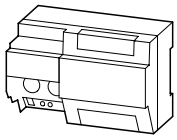
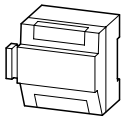


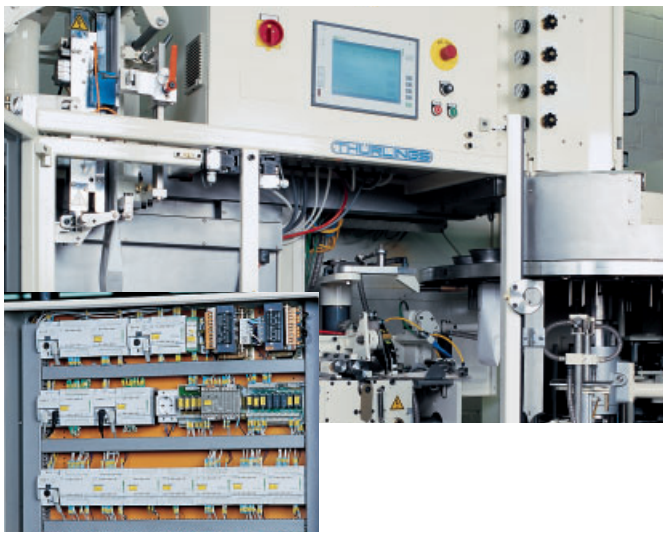


Compact PLC
Control Using the PS4 Compact PLC System

Compact PLCs are all-in-one devices that, even in their basic version are equipped with a comprehensive set of hardware and software functions and thus suitable for use in many control, regulating and measuring applications. Where the integrated functions do not suffice, the devices can be simply expanded either locally or via network. The range includes:

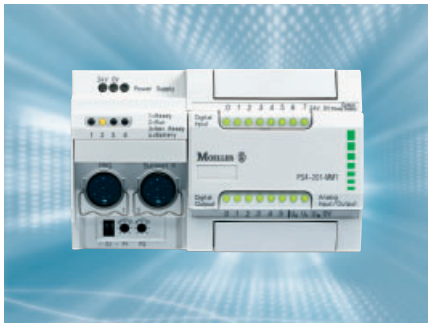
- PS4 compact controllers
- LE local expansion units
- EM4 distributed expansion units

All the controllers are networkable and programmable via fieldbus.
The programming software applicable to all is Sucosoft S40, an easy-to-use programming package to IEC61131-3.



Packaging machines make high technological demands. Greatly diverse versions of packing, closure methods and contents in most cases are dealt with by just one machine variant. This demands a modular, flexible and adaptable control system. The compact controllers of the PS4 series from Moeller are eminently suited to such tasks. They have outstandingly short reaction times and a compact footprint, and come in a comprehensive range of products.

Pumping stations and water towers for domestic water supply are independently operating processing units. In combination with the telecontrol components from Moeller, the units of the PS4 series are ideally suited for local control, as well as for monitoring correct process sequences and for rapid and reliable fault alarm signals right to the service engineer's mobile 'phone.



PS4 compact PLCs

The compact controllers from Moeller are characterised by their versatility and handling simplicity. They come in various performance classes and are equipped with differing functions, making it easy to select the optimum device for your application.

LE4 local expansion units

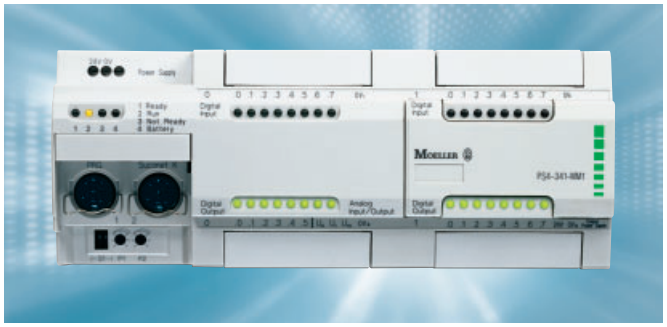
Local expansion units complement the built-in peripherals of the compact controllers. The range includes digital and analog expansion units, as well as specialist technical functions, and of course, communication modules for standard fieldbus systems.

EM4 remote expansion units

The EM4 modules of the compact series offer the possibility of decentralised expansion. Just as with the PS4 controllers, these in turn can be expanded using LE4 modules.

PS4

PS4-141/151 – the universal one



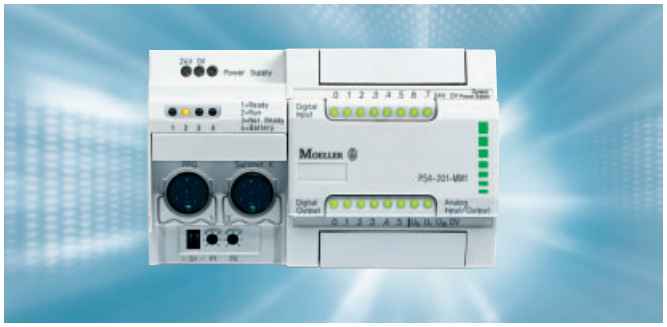
This controller can be used for many different applications and offers the complete complement of equipment of the range.

Inputs/Outputs:
16 digital inputs
14 (PS4-151: 8) digital outputs
2 analog inputs
1 analog output

Program memory:
24 kByte (+32 kByte optional)
Recipe memory (optional): 32 kByte

Expansion options:
Decentralised expansion using EM4 modules
with networking capability:
Suconet K
Ethernet

PS4-201 – the adaptable one



The flexibility to allow implementation of extensive standard solutions. Local and remote expansion possibilities guarantee versatility for configuration.

Inputs/Outputs:
8 digital inputs
6 digital outputs
2 analog inputs
1 analog output

Program memory:
24 kByte (+32 kByte optional)
Recipe memory (optional): 32 kByte

Expansion options:
Local expansion using LE4 modules
Decentralised expansion using EM4 modules
Networking capability:
Suconet K
PROFIBUS-DP
Ethernet

One system – combinations as you need them

Your PS4 system can grow flexibly with your requirement, whether you are planning a new system or need to extend an existing one. This is made possible by a comprehensive range of modules that can provide new connection options either locally or remotely, depending on the application. This gives you flexible and tailor-made solutions with precisely the performance level you require.

Practical detail

Set-point values are applied using a screwdriver instead of a programming device.

Memory modules provide great flexibility

Recipe storage in the Flash memory or voltage-independent program storage present no problem.

Clear advantages result from being able to simply send updated programs to your customer in the shape of a memory module, or to duplicate programs onto several control systems without having to use a programming device!

PS4-271 – the buildings specialist

The PLC for AC applications (supply voltage, AC inputs/relay outputs), locally and remotely expandable, with the decisive price/performance ratio.

Inputs/Outputs:
12 digital inputs
8 digital outputs (12 A)
4 analog inputs (2 of which for PT1000/Ni1000)
2 analog outputs

Program memory (+ optional expansion):
24 kByte (+32 kByte optional)
Recipe memory (optional): 32 kByte

Expansion options:
Local expansion using LE4 modules
Decentralised expansion using EM4 modules
Networking capability:
Suconet K
PROFIBUS-DP
Ethernet

PS4-341 – the high-speed PLC

The high-performance PLC for applications that demand even more speed, more sophisticated communication and larger program and data memories.

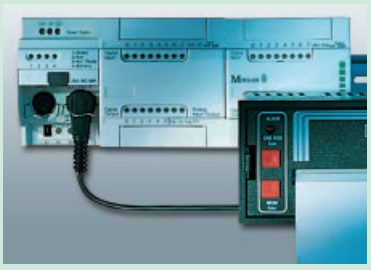
Inputs/Outputs:
16 digital inputs
14digital outputs
2 analog inputs
1 analog output

Program memory:
512 kByte
Recipe memory (optional): 512 kByte

Expansion options:
Local expansion using LE4 modules
Decentralised expansion using EM4 modules
Networking capability:
Suconet K
PROFIBUS-DP
Ethernet

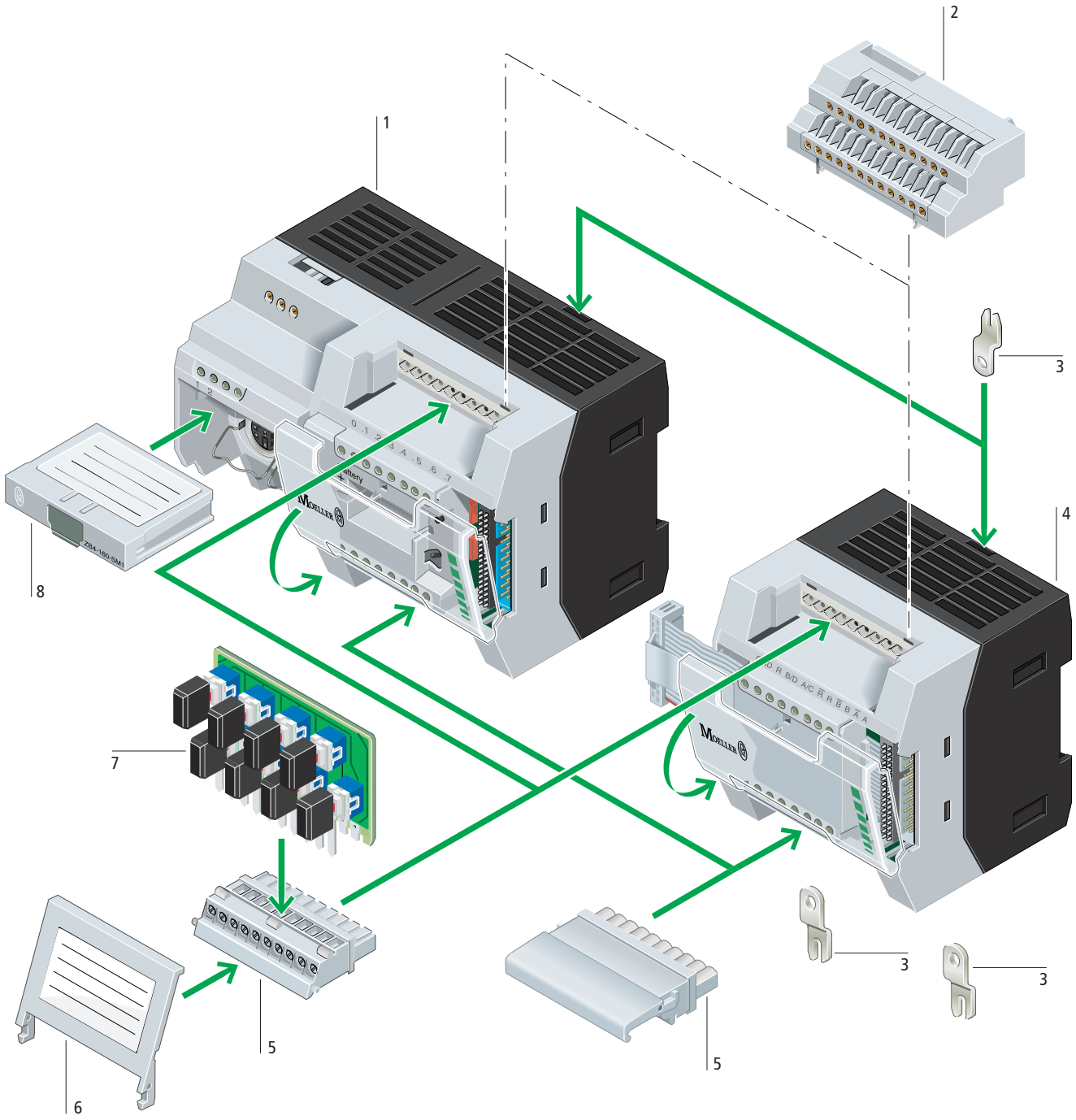
Optimum coupling options with transparent communication

The serial interfaces RS232 and RS485 enable transparency of operation by allowing a printer, barcode reader or similar devices to be coupled to the PS4.



Central programming thanks to the network

All the PS4 PLCs and the EM4 remote expansion modules are equipped with an integrated networking interface. This brings more benefits than merely allowing the system to be expanded: for example, the programming or commissioning of several distributed control systems can be quickly and efficiently carried out via the network. Access to the lower-level controllers is available via the bus master, without the need for any additional hardware or software.


1
2
3
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3
3
5

Compact PLC

PS4-150 1
24 V DC, 115 – 230 V AC
16 digital/2 analog inputs
14 digital outputs or
8 relay-outputs
1 analog output
Not locally expandable
Suconet K, 8 stations
→ Page 4/8

PS4-200 1
24 V DC
8 digital/2 analog inputs
6 digital outputs
1 analog output
Locally expandable (max. 6 LE)
Suconet K, 8 stations
(24 with two LE4-501-BS1)
→ Page 4/8

PS4-270 1
120/240V DC
12 digital/4 analog inputs
8 digital (relay)/4 analog outputs
Locally expandable (max. 5 LE)
Suconet K, 8 stations
(24 with two LE4-501-BS1)
→ Page 4/8

PS4-300 1
24 V DC
16 digital/2 analog inputs
14 digital outputs, 1 analog output
Locally expandable (max. 5 LE)
Suconet K, 30 stations
(46 with two LE4-501-BS1)
→ Page 4/8

Expansions

EM4-100 remote expansion modules 1
Not locally expandable
Suconet K
Digital input/output
Digital output (relay)
Digital input/output
→ Page 4/30

EM4-200 remote expansion modules 1
Max. 6 local expansion modules
Suconet K
PROFIBUS-DP
Digital input (24 V DC)
→ Page 4/30

LE4-... local expansion modules 4
Digital input/output
(24 V DC/230 V AC/115 V AC)
Digital output (relay,
pneumatic, transistor, triac)
Counter, analog, network modules
→ Page 4/48

Accessories

Two-level terminal block 2
For direct connection of proximity switches and actuators (2 × 11-pole)
→ Page 4/9

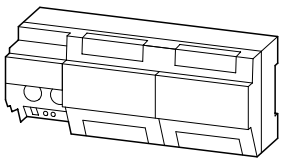
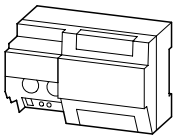
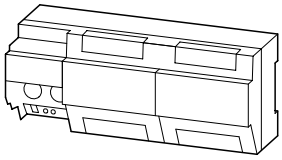
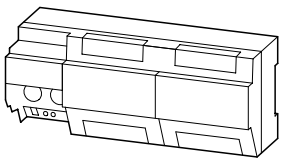
Mounting feet 3
For screw fixing on mounting plate,
3 mounting feet per device
→ Page 4/9

Plug-in screw terminal 5
With replaceable cover
10-pole, for connecting input/output signals
→ Page 4/9

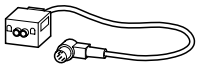
Hinged cover with large area for labelling 6
For plug-in screw terminal, for labelling of inputs/outputs,
20 characters/terminal
→ Page 4/9

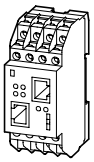
Digital input simulator 7
For the simulation of 8 digital inputs
→ Page 4/9

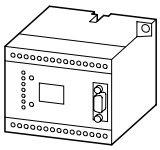
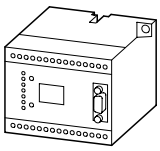
Memory modules 8
For expanding the program and recipe memory
→ Page 4/9

Rated voltage	Inputs			Outputs			Expandable by			**Type** Article no.	**Price** see price list	Std. pack
U_e	Digital 24 V DC	Digital 120/240 V AC	Analog	Digital 24 V DC	Digital 120/240 V AC	Analog	Suconet K/K1 slaves	LE4	Max. digital I/O			
V	Number	Number	Number	Number	Number	Number	Number	Number	Number			
Compact PLC PS4												
• Integrated setpoint potentiometer • 3 kHz counter • Ambient temperature 0 to +55 °C • Networking via Suconet K • RS232C programming interface												
PS4-150												
												
24 DC	16	–	2 10-bit	14	–	1 12-bit	8	–	Total 680 I/O	**PS4-141-MM1** 081871		1 off
115 – 230 AC	16	–	2 10-bit	8	–	1 12-bit	8	–	Total 680 I/O	**PS4-151-MM1** 081870		1 off
PS4-200												
												
24 DC	8	–	2 10-bit	6	–	1 12-bit	8 24	6	Total 790 I/O	**PS4-201-MM1** 051296		1 off
PS4-271												
												
120 – 240 AC	–	12	4 10-bit	–	8	4 12-bit	8 24	5	Total 790 I/O	**PS4-271-MM1** 209602		1 off
PS4-341												
												
24 DC	16	–	2 10-bit	14	–	1 12-bit	30 46	5	Total 8500 I/O	**PS4-341-MM1** 202380		1 off

Notes Expandable up to max. number of Suconet K/K1 stations: with 2 additional network modules
Devices for world markets IEC/EN ≙ UL/CSA

	Memory type	Memory size KByte	Description	For use with	**Type** Article no.	**Price** see price list	Std. pack
Accessories							
Digital input simulator 	–	–	Simulation of 8 digital inputs	PS4-... EM4-... LE4-...	**ZB4-108-ES1** 071605		1 off
T connector for bus connection 	–	–	5-pole DIN plug	PS4-... EM4-...	**TBA3.1** 012470		1 off
Plug-in screw terminals 	–	–	10-pole, for connection of signal cables	PS4-... EM4-... LE4-...	**ZB4-110-KL1** 071606		2 off
Two-level terminal block 	–	–	Snap-fit terminal block, 2 × 11-pole, for the direct connection of initiators (proximity switches) and actuators	PS4-... EM4-... LE4-...	**ZB4-122-KL1** 052101		2 off
Hinged cover with large area for labelling 	–	–	For plug-in screw terminals, for labelling of inputs/ outputs, 20 characters/terminal	PS4-... EM4-... LE4-...	**ZB4-101-GZ1** 052108		10 off
Memory modules 	Flash Flash	64 64	• Program memory backup • Recipe memory	PS4-150 PS4-200	**ZB4-128-SF1** 050189		1 off
	RAM	32	• Expansion of the program memory from 24 kByte to 56 kByte		**ZB4-032-SR1** 050190		
	Flash Flash RAM	64 64 32	• Program memory backup • Recipe memory • Expansion of the program memory from 24 kByte to 56 kByte		**ZB4-160-SM1** 050188		
	Flash EEPROM	1000	• Memory for backing up the user programs • Recipe memory • Usable from HW Version 2	PS4-300	**ZB4-901-SF2** 227883		1 off
Battery	–	–	For buffering the RAM and the real-time clock, typical storage life 5 years	PS4-150 PS4-200 PS4-300	**ZB4-600-BT1** 049822		1 off
Mounting foot For screw fixing to mounting plate	–	–	For screw fixing on mounting plate, 3 mounting feet per device	ZEV ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 PS4-... EM4-... LE4-...	**ZB4-101-GF1** 061360		9 off

	Description	For use with	**Type** Article no.	**Price** see price list	Std. pack
Accessories					
Ethernet network module					
	• Universal "Device Server" for Ethernet with TCP/IP and UDP protocol • Mounting on top-hat rail on the left of the PS4. Interface selection via slide switch • Interfaces – Control side: optionally RS232 or RS485, via RJ-45 plug or screw terminal – Ethernet side: 10 Base-T, 10/100 MBaud, via RJ-45 plug • Baud rate options: 9.6/19.2/38.4 kBits/s • LEDs for Ready, Link, Active, Error • Reset button	PS4-... PS416... ZB4-501-UM3/4	**COBOX** 226984		1 off
Connection cable					
	For connection of PS4 to CoBox.	PS4-... COBOX	**ZB4-508-KB1** 281946		1 off
Programming cable					
Coupling PC and PLC					
	• 1 × 8-pole pin connector (ZB4-108-DS1), right angle version • 1 × 9-pole socket connector • Cable length 2 m	PS4-150 PS4-200 PS4-300	**ZB4-303-KB1** 025392		1 off
Suconet K/K1 data cable					
Ready-assembled For coupling all devices with Suconet-K/K1 interface					
	• 2 × 5-pole pin connector (S1-PS3), right-angle version • Cable length 0.5 m	PS4-... EM4-...	**KPG1-PS3** 085640		1 off
	• 1 × 5-pole pin connector (S1-PS3), right-angle version • 1 × 9-pole pin connector • Cable length 2 m	PS4-... EM4-...	**KPG3-PS3** 014487		1 off
Not assembled For coupling all devices with Suconet-K/K1 interface For customer assembly of Suconet cables 2 × 0.5 mm² shielded and twisted, cable length (as ring) 100 m					
	–	PS416-CPU-... PS416-NET-4.. PS4	**LT309.096** 019233		1 off
Screen earth kit					
	For EMC-compliant connection of cable shielding	PS4-... EM4-... LE4-...	**ZB4-102-KS1** 081038		1 off

	Description	Type Article no.	Price see price list	Std. pack
Accessories				
Master for AS-Interface				
	• AS interface master as per specification V2.0 • Max. 31 AS interface stations • Supply voltage for the device via the LE bus • Display via LEDs – Operating modes – Operating state of the Suconet-K interface – Power supply • Display via LCD: – Operating states and diagnosis • Setting of operating modes and Suconet-K address by pushbuttons • Connection – AS interface via screw terminals – Suconet K via SUB-D plug connector PS416-ZBS-410	**CM4-505-GS1** 031921		1 off
	• AS interface master as per specification V2.1 • Max. 62 AS interface stations • Supply voltage via AS interface cable • Display via LEDs – Operating modes – Operating state of the PROFIBUS interface – Power supply • Display via LCD – Operating states and diagnosis • Setting of operating modes and PROFIBUS-DP address by pushbuttons • Connection – AS interface via screw terminals – PROFIBUS-DP via 9-pole SUB-D plug connector ZB4-209-DS3	**CM4-505-GV1** 231338		1 off

