MOELLER

Hardware and Engineering

LE 4-100
LE 4-300
Local Expansion Modules
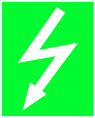
Caution!

Dangerous electrical voltage!

Before commencing the installation

- Disconnect the power supply of the device.
- Ensure that the device cannot be accidentally restarted.
- Verify isolation from the supply.
- Earth and short circuit.
- Cover or enclose neighbouring units that are live.
- Follow the engineering instructions (AWA) of the device concerned.
- Only suitably qualified personnel may work on this device/system.
- Before installation and before touching the device ensure that you are free of electrostatic charge.
- Connecting cables and signal lines should be installed so that inductive or capacitive interference do not impair the automation functions.
- Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.
- Suitable safety hardware and software measures should be implemented for the I/O interface so that a line or wire breakage on the signal side does not result in undefined states in the automation devices.

- Ensure a reliable electrical isolation of the low voltage for the 24 volt supply. Only use power supply units complying with IEC 60 364-4-41 or HD 384.4.41 S2.
- Deviations of the mains voltage from the rated value must not exceed the tolerance limits given in the specifications, otherwise this may cause malfunction and dangerous operation.
- Emergency stop devices complying with IEC/EN 60 204-1 must be effective in all operating modes of the automation devices. Unlatching the emergency-stop devices must not cause uncontrolled operation or restart.
- Devices that are designed for mounting in housings or control cabinets must only be operated and controlled after they have been installed with the housing closed. Desktop or portable units must only be operated and controlled in enclosed housings.
- Measures should be taken to ensure the proper restart of programs interrupted after a voltage dip or failure. This should not cause dangerous operating states even for a short time. If necessary, emergency-stop devices should be implemented.

List of Revisions to AWB 27-1270 GB

Edition	Page	Description	New	Modified	Omitted
04/99	gen.	Sucosoft S 30-S4			×
		Sucosoft S 4 → S 40		×	
		Suconet S → INTERBUS		×	
	7	Variable declaration		×	
	10	Syntax		×	
	21, 31, 36	Short-circuit protection	×		
	21, 26, 31, 36, 41, 46, 50, 56	EMC: RFI, Surge, line-conducted interference		×	
	23	Graphic		×	
	24	Note	×		
	28	Note	×		
	53	Note		×	

Contents

Contents

About This Manual

This manual describes the digital local modules (LE 4s) for the Moeller expandable compact programmable controllers. These include the controllers PS 4-241-MM1 (PS 4-200), PS 4-341-MM1 (PS 4-300), PS 4-401-MM2 (PS 4-400) and the expansion modules EM 4-201-DX2, EM 4-204-DX1 and EM 4-202-DX1 (EM 4-200). These local expansion modules are designed to expand digital inputs and outputs.

You will find important additional information on the operation of the LE 4 modules with the expandable automation devices in the manuals for each of the expandable automation devices:

EM 4-200:
Hardware and Engineering
Expansion modules with Suconet K1/K interface
AWB 27-1257-GB

Hardware and Engineering
Expansion modules with INTERBUS interface
AWB 27-1258-GB

Hardware and Engineering
Expansion modules for PROFIBUS DP
AWB 27-1315 GB

PS 4-200:
Hardware and Engineering
PS 4-201-MM1
AWB 27-1184 GB

PS 4-300:
Hardware and Engineering
PS 4-341-MM1
AWB 2700-1311 GB

PS 4-400:
Hardware and Engineering
PS 4-401-MM2
AWB 27-1240-GB

Overview of the digital LE 4 module types

LE 4-116-DD1	8 inputs 8 outputs (0.5 A), contactless 24 V DC	page 17
LE 4-116-DX1	16 inputs 24 V DC	page 23
LE 4-116-XD1	16 outputs (0.5 A), contactless 24 V DC	page 27
LE 4-108-XD1	8 outputs (2 A), contactless 24 V DC	page 33
LE 4-108-XR1	8 relay outputs 24 V DC/230 V AC	page 37
LE 4-308-HX1	8 inputs 120 V AC 50/60 Hz 240 V AC 50 Hz	page 43
LE 4-308-XH1	8 triac outputs 120 to 240 V AC, 0.5 A	page 47
LE 4-104-XP1	4 pneumatic outputs	page 51

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1 Software Configuration

When using PS 4-200 and PS 4-300, and PS 416 master PLCs in conjunction with EM 4-201-DX2, configure the LE 4 devices in the Sucosoft S 40 topology configurator.

