexium Controller motion controller and the encoder. Transparent Ready class: C20.
(2) Cycle time: 2 ms for 4 synchronized axes and 4 ms for 8 synchronized axes.
(3) CANopen machine bus for I/O extension, drives etc. or connection of third party products.
(4) Incremental encoders or absolute SSI series absolute encoders: Please refer to the "Osicoder" catalogue or visit "www.schneider-electric.com".
(5) Display units and Magelis graphic terminals: Please refer to the "Human-Machine interfaces" catalogue or visit "www.schneider-electric.com".

Presentation: page 1/2 | Characteristics: page 1/8 | Dimensions: page 1/32 | Schemes: page 1/34

Lexium Controller motion controllers
Option: graphic display terminal



Graphic display terminal

Presentation

The HMI terminal, available as an option with the Lexium Controller motion controller, brings the user as close as possible to the machine so that he can:
- Carry out diagnostics on the motion controller or drives
- Adjust the Lexium Controller motion controller or the drive parameters
- Carry out debugging
- Backup and restore application data

The main debugging functions are as follows:
- Management of “Auto-Manu” mode, of the axes
- Fine adjustment and validation of axes
- In Manu mode:
  - Control the position, speed and homing of the axis
  - JOG functions
- In Auto mode, controlling the execution of positioning tasks
- Creation of position registers via teach function

The principal maintenance functions are as follows:
- Diagnostics of motion controller or servo drives
- Quick restart of the machine after a stoppage
- Transfer of programs
- Backup and recovery of configuration of servo drives

It is multilingual, supplied with 6 languages installed as standard (English, French, German, Italian, Spanish and Chinese). Other languages can be downloaded to the flash memory.
It is connected to the Lexium Controller motion controller via a cable which must be ordered separately (see below).
The terminal’s maximum operating temperature is 60°C and it features IP 54 protection.

Description

The front panel of the remote graphic terminal has the following features:

1 Graphic display unit:
- 8 lines, 240 x 160 pixels
- large digits that can be read from 5 m away

2 Dynamic function keys F1, F2, F3 and F4:
- application functions: Auto/Man.
- system functions: “RUN”, “STOP”, “RESET”
- Navigation functions

3 “ESC” key: Aborts a value or a parameter to return to the previous selection

4 “JOG ↙” key: Turns the axis in the negative direction

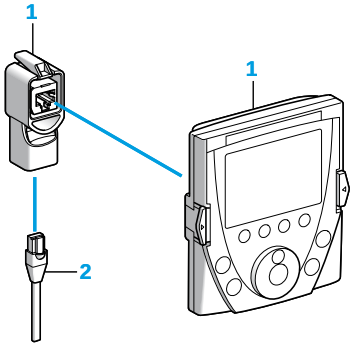
5 Navigation button:
- Press: Saves the current value (ENT)
- Turn +/-: Increases or decreases the value, takes you to the next or previous line

6 “JOG ↗” key: Turns the axis in the positive direction

7 Key to return to the home screen.

Reference

Description	No.	Reference	Weight kg
Remote graphic display terminal supplied with an angled female/female RJ45 adapter	1	**VW3 M1 701**	–



Remote graphic display terminal accessory

A cable equipped with two RJ45 connectors can be supplied in option to connect the graphic display terminal to the Lexium Controller motion controller (available in lengths of 1, 3 and 5 metres).

Reference

Description	No.	Length m	Reference	Weight kg
Remote cables for graphic display terminal VW3 M1 701 equipped with 2 RJ45 connectors	2	1	**VW3 A1 104 R10**	0.050
		3	**VW3 A1 104 R30**	0.150
		5	**VW3 A1 104 R50**	0.250

Lexium Controller motion controllers
Telefast® I/O connection bases

Presentation

The Telefast® connection base is an interface for connecting the I/O of the Lexium Controller motion controller to the operational section.
It guarantees a quick, reliable and economic connection.

It also allows:
- Distribution of common signals on inputs
- Disconnection of outputs per channel
- Protection of the 24 V ⎓ power supply of the Lexium Controller motion controller using fuses

Depending on the model, it also provides:
- Visual indication of I/O status via LEDs
- Protection of each channel using fuses

It is connected directly to the HE 10 connector of the Lexium Controller motion controller via a cable.

Characteristics

Power supply characteristics

Supply voltage	Conforming to IEC 61131-2	**V** ⎓	19…30 (Un = 24)
Maximum supply current per sub-base		**A** ⎓	2
Voltage drop on supply fuse		**V** ⎓	0,.3
Supply overload and short-circuit protection by quick-blow fuse (included)		**A**	2

Characteristics of the control circuit for one channel

Sub-base type			**Passive connection sub-bases for discrete signals**	
			ABE 7B20MPN20	**ABE 7B20MPN22**
Number of channels	Passive input		12	
	Passive output		8	
Rated voltage at Ue		**V** ⎓	24	
Min/max voltage	Conforming to IEC 61131-2	**V** ⎓	20.4/26.4	
Internal current per channel at Ue	Passive input	**mA**	–	3.2
	Passive output	**mA**	–	3.2
Conformity	Conforming to IEC 61131-2		Type 1	

Output circuit characteristics

Sub-base type			**Passive connection sub-bases for discrete signals**	
			ABE 7B20MPN20	**ABE 7B20MPN22**
Number of channels	Passive output		8	
Rated voltage at Ue	Passive output	**V** ⎓	24	
Current switched per I/O channel	Passive input/output	**mA**	15/300	
Maximum current per common	Passive output	**A**	2	
Rated insulation voltage		**V**	Not isolated	
Channel fuse protection		**mA**	–	315

Other characteristics (at ambient temperature of 20 °C)

Sub-base type		**Passive connection sub-bases for discrete signals**	
		ABE 7B20MPN20	**ABE 7B20MPN22**
Permissible leakage current without illuminating the channel LED	**mA**	–	1.5

References: page 1/17 Dimensions: page 1/33 Schemes: page 1/35

Lexium Controller motion controllers
Telefast® I/O connection bases

000013-35-M



ABE 7B20MPN20

References *(1)*

Telefast® I/O connection bases

Number of I/O	Number, type of inputs	Number, type of outputs	LED per channel	Fuse	Reference	Weight kg
20	12, Sink, 24 V ⎓	8, Source, 24 V ⎓	No	No	**ABE 7B20MPN20**	0.430
			Yes	Yes	**ABE 7B20MPN22**	0.430

Connection cables for Telefast® sub-bases

Type of signal	Type of connection		Gauge/ cross-section	Length *(2)*	Reference	Weight
	Lexium Controller side	Telefast® side	AWG/ mm²	m		kg
Discrete inputs/ outputs	HE 10 26 ways	HE 10 26 ways	28/ 0.08	0.5	**ABF T26B050**	0.080
				1	**ABF T26B100**	0.110
				2	**ABF T26B200**	0.180

Accessories

Description	Number of shunted terminals	Characteristics	Sold in lots of	Reference	Weight kg
Optional snap-on terminal blocks	20	–	5	**ABE 7BV20**	0.060
	12 + 8	–	5	**ABE 7BV20TB**	0.060
Quick-blow fuses 5 x 20, 250 V, UL	–	0.125 A	10	**ABE 7FU012**	0.010
		0.315 A	10	**ABE 7FU030**	0.010
		1 A	10	**ABE 7FU100**	0.010
		2 A	10	**ABE 7FU200**	0.010

1) For further information about Telefast® I/O connection bases, please refer to the "Twido programmable controllers" catalogue, or visit "www.schneider-electric.com".
(2) For lengths over 2 metres, please consult your Regional Sales Office.