Moeller HPL0213-2004/2005

Compact PLC PS4			PS4-141-MM1	PS4-151-MM1
General				
Standards			IEC/EN 61131-2, EN 50178	IEC/EN 61131-2, EN 50178
Ambient temperature		°C	0/55	0/55
Ambient temperature for storage		°C	25/70	25/70
Vibration resistance		g	Constant 1 g, f = 10 to 150 Hz	Constant 1 g, f = 10 to 150 Hz
Shock resistance, shock duration 11 ms		g	> 15	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59	→ Page 4/59
Control mode			Master/slave	Master/slave
Degree of protection			IP20	IP20
Insulation test	U_i	V AC	600	1500
Real-time clock			Yes	Yes
Accuracy of the real-time clock			6.1 min/year (battery-buffered)	6.1 min/year (battery-buffered)
Battery (service life)			Normally 5 years	Normally 5 years
Programming interface			RS232C	RS232C
Memory				
Program and data memory (internal) /back-up memory			32 kByte RAM (battery-buffered)	32 kByte RAM (battery-buffered)
Memory expansion (external)			32 kByte RAM	32 kByte RAM
Memory for backup and recipe data			128 kByte Flash	128 kByte Flash
Memory expansion and memory for backup and recipe data (external)			32 kByte RAM and 128 kByte Flash	32 kByte RAM and 128 kByte Flash
Write cycles (flash memory)			10000	10000
Cycle time for 1 k of instructions (Bit, Byte)		ms	5	5
Max. number of inputs (local)			16 digital/2 analog inputs	16 digital/2 analog inputs
Max. number of outputs (local)			14 digital outputs/1 analog output	8 digital outputs/1 analog output
Max. number of inputs/outputs (local)			30	24
Max. number of inputs/outputs (remote)			680 can be addressed through Suconet K line	680 can be addressed through Suconet K line
Weight		kg	0.7	0.7
Power supply				
Terminals			Screw terminals	Screw terminals
Terminal capacity				
Solid		mm^2	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 2.5	0.22 – 2.5
Inputs/outputs				
Terminals			Plug-in screw terminals	Plug-in screw terminals
Terminal capacity				
Solid		mm^2	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5	0.22 – 1.5
Networking				
Expandable (remotely)			Max. 8 stations	Max. 8 stations
Programming with Suconet K network			RS485	RS485
Interface			RS485	RS485
Bus			Suconet K	Suconet K
Data cable length		m	600/300	600/300
Data transfer rate		kBit/s	187.5/375	187.5/375

Moeller HPL0213-2004/2005

PS4-201-MM1	PS4-341-MM1
IEC/EN 61131-2, EN 50178	IEC/EN 61131-2, EN 50178
0/55	0/55
25/70	25/70
Constant 1 g, f = 10 to 150 Hz	Constant 1 g, f = 10 to 150 Hz
> 15	> 15
→ Page 4/59	→ Page 4/59
Master/slave	Master/slave
IP20	IP20
600	1500
Yes	Yes
6.1 min/year (battery-buffered)	6.1 min/year (battery-buffered)
Normally 5 years	Normally 5 years
RS232C	RS232C
32 kByte RAM (battery-buffered)	512 kByte RAM (battery-buffered)
32 kByte RAM	–
128 kByte Flash	–
32 kByte RAM and 128 kByte Flash	–
10000	–
5	0.5
104 (with 6 LE-116-XD1) digital/ 2 analog inputs	96 (with 5 LE4-116-DX1)
102 (with 6 LE-116-XD1) digital outputs/1 analog output	94 (with 5 LE4-116-XD1)
110 (with 6 LE4-116-DD1)	110 (with 5 LE4-116-DX1/XD1)
680 can be addressed through Suconet K line	8500 can be addressed through Suconet-K line
0.54	0.7
Screw terminals	Screw terminals
0.22 – 2.5	0.22 – 2.5
0.22 – 2.5	0.22 – 2.5
Plug-in screw terminals	Plug-in screw terminals
0.22 – 2.5	0.22 – 2.5
0.22 – 1.5	0.22 – 1.5
Max. 8 stations, max. 24 with 2 additional network modules	Max. 30 stations; max. 46 with 2 × LE4-501-BS1
RS485	RS485
RS485	RS485
Suconet K	Suconet K
600/300	600/300
187.5/375	187.5/375

Moeller HPL0213-2004/2005

Compact PLC PS4			PS4-141-MM1	PS4-151-MM1
Power supply				
Rated voltage	U_e	V	24 DC	115 – 230 AC
Admissible range		V	20.4 – 28.8 DC	98 – 264 AC
Rated frequency		Hz	–	47 – 63
Residual ripple on the input voltage		%	≦ 5	–
Protection against polarity reversal			Yes	–
Rated current	I_e	mA	Normally 300	Normally 90
Inrush current and duration		A	4 < 5 ms	12 at 230 V
Power consumption		W	Approx. 6.5	Approx. 20
Bridging of voltage dips				
Duration of dip		ms	10	10
Repetition rate		s	1	1
Fault indication			LED	LED
Protection class			1	1
Electrical isolation			Yes	Yes
Max. current carrying capacity for LE bus (5 V)		A	–	–
Digital inputs				
Qty.			16	16
Rated voltage				
Rated voltage	U_e	V DC	24	24
ON 0 signal	U_e	V DC	≦ 5, limit type 1	≦ 5, limit type 1
ON 1 signal	U_e	V DC	≦ 15, limit type 1	≦ 15, limit type 1
Max. ripple		%	≦ 5	≦ 5
Rated current				
ON 1 signal	I_e	mA	Normally 6 at 24 V DC	Normally 6 at 24 V DC
Delay time				
For "0" to "1"		ms	max.0.1	max.0.1
For "1" to "0"		ms	max.0.1	max.0.1
Electrical isolation				
Electrical isolation			Yes	Yes
Between the inputs			No	No
Status indication of inputs			LED	LED
Integrated power supply for inputs			–	Yes
"High-speed counter"input				
Input			I 0.0	I 0.0
Qty.			1 up counter	1 up counter
Switching frequency		kHz	3	3
Pulse shape			Square	Square
Pulse duration		%	50	50
Edge duration		%	≦ 3	≦ 3
Alarm input			I 1.0	I 1.0
Setpoint potentiometers				
Qty.			2	2
Value range			10-bit (1024 units)	10-bit (1024 units)
Setting			With screwdriver	With screwdriver
Analog inputs				
Qty.			2	2
Signal range		V DC	0 – 10	0 – 10
Total error		%	Typically 0.8 % of full scale	Typically 0.8 % of full scale
Conversions			1 × per cycle	1 × per cycle
Input resistance		kΩ	20	20
Connection type of signal encoder			Two-wire connection to transducer	Two-wire connection to transducer
Resolution		Bit	10 (1024 increments)	10 (1024 increments)

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PS4-201-MM1	PS4-341-MM1
24 DC	24 DC
20.4 – 28.8 DC	20.4 – 28.8 DC
–	–
≦ 5	≦ 5
Yes	Yes
200	Approx. 1 A
4 < 5 ms	4 < 5 ms
Approx. 6	Approx. 6.5
10	10
1	1
LED	LED
1	1
Yes	Yes
1.2	1.2
8	16
24	24
≦ 5, limit type 1	≦ 5, limit type 1
≦ 15, limit type 1	≦ 15, limit type 1
≦ 5	≦ 5
Normally 6 at 24 V DC	Normally 6 at 24 V DC
max.0.1	max.0.1
max.0.1	max.0.1
Yes	Yes
No	No
LED	LED
–	–
I 0.0	I 0.0, I 0.1 (up, down)
1 up counter	1 up or down counter
3	50
Square	Square
50	50
≦ 3	≦ 3
I 1.0	I 1.0, I 1.1
2	2
10-bit (1024 units)	10-bit (1024 units)
With screwdriver	With screwdriver
2	2
0 – 10	0 – 10
Typically 0.8 % of full scale	Typically 0.8 % of full scale
1 × per cycle	1 × per cycle
20	20
Two-wire connection to transducer	Two-wire connection to transducer
10 (1024 increments)	10 (1024 increments)

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Compact PLC PS4			PS4-141-MM1	PS4-151-MM1
Digital outputs				
Qty.			14	8
Contacts			Semiconductor	Relay (make contact)
Rated voltage				
Rated voltage	U_e	V DC	24	See switching current (resistive/inductive load)
Admissible range		V DC	20.4 – 28.8	See switching current (resistive/inductive load)
Max. ripple		%	≦ 5	–
Protection against polarity reversal			Yes	–
Electrical isolation			Yes	–
Electrical isolation in groups			–	4 isolated outputs, 4 outputs, each in 2 groups of 2
Min. contact voltage		V	–	12
Min. contact current		mA	–	100
Minimum load		W	–	1.2
Rated current				
At state "1"	I_e	A	0.5 at 24 V DC	–
Lamp load	R_{LL}	W	≦ 4 W without series resistor	–
Utilization factor	g	%	1	1
Duty factor		% DF	100	100
Parallel connection of outputs				
Parallel switching of outputs for increased power			max. 4	–
Total max. current		A	2	–
Total minimum current		mA	250	–
Residual current at state "0"		µA	Approx. 140	–
Response time		ms	–	max. 10
Reset time		ms	–	max. 10
Lifespan, mechanical	Operations		–	≧ 20000000
Switching current (resistive load)				
2 A/230 V AC	Operations		–	300000
2 A/24 V DC	Operations		–	900000
Switching current (inductive load)				
1 A/230 V AC-11	Operations		–	300000
1 A/24 V DC-11	Operations		–	100000
Short-circuit protection			Yes, without manual reset	No, external protection of relay contacts with fuse, 4 A fast
Short-circuit tripping current		A	max. 2.5 over 3 ms per output	–
OFF-delay		µs	Normally 100	–
Limiting of disconnect voltage with inductive loads			Yes, -21 V (at U_N = 24 V DC)	–
Maximum operating frequency				
With time constant L/R max. 72 ms		Ops/h	4800	–
With time constant L/R max. 15 ms		Ops/h	18000	–
Creepage and clearance distances			–	8 mm between coil and contact
Status indication of outputs			LED	LED
Analog outputs				
Qty.			1	1
Total error		%	Normally 0.4 of full scale	Normally 0.4 of full scale
Output voltage		V DC	0 – 10/2 mA	0 – 10/2 mA
Connection type			Two-wire connection	Two-wire connection
Resolution		Bit	12 (4096 units)	12 (4096 units)

Moeller HPL0213-2004/2005

PS4-201-MM1	PS4-341-MM1
6	14
Semiconductor	Semiconductor
24	24
20.4 – 28.8	20.4 – 28.8
≦ 5	≦ 5
Yes	Yes
Yes	Yes
–	–
–	–
–	–
–	–
0.5 at 24 V DC	0.5 at 24 V DC
≦ 4 W without series resistor	≦ 4 W without series resistor
1	1
100	100
max. 4	max. 4
2	2
250	250
Approx. 140	Approx. 140
–	–
–	–
–	–
–	–
–	–
–	–
–	–
Yes, without manual reset	Yes, without manual reset
max. 1.2 over 3 ms per output	max. 1.2 over 3 ms per output
Normally 100	Normally 100
Yes, -21 V (at U_N = 24 V DC)	Yes, -21 V (at U_N = 24 V DC)
4800	4800 (g=1) 7500 (g=0.5)
18000	18000
–	–
LED	LED
1	1
Normally 0.4 of full scale	Normally 0.4 of full scale
0 – 10/2 mA	0 – 10/2 mA
Two-wire connection	Two-wire connection
12 (4096 units)	12 (4096 units)

Compact PLC PS4			PS4-271-MM1
General			
Standards			IEC/EN 61131-2, EN 50178
Ambient temperature		°C	0/55
Ambient temperature for storage		°C	-25/70
Vibration resistance		g	Constant 1 g, f = 10 to 150 Hz
Shock resistance, shock duration 11 ms		g	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59
Programming interface			RS232C, programming cable length < 3 m
Interface			RS485
Bus			Suconet K
Data cable length		m	600/300
Data transfer rate		kBit/s	187.5/375
Control mode			Master/slave
Degree of protection			IP20
Rated insulation voltage	U_i	V AC	1800
Real-time clock			Yes
Accuracy of the real-time clock			6.1 min/year (battery-buffered)
Battery (service life)			Normally 5 years
Expandable (locally)			Max. 5 LEs
Expandable (remotely)			Max. 8 stations
User and data memory (internal)			32 KByte
Memory modules (external)			32 KByte RAM 128 KByte FLASH 32 KByte RAM + 128 KByte flash
Cycle time for 1 k of instructions (Bit, Byte)		ms	5
Max. number of inputs (local)			12
Max. number of outputs (local)			8 (relay)
Weight		kg	0.95
Power supply			
Terminals			Screw terminals
Terminal capacity			
Solid		mm^2	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 2.5
Inputs/outputs			
Terminals			Plug-in screw terminals
Terminal capacity			
Solid		mm^2	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5
Power supply			
Rated voltage	U_e	V	120 – 240 AC
Admissible range		V	98 – 264 AC
Rated frequency		Hz	47 – 63
Rated current	I_e	mA	300 (120 V AC) 150 (240 V AC) with LE
Inrush current and duration		A	4 < 5 ms
Heat dissipation (total for device)		W	Approx. 9.5 (120 V AC) Approx. 12.5 (240 V AC)
Bridging of voltage dips			
Duration of dip		ms	10
Repetition rate		s	1
Fault indication			Yes (LED)
Protection class			1
Electrical isolation			Yes
Max. current carrying capacity for LE bus (5 V)		A	1.2

Compact PLC PS4			PS4-271-MM1
Digital inputs			
Qty.			12
Rated voltage	U_e	V AC	120 at 47 – 63 Hz 240 at 47 – 55 Hz
Rated current at state "1"			
120 V AC/50 Hz	I_e	mA	Normally 6
240 V AC/50 Hz	I_e	mA	Normally 12
Electrical isolation			
Between the inputs			No
Input to LE bus/Suconet K			Yes
Overvoltage category/pollution degree			II, basic insulation
Different phases at adjacent inputs			Only permissible between groups, input can be switched only with phase
Voltage level to IEC/EN 61131-2			
Limit value type 1			U_n = 120 V AC/240 V AC
Min. switching level, high		V	79/164
max. low level		V	20/40
ON-delay, 120/240 V AC		ms	≦ Normally 10 at 50 Hz
OFF-delay, 120/240 V AC		ms	Normally 30 at 50 Hz
Status indication of inputs			Yes (LED)
Setpoint potentiometers			
Qty.			2
Value range			10-bit (1024 units)
Setting			With screwdriver
Analog inputs			
Qty.			4; 2 × current/voltage, 2 × resistance
Voltage		V	0 – 10
Input resistance		kΩ	220
Total error		%	Normally 0.8 of full scale
Max. current		mA	0 to 20 (4 to 20 through software)
Input resistance		Ω	250
Total error		%	Normally 0.8 of full scale
Resistance	R	kΩ	0 to 1.5
Temperature detector			Pt1000 Ni1000
Measuring current		mA	Approx. 0.4
Total error		%	Normally 0.8 of full scale
Connection type of signal encoder			Two-wire connection to transducer
Resolution		Bit	10-bit max. (1024 units)

Compact PLC PS4			PS4-271-MM1
Digital outputs			
Qty.			8
Contacts		Qty.	Make contact
Electrical isolation			Yes, in groups
Rated voltage	U_e	V	250 AC
Conventional thermal current	I_{th}	A	Max. 8 (UL/CSA: 10)
Short-circuit proof p.f. = 1			16 A characteristic B (FAZ-B16/1) at 600 A
Short-circuit proof p.f. = 0.5 to 0.7			16 A characteristic B (FAZ-B16/1) at 900 A
Contact material			$AgSnO_2$
Response time		ms	Normally 6
Reset time		ms	Normally 10
Bounce duration		ms	Normally 0.5
Min. contact voltage		V	12
Min. contact current		mA	500
Minimum load		W	6
Max. switching duty			
AC		VA	2000 (250 V/8 A/10 A UL/CSA)
DC		W	240 (30 V DC/8 A/10 A UL/CSA)
Lifespan			
Mechanical			
Lifespan, mechanical	Operations		10000000
Mechanical operating frequency		Hz	10
Resistive lamp load		Hz	2
Inductive load		Hz	0.5
Electrical			
Electrical lifespan at 8 A/230 V AC/70 °C	Operations		100000
Operation at AC-15, 230 V, 3 A p.f. = 0.4, 600 Ops/h	Operations		300000
– at DC-13, 24 V DC, 1 A L/R = 150 ms, 500 Ops/h	Operations		200000
Filament bulb load			
1000 W at 230/240 V AC	Operations		25000
500 W at 115/120 V AC	Operations		25000
Fluorescent lamp load 10 x 58 W at 230/240 V AC			
With upstream electrical device	Operations		25000
Uncompensated	Operations		25000
Fluorescent lamp load 1 x 58 W at 230/240 V AC, conventionally compensated	Operations		25000
Parallel switching of outputs for increased output			Not permissible
Protection of an output relay			FAZ-B16/1 miniature circuit-breaker or 8 A (slow) fuse
Contact protection			None
Overload and short-circuit protection			No
Insulation			IEC/EN 60664/VDE 0110 (01/89)
Pollution degree			2
Overvoltage category			II
Creepage distance coil/contact		mm	8
Air clearance coil/contact		mm	8
Test/alternating voltage at the open contact		kV	1
Test/alternating voltage at coil/contact		kV	4
Status indication of outputs			Yes
Analog outputs			
Max. current			
Current output, number			2
Signal range		mA	0 to 20 4 to 20
Resolution		Bit	12-bit (4096 units)
Total error		%	Normally 0.4 of full scale
Load on current outputs		Ω	≧ 500
Connection type			Two-wire connection
Voltage			
Voltage output, number			2
Signal range		V	0 – 10
Resolution		Bit	12 (4096 units)
Total error		%	Normally 0.4 of full scale
Output load		kΩ	≧ 2
Connection type			Two-wire connection

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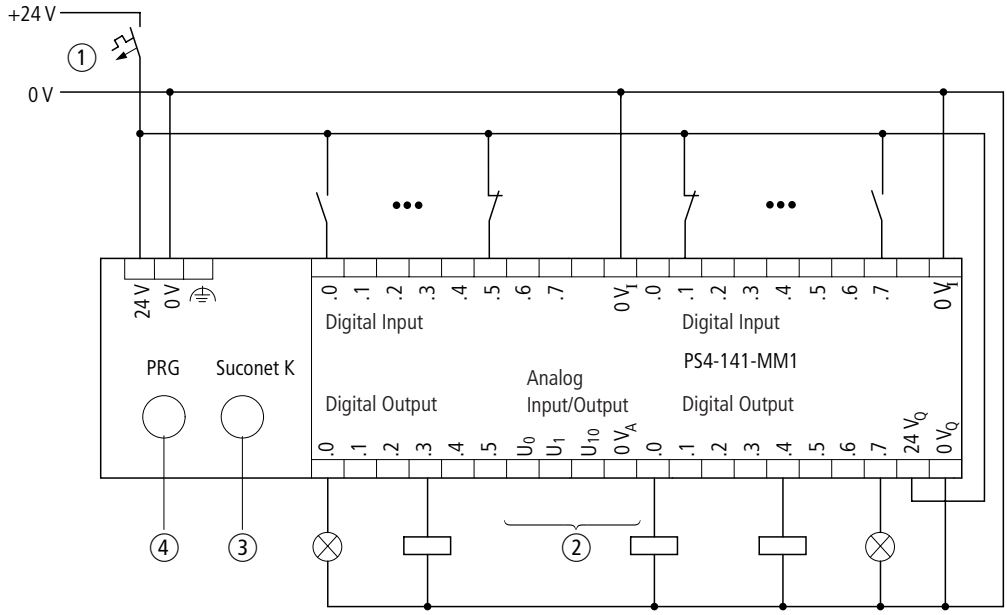
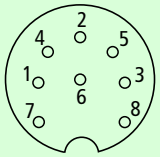
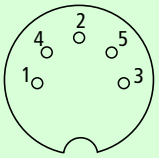
PS4-141-MM1

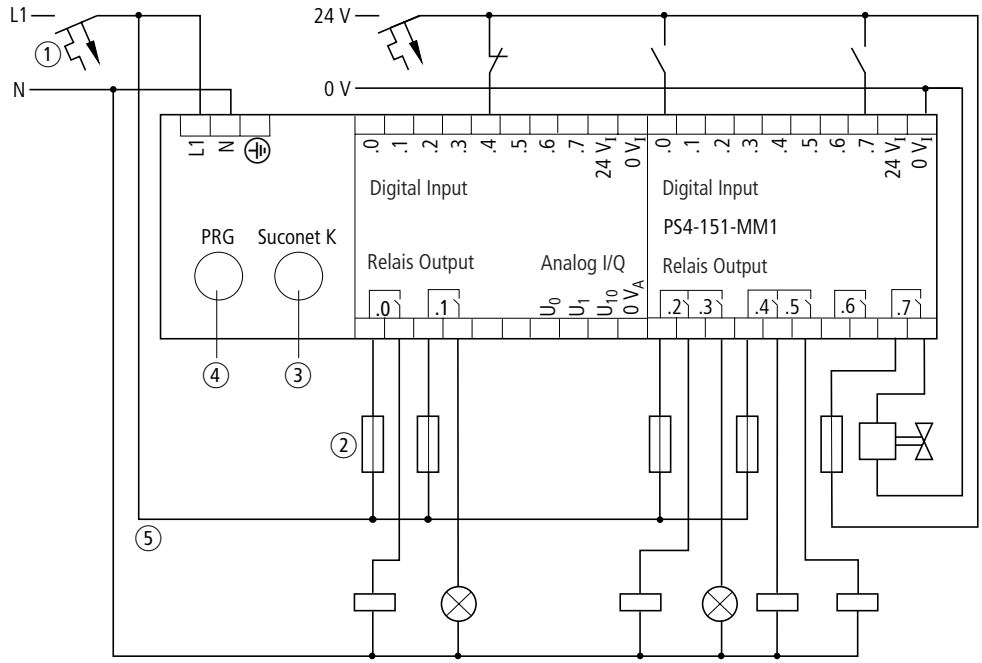


Wiring for common 24 V DC supply

① Circuit protection device
② Analog inputs/outputs
③ Suconet-K interface (5-pole)
④ PRG interface (8-pole)