Sucosoft S 40

You will find details on how to connect the LE 4, in conjunction with the EM 4-201-DX2, to the PS 416 modular PLC in the manual "Engineering and Configuration: Suconet K interface" (AWB 27-1210-GB), Chapter 4. To connect the LE 4 to the PS 4-200 and PS 4-300 compact PLCs or in conjunction with the EM 4 devices of the 200 series, please refer to the manual "Sucosoft S 40 User Interface" (AWB 2700-1305 GB), Chapter 5.

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2 Addressing the LE 4 on the EM 4-201-DX2

Together with the EM 4-201-DX2, the LE 4 devices form a station which is assigned a bus address. This address can be set at the DIP switch of the EM 4-201-DX2.

The addressing of the inputs/outputs depends on the spatial configuration of the stations. The following syntax applies for the operands:

```
Q x 1.1.2.0.7
```

Bit number	0 to 7
Byte number	0 to ...[1]
Module	0 to 6
Station	1 to 8
Line number	1[2]
Data type	– W = Word format
	– B = Byte format
	– Omitted for bit format
Inputs/outputs	(I/Q)
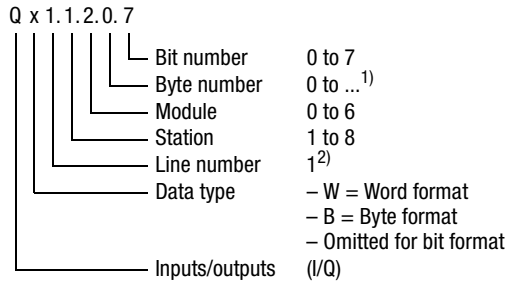
[1] depending on the system parameter setting in the Topology Configurator

[2] "0" stands for basic unit with local expansion modules

☞ The last two digits (byte and bit number) depend on the implemented data type. If a byte or word is accessed, the fifth digit is omitted. It defines the bit number only.

Addressing via Sucosoft S 40 requires the use of variable declarations:

Example:
```
VAR
  Input AT%I1.1.1.0.0      :BOOL;
END_VAR
```

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3 Scanning LE 4 Information

The following descriptions of the LE 4 modules give a detailed breakdown of the input/output and diagnostic bytes. The following example demonstrates the type of addressing/scanning of these bytes. Variables must be declared when addressing via Sucosoft S 40.
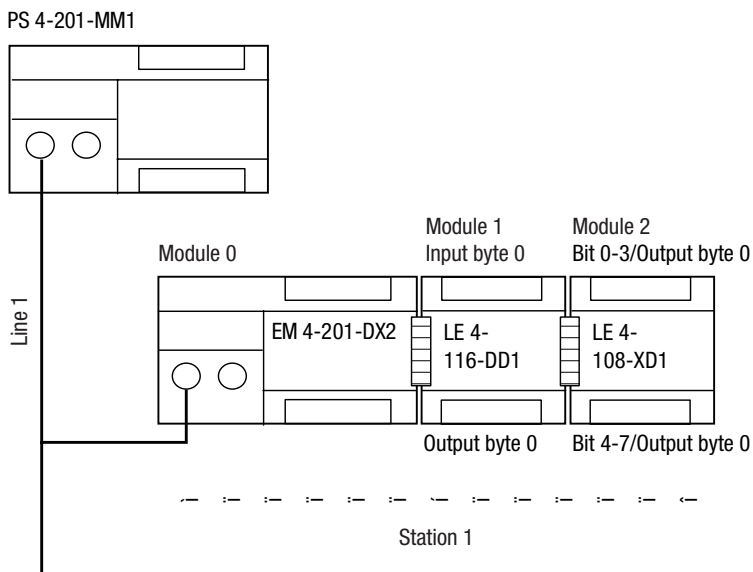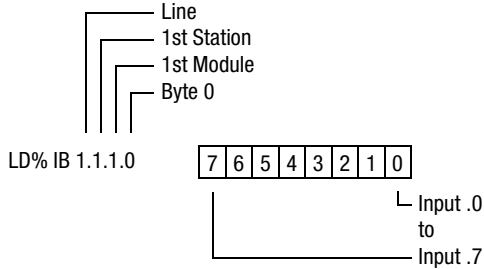
PS 4-201-MM1
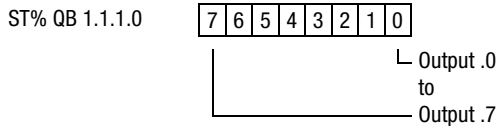