Lexium Controller motion controllers
Communication buses and networks

Modbus serial link

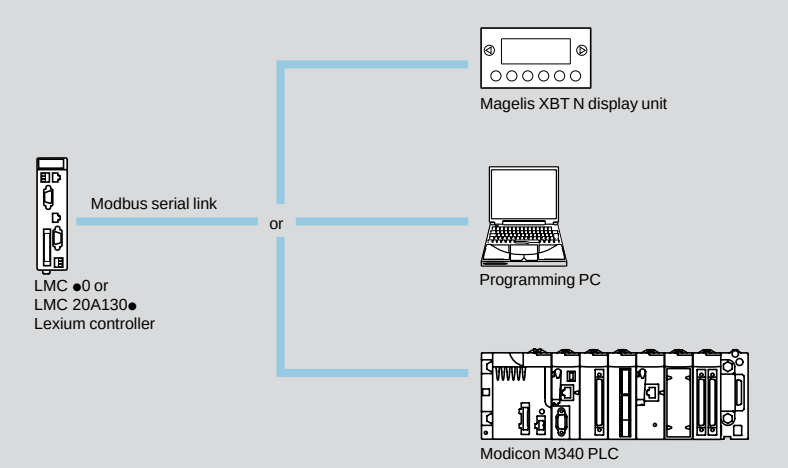
Presentation

The Modbus protocol is of master/slave type, consisting of a master station and slave stations. Lexium Controller LMC 10, LMC 20 and LMC 20A130● motion controllers have the Modbus protocol integrated as standard: These are slave stations.

Two exchange mechanisms are possible:
■ Request/response: The request from the master is addressed to a given slave. The master then waits for the response from the slave which has been interrogated.
■ Broadcasting: The master broadcasts a request to all the slave stations on the bus, which execute the command without transmitting a response.

The Modbus protocol allows:
■ Programming and configuration of the Lexium Controller motion controller with Easy Motion and Motion Pro software or with the remote graphic terminal
■ Connection of an HMI terminal (Magelis XBT GT graphic terminal, Magelis XBT N alphanumeric display or Magelis XBT R alphanumeric terminal)
■ An economical connection point for sharing application data with a PLC or any other type of client.

Architecture



Example of architecture with Modbus serial link

CANopen machine bus and CANoption Motionbus

Presentation

The CANopen machine bus complies with standard ISO 11898. Thanks to its standard communication profiles, it can be used to ensure openness and interoperability with various devices (drives, motor starters, smart sensors, etc.).

The CANopen bus is a multi-master bus based on the master/slave principle, which guarantees secure access to realtime automation device data. The CSMA/CA type protocol is based on broadcast exchanges, transmitted cyclically or on event, which guarantee optimum use of the bandwidth. A messaging channel is also used to parameterize the slave devices.

A staged CANopen connectivity solution reduces costs and optimizes the realization of your architecture, thanks to:
■ Reduced cabling time
■ Greater reliability of the cabling
■ Flexibility should you need to add or remove equipment.

Lexium Controller motion controllers
Communication buses and networks

Architecture

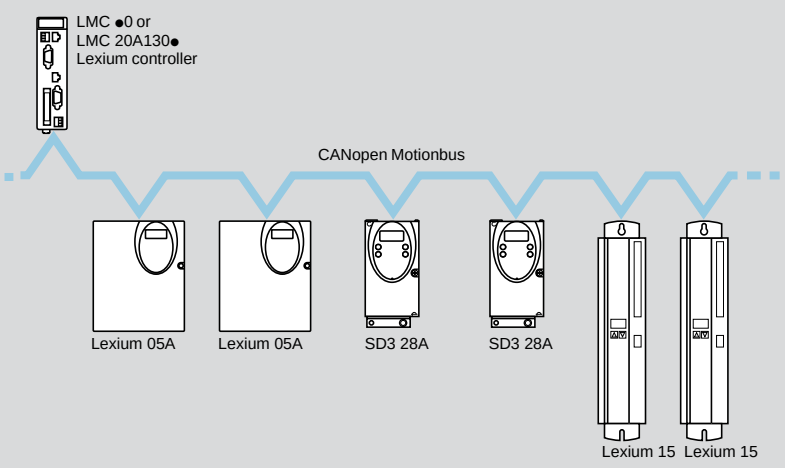
CANopen Motionbus

The CANopen connection dedicated to the Motion bus allows the possibility of connecting and controlling up to 8 Lexium 05A, Lexium 15 servo drives or SD3 28A steppers.

The network cycle ensures updating of the position setpoints so as to guarantee synchronization of axes.

Lexium Controller LMC 10, LMC 20 and LMC 20A130● motion controllers have the CANopen Motionbus integrated as standard.

To guarantee the performance of the CANopen Motionbus, it is advisable to create a bus in a daisy-chain formation, without tap junctions; our range of connection accessories has been extended with this in mind.



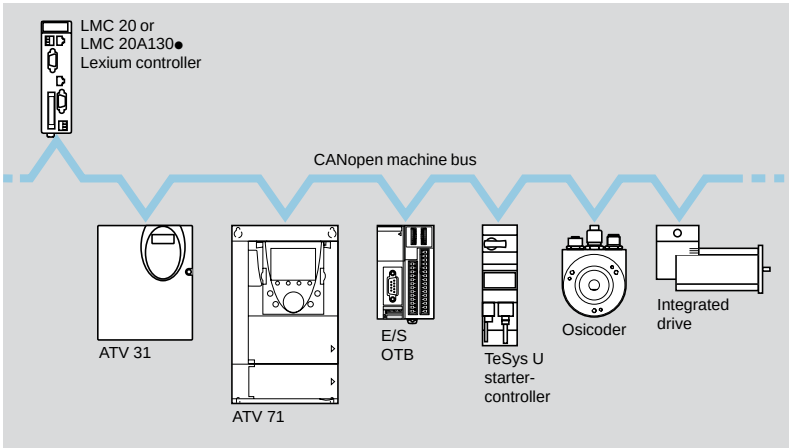
Example of architecture with CANopen Motionbus

CANopen machine bus

Thanks to their CANopen connection, Lexium Controller LMC 20 and LMC 20A130● motion controllers extend their capabilities to include applications requiring the control of a greater number of I/O, control devices or motor starters.

Schneider Electric products which can be connected to the CANopen machine bus are:

- TeSys U controller-starters
- Advantys OTB and STB distributed I/O
- Advantys FTB and FTM I/O splitter boxes
- Altivar 31, Altivar 61 and Altivar 71 variable speed drives
- XCC incremental or absolute rotary encoders
- Lexium integrated drives.

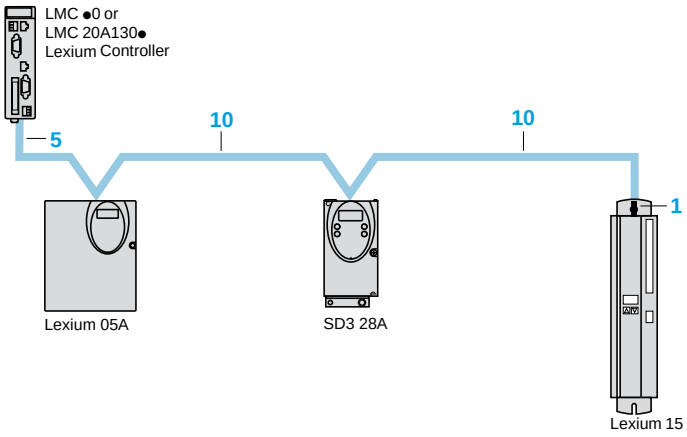


Example of architecture with CANopen machine bus

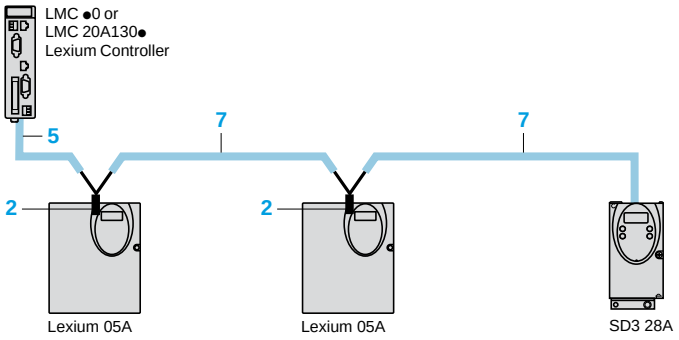
Lexium Controller motion controllers
Communication buses and networks