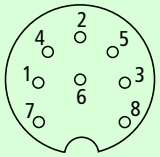
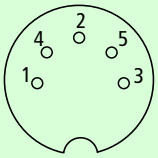
Pin	PRG	Suconet K
		
1	–	TB/RB
2	RxD	Internally connected
3	0 V	Internally connected
4	–	TA/RA
5	TxD	Internally connected
6 – 8	–	

PS4-151-MM1

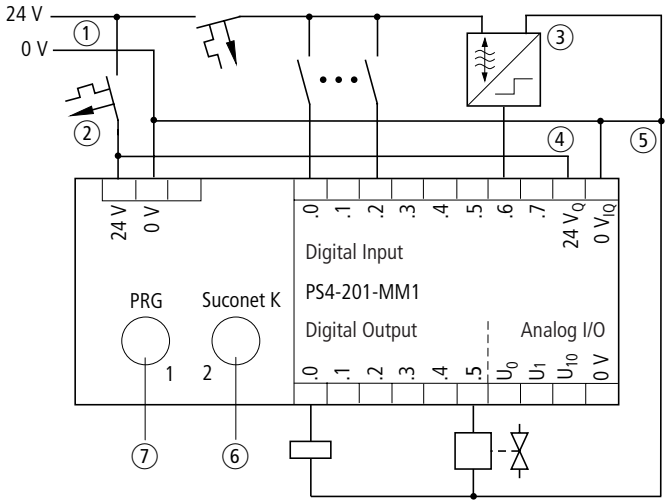


Wiring for 115 – 230 V AC supply
- Relay contact with the 230 V AC and 24 V DC potentials

① Circuit protection device
② Fuse 4 A fast, for protection of the relay contacts
③ Suconet-K interface (5-pole)
④ PRG interface (8-pole)
⑤ 230 V AC relay outputs must be wired up to the same phase (e. g. L1) (max. 250 V potential difference)

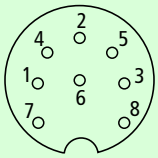
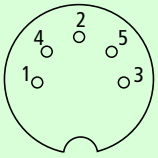
Pin	PRG	Suconet K
		
1	–	TB/RB
2	RxD	Internally connected
3	0 V	Internally connected
4	–	TA/RA
5	TxD	Internally connected
6 – 8	–	

PS4-201-MM1

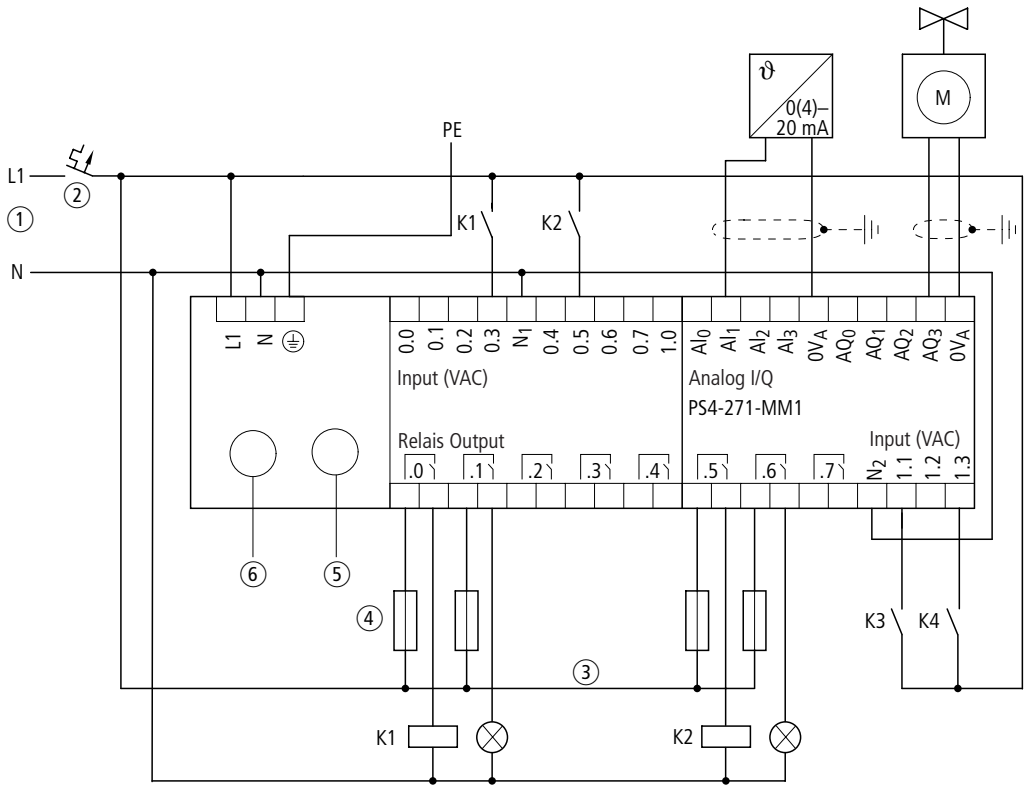


Wiring for common 24 V DC supply

① 24 V DC supply
② Circuit protection device
③ Proximity switch
④ 24 V DC supply for the outputs
⑤ 0 V potential for the inputs/outputs
⑥ Suconet-K interface (5-pole)
⑦ PRG interface (8-pole)

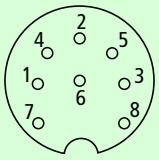
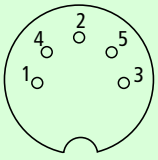
Pin	PRG 	Suconet K 
1	–	TB/RB
2	RxD	Internally connected
3	0 V	Internally connected
4	–	TA/RA
5	TxD	Internally connected
6 – 8	–	

PS4-271-MM1



Wiring for common 230 V AC supply

① Electrical supply
② Circuit protection device
③ 230 V AC relay outputs must be wired up to the same phase (e. g. L1) (max. 250 V potential difference)
④ Fuse 4 A fast, for protection of the relay contacts
⑤ Suconet-K(1) interface
⑥ Suconet-K(1)-PRG interface

Pin	PRG	Suconet K
		
1	–	TB/RB
2	RxD	Internally connected
3	0 V	Internally connected
4	–	TA/RA
5	TxD	Internally connected
6 – 8	–	

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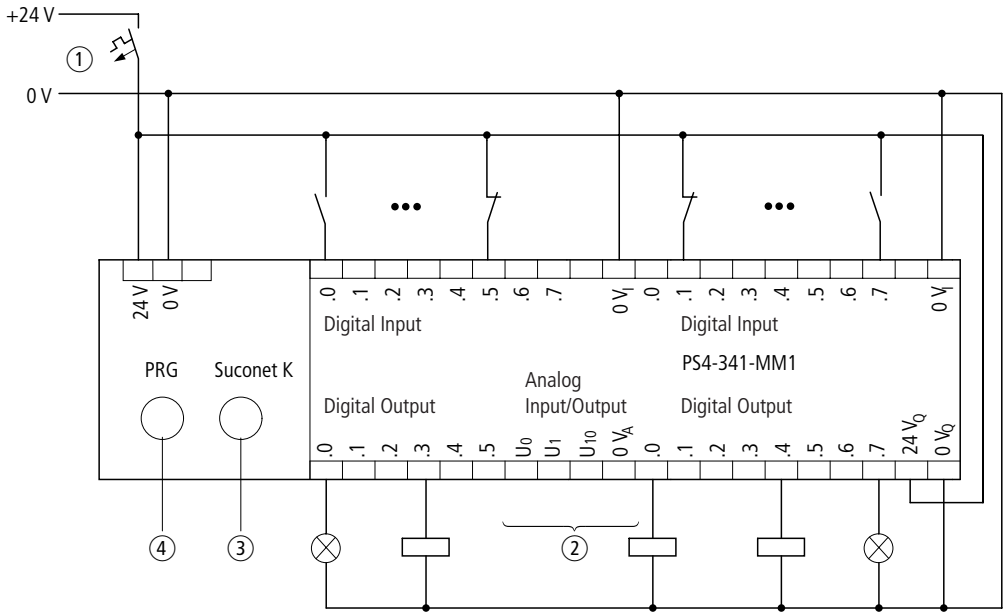
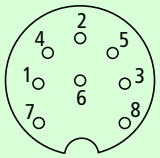
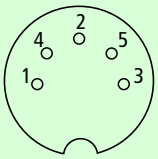
PS4-341-MM1



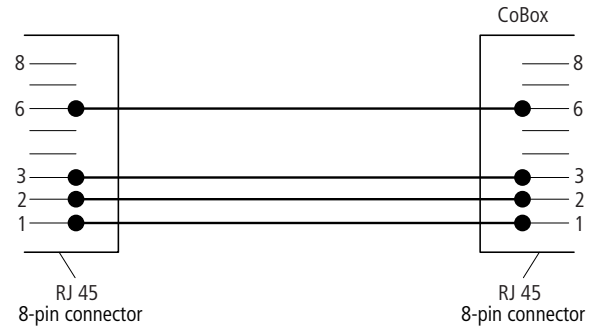
Wiring for common 24 V DC supply

① Circuit protection device
② Analog inputs/outputs
③ Suconet-K(1) interface (5-pole)
④ Suconet-K(1)-PRG interface (8-pole)

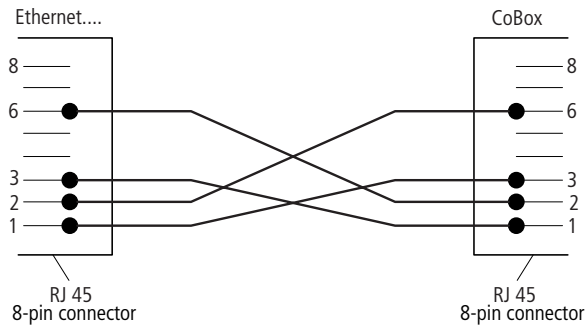
Pin	PRG	Suconet K
		
1	–	TB/RB
2	RxD	Internally connected
3	0 V	Internally connected
4	–	TA/RA
5	TxD	Internally connected
6-8	–	

Ethernet cable connection

K1
Standard Ethernet (to hub/switch)

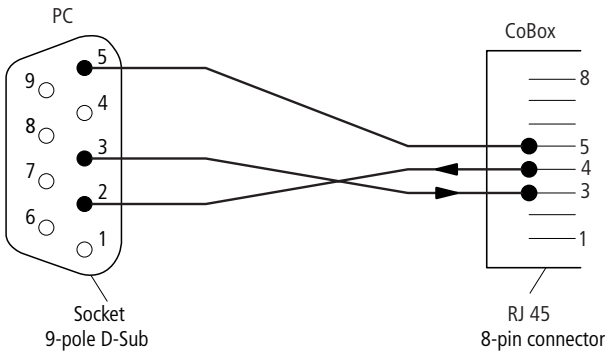


K2
Cross-connect Ethernet

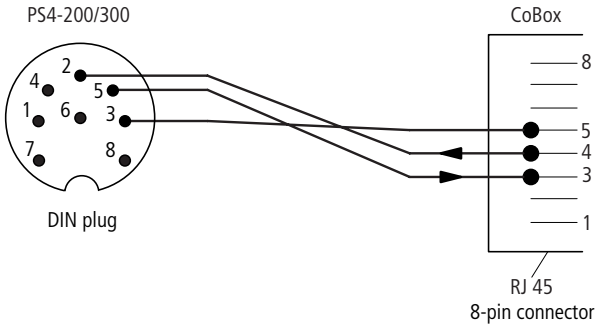


Serial interface cable connection

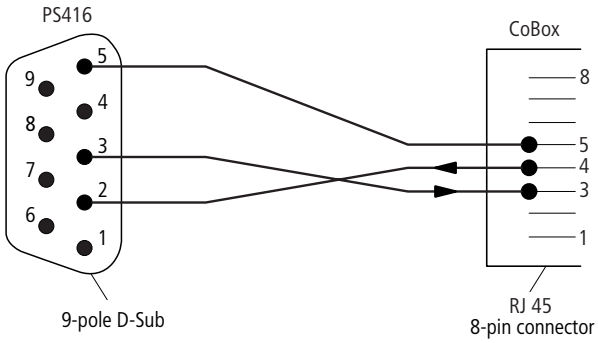
K3
Cable for configuration



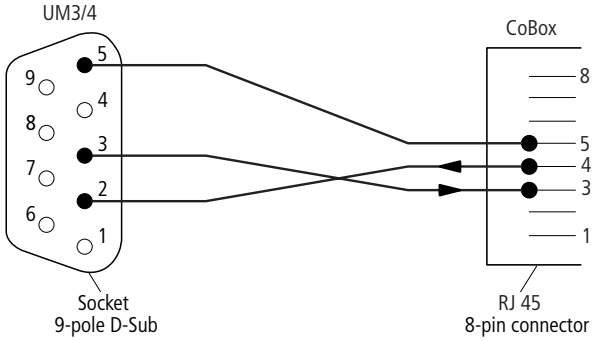
K4
Cable for PS4 controller



K5
Cable for PS416 controller



K6
Cable for ZB4-501-UM3/-4 (as for PC cable)



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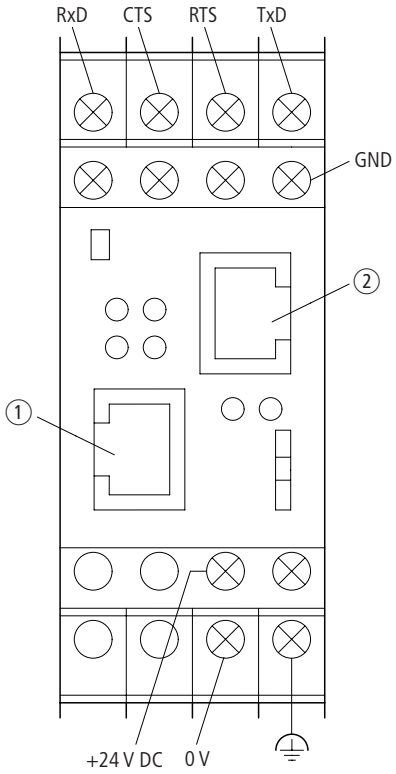
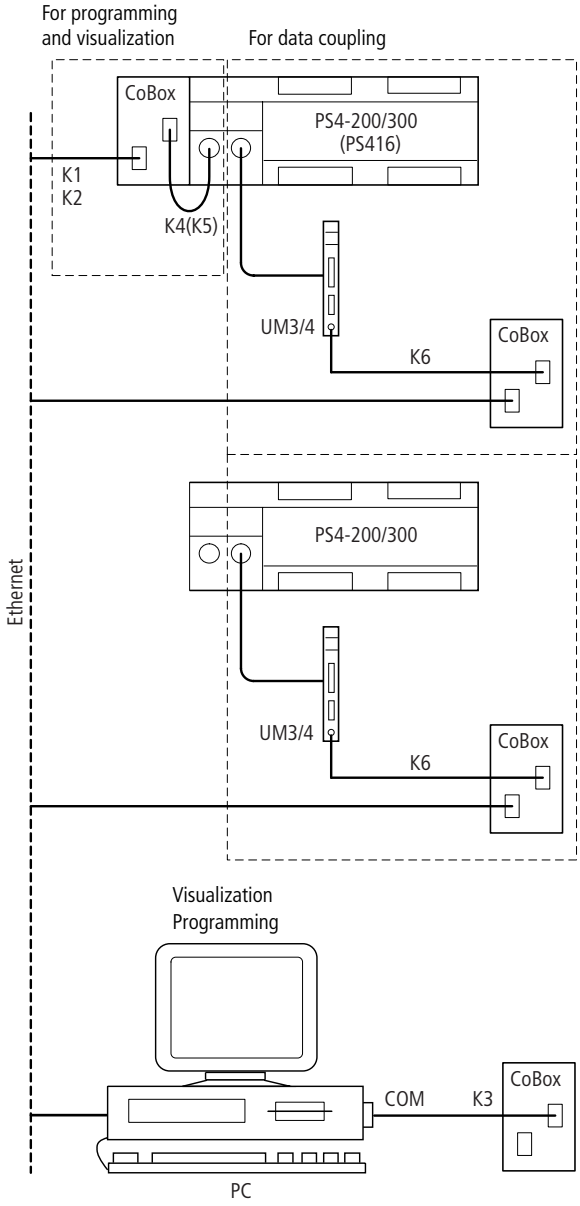
Device conection

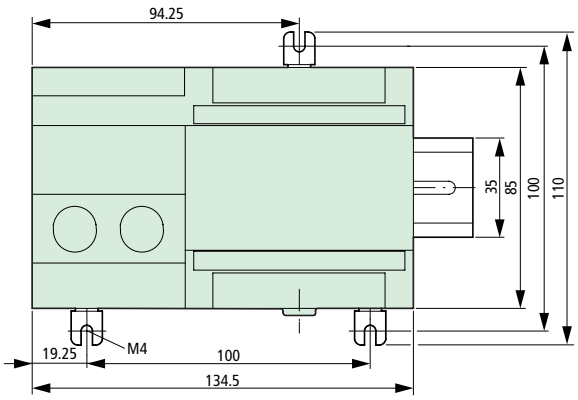


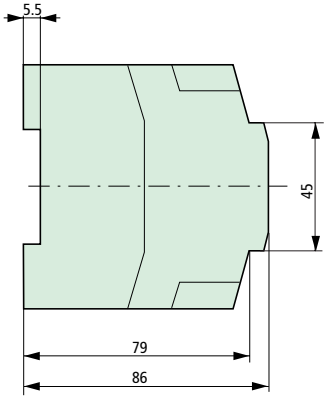
① Ethernet cable connection
② Serial interface cable connection



Compact PLC

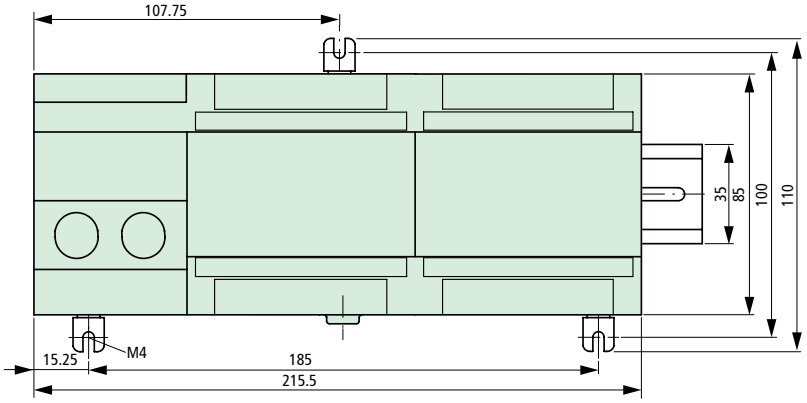
PS4-201

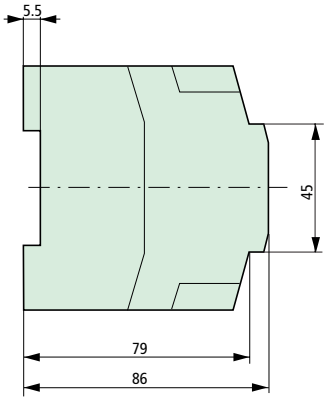




Compact PLC

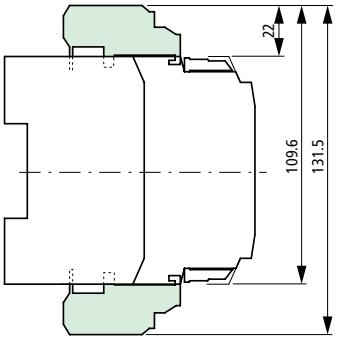
PS4-150, PS4-271, PS4-300





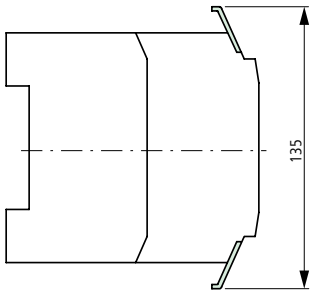
Compact PLC / expansion plus two-level terminal block

PS4-...



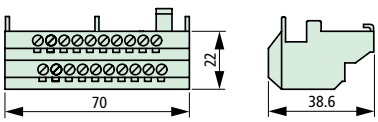
Compact PLC / expansion plus labelling flap

PS4-...