Figure 1: Assigning the input and output bytes of LE 4 modules

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The input/output and diagnostic bytes of the LE 4 modules are addressed using the following syntax:

Input byte of the LE 4-116-DD1:

```
                    ┌──── Line
                    ├──── 1st Station
                    ├──── 1st Module
                    ┌──── Byte 0

LD% IB 1.1.1.0      │7│6│5│4│3│2│1│0│
                              └── Input .0
                                      to
                              ─── Input .7
```

Output byte of the LE 4-116-DD1:

```
ST% QB 1.1.1.0      │7│6│5│4│3│2│1│0│
                              └── Output .0
                                      to
                              ─── Output .7
```

Diagnostic byte of the LE 4-116-DD1:

```
LD% ISB 1.1.1.0     │7│6│5│4│3│2│1│0│
                              └── No/incorrect module
```

Output byte of the LE 4-108-XD1:

```
ST% QB 1.1.2.0      │7│6│5│4│3│2│1│0│
                              └── Output .0
                                      to
                              ─── Output .7
```

Diagnostic byte of the LE 4-108-XD1:

```
LD% ISB 1.1.2.0     │7│6│5│4│3│2│1│0│
                              └── No/incorrect module
                              ─── Short-circuit
```
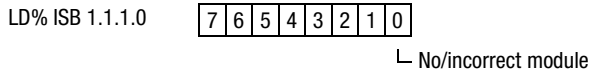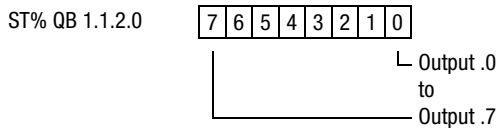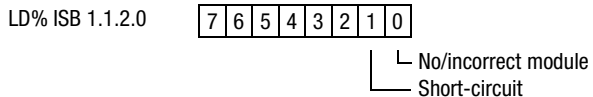
4 Engineering

Figure 2: Connections

① Socket connector
② Plug-in screw terminal
③ Terminal cross-sections:
flexible with ferrule: 0.22 to 1.5 mm^2
(AWG 23 to 16)
solid: 0.22 to 2.5 mm^2
(AWG 23 to 13)
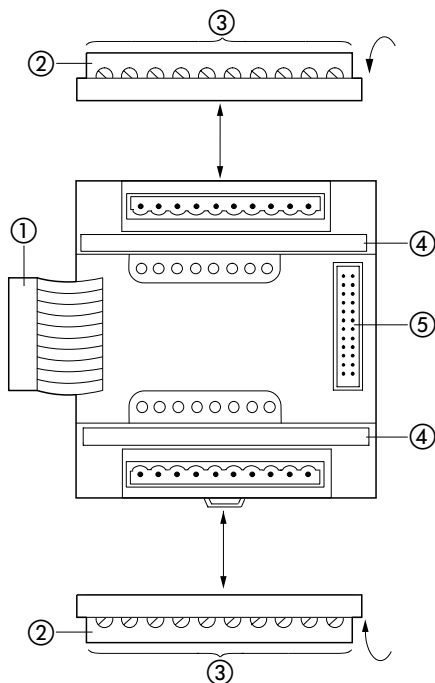④ Designation strips
⑤ Plug connector

Engineering

☞ | The connections of the LE 4-104-XP1 are described in the relevant chapter.

☞ | The LE 4-308-HX1 and LE 4-308-XH1 local expansion modules may only be connected to the EM 4-201-DX2 and EM 4-202-DX1 version 02 or higher.

☞ | In the case of mains circuits in Overvoltage Category III (power supply and relay outputs), appropriate measures must be taken to ensure safe isolation (e. g. using a transformer which provides at least basic insulation between the primary and secondary sides).

☞ | Please also refer to the configuration instructions in the manual "EMC Engineering Guidelines for Automation Devices" (AWB 27-1287-GB).

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5 Mounting

Mounting of the local expansion modules in conjunction with the EM 4-200 or PS 4-200 devices is the same for all device types.

☞ | The devices may only be mounted horizontally!

**Mounting
on a top-hat rail**

To mount the controller on the top-hat rail, proceed as follows:

▶ Hook the back of the device onto the top edge of the top-hat rail.

▶ Use a screwdriver ① to slide the spring-loaded clip out of the device ②.

▶ Push the device fully onto the top-hat rail ③.