Examples of connection to CANopen Motionbus

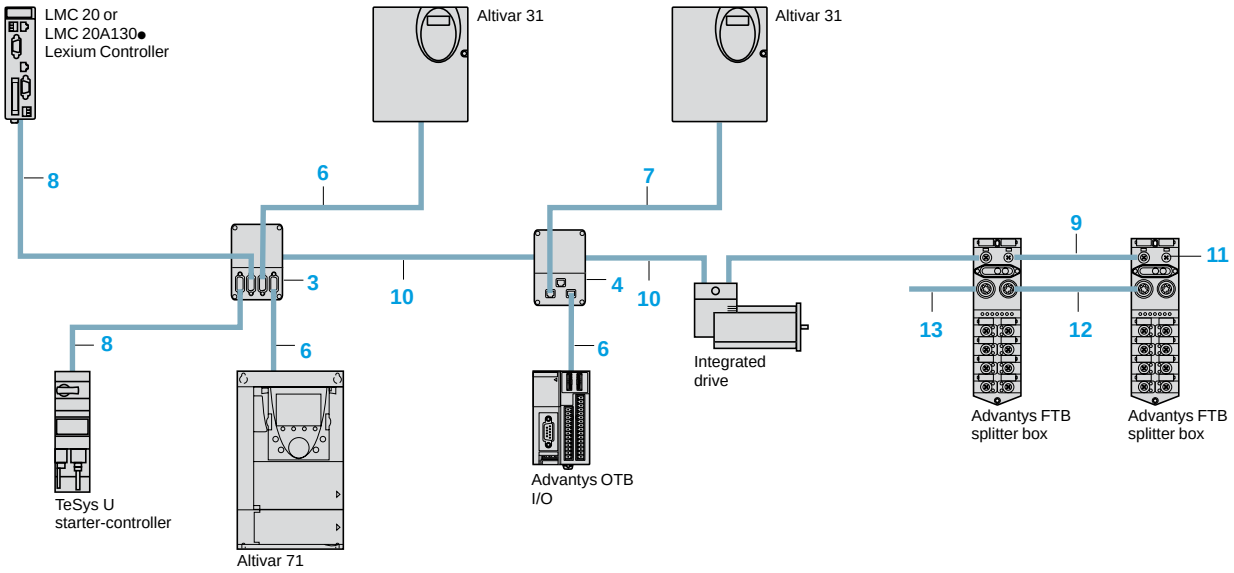
For Lexium 05A and Lexium 15 servo drives or SD3 28A stepper, for customer assembly



For Lexium 05A servo drive or SD3 28A stepper, prewired



Example of connection to CANopen machine bus



Lexium Controller motion controllers
Communication buses and networks

Connection accessories

Connection accessories

Description	Use	No.	Reference	Weight kg
Connector 9-way female SUB-D with screw terminals and line terminator	Connection of Lexium 15 servo drive	1	**VW3 M3 802**	–
Daisy chain tap with 3 RJ45 connectors and a 0.3 m cable	Daisy-chain connection of Lexium 05 servo drive or SD3 28A stepper	2	**TCS CTN023F13M03**	–
CANopen IP 20 tap junctions				
With 4 SUB-D ports. Screw terminals for connection of trunk cables. Line terminator	Tapping of trunk cable for SUB-D cabling	3	**TSX CAN TDM4**	0.196
With 2 RJ45 ports	Tapping of trunk cable for RJ45 cabling	4	**VW3 CAN TAP2**	–

Description	Use From	Use To	No.	Length. m	Reference	Weight kg
Connection cables with connectors						
CANopen cable with one 9-way female SUB-D connector with integrated line terminator and one RJ45 connector	LMC Lexium controller	Lexium 05A servo drive, SD3 28A stepper, TCS CTN023F13M03 daisy chain tap	5	1	**VW3 M3 805R010**	–
CANopen cables with one 9-way female SUB-D connector and one RJ45 connector	TSX CAN TDM4 junction box	ATV 31 drive, ATV 71 drive	6	0.5	**TCS CCN4F3M05T**	–
				1	**TCS CCN4F3M1T**	–
	TSX CAN TAP2 junction box	Advantys OTB I/O		3	**TCS CCN4F3M3T**	–
CANopen cables *(1)* with 1 RJ45 connector at each end	TCS CTN023F13M03 daisy chain tap	TCS CTN023F13M03 daisy chain tap	7	0.3	**VW3 CAN CARR 03**	–
	VW3 CAN TAP2 junction box	ATV 31 drive		1	**VW3 CAN CARR 1**	–
CANopen IP 20 cables *(1)* with one 9-way female SUB-D connector at each end Standard cable, CE marking Low smoke emission, halogen-free Flame retardant (IEC 60332-1)	LMC Lexium controller	TSX CAN TDM4 junction box	8	0.3	**VW3 CAN CADD 03**	0.091
				1	**VW3 CAN CADD 1**	0.143
	TSX CAN TDM4 junction box	TeSys U starter-controller		3	**VW3 CAN CADD 3**	0.295
				5	**VW3 CAN CADD 5**	0;440
CANopen IP 67 cables *(1)* with 2 x 5-way angled M12 connectors, A coding (1 female connector and 1 male connector)	Advantys FTB splitter box	Advantys FTB splitter box	9	0.3	**FTX CN 3203**	0.040
				0.6	**FTX CN 3206**	0.070
				1	**FTX CN 3210**	0.100
				2	**FTX CN 3220**	0.160
				3	**FTX CN 3230**	0.220
				5	**FTX CN 3250**	0.430
Connection cables						
CANopen IP 20 cables *(1)*						
Standard cables, CE marking Low smoke emission, halogen-free Flame retardant (IEC 60332-1)			10	50	**TSX CAN CA 50**	4.930
				100	**TSX CAN CA 100**	8.800
				300	**TSX CAN CA 300**	24.560
UL certification, CE marking Flame retardant (IEC 60332-2)				50	**TSX CAN CB 50**	3.580
				100	**TSX CAN CB 100**	7.840
				300	**TSX CAN CB 300**	21.870
Cable for harsh environments *(2)* or mobile installation, CE marking Low smoke emission, halogen-free Flame retardant (IEC 60332-1)				50	**TSX CAN CD 50**	3,510
				100	**TSX CAN CD 100**	7.770
				300	**TSX CAN CD 300**	21.700
Connection accessories						
IP 67 line terminator with one M12 connector (for end of bus)	–	–	11		**FTX CNTL12**	0.010
Power supply cables 24 V ⎓ with two 5-way 7/8 connectors	Advantys FTB splitter box	Advantys FTB splitter box	12	0.6	**FTX DP2206**	0.150
				1	**FTX DP2210**	0.190
				2	**FTX DP2220**	0.310
				5	**FTX DP2250**	0.750
Power supply cables 24 V ⎓ with one 5-way 7/8 connector and one stripped end	Phaseo ABL 7 power supply	Advantys FTB splitter box	13	1.5	**FTX DP2115**	0.240
				3	**FTX DP2130**	0.430
				5	**FTX DP2150**	0.700

(1) Please refer to the "Machines and installations with CANopen" catalogue.
(2) Harsh environments:
- resistance to hydrocarbons, industrial oils, detergents, solder splashes
- relative humidity up to 100 %,
- saline atmosphere,
- significant temperature variations,
- operating temperature between - 10°C and + 70°C.

1

PROFIBUS DP and DeviceNet fieldbuses

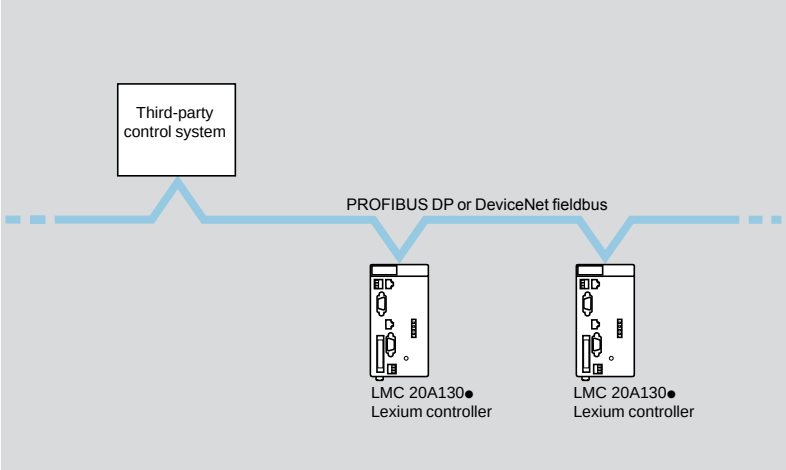
Presentation

The PROFIBUS DP bus is a fieldbus that meets industrial communication requirements.
It has linear bus topology with a master/slave-type centralized access procedure. The physical link is made by a single shielded twisted pair, although optical interfaces are available for establishing tree, star or ring structures.