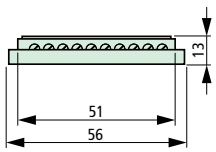


Accessories

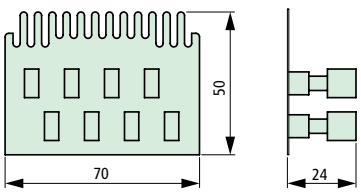
Two-level terminal block ZB4-122-KL1



Plug-in screw terminal ZB4-110-KL1

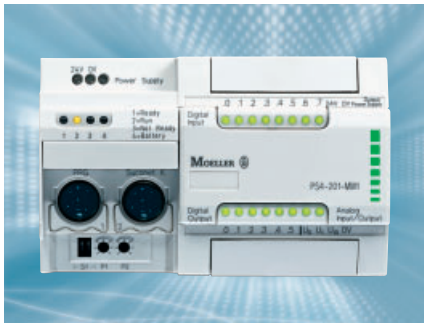


Digital input simulator ZB4-108-ES1



Decentralised Expansion: EM4, UM3/4, TC1/2

Digital and analog I/O modules



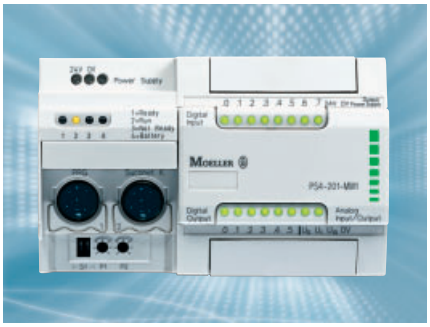
EM4-101-DD2:
Suconet K slave
8 digital inputs, 24 V DC
8 digital outputs, 24 V DC, 0.5 A

EM4-111-DR2:
Suconet K slave
8 digital inputs, 24 V DC
6 relay outputs, 2 A (1 A inductive)

EM4-201-DX2:
Suconet K slave
16 digital inputs, 24 V DC
Expandable by up to 6 LE4 modules
(digital and analog)

EM4-101-AA2:
Suconet K slave
Up to 8 analog inputs
(current or voltage)
4 analog outputs
(voltage only)

Technology and networking modules



Specialised technical (intelligent I/O) modules

EM4-101-TX1:
Suconet K slave
6 inputs, PT100 or Ni1000
2 inputs (0 …10 V)

EM4-101-TX2:
Suconet K slave
6 inputs for J, K, L thermo-elements

Networking modules

EM4-204-DX1:
PROFIBUS-DP slave
16 digital inputs, 24 V DC
Expandable by up to 6 LE4 modules
(digital and analog)

Telecontrol modules and serial communication modules

Telecontrol modules

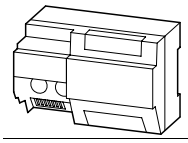
ZB4-501-TC1/TC2:
Supported protocols:
FT1.2, FT3 asynchronous
Usable data length: 220 Bytes
Transmission rate: 600 … 19200 Baud
Interface for modem: RS232C
Maximum quantity: 1 (TC1), 14 (TC2)

ZB4-501-UM3/UM4:
Usable data length: 250 Bytes
Transmission rate: 600 … 19200 Baud
Maximum quantity: 1 (UM3), 14 (UM4)

Local expansion using LE4 modules
Depending on the PLC used, up to 6 LE4 local expansion modules can be simply plugged into the base unit, i.e. PS4 or EM4.

In this way, the controllers can be expanded, locally as well as remotely, by additional digital or analog inputs/outputs, counters, and also network interfaces.

Decentralised expansion using EM4 modules
The modules of the EM4 series allow the controllers of the PS4 and PS416 ranges to be simply expanded via a fieldbus system. All the modules have a Suconet K interface as standard, and bus couplers for PROFIBUS-DP are available. Each EM4 module is equipped with switchable bus terminating resistors. This saves time and money.

	Description	Type Article no.	Price see price list	Std. pack
EM4 remote expansion modules				
				
EM4-100 Not locally expandable				
Digital modules Not locally expandable				
Networking through Suconet K1/K	• 24 V DC supply • 8 inputs 24 V DC (10 inputs optional) • 8 outputs 24 V/0.5 A DC (6 outputs with 10 inputs) Note: EM4-101-DD2 replaces ...DD1	**EM4-101-DD2** 206950		1 off
Networking through Suconet K1/K	• Supply voltage 115 – 230 V AC • 8 inputs, 24 V DC • 6 relay outputs, max. 230 V AC or 24 V DC Note: EM4-111-DR2 replaces ...DR1	**EM4-111-DR2** 206951		1 off
Analog modules Not locally expandable				
Networking through Suconet K1/K	• Supply voltage 24 V DC, configurable inputs and outputs • 6/8 analog inputs, 8/12-bit resolution • 4 analog inputs, 8/12-bit resolution	**EM4-101-AA2** 046202		1 off
Temperature measuring modules Not locally expandable				
Networking through Suconet K	• 24 V DC supply • 6 inputs for Pt100-/Ni1000 resistance thermometers – Pt100: –100 °C to +300 °C – Ni1000: –50 °C to +150 °C • 2 inputs 0 – 10 V,12-bit resolution	**EM4-101-TX1** 087437		1 off
Networking through Suconet K	• 24 V DC supply • 6 inputs for thermocouple types – J: 0 °C to 1200 °C – K: 0 °C to 1300 °C – L: 0 °C to 900 °C	**EM4-101-TX2** 205103		1 off
EM4-200 Locally expandable with expansion modules LE4-...				
Digital modules • Expansion module handles signal states and digital values • 24 V DC supply • 16 inputs (24 V DC)				
Networking through Suconet K1/K	(EM4-201-DX2 replaces ...DX1)	**EM4-201-DX2** 046990		1 off
Networking via PROFIBUS-DP	Corresponding configuration file (*.GSD) available via download from: • Internet address: www.moeller.net/automation • Internet address: www.profibus.com	**EM4-204-DX1** 088985		1 off

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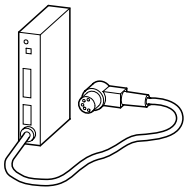
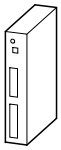
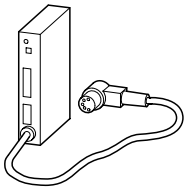
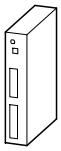
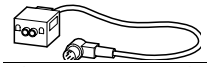
	Description	Type Article no.	Price see price list	Std. pack
Interface converter for PS4				
	Suconet K on RS232C • 1 RS485 interface with 5-pole DIN connector for connection to Master-PLC • 1 RS485 interface for the continuation via Suconet-K bus (plug-in screw terminal) • 1 RS232C interface for the connection of the partner device (9-pole SUB-D connector) • Supply voltage 9 V DC via PLC (PS4, apart from PS4-100/400) • Address 2 (fixed setting)	**ZB4-501-UM3** 215355		1 off
Interface converter for PS4/PS416				
	Suconet K on RS232C • 1 RS485 interface for the Suconet-K bus (plug-in screw terminal) • 1 RS232C interface for the connection of the partner device (9-pole SUB-D connector) • 24 V DC supply • Address can be set	**ZB4-501-UM4** 225350		1 off
Telecontrol module for PS4				
	• 1 RS485 interface with 5-pole DIN connector for connection to master PLC (cable length 20 cm) • 1 RS485 interface for the continuation via Suconet-K bus (plug-in screw terminal) • 1 RS232C interface with 9-pole SUB-D DIN connector for modem connection • Supply voltage 9 V DC via PLC (PS4, apart from PS4-100-400) • Address 2 (fixed setting)	**ZB4-501-TC1** 201778		1 off
Telecontrol module for PS4/PS416				
	• 1 RS485 interface for the Suconet-K bus (plug-in screw terminal) • 1 RS232C interface with 9-pole SUB-D DIN connector for modem connection • Supply voltage 24 V DC (plug-in terminal block) • Address can be set	**ZB4-501-TC2** 225353		1 off

	Description	For use with	**Type** Article no.	**Price** see price list	Std. pack
Accessories					
Digital input simulator					
	Simulation of 8 digital inputs	PS4-... EM4-... LE4-...	**ZB4-108-ES1** 071605		1 off
T connector for bus connection					
	5-pole DIN plug	PS4-... EM4-...	**TBA3.1** 012470		1 off
Plug-in screw terminals					
	10-pole, for connection of signal cables	PS4-... EM4-... LE4-...	**ZB4-110-KL1** 071606		2 off
Two-level terminal block					
	Snap-fit terminal block, 2 × 11-pole, for the direct connection of proximity switches (initiators) and actuators	PS4-... EM4-... LE4-...	**ZB4-122-KL1** 052101		2 off
Hinged cover with large area for labelling					
	For plug-in screw terminals, for labelling of inputs/outputs, 20 characters/terminal	PS4-... EM4-... LE4-...	**ZB4-101-GZ1** 052108		10 off
Bus plug connector for PROFIBUS-DP					
	• Metallised insulated housing • Maximum transfer rate 12 MBit/s • Integrated switch for bus terminating resistor • Terminal block for two cable entries, can optionally be mounted for or 90° cable entry • Suitable for – LE4-504-BS1/-BT1, – MV4 with DP interface, – PS416-NET-440/-441, – EM4-204-DX1 via adapter ZB-014-AD1 – Gateway CM4-504-GS1; **not** suitable for MI4 with DP interface	EM4-... LE4-...	**ZB4-209-DS3** 217820		1 off
Mounting foot For screw fixing to mounting plate					
	For screw fixing on mounting plate, 3 mounting feet per device	ZEV ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 PS4-... EM4-... LE4-...	**ZB4-101-GF1** 061360		9 off

	Description	For use with	**Type** Article no.	**Price** see price list	Std. pack
Accessories					
Suconet K/K1 data cable					
Ready-assembled (not for interface card EPC335.1) For coupling all automation devices via Suconet-K/K1 interface					
	• 2 × 5-pole pin connector (S1-PS3), right-angle version • Cable length 0.5 m	PS4-... EM4-...	**KPG1-PS3** 085640		1 off
	• 1 × 5-pole pin connector (S1-PS3), right-angle version • 1 × 9-pole pin connector • Cable length 2 m	PS4-... EM4-...	**KPG3-PS3** 014487		1 off
Not assembled For coupling all devices with Suconet-K/K1 interface For customer assembly of Suconet cables 2 × 0.5 mm² shielded and twisted, cable length (as ring) 100 m					
	–	PS416-CPU-... PS416-NET-4.. PS4	**LT309.096** 019233		1 off
Screen earth kit					
	For EMC-compliant connection of cable shielding	PS4-... EM4-... LE4-...	**ZB4-102-KS1** 081038		1 off
Data plug					
	For automation devices with a Suconet K/K1 connection • 5-pole pin connnector, right-angle version	PS4-... EM4-...	**S1-PS3** 095132		2 off
	9-pole SUB-D pin connector, right-angled, kit without cable for connecting data cables	PS416-CPU-... PS416-NET-2.. PS416-NET-4.. PS416-COM-... PS416-MOD-... EM4-...	**PS416-ZBS-410** 051752		1 off
	For expansion modules EM4-102-AA1 and EM4-102-DX1 • 8-pole pin connnector, right-angle version	EM4-...	**ZB4-108-DS1** 060385		1 off
PROFIBUS-DP adapter cable					
	For expansion module EM4-204-DX1 • for 9-pole SUB-D socket to 5-pole DIN plug connector • Cable length 0.20 m	EM4-...	**ZB4-014-AD1** 206981		1 off

Digital EM4			EM4-101-DD2	EM4-111-DR2	EM4-201-DX2	EM4-204-DX1
General						
Standards			IEC/EN 61131-2, EN 50178	IEC/EN 61131-2, EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0/55	0/55	0/55	0/55
Ambient temperature for storage		°C	25/70	25/70	25/70	25/70
Vibration resistance		g	Constant 1 g, f = 10 to 150 Hz			
Shock resistance, shock duration 11 ms		g	> 15	> 15	> 15	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59	→ Page 4/59	→ Page 4/59	→ Page 4/59
Degree of protection			IP20	IP20	IP20	IP20
Insulation test	U_i	V AC	600	1800	600	600
Expandable (locally)			No	No	Yes	Yes
Weight		kg	0.44	0.44	0.455	0.46
Power supply						
Terminals			Screw terminals	Screw terminals	Screw terminals	Screw terminals
Terminal capacity						
Solid		mm^2	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5
Inputs/outputs						
Terminals			Plug-in screw terminals			
Terminal capacity						
Solid		mm^2	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5	0.22 – 1.5	0.22 – 1.5	0.22 – 1.5
Power supply						
Rated voltage	U_e	V	24 DC	115 – 240 AC	24 DC	24 DC
Admissible range		V	20.4 – 28.8 DC	98 – 264 AC	20.4 – 28.8 DC	20.4 – 28.8 DC
Rated frequency		Hz	–	47 – 68	–	–
Residual ripple on the input voltage		%	≦ 5	–	≦ 5	≦ 5
Protection against polarity reversal			Yes	–	–	–
Rated current	I_e	mA	100	40	400	max. 500
Inrush current and duration		A	3 for max. 5 ms	< 12 at 253 V AC	10 for max.1.3 ms	10 for max.1.3 ms
Heat dissipation (total for device)		W	Approx. 5	Approx. 9	Approx. 7	Approx. 7
Bridging of voltage dips						
Duration of dip		ms	10	10	10	10
Repetition rate		s	1	1	1	1
Protection class			1	1	1	1
Electrical isolation between inputs and internal power supply			Yes	Yes	Yes	Yes
Networking						
Bus			Suconet K1/K	Suconet K1/K	Suconet K1/K	PROFIBUS-DP
Data transfer rate		kBit/s	187.5/375	187.5/375	187.5/375	9.6 to 12000
Interface			RS485	RS485	RS485	RS485
Addressing			Through coding switch	Through coding switch	Through coding switch	Through coding switch
Slave address			2 – 31	2 – 31	2 – 31	1 – 126
EM4 in the line		Qty.	–	–	–	max. 125 (30 without repeater)
Digital inputs						
Qty.			8 or 10	8	16	16
Outputs configurable as additional inputs		Qty.	2	–	–	–
Rated voltage						
Rated voltage	U_e	V DC	24	24	24	24
ON 0 signal	U_e	V DC	≦ 5, limit type 1			
ON 1 signal	U_e	V DC	≦ 15, limit type 1			
Rated current at state "1"			Normally 6 mA at 24 V DC			
Delay time						
For "0" to "1"		ms	Normally 0.2	Normally 0.2	Normally 0.2	Normally 0.2
For "1" to "0"		ms	Normally 0.2	Normally 0.2	Normally 0.2	Normally 0.2
Electrical isolation						
Electrical isolation			Yes	Yes	Yes	Yes
Between the inputs			No	No	No	No
of the 2 additional inputs			Yes	–	–	–
Status indication of inputs			Yes (LED)	Yes (LED)	Yes (LED)	Yes (LED)

Digital EM4			EM4-101-DD2	EM4-111-DR2	EM4-201-DX2	EM4-204-DX1
Digital outputs						
Qty.			8 or 6, with 10 inputs	6 (relay)	–	–
Contacts			–	Make contact	–	–
Rated voltage						
Rated voltage	U_e	V	24 DC	See switching current	–	–
Admissible range		V DC	20.4 – 28.8	–	–	–
Max. ripple		%	≦ 5	–	–	–
Protection against polarity reversal			Yes	–	–	–
Electrical isolation			Yes	Yes	–	–
Electrical isolation in groups			No	2 isolated outputs, 4 outputs, in 2 groups of 2	–	–
Contact protection			–	None	–	–
Minimum load						
Minimum load		W	–	10	–	–
At contact voltage		V	–	>12	–	–
At contact current		mA	–	>100	–	–
Rated current						
At state "1"	I_e	A	0.5 A at 24 V DC	–	–	–
Lamp load	R_{LL}	W	≦ 4, without series resistor	–	–	–
Utilization factor	g	%	1	1	–	–
Duty factor		% DF	100	100	–	–
Residual current at state "0"		µA	max. 300	–	–	–
Response time		ms	–	max. 10	–	–
Reset time		ms	–	max. 15	–	–
Lifespan, mechanical	Operations		–	≧ 20000000	–	–
Switching current (resistive load)						
2 A/230 V AC	Operations		–	300000	–	–
2 A/24 V DC	Operations		–	900000	–	–
Switching current (inductive load)						
1 A/230 V AC-11	Operations		–	300000	–	–
1 A/24 V DC-11	Operations		–	100000	–	–
Short-circuit protection			Yes, without manual reset	No, external protection of relay contacts by max. 4 A fast fuse is required	–	–
Limitation of disconnect voltage with inductive loads			Yes	–	–	–
Maximum operating frequency						
With time constant L/R max. 72 ms		Ops/h	4000	–	–	–
With time constant L/R max. 15 ms		Ops/h	10000	–	–	–
Creepage and clearance distances			–	Group C, 250 V AC to VDE 0110	–	–
Insulation test voltage, contact/coil		kV	–	4	–	–
Status indication of outputs			Yes (LED)	Yes (LED)	–	–
Insulation test	U_i	V AC	–	2800	–	–

Analog EM4			EM4-101-AA2	EM4-101-TX1	EM4-101-TX2
General					
Standards			IEC/EN 61131-2, EN 50178	IEC/EN 61131-2, EN 50178	IEC/EN 61131-2, EN 50178
Ambient temperature		°C	0/55	0/55	0/55
Ambient temperature for storage		°C	25/70	25/70	25/70
Vibration resistance		g	Constant 1 g, f = 10 to 150 Hz		
Shock resistance, shock duration 11 ms		g	> 15	> 15	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59	→ Page 4/59	→ Page 4/59
Degree of protection			IP20	IP20	IP20
Rated insulation voltage	U_i	V AC	600	600	600
Expandable (locally)			No	No	No
Weight		kg	0.455	0.44	0.44
Power supply					
Terminals			Screw terminals	Screw terminals	Screw terminals
Terminal capacity					
Solid		mm^2	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5
Inputs/outputs					
Terminals			Plug-in screw terminals	Plug-in screw terminals	Plug-in screw terminals
Terminal capacity					
Solid		mm^2	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5	0.22 – 1.5	0.22 – 1.5
Power supply					
Rated voltage	U_e	V DC	24	24	24
Admissible range	U_e	V DC	20.4 – 28.8	20.4 – 28.8	20.4 – 28.8
Residual ripple on the input voltage		%	≦ 5	≦ 5	≦ 5
Protection against polarity reversal			Yes	Yes	Yes
Rated current	I_e	mA	150	150	150
Inrush current and duration		A	5 for max. 5 ms	5 for max. 5 ms	5 for max. 5 ms
Heat dissipation (total for device)		W	Approx. 3	Approx. 3	Approx. 3
Bridging of voltage dips					
Duration of dip		ms	10	10	10
Repetition rate		s	1	1	1
Protection class			1	1	1
Electrical isolation between inputs and internal power supply			Yes	Yes	Yes
Networking					
Bus			Suconet K1/K	Suconet K	Suconet K
Data transfer rate		kBit/s	187.5/375	187.5/375	187.5/375
Interface			RS485	RS485	RS485
Addressing			Through coding switch	Through coding switch	Through coding switch
Slave address			2 – 31	2 – 31	2 – 31

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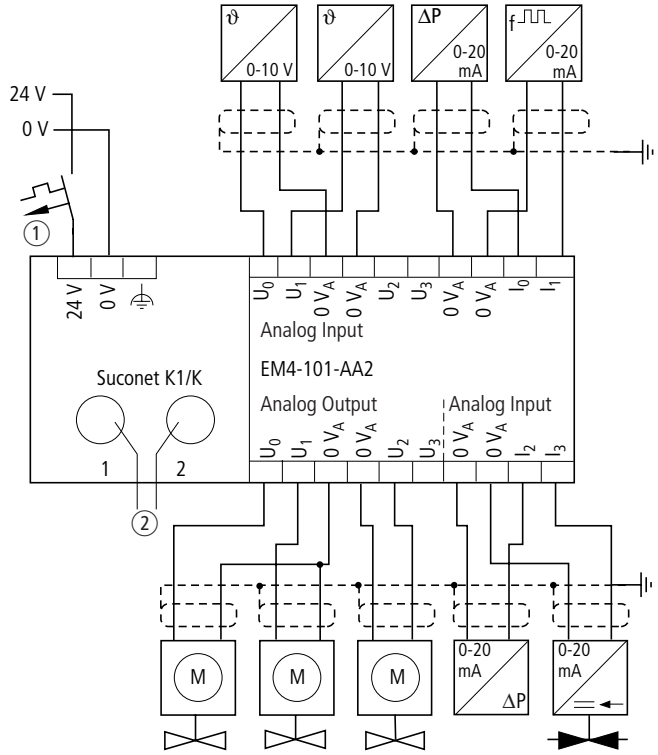
Analog EM4		EM4-101-AA2	EM4-101-TX1	EM4-101-TX2
Analog inputs				
Qty.		8 (4V/4I)	2 V	–
Signal ranges		0 – 5 V 0 – 10 V ± 5 V ± 10 V 0 – 20 mA	0 – 10 V	–
Electrical isolation		Yes, between inputs and ground, 24-V-DC supply voltage and bus, but not between inputs (and outputs, for AA2/AA1)		
Connection type of signal encoder		Two-wire connection to transducer		
Resolution	Bit	8/12	12	–
Permissible potential difference				
Between inputs		Not permissible	–	–
Between inputs and central earth point		See rated insulation voltage	–	–
Input current				
Range 0 to 20 mA	mA	≦30	–	–
Permissible input voltage	V	max. ± 15	+20 (destruction limit)	–
Error indication on overrange		Yes	–	–
Total error	%	Normally 0.4 of full scale	Normally 0.5 of full scale	–
Cable length screened	m	< 50 for cable cross-section ≧ 0.14 mm²	< ≦ 20	–
Input resistance				
–5 to 10 V	kΩ	> 100 kΩ per input	–	–
–10 to 10 V	kΩ	> 100 kΩ per input	20 kΩ	–
–5 to 10 V	kΩ	> 100 kΩ per input	–	–
–10 to 10 V	kΩ	> 100 kΩ per input	–	–
0 to 20 mA	Ω	50 Ω per input	–	–
Analog inputs Pt100/Ni1000				
Qty.		–	6 temperature inputs for Pt100/Ni1000	6 for thermocouple types J, K, L
Connection type		–	3-wire or 2-wire connection	–
Temperature range		–	Pt100: -100 to +300 °C Ni1000: -50 to +150 °C	J: 0 to 1200 °C K: 0 to 1300 °C L: 0 to 900 °C
Deviation		–	Pt100: max. ± 0.4 %; typically ± 0.2 % Ni1000: max. ± 0.2 %; typically ± 0.1 %	Converter: max. 0.5 % of preset final value Cold junction: max. 4 °C
Linearity factor		–	Pt100: max. ± 0.15 % Ni1000: max. ± 0.1 %	max. 0.4 °C
Reproducibility (with steady state at 25 C)		–	Pt100: max. ± 0.3 °C Ni1000: max. ± 0.2 °C	–
Error indication		–	Detection of cable break or short-circuit	Detection of cable break, overrange or underrange
R0 to R5 short-circuit-proof		–	Yes	–
Analog outputs				
Qty.		4	–	–
Signal ranges		0 – 10 V ± 10 V	–	–
Electrical isolation		Yes, of inputs from earthing point 24 V DC supply and bus, not between inputs and outputs	–	–
Resolution	Bit	8/12	–	–
Total error	%	Normally 0.4 of full scale	–	–
Connection type		Two-wire connection	–	–
Protection against short circuit		Yes	–	–
Short-circuit current	mA	±32	–	–
Permissible potential difference between earthing point and between outputs		See Rated insulation voltage	–	–
Cable length, screened	m	< 50 for cable cross-section ≧ 0.14 mm²	–	–
Load resistance per voltage output, min.	Ω	2000	–	–