▶ Remove the screwdriver so that the slide snaps back and engages behind the top-hat rail.
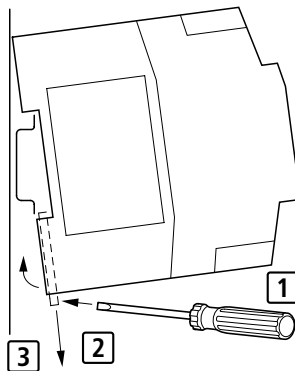
▶ Check that the device is attached securely.

Figure 3: Mounting on top-hat rail

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Mounting on fixing brackets

To mount the controller on fixing brackets, proceed as follows:

▶ Insert the fixing bracket so that it engages ①.

▶ Check that the PLC is seated correctly. The locating pin must be located in the bore hole ②.

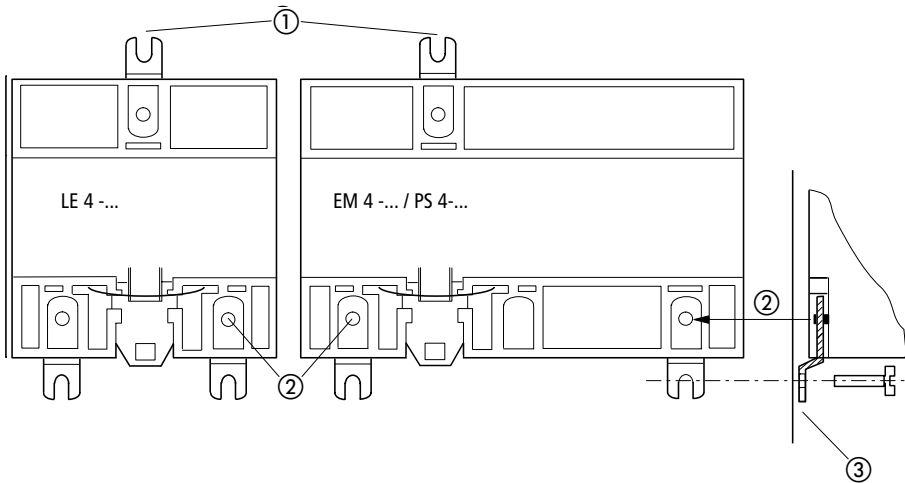▶ Use M4 screws to secure the fixing brackets to the mounting plate ③.

Figure 4: Mounting on fixing brackets

Installation in a control cabinet

To install the controller in a control cabinet, please observe the following conditions :

▶ Secure the local expansion module horizontally in the control cabinet.

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To prevent electromagnetic interference, which may impair the function of the control electronics, proceed as follows:

▶ Keep a distance of at least 5 cm (2 ") between the cable duct ① and the local expansion module.

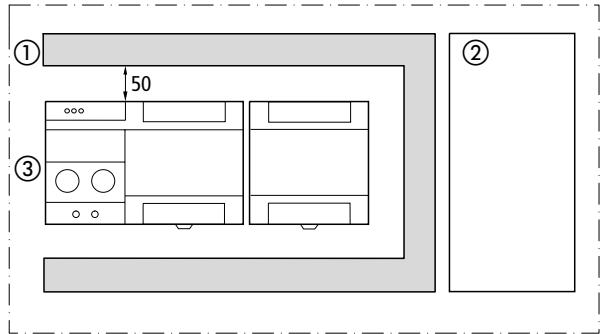▶ Ensure that the control ③ and power sections ② are located separately.

Figure 5: Horizontal arrangement of devices in the control cabinet
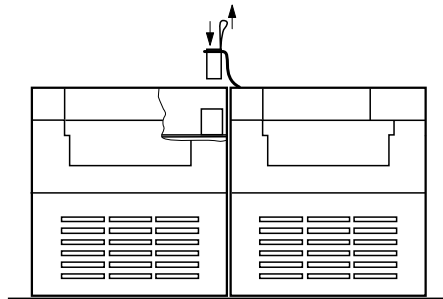

Figure 6: Connecting the LE 4 modules

☞ Before connecting an LE 4 module to another LE 4 module (see Fig. 6), the device must be correctly clipped on the top-hat rail or secured to the mounting plate.