The DeviceNet fieldbus is an open low-end type bus system, used in various industrial applications. It is based on CAN technology (layers OSI 1 and 2).
The DeviceNet fieldbus is based on the master/slave principle. The physical link is composed of 2 shielded twisted pairs to which it is possible to connect up to 63 slaves. Each end must have a line terminator.

The connection to the PROFIBUS DP and DeviceNet fieldbuses allows the LMC 20A1307 and LMC 20A1309 motion controllers to standardize the motion control solutions, while remaining independent of the system controlling the automation of the machine.

Architecture



Example of architecture with PROFIBUS DP or DeviceNet fieldbus

Connection type

For	Description
PROFIBUS DP fieldbus	9-way male SUB-D connector 490 NAD 911 for LMC 20A1307 Lexium Controller
DeviceNet fieldbus	Removable 5-way screw terminal for LMC 20A1309 Lexium Controller

Modbus TCP network

Presentation

Introduced by Schneider Electric, the Transparent Ready concept enables transparent communication between control system devices, production and management. Network technologies and the associated new services are used to share and distribute data between sensors, PLCs, workstations and third-party devices in an increasingly efficient manner.

This concept is based on the Modbus TCP industrial standard which proposes a single network that meets most communication requirements from sensors/actuators through to production management systems. Where a variety of communication systems are usually required, Transparent Ready standard technologies can result in significant cost savings in the areas of definition, installation, maintenance or training.

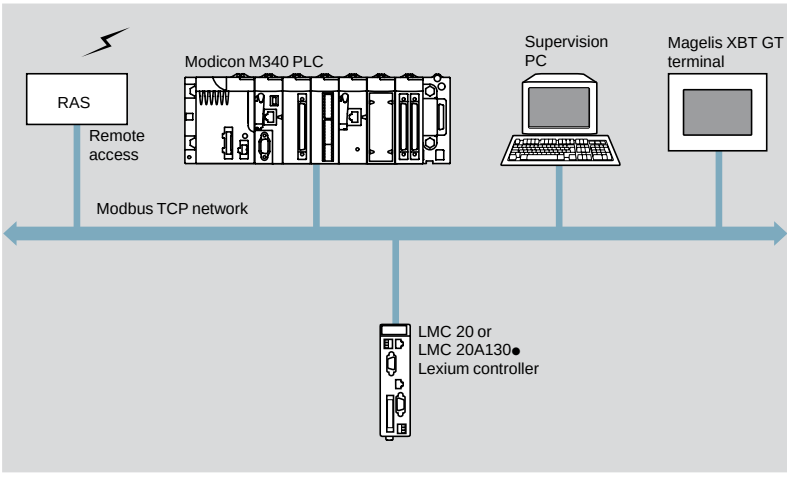
Transparent Ready is based on:
- Modbus TCP-based services meeting control system requirements in terms of functions, performance and quality of services
- Products including motion controllers, several ranges of PLC, distributed I/O, industrial terminals, variable speed drives, gateways and an increasing number of partner products
- The ConneXium range of cabling accessories: hubs, switches, cables adapted to the environment and to the requirements of industrial conditions.

Lexium Controller LMC 20 and LMC 20A130● motion controllers are connected to the Modbus TCP network via an RJ45 connector.

They are supplied with an integrated Web server which users can adapt according to the application. This can be used to:
- Access configuration data transparently
- Perform remote diagnostics or maintenance
- Incorporate simple human/machine interface functions.

The Modbus TCP link thus provides a convenient connection for the programming, configuration and debugging of your Lexium PAC: Lexium Controller LMC 20 and LMC 20A130● motion controllers, Lexium 05A and Lexium 15 servo drives, and BSH and BDH servo motors.

Architecture



Example of architecture with Modbus TCP network

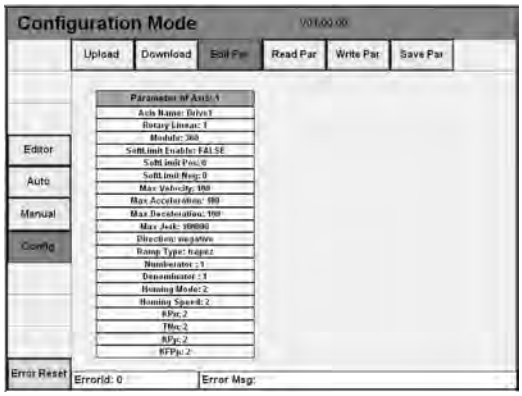
Lexium Controller motion controllers
Software solution

EasyMotion

The Lexium Controller range offers two levels of application implementation:
Easy Motion mode for configuration and Motion Pro mode for configuration and programming.

Easy Motion mode is intended for applications in which the Lexium Controller motion controller handles the positioning functions, while a third-party device, such as a PLC, controls the machine automation functions.
This mode is available with Lexium 05A servo drive.

Motion Pro mode is intended for applications in which the Lexium Controller motion controller handles both the motion control functions and the automation functions.



Example of configuration with the application template

Easy Motion mode

Presentation

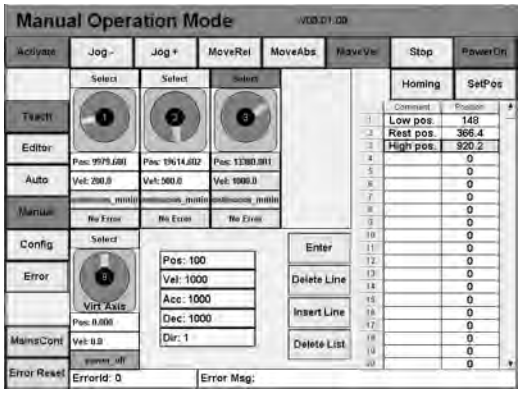
Supplied preinstalled in Lexium Controller motion controllers, the application template associated with the Easy Motion software is an ergonomic tool which allows:
- Rapid configuration of axes
- Implementation of the first movements in manual mode (JOG+/-)
- Creation of a Motion task table
- Control of execution of this table in automatic mode
- Diagnostics of the motion controller and of the different axes
- Backup and recovery of the machine parameters.

This tool optimizes debugging times, whether it involves a new installation, a prototype or on-site set-up.

Configuration

Configuration of axes

Configuration involves defining the physical parameters of the axis:
- Rotary or linear axis
- Maximum and minimum limits
- User units
- Principal parameters of the Lexium 05A servo drive

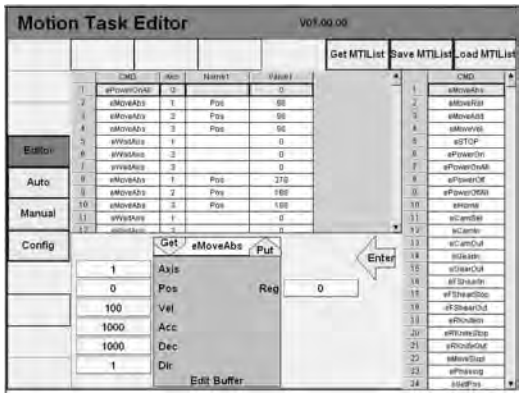


Manual control mode

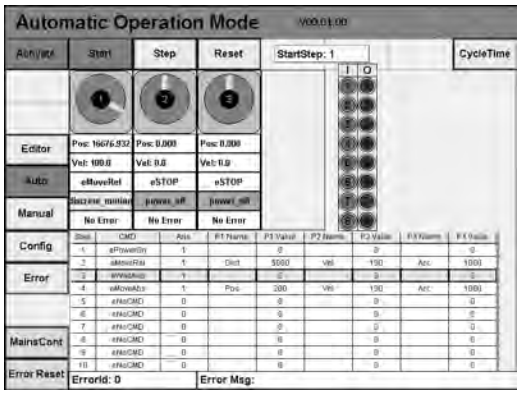
Manual control

One control panel per axis enables the first movements to be implemented manually, so that the mechanical constraints of the machine can be identified very quickly.