Serial interface converter			ZB4-501-UM3	ZB4-501-UM4
General				
Ambient temperature		°C	0/55	0/55
Ambient temperature for storage		°C	-25/70	-25/70
Weight		kg	Approx. 0.18	Approx. 0.18
Electromagnetic compatibility (EMC)			→ Page 4/59	→ Page 4/59
Degree of protection			IP20	IP20
Mounting			Top-hat rail mounting	Top-hat rail mounting
Power supply		V DC	9 via PLC (PS4)	–
Power supply				
Rated voltage	U_e	V DC	–	24
Admissible range		V DC	–	20.4 – 28.8
Residual ripple		%	–	≦ 5
Protection against polarity reversal			–	Yes
Rated current	I_e	mA	–	100
Inrush current and duration		A	–	1/< 5 ms
Power loss		W	–	2.4
Protection class			–	1
Electrical isolation between supply voltage and interfaces			–	Yes
Terminals			–	Plug-in screw terminals
Terminal cross-section		mm^2	–	≦ 1.5
Operating data				
Qty. of modules			1 module per PS4 master control	14 modules per PS416-/PS4 master control
Network address			2, fixed setting	2 to 15, variable
Suconet-K transmit data			36 bytes (30 bytes of user data)	36 bytes (30 bytes of user data)
Suconet-K receive data			36 bytes (30 bytes of user data)	36 bytes (30 bytes of user data)
Telegram format			Transparent	Transparent
Max. quantity of user data in telegram		Byte	250	250
Interfaces				
RS485			2, with 5-pole DIN connector for connection to master PLC (cable length 20 cm), with plug-in screw terminal for connection to the Suconet-K bus extension	1, with plug-in screw terminal for connection to the Suconet-K bus, adjustable bus termination resistors
RS232C			1, with 9-pole SUB-D connector for the terminal device	
Recommended cable				
RS485			Cable 2 × 0.5 mm^2, shielded and twisted, for fabrication of Suconet cables. The connecting cable to the master control is part of the module assembly.	Cable 2 × 0.5 mm^2, shielded and twisted, for fabrication of Suconet cables.
Data transfer rate		kBit/s	0.6, 1.2, 2.4, 4.8, 9.6	0.6, 1.2, 2.4, 4.8, 9.6
Handshake signals			RTS, CTS, DTR, DSR, DCD	RTS, CTS, DTR, DSR, DCD
Electrical isolation			No	No

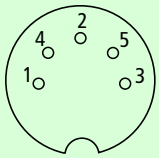
Telecontrol modules			ZB4-501-TC1	ZB4-501-TC2
General				
Ambient temperature		°C	0/55	0/55
Ambient temperature for storage		°C	-25/70	-25/70
Weight		kg	Approx. 0.18	Approx. 0.18
Degree of protection			IP20	IP20
Mounting			Top-hat rail mounting	Top-hat rail mounting
Power supply		V DC	9 via PLC (PS4)	–
Power supply				
Rated voltage	U_e	V DC	–	24
Admissible range		V DC	–	20.4 – 28.8
Residual ripple		%	–	≦ 5
Protection against polarity reversal			–	Yes
Rated current	I_e	mA	–	100
Inrush current and duration		A	–	1/< 5 ms
Power loss		W	–	2.4
Protection class			–	1
Electrical isolation between supply voltage and interfaces			–	Yes
Terminals			–	Plug-in screw terminals
Terminal cross-section		mm^2	–	≦ 1.5
Operating data				
Qty. of modules			1 module per PS4 master control	14 modules per PS416-/PS4 master control
Network address			2, fixed setting	2 to 15, variable
Suconet-K transmit data			36 bytes (30 bytes of user data)	36 bytes (30 bytes of user data)
Suconet-K receive data			36 bytes (30 bytes of user data)	36 bytes (30 bytes of user data)
Data transmission protocols			FT 1.2, FT 3 asynchronous (IEC/EN 60 870-5)	FT 1.2, FT 3 asynchronous (IEC/EN 60 870-5)
Max. quantity of user data in telecontrol protocol		Byte	220	220
Interfaces				
RS485			2, with 5-pole DIN connector for connection to master PLC (cable length 20 cm), with plug-in screw terminal for connection to the Suconet-K bus extension	1, with plug-in screw terminal for connection to the Suconet-K bus
RS232C			1, with 9-pole SUB-D connector for the modem connection	1, with 9-pole SUB-D connector for the modem connection
Recommended cable				
RS485			Cable 2 × 0.5 mm^2, shielded and twisted, for fabrication of Suconet cables. The connecting cable to the master control is part of the telecontrol module.	Cable 2 × 0.5 mm^2, shielded and twisted, for fabrication of Suconet cables.
RS232C			Shielded modem cable ZB4-254-KB1, Cable length max. 2 m	Shielded modem cable ZB4-254-KB1, Cable length max. 2 m
Data transfer rate		kBit/s	0.6, 1.2, 2.4, 4.8, 9.6	0.6, 1.2, 2.4, 4.8, 9.6
Handshake signals			RTS, CTS, DTR, DSR, DCD	RTS, CTS, DTR, DSR, DCD
Electrical isolation			No	No

EM4-101-AA2

Wiring for 24 V DC supply to the device with unipolar switching of the sensors



① Circuit protection device
② Suconet-K1/K interface

Pin	Suconet K1/K
	
1	TB/RB
3	SGND
4	TA/RA

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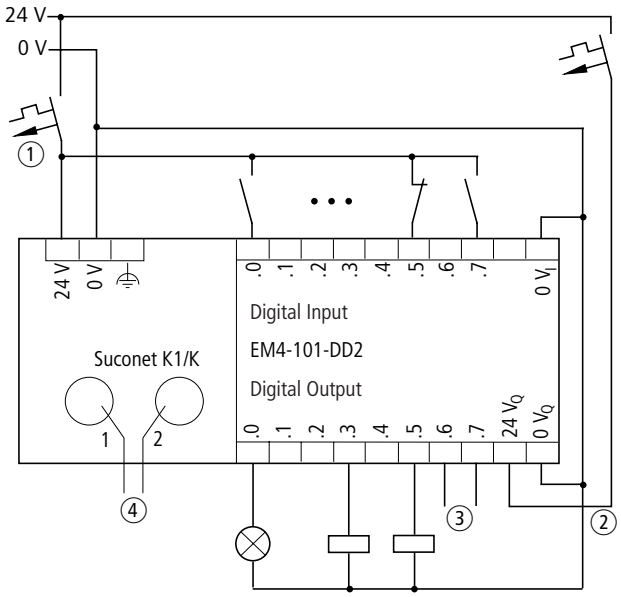
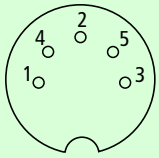
EM4-101-DD2

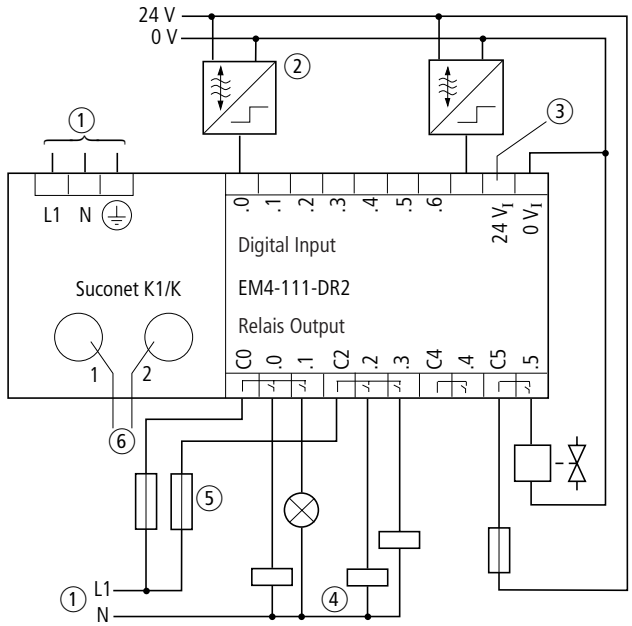


Wiring for common 24 V DC supply to the device

① Circuit protection device
② 24 V DC supply for the digital outputs
③ If output Q6 and/or Q7 is used as input I8 and/or I9, apply the same voltage as for outputs Q0 – Q5
④ Suconet-K1/K interface

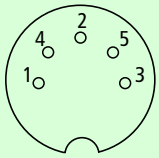
Pin	Suconet K1/K
	
1	TB/RB
3	SGND
4	TA/RA

EM4-111-DR2

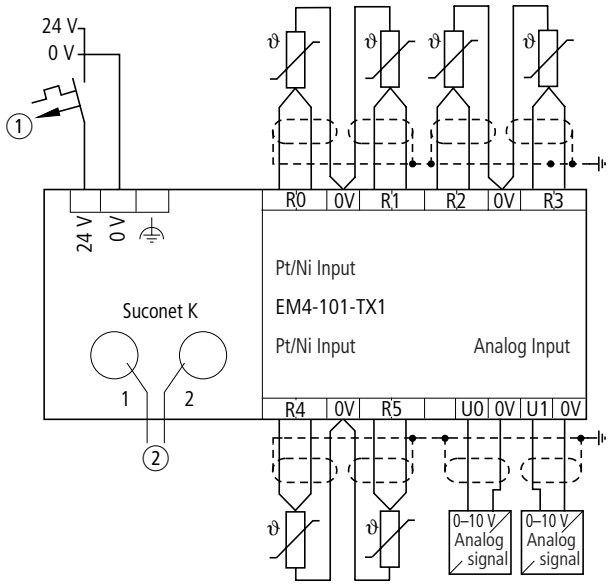


Wiring for common 230 V AC supply to the device
- Relay contact with the 230 V AC and 24 V DC potentials
- 24 V DC inputs

① Electrical supply
② Proximity switch
③ 24 V DC supply for digital inputs, alternative to an external power supply
④ 230 V AC relay outputs must be wired up to the same phase (e. g. L1) (max. 250 V AC potential difference)
⑤ Fuse (4 A fast) for protection of the relay contacts
⑥ Suconet-K1/K interface

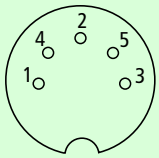
Pin	Suconet K1/K
	
1	TB/RB
3	SGND
4	TA/RA

EM4-101-TX1

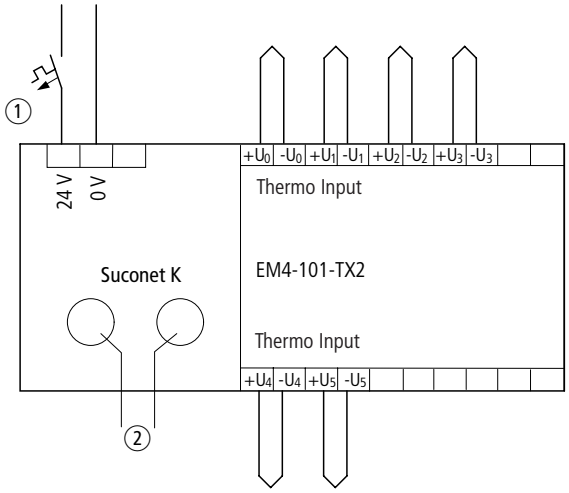


Wiring for 24 V DC supply to the device for 2- or 3-wire connection of the resistance thermometers

① Circuit protection device
② Suconet K interface

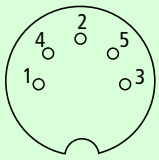
Pin	Suconet K
	
1	TB/RB
3	SGND
4	TA/RA

EM4-101-TX2



Wiring for 24 V DC supply to the device and thermocouple connections

① Circuit protection device
② Suconet K interface

Pin	Suconet K
	
1	TB/RB
3	SGND
4	TA/RA

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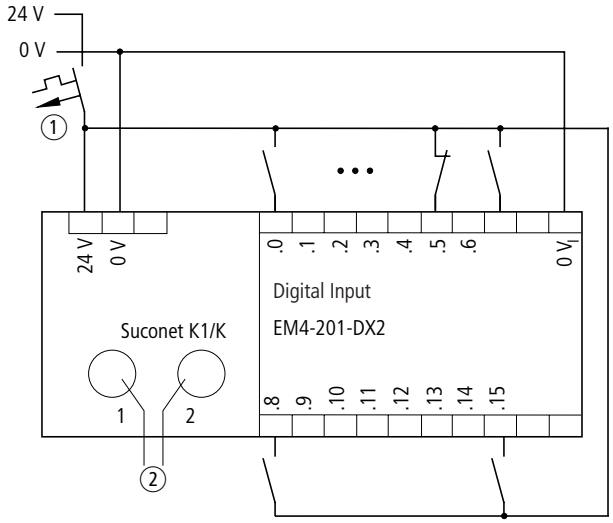
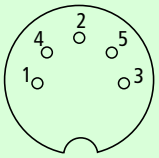
EM4-201-DX2

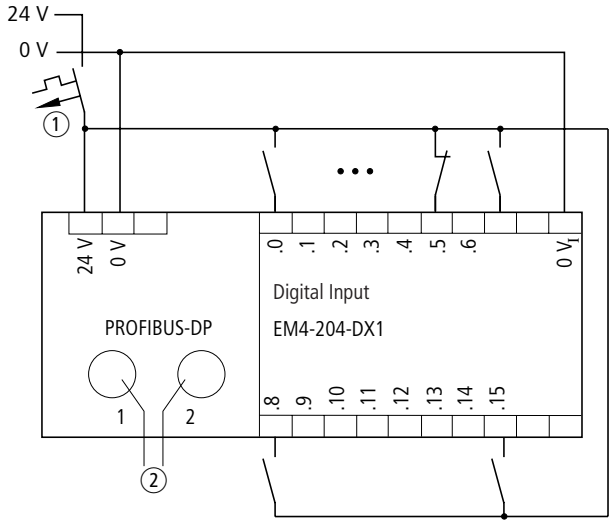


Wiring for common 24 V AC supply to the device

① Circuit protection device
② Suconet K interface

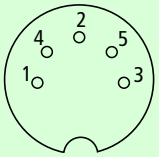
Pin	Suconet K
	
1	TB/RB
3	SGND
4	TA/RA

EM4-204-DX1



Wiring for common 24 V AC supply to the device

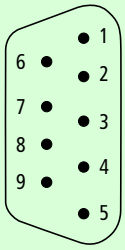
① Circuit protection device
② PROFIBUS-DP interface

Pin	PROFIBUS-DP
	
1	RxD/TxD-N
3	DGND
4	RxD/TxD-P
5	VP

ZB4-501-TC1/2
ZB4-501-UM3/4

Connections

RS232C interface (9-pole SUB-D connector)

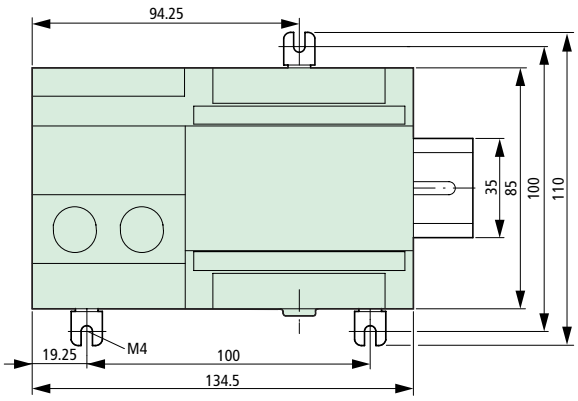


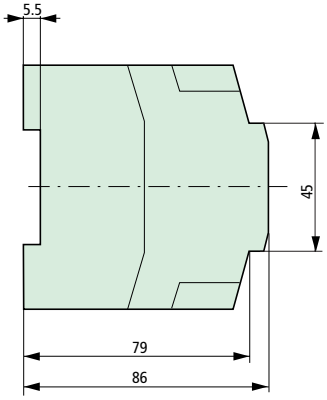
Pin	RS232C
1	DCD
2	RxD
3	TxD
4	DTR
5	SGND
6	DSR
7	RTS
8	CTS

Suconet-K interface (plug-in screw terminal block)
RS485: A/B/GND

Remote expansion modules

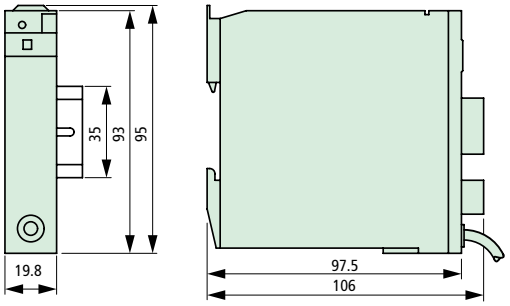
EM4-100
EM4-200





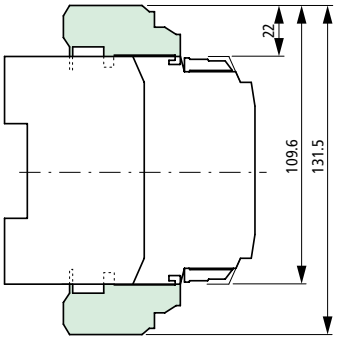
Interface converter, telecontrol module

ZB4-501-UM3/UM4
ZB4-501-TC1/TC2



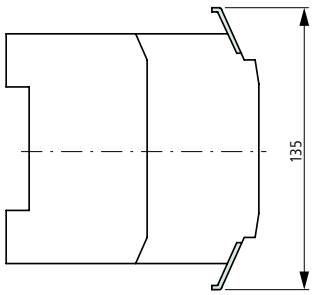
Expansion plus two-level terminal block

EM4-.../LE4-... plus ZB4-122-KL1



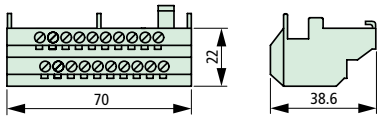
Expansion plus labelling flap

EM4-.../LE4-... plus ZB4-101-GZ1

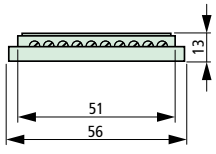


Accessories

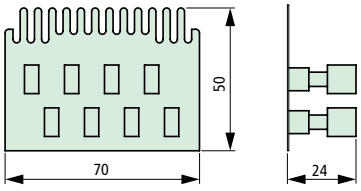
Two-level terminal block ZB4-122-KL1



Plug-in screw terminal ZB4-110-KL1



Digital input simulator ZB4-108-ES1



LE4

Digital and analog I/O modules

LE4-116-DD1:
8 digital inputs, 24 V DC
8 digital outputs, 24 V DC, 0.5 A

LE4-116-DX1:
16 digital inputs, 24 V DC

LE4-116-XD1:
16 digital outputs, 24 V DC, 0.5 A

LE4-108-XD1:
8 digital outputs, 24 V DC, 2 A

LE4-108-XR1:
8 relay outputs, 1 A DC, 2 A AC

LE4-308-HX1:
8 digital inputs, 240 V AC

LE4-308-XH1:
8 digital outputs, 240 V AC, 0.5 A

LE4-206-AA1:
4 analog inputs, +/- 10 V
2 analog outputs, +/- 10 V

LE4- 206-AA2:
4 analog inputs, 0(4) ...20 mA
2 analog outputs, 0(4)…20 mA

Technology modules for counting, decoding, etc.

LE4-622-CX1:
2 channels (24-Bit counter range),
3 selectable operating modes per channel,
Connection for 5 V and 24 V incremental encoders

LE4-633-CX1:
3 channels (25-Bit resolution),
125 or 250 kHz transmission speed,
SSI interface/protocol for connection of SSI rotary generators

Networking modules

LE4-501-BS1:
Suconet K, master or slave

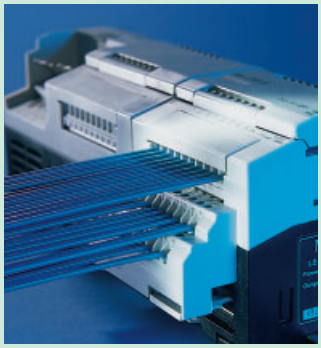
LE4-503-BS1:
PROFIBUS-FMS, slave

LE4-504-BS1:
PROFIBUS-DP, master

LE4-504-BT1:
PROFIBUS-DP, slave

Quick installation using plug-in technology
The plug-in screw terminals of PS4, EM4 and LE4 modules make pre-wiring easy. Any module can thus be quickly exchanged without the necessity for re-wiring.

Extreme space saving – the tiered terminal
The tiered terminal is the perfect solution for space- and costsaving installation of threewire sensors or actuators. You simply snapfit the terminal to the housing of the PS4, EM4 or LE4, and you have a compact installation feature that does away with terminal strips in the machine control panel – it virtually halves the space requirement!

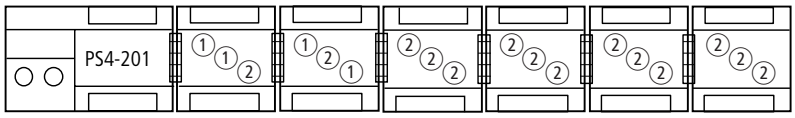


The CoBox – Ethernet accessible to all!
The CoBox networking module makes it possible for all PS4 and PS416 control systems to communicate with Ethernet. This serves various application areas such as programming, visualisation and data coupling.
In addition, the COBOX has an integrated WEB server that enables connection to the Internet/Intranet.

Engineering

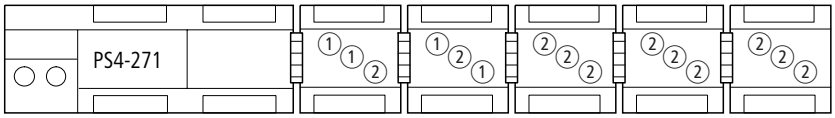
The functional requirements of the LE modules mean that they can only be used in specific positions.
The position numbers ① and ② indicate which LEs can be used in a particular position.
Please check the current loading.

Locally expandable compact PLCs



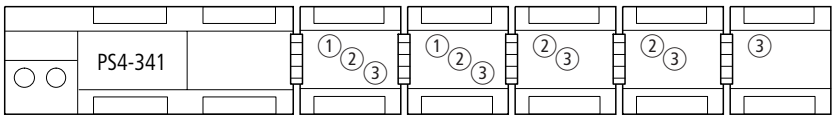
① LE4-206-AA1
LE4-206-AA2
LE4-501-BS1
LE4-503-BS1
LE4-504-BT1
LE4-622-CX1

② LE4-108-XD1
LE4-108-XR1
LE4-116-DD1
LE4-116-DX1
LE4-116-XD1
LE4-308-HX1
LE4-308-XH1



① LE4-206-AA1
LE4-206-AA2
LE4-501-BS1
LE4-503-BS1
LE4-504-BT1
LE4-622-CX1

② LE4-108-XD1
LE4-108-XR1
LE4-116-DD1
LE4-116-DX1
LE4-116-XD1
LE4-308-HX1
LE4-308-XH1

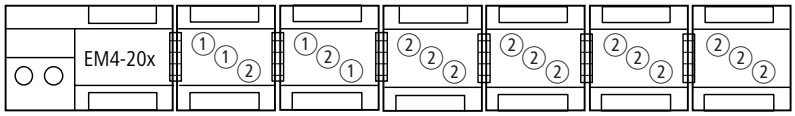


① LE4-206-AA2
LE4-501-BS1
LE4-503-BS1
LE4-504-BS1
LE4-504-BT1

② LE4-206-AA1
LE4-622-CX1
LE4-633-CX1

③ LE4-108-XD1
LE4-108-XR1
LE4-116-DD1
LE4-116-DX1
LE4-116-XD1
LE4-308-HX1
LE4-308-XH1

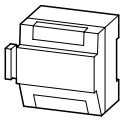
Locally expandable EM4 modules



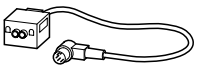
① LE4-206-AA1[1)]
LE4-206-AA2[1)]

② LE4-108-XD1
LE4-108-XR1
LE4-116-DD1
LE4-116-DX1
LE4-116-XD1
LE4-308-HX1
LE4-308-XH1

Notes [1)] LEs can only be coupled to the EM4-204-DX1

Description	Type Article no.	Price see price list	Std. pack
LE4-... local expansion modules 			
Digital modules			
• 8 inputs, 24 V DC • 8 outputs (transistor) 24 V DC/0.5 A	**LE4-116-DD1** 049326		1 off
• 16 inputs (24 V DC)	**LE4-116-DX1** 061213		
• 16 outputs (transistor) 24 V DC/0.5 A	**LE4-116-XD1** 061215		
• 8 outputs (relays) 24 V DC/2.0 A or 230 V AC/2.0 A	**LE4-108-XR1** 051324		
• 8 outputs (transistor) 24 V DC/2.0 A	**LE4-108-XD1** 049325		
• 8 outputs, 120/240 V AC	**LE4-308-HX1** 200210		
• 8 outputs (Triac) 120 – 240 V AC	**LE4-308-XH1** 200211		
Counter modules			
• 2 channels (24-bit count range) • 3 selectable operating modes per channel: path measurement system for 5V and 24V incremental encoders, fast counters for 24V encoders • Incremental path measurement	**LE4-622-CX1** 081940		1 off
Absolute encoder			
• 3 channels (25-bit) • SSI interface/protocol • Transfer rate 125/250 kHz	**LE4-633-CX1** 203533		1 off
Analog modules			
• 4 analog inputs –10 to +10 V • 2 analog outputs, –10/+10 mA, 10/12-bit resolution	**LE4-206-AA1** 081939		1 off
• 4 analog inputs, 0(4) to 20 mA, 12-bit resolution • 2 analog outputs, 0(4) to 20 mA, 12-bit resolution	**LE4-206-AA2** 203958		1 off
Network modules			
for Suconet K	**LE4-501-BS1** 045608		1 off
For PROFIBUS-FMS, slave function	**LE4-503-BS1** 050960		
For PROFIBUS-DP, master function	**LE4-504-BS1** 214817		
fFor PROFIBUS-DP, slave function	**LE4-504-BT1** 214818		

Moeller HPL0213-2004/2005

	Description	For use with	**Type** Article no.	**Price** see price list	Std. pack
Accessories					
Digital input simulator					
	Simulation of 8 digital inputs	PS4-... EM4-... LE4-...	**ZB4-108-ES1** 071605		1 off
T connector for bus connection					
	5-pole DIN plug	PS4-... EM4-...	**TBA3.1** 012470		1 off
Plug-in screw terminals					
	10-pole, for connection of signal cables	PS4-... EM4-... LE4-...	**ZB4-110-KL1** 071606		2 off
Two-level terminal block					
	Snap-fit terminal block, 2 × 11-pole, for the direct connection of initiators and actuators	PS4-... EM4-... LE4-...	**ZB4-122-KL1** 052101		2 off
Hinged cover with large area for labelling					
	For plug-in screw terminals, for labelling of inputs/outputs, 20 characters/terminal	PS4-... EM4-... LE4-...	**ZB4-101-GZ1** 052108		10 off
Mounting foot For screw fixing to mounting plate					
	For screw fixing on mounting plate, 3 mounting feet per device	ZEV ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 PS4-... EM4-... LE4-...	**ZB4-101-GF1** 061360		9 off
Screen earth kit					
	For EMC-compliant connection of cable shielding	PS4-... EM4-... LE4-...	**ZB4-102-KS1** 081038		1 off

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Digital LE4			LE4-116-DD1	LE4-116-DX1	LE4-116-XD1
General					
Standards			IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0/55	0/55	0/55
Ambient temperature for storage		°C	25/70	25/70	25/70
Vibration resistance		g	Constant 1 g/*f* = 10 to 150 Hz		
Shock resistance, shock duration 11ms		g	> 15	> 15	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59	→ Page 4/59	→ Page 4/59
Rated insulation voltage	U_i	V AC	–	–	–
Terminals			Plug-in screw terminals		
Terminal capacity					
Solid		mm^2	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5	0.22 – 1.5	0.22 – 1.5
Degree of protection			IP20	IP20	IP20
Weight		kg	0.265	0.23	0.275
Protection class			1	1	1
Overvoltage category			–	–	–
Power supply					
Rated voltage	U_e	V DC	24	24	24
Admissible range		V DC	20.4 – 28.8	20.4 – 28.8	20.4 – 28.8
Residual ripple		%	≦ 5	≦ 5	≦ 5
Electrical isolation			Yes	Yes	Yes
Digital inputs					
Qty.			8	16	–
Rated voltage					
Rated voltage	U_e	V	24 DC	24 DC	–
ON 0 signal	U_e	V	≦ 5 DC, limit type 1	≦ 5 DC, limit type 1	–
ON 1 signal	U_e	V	≧ 15 DC, limit type 1	≧ 15 DC, limit type 1	–
Rated current					
ON 1 signal	I_e	mA	Normally 6 at 24 V DC	Normally 6 at 24 V DC	–
Delay time					
For "0" to "1"		ms	Normally 0.2	Normally 0.2	–
For "1" to "0"		ms	Normally 0.2	Normally 0.2	–
Electrical isolation					
Between the inputs			No	No	–
Status indication of inputs			LED	LED	–
Permissible voltage ranges			–	–	–
Different phases at adjacent inputs			–	–	–

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LE4-108-XD1	LE4-108-XR1	LE4-308-HX1	LE4-308-XH1
IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
0/55	0/55	0/55	0/55
25/70	25/70	25/70	25/70
Constant 1 g/*f* = 10 to 150 Hz			
> 15	> 15	> 15	> 15
→ Page 4/59	→ Page 4/59	→ Page 4/59	→ Page 4/59
–	1800	1800	1800
Plug-in screw terminals			
0.22 – 2.5	0.22 – 2.5	0.22 – 2.5	0.22 – 2.5
0.22 – 1.5	0.22 – 1.5	0.22 – 1.5	0.22 – 1.5
IP20	IP20	IP20	IP20
0.275	0.305	0.25	0.275
1	1	1	1
–	–	II, basic insulation	II, basic insulation
–	24	–	–
–	20.4 – 28.8	–	–
–	≦ 5	–	–
–	Yes	–	–
–	–	8	–
–	–	120/240 V AC	–
–	–	≦ 40 V AC, limit type 1	–
–	–	≧ 79 AC, limit type 1	–
–	–	Normally 6 at 120 V AC/50 Hz; normally 12 at 240 V AC/50 Hz	–
–	–	Normally 10	–
–	–	Normally 30	–
–	–	No	–
–	–	LED	–
–	–	120 V AC at 47 – 63 Hz 240 V AC at 47 – 63 Hz	–
–	–	Not permissible	–

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Digital LE4			LE4-116-DD1	LE4-116-DX1	LE4-116-XD1
Digital outputs					
Qty.			8	–	16
Power supply					
Rated voltage	U_e	V	24 DC	–	24 DC
Admissible range		V	20.4 – 28.8 DC	–	20.4 – 28.8 DC
Max. ripple		%	≦ 5 %	–	≦ 5 %
Protection against polarity reversal			Yes	–	Yes
Max. supply current		mA	100	–	130
Electrical isolation			Yes	–	In 2 groups of 8 outputs each
Rated current					
At state "1"	I_e	A	0.5 at 24 V DC	–	0.5 at 24 V DC
Utilization factor	g	%	1	–	1
Duty factor		% DF	100	–	100
Response time		ms	–	–	–
Reset time		ms	–	–	–
Lifespan, mechanical	Operations		–	–	–
Switching current (resistive load)					
2 A/230 V AC	Operations		–	–	–
2 A/24 V DC	Operations		–	–	–
Switching current (inductive load)					
1 A/230 V AC-11	Operations		–	–	–
1 A/24 V DC-11	Operations		–	–	–
Short-circuit protection			Yes, without manual reset	–	Yes, without manual reset
Limitation of disconnect voltage with inductive loads			Yes	–	Yes
Maximum operating frequency					
With time constant L/R max. 15 ms		Ops/h	–	–	10000
With time constant L/R max. 60 ms		Ops/h	–	–	–
With time constant L/R max. 72 ms		Ops/h	4000	–	3000
With time constant L/R max. 300 ms		Ops/h	–	–	–
Creepage and clearance distances			–	–	–
Insulation group			–	–	–
Insulation test voltage, contact/coil		kV	–	–	–
Status indication of outputs			LED	–	LED
Frequency range		Hz	–	–	–
Min. load current	I_e	mA	–	–	–
Residual current		mA	–	–	–
Make/break delay			–	–	–
Making and breaking capacity to IEC/EN 60947-5-1			–	–	–

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LE4-108-XD1	LE4-108-XR1	LE4-308-HX1	LE4-308-XH1
8	8	–	8
24 DC	24 V DC/230 V AC	–	240 AC
–	20.4 – 28.8 DC	–	–
≦ 5 %	–	–	–
Yes	–	–	–
160	–	–	–
No	Yes	–	Yes, between outputs 0 to 3 and outputs 4 to 7, and between outputs and bus
2 at 24 V DC	1 (2 A at 24 V DC/230 V AC	–	0,5
1	1	–	1
100	100	–	100
–	max. 10	–	–
–	max. 15	–	–
–	≧ 20000000	–	–
–	800000	–	–
–	2000000	–	–
–	1000000	–	–
–	300000	–	–
Yes, without manual reset	No, external protection of relay contacts, max. 4 A fast fuse required	–	No, external protection through fuse, 0.63 A slow fuse required
Yes	–	–	–
–	–	–	–
2500	–	–	–
–	–	–	–
360	–	–	–
–	≧ 8 mm	–	–
–	Group C, 250 V AC to VDE 0110	–	–
–	4	–	–
LED	LED	–	LED
–	–	–	47 – 63
–	–	–	10
–	–	–	Normally2
–	–	–	Normally 1/2 line period
–	–	–	AC-15 normal conditions

Analog LE4			LE4-206-AA1	LE4-206-AA2
General				
Standards			IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0/55	0/55
Ambient temperature for storage		°C	25/70	25/70
Vibration resistance		g	Constant 1 g/*f* = 10 to 150 Hz	Constant 1 g/*f* = 10 to 150 Hz
Shock resistance, shock duration 11 ms		g	> 15	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59	→ Page 4/59
Terminals			Plug-in screw terminals	Plug-in screw terminals
Terminal capacity				
Solid		mm^2	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5	0.22 – 1.5
Rated insulation voltage	U_i	V AC	600	600
Degree of protection			IP20	IP20
Weight		kg	0.265	0.3
Protection class			1	1
Configuration			Max. 2 LE in conjunction with PS4-2xx-MM1, PS4-341-MM1 or EM4-204-DX1	Max. 2 LE in conjunction with PS4-2xx-MM1, PS4-341-MM1 or EM4-204-DX1
Analog inputs				
Qty.			4	4
Input ranges			± 10 V	0 to 20 mA, 4 to 20 mA
Electrical isolation			Yes, between inputs and bus, not between inputs and outputs	
Connection type of signal encoder			Two-wire connection to transducer	
Resolution		Bit	Possible setting; 12-bit (4096 units)/10-bit (1024 units)	12-bit (4096 units)
Permissible potential difference				
Between inputs and central earth point			See rated insulation voltage	–
Permissible input voltage		V	Max. ± 15	–
Error indication on overrange			Yes	Yes
Error indication on open-circuit detection			No	Yes, at 4 to 20 mA
Total error		%	Typically 0.8 % of full scale	Normally 0.4 % of full-scale (0 to 55 °C)
Cable length screened		m	< 50 for cable cross-section ≧ 0.14 mm^2	–
Input resistance			40 per input	0.05 per input
Analog outputs				
Qty.			2	2
Output range			± 10 V	0 to 20 mA, 4 to 20 mA
Electrical isolation			Yes, between outputs and bus, not between inputs and outputs	
Load impedance per output		Ω	2000	500
Connection type			Two-wire connection	
Resolution		Bit	Possible setting; 12-bit (4096 units)/10-bit (1024 units)	12-bit (4096 units)
Protection against short circuit			Yes	–
Short-circuit current		mA	±32	–
Permissible potential difference between earthing point and between outputs			See rated insulation voltage	600 V AC
Total error		%	Typically 0.8 % of full scale	Normally 0.4 % of full-scale (0 to 55 °C)
Cable length screened		m	< 50 for cable cross-section ≧ 0.14 mm^2	–

Counter LE4			LE4-622-CX1
General			
Standards			IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0/55
Ambient temperature for storage		°C	25/70
Vibration resistance		g	Constant 1 g/*f* = 10 to 150 Hz
Shock resistance Shock duration 11 ms		g	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59
Terminals			Plug-in screw terminals
Terminal capacity			
Solid		mm^2	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5
Rated insulation voltage	U_i	V AC	600
Degree of protection			IP20
Weight		kg	0.27
Protection class			1
Configuration			Max. 2 LEs in conjunction with PS4-201-MM1 or PS4-341-MM1
Counter signals			
Phase shift deviation (mode 1+2; 5 V and 24 V incremental encoder)		%	±max. 50
Minimum pulse width		µs	16 (Mode 3; 24 V incremental encoder)
Counting inputs 5 V			
Level			To RS 422
Differential input voltage		V	U_{max}= 5.25 U_{min} = 2
Input current		mA	I_{max} = 20 at U < 5.25 V I_{min} = 2.5 at U > 2 V
Maximum counter frequency		kHz	300
Pulse quadrature			Yes
90° offset signals			Yes
Antivalent signals			Yes
Counter range		Bit	24
Electrical isolation			Yes
Counter inputs 24 V			
Input voltage			U_{max} = 30 V, U_{min} = 18 V
Input current			I_{min} = 2.5 mA at U = 18 V
Max. counter frequency		Hz	30000
Pulse quadrature			Yes (for incremental encoder)
90° offset signals			Yes (for incremental encoder)
Counter range		Bit	24
Electrical isolation			Yes
Notes			For 5 V and 24 V encoders, always use shielded cables. Follow the instructions of the encoder manufacturer.

Counter LE4			LE4-633-CX1
General			
Standards			IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0/55
Ambient temperature for storage		°C	25/70
Vibration resistance		g	Constant 1 g/*f* = 10 to 150 Hz
Shock resistance, shock duration 11 ms		g	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59
Degree of protection			IP20
Humidity class			RH 1
Rated insulation voltage	U_i	V AC	600
Weight		kg	0.27
Terminals			Plug-in screw terminals
Terminal capacity			
Solid		mm^2	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5
Power supply of encoders			Separate through ZB 4-122-KL1 two-level terminal block
Data cable to encoder			According to encoder manufacturer specifications (normally: screened cable)
Number of SSI interfaces		Qty.	3
Data code			Gray or binary (suitable conversion required in PS4)
Data format			Multi-turn 25-bit (single-turn 13-bit or multi-turn 21-bit must be evaluated accordingly)
Electrical isolation			
Between LE bus and SSI interfaces			Yes
Between SSI interfaces			No
Clock output for SSI interface			RS 422 isolated, T+, T–
SSI interface data input			RS 422 isolated, D+, D-
Detection of wire break			Yes (RS422, only data input D+, D-)
Data transfer rate		kHz	125 or 250 for all 3 SSI interfaces
Max. cable length to absolute encoder			Depends on the transfer rate of the absolute encoder and is specified by the manufacturer in the technical data of the encoder. With the following limit: baud rate/cable length: 250 kHz/<150 m 125 kHz/< 350 m
Current consumption		mA	Max. 180 mA Normally 150 mA

Network modules			Suconet K LE4-501-BS1	PROFIBUS FMS LE4-503-BS1
General				
Standards			IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0/55	0/55
Ambient temperature for storage		°C	25/70	25/70
Vibration resistance		g	Constant 1 g/*f* = 10 to 150 Hz	Constant 1 g/*f* = 10 to 150 Hz
Shock resistance, shock duration 11 ms		g	> 15	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59	→ Page 4/59
Terminals			Plug-in screw terminals	Plug-in screw terminals
Terminal capacity				
Solid		mm^2	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5	0.22 – 1.5
Degree of protection			IP20	IP20
Weight		kg	0.25	0.28
Protection class			1	1
Operating data				
Configuration			Max. 2 LEs in conjunction with PS4-2-MM1 or PS4-341-MM1	Max. 2 LEs in conjunction with PS4-2-MM1 or PS4-341-MM1
Function			Suconet-K interface master/slave	PROFIBUS-DP interface, slave
Bus protocol			Suconet K1/K	PROFIBUS-FMS
Interface			RS485	RS485
Electrical isolation			Yes, for internal supply voltage	Yes, for internal supply voltage
Bus terminating resistors			can be switched into circuit	–
Bus diagnosis			LED	–
Master mode				
Stations		Qty.	max. 8	–
Send and receive data			max. 128	–
Slave mode				
Addresses			2 to 31 can be set through software	–
Send and receive data			max. 78	–
Bus addresses			–	1 to 126
Server services			–	READ, WRITE, STATUS, IDENTIFY, GET OV, INITIATE, ABORT
Objects			–	Simple variable
Data type			–	Octet string
Access right				
Objects (READ)			–	Read All: 2 × 6 bytes, 1 × 10 bytes, 1 × 30 bytes
Objects (WRITE)			–	Write All: 3 × 6 bytes, 1 × 20 bytes
Connections (open)			–	2 MSZY, 2 MSAZ
Parallel capability			–	1
Data transfer rate		kBit/s	187,5/375	500
Times				
Slot-time: TSL		Bit	–	3500
Min. station delay time: TSDR		Bit	–	500
Max. station delay time: TSDR		Bit	–	1000