The available functions are:
- Validation drive variables
- Speed control
- Position control
- JOG+/JOG-
- Homing
- Creation of position registers via the teach function.



Motion Task Editor



Automatic control mode

Motion Task Editor

The Motion Task editor allows you to define a motion task table and configure each task.
These functions conform to the PLCopen standard.

The principal configurable functions are as follows:
■ Single-axis:
□ Absolute positioning
□ Relative positioning
□ Additive positioning
□ Homing
□ Speed control

■ Multi-axis:
□ Cam profile
□ Phasing
□ Electronic gearing

■ For the application function blocks:
□ Flying shear
□ Rotary knife
□ Grouping/ungrouping
□ Clamping with torque control

In addition, logical functions (waiting for conditions, time delay etc.) allow you to create a complete positioning sequence.

Automatic control

Automatic control mode allows execution of Motion Task table.

This step ensures debugging of program sequences and parameters.

Thanks to the control panel, it is possible:
■ To visualize the behaviour of all the axes
■ To control the execution of the function table (stop, pre-positioning etc.).

Complementary functions

Configuration in Easy Motion mode also allows:
■ Editing of cam profiles (8 profiles of 16 points of type XYVA)
■ Backup and recovery:
□ of the machine parameters (configuration of axes, positioning function table)
□ of the complete configuration of the Lexium 05A, to reduce the time taken to replace a device
□ of the Motion Task table
■ Access to on-line help

1

MotionPro

Motion Pro mode

Presentation

Motion Pro mode provides a graphical development environment for configuring, programming and managing motion controller applications.

It relies on a standard interface, CoDeSys®, offering the convenience of the familiar Windows® environment: windows, toolbars, pop-up menus, contextual help etc. As in Easy Motion mode, the application template can be used to configure the positioning functions. The automation functions are then added in the program organization units (POU).

In this way, Motion Pro allows you to create an application perfectly adapted to your needs.

Programming in Motion Pro

Creating a project

The application is structured using function modules, function blocks or programs. An ergonomic browser gives you an overall view of the different components of the application.

Configuration

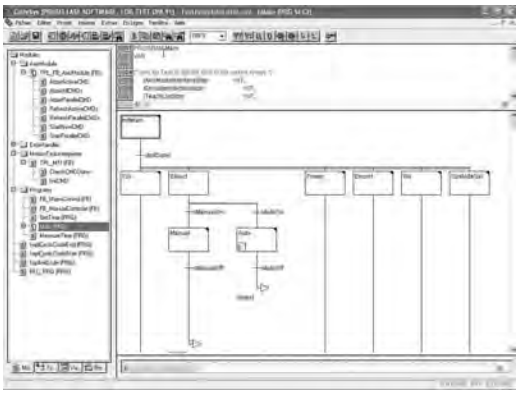
The Motion Pro software allows you to configure:
- I/O (discrete, capture or event-triggered)
- Tasks (master, auxiliary or event-triggered)
- Networks (Modbus TCP)
- Fieldbuses (PROFIBUS DP or Device Net)
- A CANopen machine bus and CANopen Motionbus

Programming conforming to standard IEC 61131

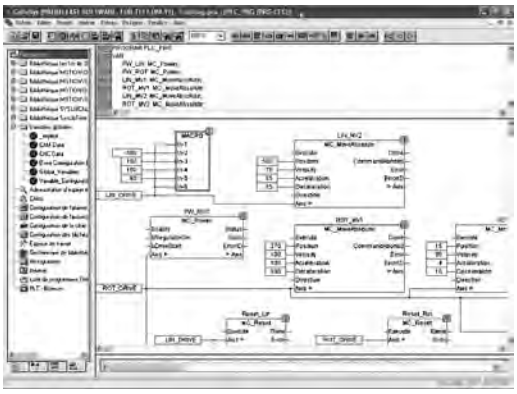
The Motion Pro software offers six programming languages of which two are text languages and four are graphical languages.

The text languages are:
- IL: Instruction List
- ST: Structured Text language

The graphical languages include:
- LD: Ladder Diagram (FBD reversible)
- FBD: Function Block Diagram (LD reversible)
- SFC: Sequential Function Chart (Grafcet)
- CFC: Continuous Function Chart



Example of sequential function chart (Grafcet)



Example of continuous sequential function chart

Multitask structure

The master task, which controls the synchronization of axes, is sequenced from 1 to 8 ms. This cycle time is linked to the number of configured drives to be synchronized. One auxiliary, non-priority task can be configured to process the automation functions.

To be able to manage reflex actions in response to external events, it is also possible to configure two event-triggered tasks.

Library manager

The library manager lists all the libraries integrated into the project.

- Standard library

The main functions are as follows:
- Processing on character string
- Time delay
- Counting
- Bistable
- Data type conversion
- Mathematical calculation functions
- System



Library manager (continued)

■ Motion library

This library is based on the 3S SoftMotion function library and conforms to the PLCopen standard.

It is composed of administrative function blocks (read/write parameters, statuses etc.) and single-axis and multi-axis function blocks.

The main functions are as follows:
- □ "Power On", stop, reset
- □ Absolute, relative or additive positioning
- □ Continuous positioning (reaching position at a predetermined speed)
- □ Velocity control
- □ Velocity profile
- □ Position profile
- □ Cam profile
- □ Electronic gearing
- □ Phasing
- □ Programmable cam switch
- □ Linear or circular interpolation

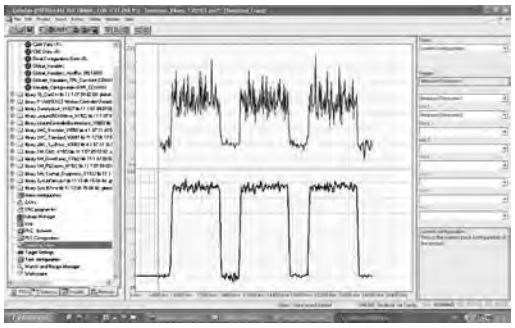
This library also includes application function blocks:
- □ Flying shear
- □ Rotary knife
- □ Grouping/ungrouping
- □ Clamping with torque control

See pages 1/30 and 1/31.

■ User library

With Motion Pro software, it is very easy to create your own function blocks (user library) so as to reduce programming time.

Creating a user library simplifies the standardization and reuse of programs and also allows you to protect your know-how.



Example of trace recording

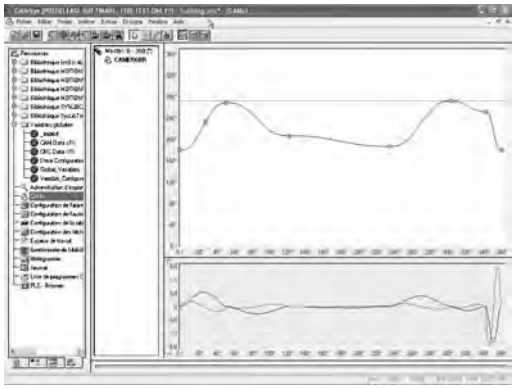
Debugging tools

Motion Pro software offers tools to help the user debug his applications, including:
- ■ Dynamic animation of program blocks
- ■ Breakpoints which allow you to run the program step by step
- ■ Display screens:
  - □ Direct access to the variables of the Lexium Controller motion controller
  - □ Command buttons
  - □ Visualization of dynamic values
  - □ Animation of diagrams

Trace recording

In trace recording, the sequence of variable values is logged during a particular period.

The values are written into a ring memory (trace buffer).
When the memory is full, the oldest values are overwritten. It is possible to record a maximum of 20 variables, each with up to 500 values, at the same time.



Example of cam profile

Cam profile editor

Two graphic editors are incorporated into the programming interface of the Motion Pro software:
- ■ A cam profile editor
- ■ An interpolation profile editor

These editors allow you to create, back up and restore profiles.

1

Comparative table of functions

Functions	Graphic display terminal	Easy Motion mode	Motion Pro mode	
	With application template			Without application template
	For Lexium 05A			For Lexium 15
Configuration of axes and drives				
Mechanical parameters	■	■	■	■
User units	■	■	■	■
Configuration of master encoder	■	■	■	■
Drive parameters	■	■	■	■
Manual mode functionalities				
Power On/Off	■	■	■	■
JOG+/JOG-	■	■	■	■
Absolute or relative positioning	■	■	■	■
Velocity reference	■	■	■	■
Position teaching	■	■	■	■
Set position	■	■	■	■
Homing	■	■	■	■
Automatic mode functionalities				
Execution of motion task table	■	■	■	■
Pre-positioning of motion task table	■	■	■	■
Diagnostics	■	■	■	■
Motion functions				
Configuration	■	■	■	■
Configuration of motion task table	■	■	■	■
Status of motion task table	■	■	■	■
Backup and restore motion task table	■	■	■	■
Programming conforming to standard IEC 61131	■	■	■	■
Cam profile functionalities				
Creation of “CAM” function	■	■	■	■
Cam profile editor	■	■	■	■
XYVA profiles	■	■	■	■
Equidistant point profiles	■	■	■	■
Number of cam profiles	■	■	■	■
Programmable cam switch	■	■	■	■

■ Function accessible ■ Function not accessible ■ Not applicable

Comparative table of functions (continued)

Functions	Graphic display terminal	Easy Motion mode	Motion Pro mode	
	With application template			Without application template
	For Lexium 05A			For Lexium 15
I/O functionalities				
Input forcing and display	■	■	■	■
Output forcing and display	■	■	■	■
Logical functions and combinations	■	■	■	■
Dedicated output: power control	■	■	■	■
Position capture (by Touch Probe input)	■	■	■	■
Distance measurement (by Touch Probe input)	■	■	■	■
Event-triggered tasks	■	■	■	■
Up/Downloading				
Applications (data and program)	■	■	■	■
Table of motion tasks	■	■	■	■
Configuration of drives	■	■	■	■
Programming of logical functions conforming to standard IEC 61131	■	■	■	■
Programming of motion control functions conforming to standard IEC 61131	■	■	■	■
Programming of linear and circular interpolation function blocks in 2½ dimensions	■	■	■	■
CANopen machine bus				
Configuration of slave devices	■	■	■	■
Configuration of Lexium Controller motion controller				
IP address	■	■	■	■
Modbus bus address	■	■	■	■
Profibus DP/DeviceNet bus addresses (via terminal with 8 microswitches)	■	■	■	■
RUN/STOP Lexium Controller	■	■	■	■
Configurable automatic “RUN” mode (default: no)	■	■	■	■
User management				
Password creation	■	■	■	■
Access limited by password	■	■	■	■

■ Function accessible ■ Function not accessible ■ Not applicable

1

Application function block library

Presentation

This library is a function library developed specifically by Schneider Electric.

It contains application functions currently encountered in applications used in the fields of:
- Assembly
- Material handling
- Cutting to length

Each function block comprises a large number of mechanical and application variants.

The use of function blocks:
- Saves programming time
- Saves set-up time
- Makes reading easier

The function blocks available in the library are:
- Flying shear
- Rotary knife
- Grouping/ungrouping
- Clamping with torque control

"Flying shear" function block

This function block optimises the production performance of machines. It enables an operation to be performed on a product without stopping the flow.

The "Flying shear" function block guarantees synchronisation of two linear axes, the master axis conveying the product and the slave axis performing the operation. Once the operation is finished, the slave axis returns to its home position and is resynchronised for the next operation.

This function block is suitable for such diverse applications as:
- Cutting (thick or hard products)
- Gluing
- Inspection
- Assembly
- ...

To meet a wide range of applications, the "Flying shear" function block incorporates numerous mechanical and functional variants:
- Continuous or discontinuous flow
- With or without mark detection
- With or without tolerance window on mark detection
- Dynamic length modification
- Immediate cutting
- Master/slave coefficient

"Rotary knife" function block

Like "Flying shear" function block, this function block optimizes the production performance of machines. It enables an operation to be performed on a product without stopping the flow.

It guarantees synchronization of a linear master axis conveying the product and of a rotary slave axis performing the operation. Once the operation is finished, the slave axis carries on turning to its home position before being resynchronized for the next operation.

This function block is suitable for such diverse applications as:
- Cutting (fine products, flexible products etc.)
- Printing of motifs
- Marking
- …

To meet a wide range of applications, the "Rotary knife" function block incorporates numerous mechanical and functional variants:
- Continuous or discontinuous flow
- With or without mark detection
- With or without tolerance window on mark detection
- Dynamic length modification
- Immediate cutting
- Master/slave coefficient

"Grouping/ungrouping" function block

The "Grouping/Ungrouping" function is very widely used in manufacturing and the handling sector.
It synchronizes several linear axes so that products can be sorted and grouped on a conveyor, with defined spacing between products/groups.

The function is suitable for applications requiring handling:
- Of products of different sizes
- Of fragile products
- With low acceleration/deceleration to avoid products sliding on the conveyor.

To meet a wide range of applications, the "Grouping/ungrouping" function block takes account of numerous mechanical and functional variants:
- Different groups of products possible
- Fixed or variable spacing between groups and products
- Number and type of conveyors that can be adapted to the application requirements

"Clamping" function block

This function block provides automatic tightening of a part with torque control to avoid marking the part.

The logical sequence is carried out in three steps:
- Rapid approach
- Tightening
- Rapid release

This function block is suitable for such diverse applications as:
- Shoeing/welding
- Machine tool chucking
- Inspection
- Assembly/shrink fitting
- …

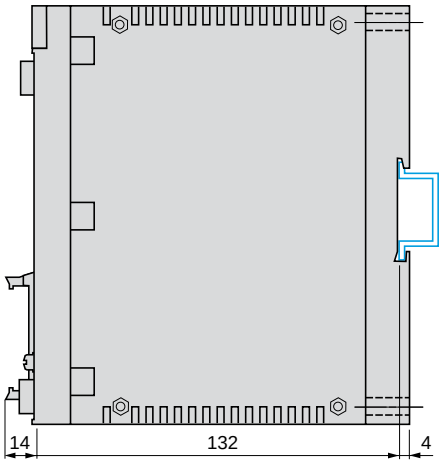
To meet a wide range of applications, the "Clamping" function block incorporates numerous mechanical and functional variants:
- Automatic measurement of approach distance
- With or without teach function

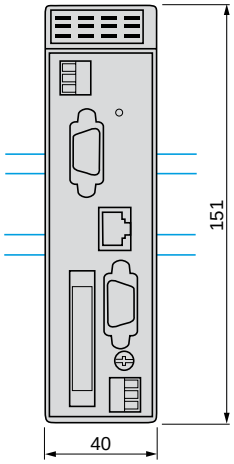
Lexium Controller motion controllers

1

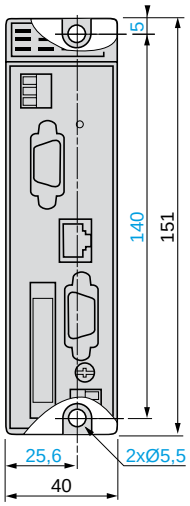
Lexium Controller motion controller LMC 10 *(1)*