Network modules			PROFIBUS-DP LE4-504-BS1	PROFIBUS-DP LE4-504-BT1
General				
Standards			IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0/55	0/55
Ambient temperature for storage		°C	25/70	25/70
Vibration resistance		g	Constant 1 g/*f* = 10 to 150 Hz	Constant 1 g/*f* = 10 to 150 Hz
Shock resistance, shock duration 11 ms		g	> 15	> 15
Electromagnetic compatibility (EMC)			→ Page 4/59	→ Page 4/59
Terminals			9-pole SUB-D bus connector	9-pole SUB-D bus connector
Terminal capacity				
Solid		mm^2	0.22 – 2.5	0.22 – 2.5
Flexible with ferrule		mm^2	0.22 – 1.5	0.22 – 1.5
Rated insulation voltage	U_i	V DC	850	850
Degree of protection			IP20	IP20
Weight		kg	0.3	0.3
Protection class			1	1
Power supply				
Current consumption		mA	Max. 800 (internal LE bus / 5 V DC)	Max. 500 (internal LE bus / 5 V DC)
Power loss		W	4	2.5
Operating data				
Configuration			1 LE in conjunction with PS4-341-MM1	Max. 1 LE in conjunction with PS4-201-MM1, PS4-271-MM1, PS4-341-MM1
Function			PROFIBUS-DP interface, master (class 1)	PROFIBUS-DP interface, slave
Bus protocol			PROFIBUS-DP, EN 50 170 Vol 2	PROFIBUS-DP, EN 50 170 Vol 2
Interface			RS485	RS485
Electrical isolation			Yes, for internal supply voltage	Yes, for internal supply voltage
Bus terminating resistors			can be switched into circuit	can be switched into circuit
Bus diagnosis			LED and software	LED
Master mode				
Stations		Qty.	max. 124 (30 without repeater)	–
Send and receive data			3.5 kBytes each for I and Q	–
Slave mode				
Addresses			–	0 to 125 can be set through software
Send and receive data			–	244I/244Q, 400 total max.
Bus addresses			–	0 to 126
Data transfer rate		MBits/s	To 12	To 12
Max. bus length		m	1200 (depending on the transfer rate)	1200 (depending on the transfer rate)
Cable			PROFIBUS-DP 2-wire cable ZB4-900-KB1	PROFIBUS-DP 2-wire cable ZB4-900-KB1

Verification of the rated switching and disconnecting capability
Conditions for switch-on and switch-off according to utilization categories

Current type	Utilization category	Normale utilization category					
		Switch-on			Switch-off		
Alternating current	AC–-11	I/I_e	U/U_e	cos φ	I_c/I_e	U_r/U_e	cos φ
		10	1	0.7[1)]	1	1	0.4[1)]
Direct current	DC – -11	I/I_e	U/U_e	$t_{0,95}$	I/I_e	U_r/U_e	$t_{0,95}$
		1	1	$6 \times P$[2)]	1	1	$6 \times P$[2)]

[1)]The power factors that are quoted (cos φ = p.f.) are conventional values, and apply to circuits that simulate the electrical characteristics of inductive circuits. For circuits with a p.f. (cos φ) = 0.4 (normal conditions of usage), parallel resistors are applied (see Figs. 1 and 2), to simulate the damping effect of the eddy-current losses of the actual electromagnets.

[2)]The value "$6 \times P$" is derived from an empirical relationship that corresponds to most DC magnet loads up to the upper limit of P = 50 W, whereby 6 [ms]/[W] = 300 [ms]. This requires that no individual loads occur that have a rated power greater than 50 W, and that, for higher power ratings, the load is composed of several smaller loads connected in parallel. For this reason, 300 ms represent an upper limit.

I	Inrush current
I_c	Switch-off current
I_e	Rated operating current
U	Voltage before switch-on
U_e	Rated circuit operation
U_r	Repeated voltage
$t_{0,95}$	Time (in milliseconds) taken to reach 95 % of the stationary current value
$P = U_e \times I_e$	Rated power, in watts

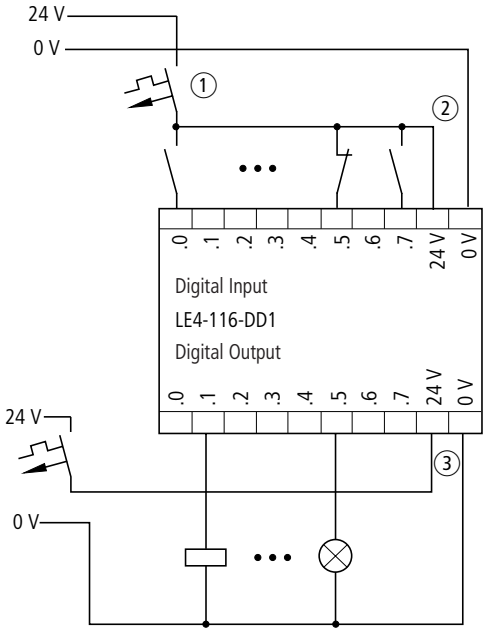
General information on electromagnetic compatibility (EMC) of automation systems

Emitted interference	EN 55011/22 Class A (VDE 0875, Part 11)		
Noise immunity			
ESD	IEC/EN 60947-4-2	Contact discharge Air discharge	4 kV 8 kV
Radiated RFI	IEC/EN 60947-4-3	AM/PM	10 V/m
Burst	IEC/EN 60947-4-4	Supply/digital-I/O analog-I/O, fieldbus	2 kV 1 kV
Surge	IEC/EN 60068-4-5	Digital I/O,asymmetrical Supply DC, asymmetrical Supply DC, symmetral Supply AC, asymmetricalh Supply AC, symmetrical	0.5 kV 1 kV 0.5 kV 2 kV 1 kV
Conducted RFI	IEC/EN 60947-4-6	AM	10 V

LE4-116-DD1
Wiring for 24 V DC supply to inputs and outputs

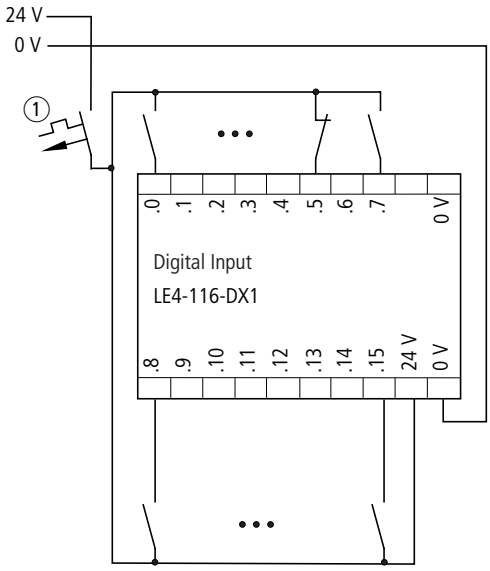
① Circuit protection device
② 24 V DC supply for the digital inputs
③ 24 V DC supply for the digital outputs

The two supply voltages are electrically isolated.



LE4-116-DX1
Wiring for 24 V DC supply to the inputs

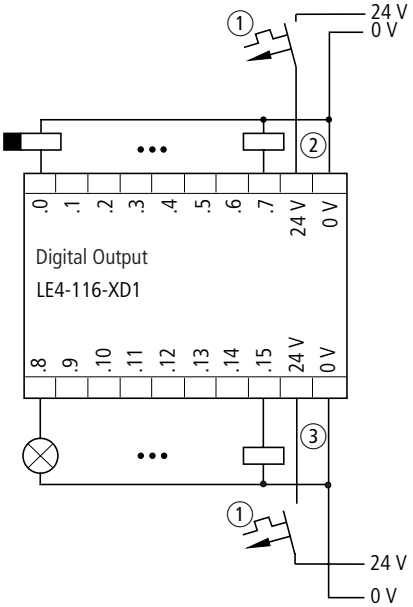
① Circuit protection device



LE4-116-DX1
Wiring for 24 V DC supply to the outputs

① Circuit protection device
② 24 V DC supply for the digital outputs Q0.0 to Q0.7
③ 24 V DC supply for the digital outputs Q0.8 to Q0.15

The two supply voltages are electrically isolated.



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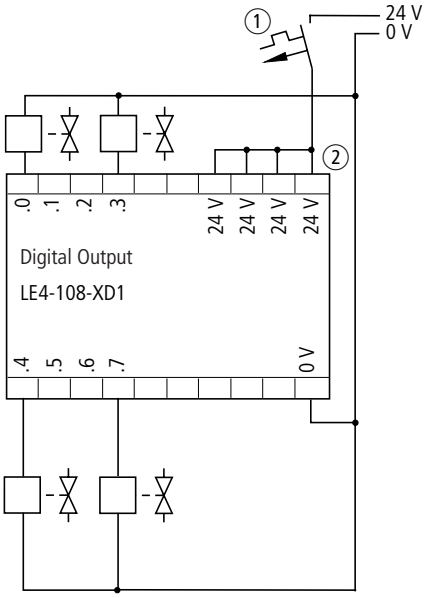
LE4-108-DX1
Wiring for 24 V DC supply to the outputs

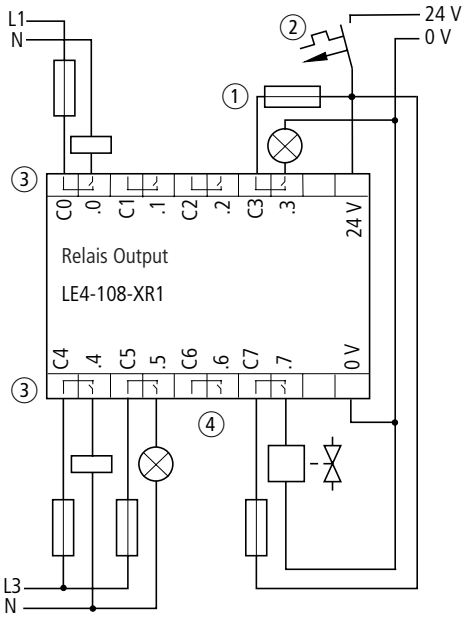
① Circuit protection device
② 24 V DC supply for the digital outputs

As a rule, all the 24 V-connection must be wired up.



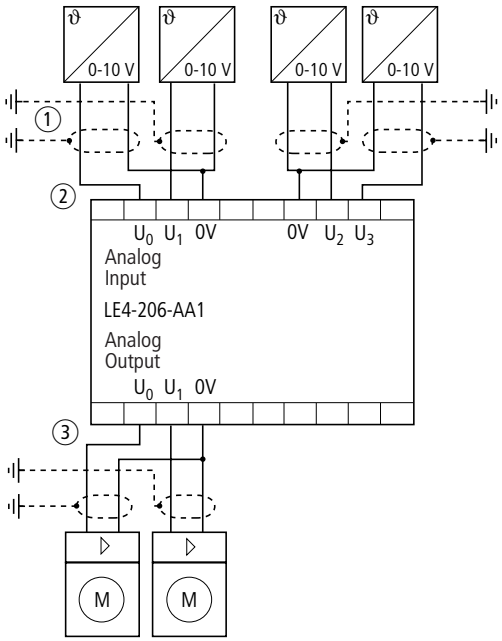
LE4-108-XR1
Wiring for 24 V DC/230 V AC supply to the outputs

① Fuse (4 A fast) for protection of the relay contacts
② Circuit protection device
③ 230 V AC relay-outputs in the same row must be wired up to the same phase (e.g. L1). (max. potential difference 250 V)
④ With mixed 230 V AC / 24 V DC operation, one output must remain unconnected between the groups.



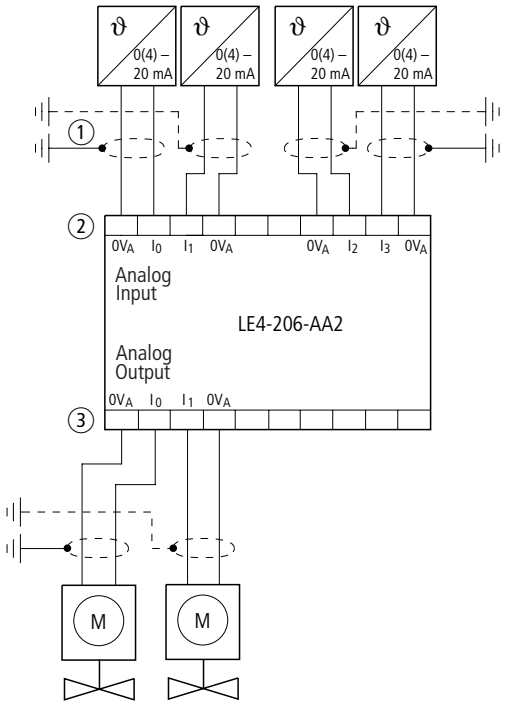
LE4-206-AA1
Wiring for sensors and actuators

① Screen connection
② Sensor connection
③ Actuator connection



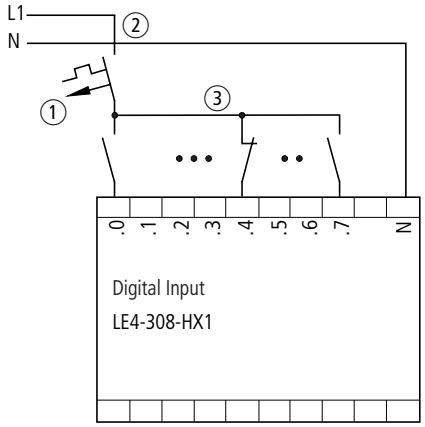
LE4-206-AA2
Wiring for sensors and actuators

① Screen connection
② Sensor connection
③ Actuator connection



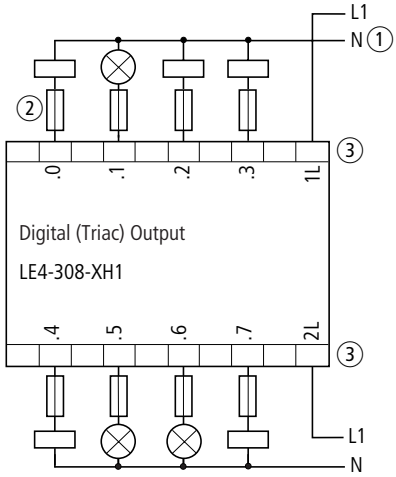
LE4-308-XR1
Wiring for 120 V DC /240 V AC supply to the outputs

① Circuit protection device
② Supply voltage to the digital inputs
120 V AC at 50/60 Hz
240 V AC at 50 Hz
③ Inputs must be wired up to the same phase
(e.g. L1)



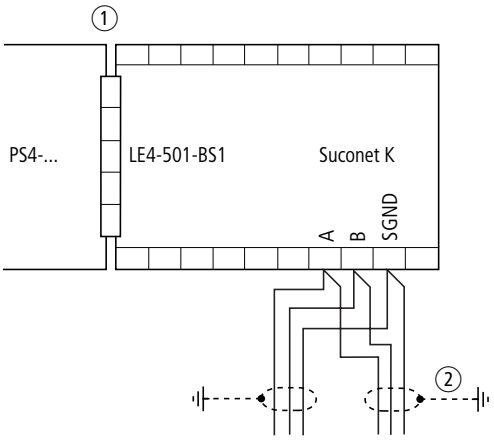
LE4-308-XH1
Wiring for 120 – 240 V AC supply to the outputs

① Supply voltage to the triac outputs
120 – 240 V AC; 50/60 Hz; 0.5 A
② Fuse (0.6 A slow) for protection of the triac outputs
③ Triac outputs must be wired up to the same phase
(e.g. L1)



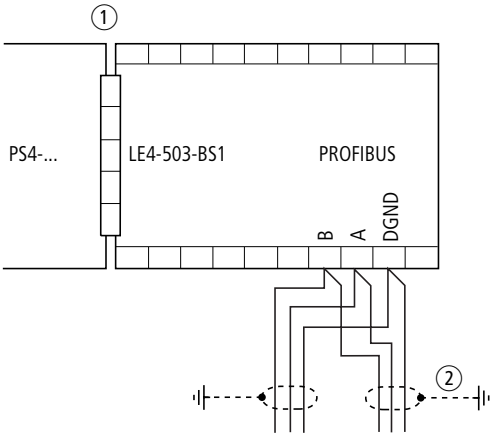
LE4-501-BS1
Wiring of the bus cable for Suconet K

① Connect directly to the locally expandable PS4
② Screen connection



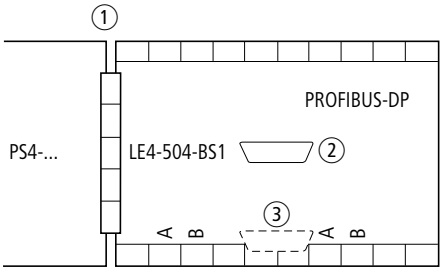
LE4-503-BS1
Wiring of the bus cable for PROFIBUS-FMS

① Connect directly to the locally expandable PS4
② Screen connection



Moeller HPL0213-2004/2005

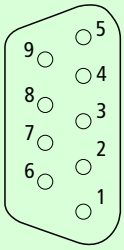
LE4-504-BS1



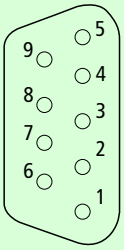
Wiring of the bus cable for PROFIBUS-DP (master)

① Connect directly to the locally expandable PS4

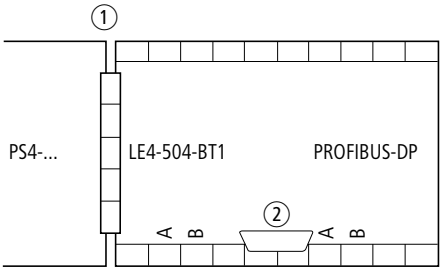
② Configurator interface

Pin	Designation
	
2	RxD
3	TxD
5	DGND

③ PROFIBUS-DP interface

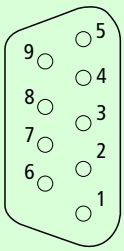
Pin	Designation
	
3	RxD/TxD-P
5	DGND
6	VP
8	RxD/TxD-N

LE4-504-BT1

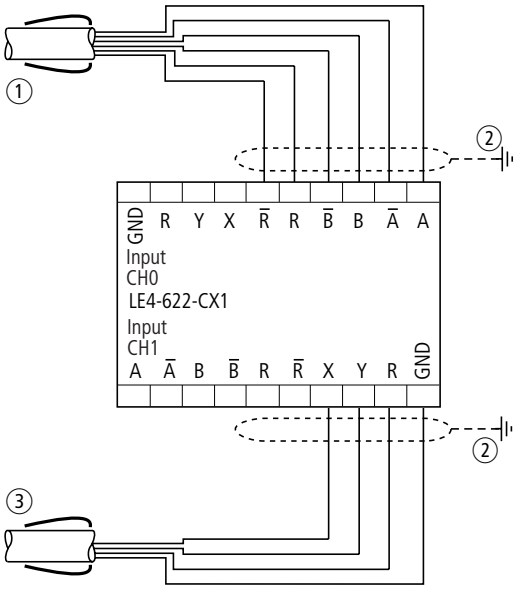


Wiring of the bus cable for PROFIBUS-DP (slave)

① Connect directly to the locally expandable PS4
② PROFIBUS-DP interface

Pin	Designation
	
3	RxD/TxD-P
5	DGND
6	VP
8	RxD/TxD-N

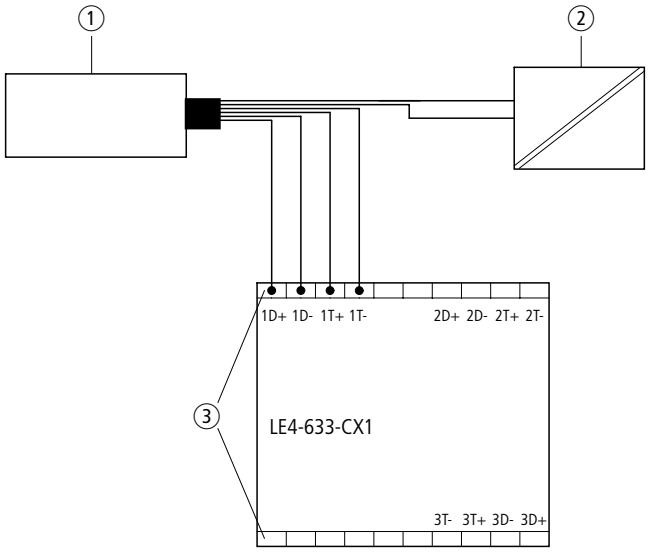
LE4-622-CX1



Wiring of the incremental encoder

① Wiring an incremental rotary encoder for 5 V
② Screen connection
③ Wiring an incremental rotary encoder for 24 V

LE4-633-CX1



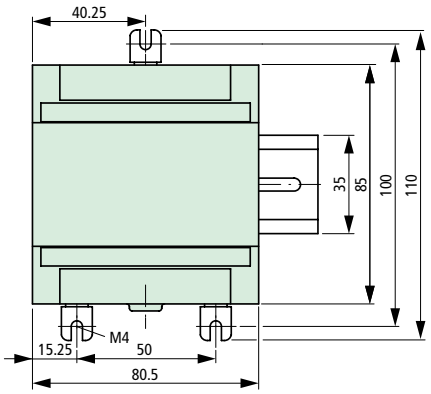
Wiring for an absolute rotary encoder

① Absolute rotary encoder
② Supply voltage for absolute rotary encoder
③ Connection terminals for channels 1 – 3

Moeller HPL0213-2004/2005

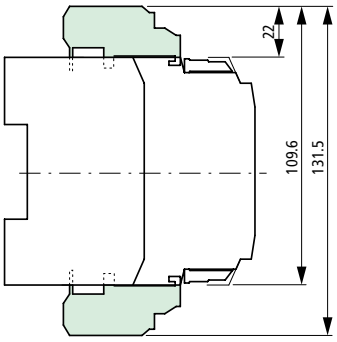
Local expansion

LE4-...