Mounting on 35 mm ⊔ rail



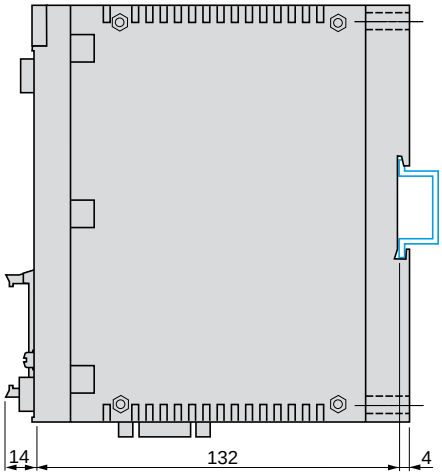


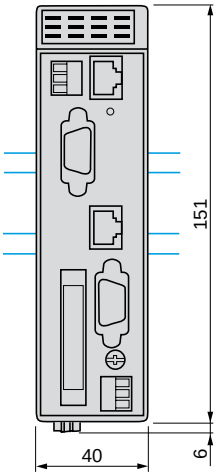
Screw fixing



Lexium Controller motion controller LMC 20 *(1)*

Mounting on 35 mm ⊔ rail





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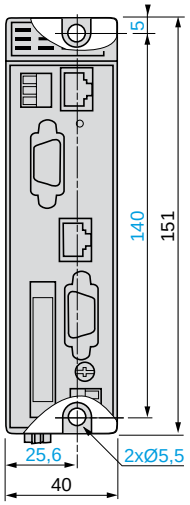
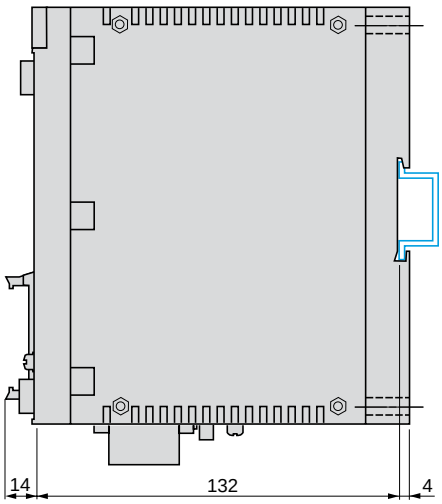
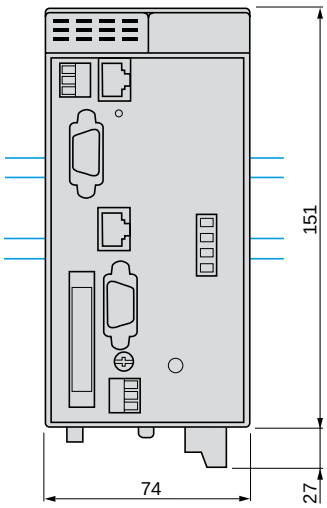


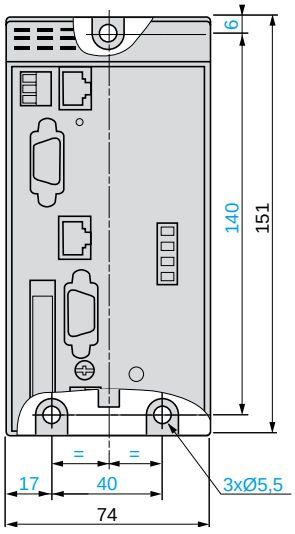
Lexium Controller motion controllers LMC 20A1307 and LMC 20A1309 *(1)*

Mounting on 35 mm ⊔ rail





Screw fixing



(1) Leave 50 mm free space above and below the unit for cooling purposes.

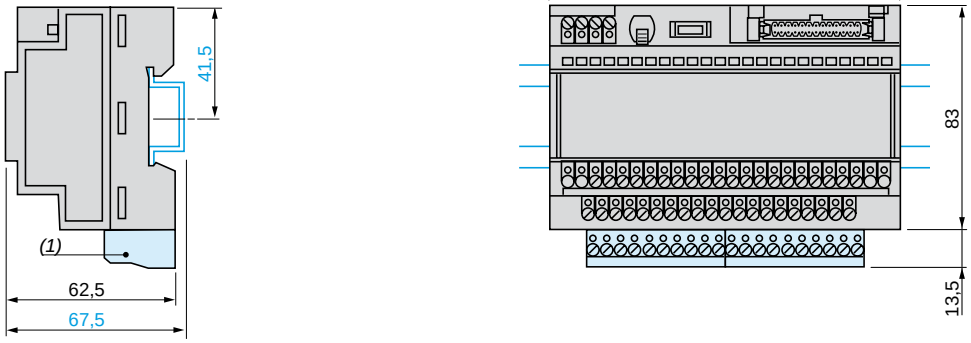
Presentation: page 1/2
Characteristics: page 1/8
References: page 1/14
Schemes: page 1/34

Schneider Electric

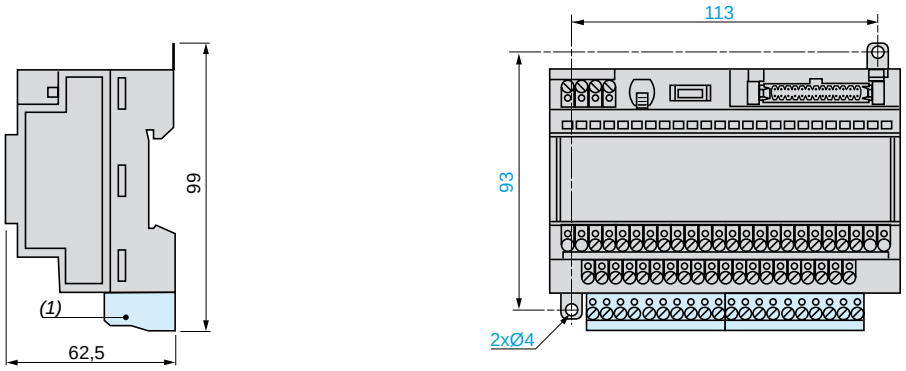
1

Telefast® connection bases ABE7 B20MPN2●

Mounting on 35 mm ⊔ rail



Screw fixing (retractable lugs)