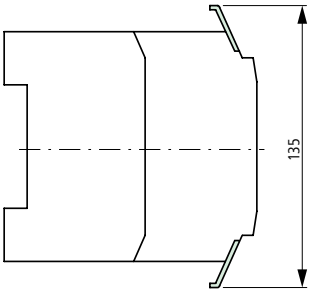
Expansion plus two-level terminal block

PS4-... /EM4-.../LE4-... plus ZB4-122-KL1



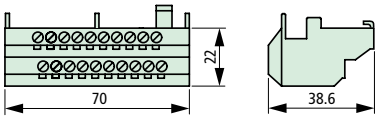
Expansion plus labelling flap

PS4-... /EM4-.../LE4-... plus ZB4-101-GZ1

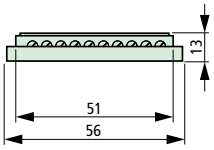


Accessories

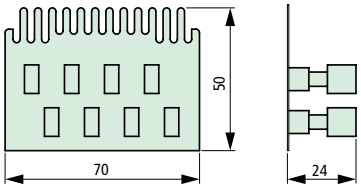
Two-level terminal block ZB4-122-KL1



Plug-in screw terminal ZB4-110-KL1



Digital input simulator ZB4-108-ES1



Sucosoft S40

Effective and ergonomic software is the basis for efficient processing of automation tasks and saves expenditure as well.

Any range of mutually compatible hardware components therefore, needs equally high-performance software products, from programming to communication.

The S40 software package is the comprehensive tool for the PS4 control system:
Sucosoft S40 for programming to IEC61131
S40 Library Manager for efficient project administration
S40 OPC Server for open communication links

It goes without saying that these products can be used with all PS4 controllers.

Sucosoft S40

Sucosoft S40 is a cohesive programming system for PS4/PS416 PLCs.

S40 supports the following programming languages IL, LD, FBL and ST to IEC61131.

The following dialog languages are available: English, German, French, Italian, Spanish.

The topology configurator for controllers and Suconet K networks is based on graphics and enables convenient configuration of local stations and fieldbus participants.

Testing and commissioning, diagnostics and wiring test of the entire device configuration is effected via one central connection on the master PLC.

Online program modifications can be carried out locally and via the network. With remote programming, this happens via modem.

Manufacturer-generated function blocks offer solutions for complex tasks, such as shift registers, and just need to be incorporated into the program.

S40 Library Manager

The add-on package, the S40 Library Manager, allows the user to establish his own library for PS4 and PS416 control systems. In such a library, he can collect his own in-house generated functions and function blocks. Since these libraries do not contain source information, the user's expertise is fully protected in the stored function blocks.

In addition, it is possible to connect to WINDOWS Help texts that can explain the operation online.

The data can be protected against unauthorised access, by using a password.

License texts and serial numbers can be obtained for the user to market his own software libraries.

Libraries created using the S40 Library Manager can be imported by the user into Sucosoft S40, and then applied for processing his project.

S40 OPC-Server

The S40 OPC Server supplies the OPC clients (e.g. process control systems, visual display units) with the process data from the PS4 or PS416 PLCs. It supports the OPC specifications Data Access Versions 1.0 and 2.0, Alarm and Events Version 1.0.

The integrated scaling and data type conversion functions facilitate the adaptation of variables to the requirements of the process.

A comprehensive range of test and simulation functions makes testing and commissioning user-friendly.

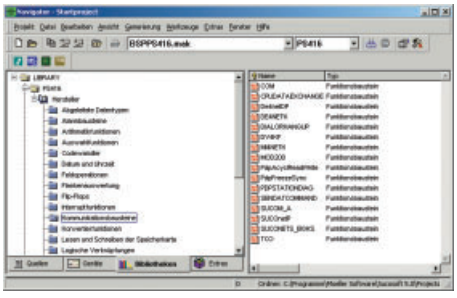
PLC variables can be transferred directly from the application program via the data import function, with the actual values of the variables being displayed on the monitor screen.

Communication between client and server can be checked via a Test Client.

Sucosoft S40 Programming

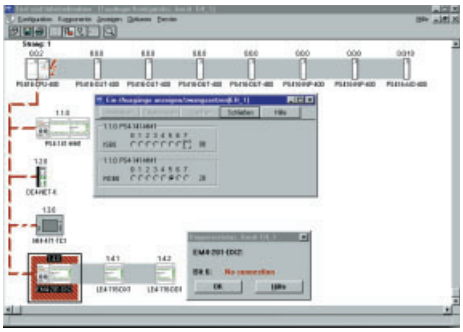
Programming made easy
With Sucosoft S40, the programming software for the PS4 and PS416 system, Moeller fulfils the demand for a single software for all the PLCs.
Sucosoft S40 complies with the international Standard IEC 61131-3, and enables programming in the following languages:
- Instruction Set (IS)
- Ladder Diagram (LD)
- Function Block Language (FBL)
- Structured Text (ST)

The central tool for project processing is the navigator. It supports the user in the organisation and storage of project files, and offers sources, programs and installed libraries corres-ponding to the selected control system.

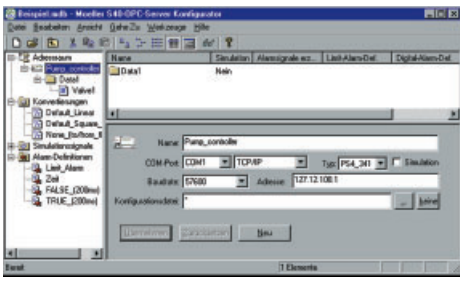


Hardware configuration just like using a child's building blocks
Every project begins with the configuration of the hardware. The hardware components of the automation system are put together in a clear way using the graphics topology configu-rator. User-friendly dialog boxes assist with selection and subsequent parameter allocation. This avoids input errors and inadmissible device combinations from the start.

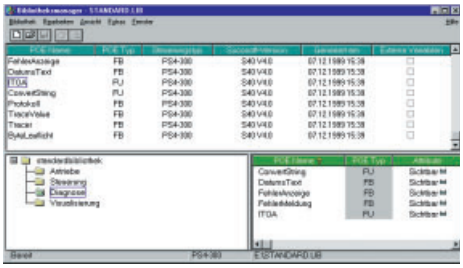
Testing and commissioning
A clear and definitive insight into the system is extremely valuable, in particular during the commissioning phase. Faults can be quickly and systematically eliminated given the status indication for individual data and devices, as well as the possibility of carrying out online program modifications over the entire networked system via the master PLC.



Protecting your expertise!
The utilisation of proven building blocks prevents errors and speeds up commissioning. The S40 Library Manager lets you put together your own libraries of in-house generated and tested function blocks.
The modules stored there can be simply used like vendor-obtained function blocks. The user however, cannot access the source code, and your expertise therefore remains where it belongs – at home, with you!

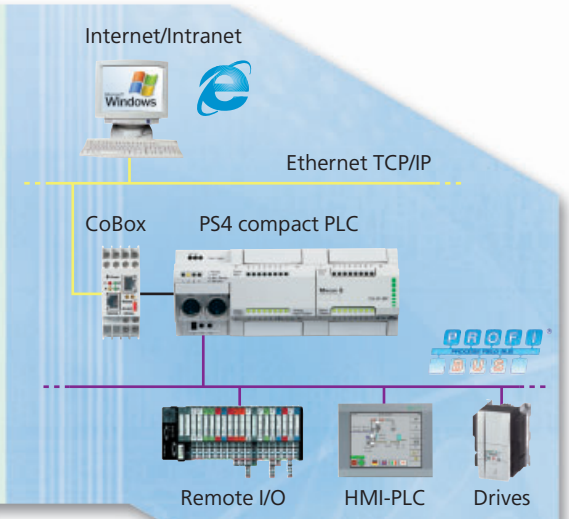


Open communication standards
The exchange of data via standardised interfaces is gaining in importance all the time. The S40 OPC server allows several PS4 controllers to be connected to OPC client applications such as visualisation systems. The data for configuration of the communication variables are simply imported from the corresponding application programs.

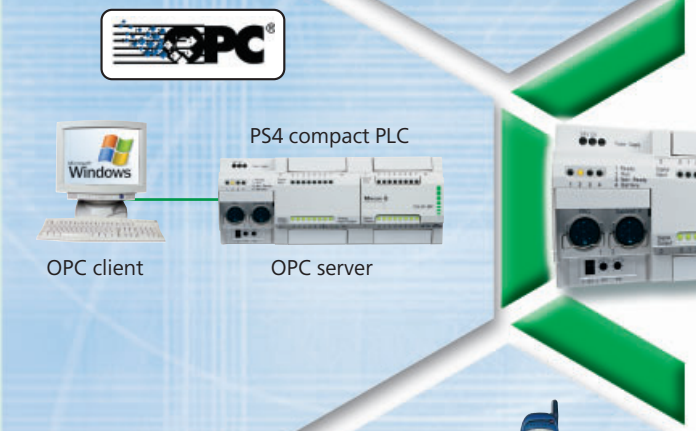


Software Libraries Provide Flexibility, Versatility and Efficiency

Using the CoBox to access the Ethernet
The CoBox network module makes all PS4 and PS416 controllers Ethernet and WEB capable. The integrated WEB server allows them to be connected to the Intranet and Internet with their own IP address. Using the CoBox, an event-driven data exchange can be implemented between PLCs. Every PS4 controller can function as a bus master and can, if required, send data to every other PLC.
Characteristics:
- Universal device server for Ethernet with TCP/IP and UDP protocol
- Interfaces:
  Controller side: either RS232 or RS485 as required
  Ethernet side: 10-base T, 10 MBaud
- Network interface: integrated 10-base T port (RJ-45 plug)
  (Separate hardware optionally required)



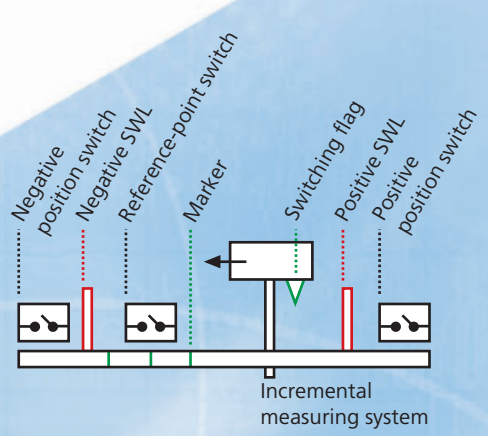
OPC-server
Virtually all SCADA, visualisation and process control systems support the OPC client server interface. PS4 and PS416 controllers supply the OPC client with process data via their OPC server.
It supports access to the data via the serial interface and via Ethernet. In this operating mode, the OPC server automatically configures the PS4 CoBox. Even data transfer to individual Excel applications is catered for. Each OPC server can process enquiries from several clients.
Where data are to be used by more than one application, say by a visual display system or a data base, then various software packages can have access to the OPC server data without the need for vendor-specific agreements or additional implementation functions.



Notification via SMS
System status or alarm messages can be simply sent via SMS, whether for protocol purposes or for direct communication with the service engineer.
Using prepared application modules, you have all these options, and can at all times be kept abreast of the operational status of your machine and system.

Tailor-Made Application Libraries

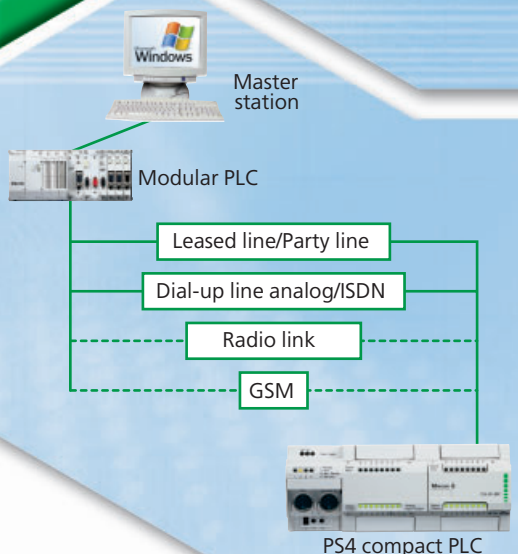
- Prepared, proven and branch-specific software function blocks for Sucosoft S40
- Function blocks with self-explanatory names for the variables
- Numerous parameters and monitor outputs for adaptation of function blocks to individual requirements
- Representation of function blocks in Instruction List (IL), Function Block Diagram (FBD) or Ladder Diagram (LD).



Motion control toolbox
The Motion control toolbox is a comprehensive set of system modules for positioning tasks.
It contains functions such as:
- Asynchronous point-to-point positioning
- Incremental positioning
- Rotary axis positioning with optimised travel beyond zero
- Electronic gearbox
- Cam shafts

Closed-loop control toolbox
Typical applications for the Closed-loop control toolbox are: highly dynamic auto-tuning temperature regulation of packaging machines, extruder temperature regulation, Fuzzy control of heating stations and pressure and volume controls.
There are more than 100 function blocks available:
- Various PID loop controls
- Fuzzy controls
- Auto-tuning regulators

The mathematical basis of the toolbox can be utilised to expand the functions of the PS4 system, by, for example, enabling calculation of trigonometric functions or interpolations within the PLC.



Telecontrol and remote signalling
Telecontrol using secure transmission options:
- Telecontrol to IEC 870-5
- Telecontrol to Companion Standard 870-5-101
- Remote signalling via SMS

The PS4 telecontrol toolbox enables large geographical distances between various parts of a system to be bridged simply and securely.
Moeller offers hardware and software components for leased-line, dial-up-line or radio transmission/ GSM, depending on the system and the transmission distance involved.

	Language	For use with	**Type** Article no.	**Price** see price list	Std. pack
Programming the PS4-150/PS4-200/PS4-300/PS416					
Software package S40 (WINDOWS) • CD-ROM • Documentation on CR-ROM in English, French, German • Programming languages to IEC/EN 61131-3 – Instruction list (IL) – Ladder diagram (LD) – Function block diagram (FBD) – Structured text (ST) • Dialog languages: English, French, German, Italian, Spanish • Graphical topology configurator for control systems ,Suconet-K and PROFIBUS-DP networks	–	PS4-150 PS4-200 PS4-300 PS416	**S40-CD** 235237		1 off
Upgrade S40 Sucosoft S40 V4.x must be installed. Observe ordering conditions.	–	PS4-150 PS4-200 PS4-300 PS416	**S40-CD-U** 258663		1 off
S40 LIBRARY MANAGER additional package					
S40 LIBRARY MANAGER additional package • CD-ROM • Documentation on CR-ROM in English, French, German • Create controller-specific libraries • Structured storage of user functions and user function blocks in the library • Link to Windows help texts for the functions and function blocks that are stored in the library • Full know-how protection for the stored blocks, since library does not contain source informationn • Passwort protection against unauthorized access • Entry of license texts • Serial numbers can be assigned • Documentation in English, French and German on CD-ROM • Menu operation in 5 languages (English, French, German, Italian, Spanish) Product cannot be used separately! Software requirements: WINDOWS 98, ME, 2000, XP or WINDOWS NT from 4.0 Sucosoft S 40 V 5.0 or higher	–	PS4-150 PS4-200 PS4-300 PS416	**S40-LIBRARY-MANAGER** 219926		1 off
S40 OPC server					
• CD-ROM • Documentation on CR-ROM in English, French, German • OPC specification – The S40 OPC server supports the OPC specifications Data Access Version 1.0 & 2.0 Alarm & Events Version 1.0 • Physical connections between the PC and the PLC – Serial connection via the COM interface – Modem connection via the COM interface – Ethernet TCP/IP connection with Ethernet card in the PC • Scaling and data type conversion • Simulation of process variables • Configurator with variable import function • Sample client	German and English	PS4-150 PS4-200 PS4-300 PS416	**S40-OPC-SERVER** 226834		1 off

Notes

Ordering conditions for upgrades:
To use an upgrade, a previous version must be installed. When the upgrade is installed, the system searches for a previous version. The upgrade is the same as the standard version.
Information on updates, software standards (application modules) for closed-loop control, open-loop control data processing etc. can be obtained from:
Internet address: www.moeller.net/automation

	Language	For use with	**Type** Article no.	**Price** see price list	Std. pack
Closed-loop control toolbox, full version					
• CD-ROM • Documentation Application examples: • Synchrocontrol for brush manufacturing • Extruder temperature control • High-dynamics autotuning, temperature control of packing machinery • De-icing control for airplanes • Chlorine control for indoor swimming pools • Standard application in PID controllers and pulse-width modulation for various control tasks, e.g. control of pressure or flow volume	German	PS4-150 PS4-200 PS4-300 PS416	**APP-RTT-E-D** 210160		1 off
	English	PS4-150 PS4-200 PS4-300 PS416	**APP-RTT-E-GB** 218606		1 off
Closed-loop control toolbox, basic version					
• Diskette • Documentation	German and English	PS4-150 PS4-200 PS4-300 PS416	**APP-RTT-B-D/GB** 215084		1 off
Positioning toolbox					
• Diskette • Documentation Application examples: • Asynchronous point-to-point axis control for electrical and hydraulic axes with controllable acceleration and deceleration ramps and the following functions: – Manual mode – Automatic mode – Referencing • Rotary axis positioning with optimised paths over the zero point • Typical cam controller applications • Incremental dimension positioning • Master - slave interconnected axes with any functional relationship • Electronic gears	German	PS4-150 PS4-200 PS4-300 PS416	**APP-POS-S-D** 227053		1 off
	English	PS4-150 PS4-200 PS4-300 PS416	**APP-POS-S-GB** 229412		1 off

Notes

Ordering conditions for upgrades:
To use an upgrade, a previous version must be installed. When the upgrade is installed, the system searches for a previous version. The upgrade is the same as the standard version.
Information on updates, software standards (application modules) for closed-loop control, open-loop control data processing etc. can be obtained from:
Internet address: www.moeller.net/automation

Task

The APP-RTT-E-D and APP-RTT-E-GB closed-loop control toolbox is a function block library for the Sucosoft S40 programming software.
It contains approximately 100 function blocks for the following areas and is available in two versions:

	Full version	Basic version
Regulating		
PID controller	●	●
PID split range closed-loop controller (heating/cooling)	●	
PID auto-tuning closed-loop controller	●	
3-point step controller	●	●
2-point controller, 3-point controller	●	●
Pulse-width modulation		
Conventional	●	●
Dynamic	●	
Noise shape process	●	
Split range (heating/cooling)	●	
Signal processing		
Scaling	●	●
Characteristics interpolation	●	
PT1 signal filter	●	●
Simulation		
PTn systems	●	
Fuzzy	●	
Simple fuzzy systems with up to 4 linguistic input variables and up to 5 terms per input variable	●	
Mathematical functions		
Trigonometric functions (also arc function)	●	
Exponential function, root function	●	

Task

The APP-POS-S-D and APP-POS-S-GB positioning toolbox is a function block library for the Sucosoft S40 programming software.
Approximately 30 function blocks are available for the following areas:

- Position control
  – Basic positioning
  – Rapid traverse crawl speed
  – Characteristics control
  – Closed-loop position control
- Step sequence
  – Sequencer with 10 step sequences
- Simulation
  – Simulation of a rotating axis
- Frequency measurement
  – Single and multi-layer frequency measurement
- Synchronization
  – Rotation and angle synchronization with electronic gears
- Visualization
  – Data-buffering of fast positioning movemments with slow-motion read-out ⇒ substitute for an oscilloscope
- Other function blocks
  – Camshaft controller
  – Hydraulics
  – Referencing
  – Incremental encoder evaluation

Type overview

Telecontrol application module
S40-AM-TL

Application

- Provision of communication services
- Management of telecontrol data

S40-AM-TL

- Communication between telecontrol stations via a dedicated line / party line

Features

S40-AM-TL V2.1

- Basic and universal function blocks for master stations and outstations
- Suconet asynchronous/synchronous mode as required
- GAP time for wireless modem adjustable

Hardware and software requirements

Module	Hardware	Software (Version V... and higher)
S40-AM-TL V2.1	ZB4-501-TC1/-TC2 PS416-TCS-200	S40 V4.1

Type overview

Telecontrol application module
S40-AM-TD

Application

- Provision of communication services
- Management of telecontrol data

S40-AM-TD

- Communication between telecontrol stations via a dial-up line / GSM

Features

S40-AM-TD from V2.1

- Dial-up and telecontrol function blocks for telecontrol stations
- The dial-up function blocks initialize the modems and control connection establishment and termination.
- Suconet asynchronous/synchronous mode as required
- GAP time for GSM modem adjustable

Hardware and software requirements

Module	Hardware	Software (Version V... and higher)
S40-AM-TD V2.0	ZB4-501-TC1/-TC2	S40 V4.1

Services		S40-AM-TL	S40-AM-TD
Variable Access Services			
Send data, fixed telegram length	RAM	●	●
	RAM Broadcast	●	
Send data, variable telegram length	RAM	●	●
	FLASH/RAM Memory Card	●	●
	RAM Broadcast	●	
Read data, variable telegram length	RAM	●	●
	FLASH/RAM Memory Card	●	●
Send/read data, fixed telegram length	RAM	●	●
Support services			
Read PLC time of outstation		●	●
Synchronize the PLC clock of outstation		●	●
Synchronize the PLC clock of outstation Broadcast		●	
Remote Control			
Remote Reset		●	●
Read Status		●	●
Send Token		●	
Send Information String			●