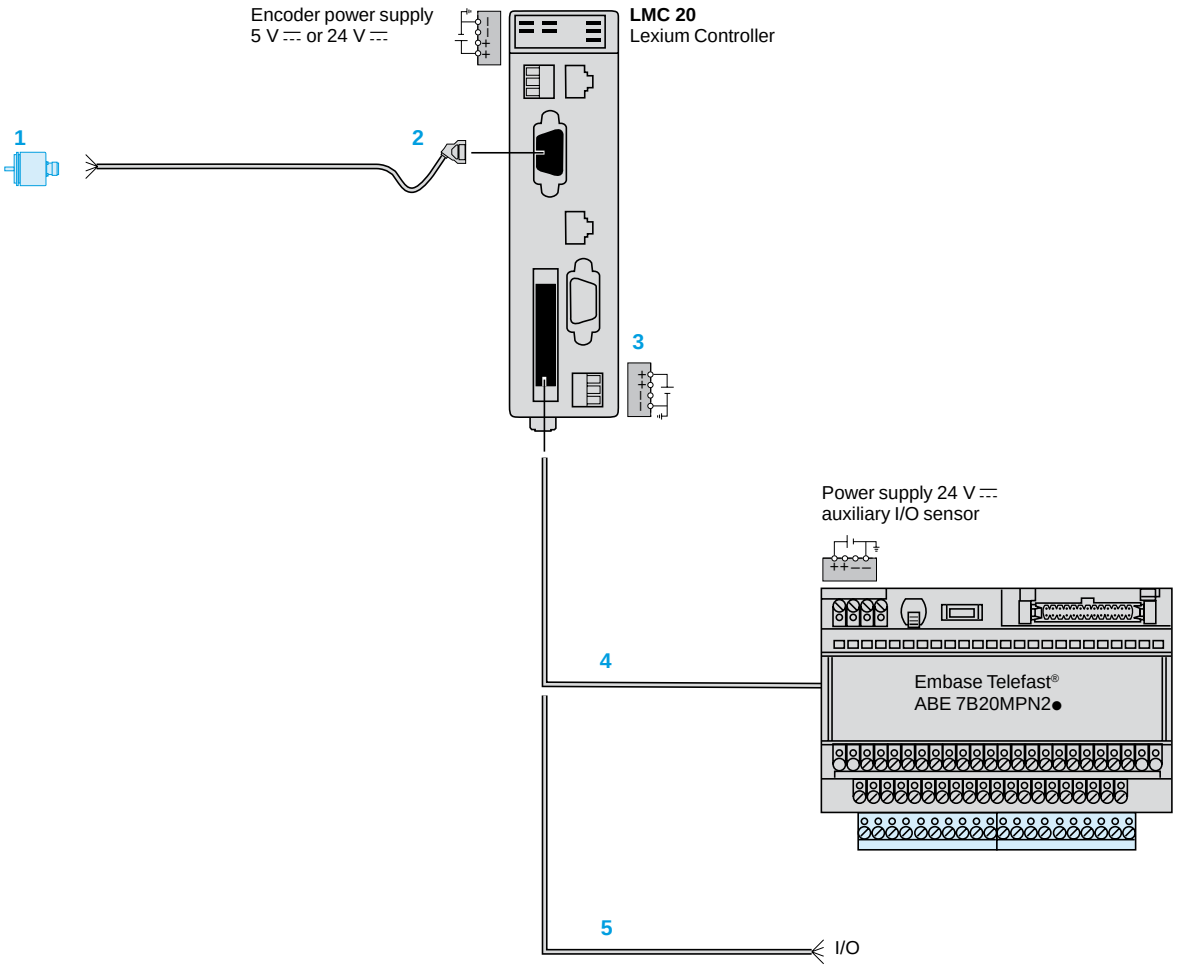


(1) ABE7 BV20, ABE7 BV20TB (please refer to the "Programmable controller Twido" catalogue or visit "www.schneider-electric.com").

Lexium Controller motion controllers

1

Example of connection of the Lexium Controller motion controller

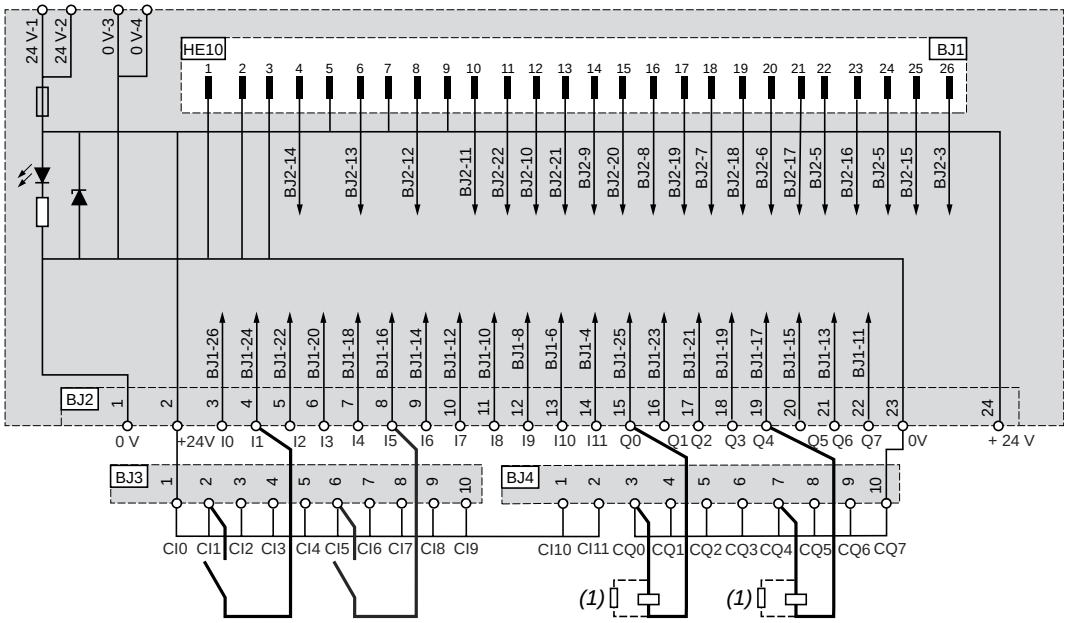


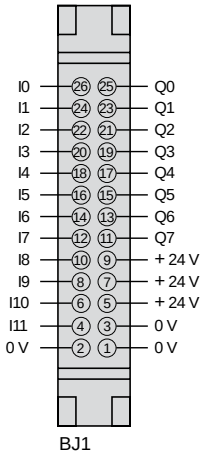
Components for use with the Altivar	
Repère	**Description**
1	Incremental encoder type XCC 1 or SSI series absolute encoder type XCC 3. Please refer to the “Osicoder” catalogue or visit “www.schneider-electric.com”.
2	VW3 M4 701 cable
3	Phaseo (TBTS) 24 V ⎓ power supply. Please refer to the “Power supplies & transformers - Phaseo” catalogue or visit “www.schneider-electric.com”.
4	ABF T26B●●● cable
5	Cable (not supplied) for direct connection to HE 10 female connector supplied with Lexium Controller LMC ●●

Telefast® I/O connection bases

ABE7 B20MPN20

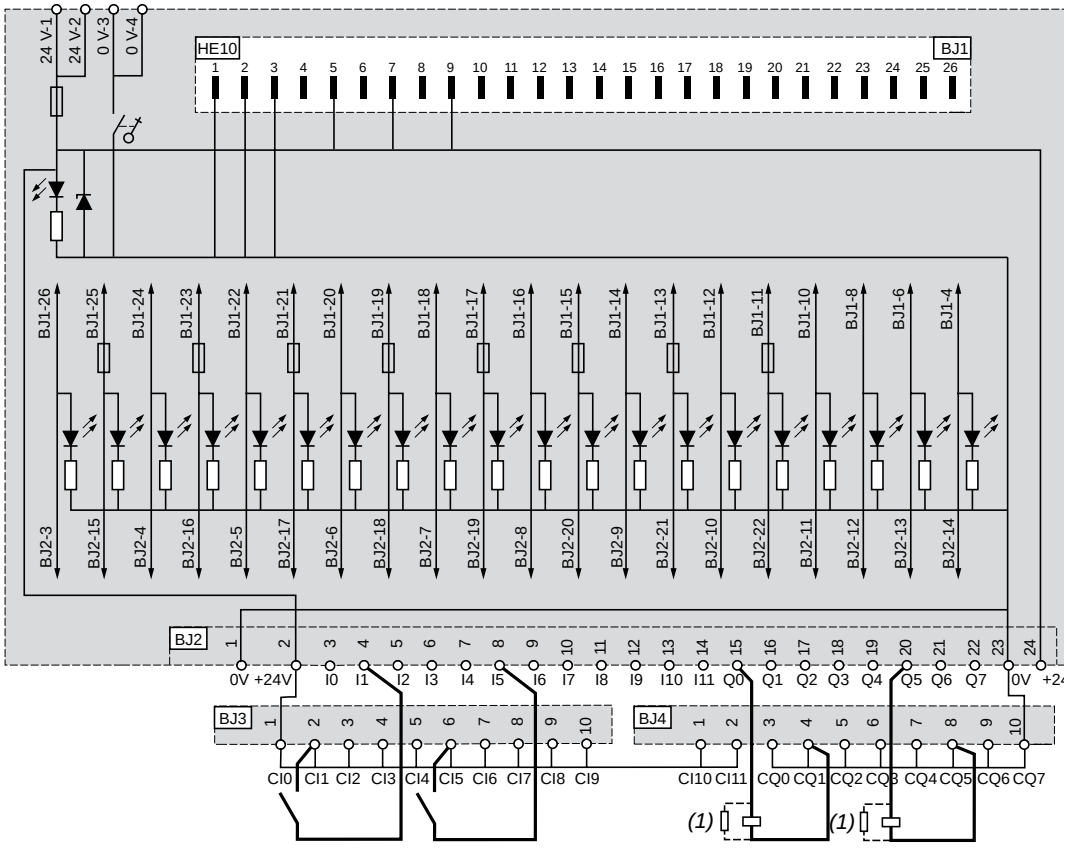
HE 10, 26-way

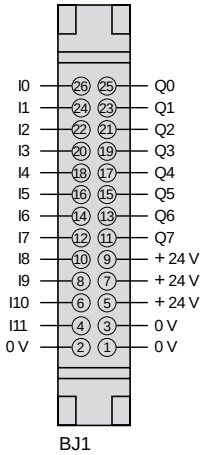




ABE7 B20MPN22

HE 10, 26-way





(1) Example of output connections.
For an inductive load, a diode or varistor is required.