Dimensions

16

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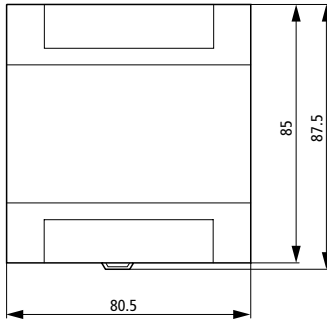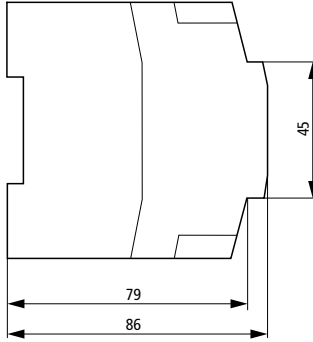
6 LE 4-116-DD1

The LE 4-116-DD1 is a local expansion module for 8 digital inputs and 8 digital outputs.

Front view
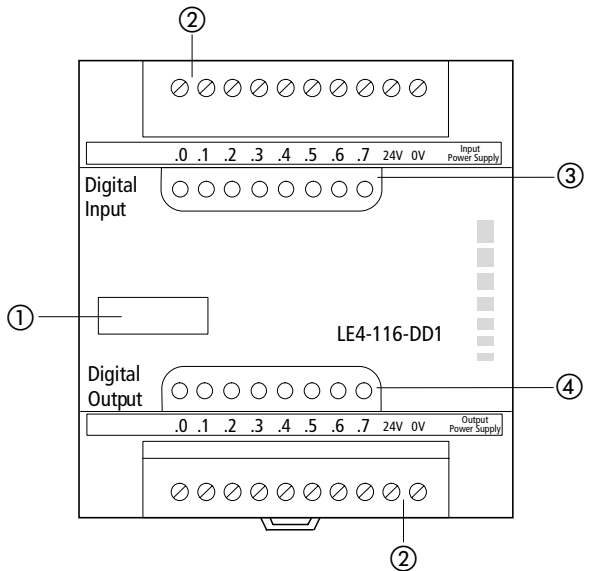
Figure 7: Front view of the LE 4-116-DD1

① Device designation in accordance with HAEG 18 × 6.5

② Plug-in screw terminal

③ LED status display of inputs

④ LED status display of outputs
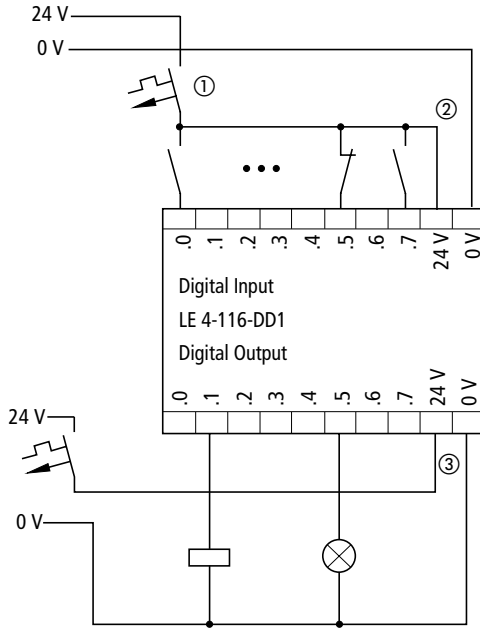
Wiring

Figure 8: Wiring of the LE 4-116-DD1

① Miniature circuit-breaker

② 24 V DC supply of digital outputs

③ 24 V DC supply of digital inputs

Attention!
If the 24 V supply of the inputs is interrupted, the input states are reset to "0".

Breakdown of the
input, output
and diagnostic bytes

**Breakdown of the
input, output
and diagnostic bytes**

Addressing the inputs and outputs

Input byte:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

└─ Input .0 ──────── Inputs
to
─ Input .7

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

LE 4-116-DD1

Output byte:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

└─ Output .0 ──────── Outputs
to
─ Output .7

Access possible to: bit, byte

Scanning the diagnostic byte

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

└─ No/incorrect module
── Short-circuit

Access possible to: bit, byte

You will find the corresponding diagnostic scan
command in the documentation for the master PLC.

Technical data

General	
Standards, regulations	EN 61 131-2, EN 50 178
Ambient temperature	0 to 55 °C
Storage temperature	−25 to +70 °C
Vibration resistance	Constant 1 g/0 to 150 Hz
Shock resistance	15 g/11 ms
EMC	see page 21
Terminals	Plug-in screw terminal
Terminal cross-section	
Flexible with ferrule	0.22 to 1.5 mm^2 (AWG 23 to 16)
Solid	0.22 to 2.5 mm^2 (AWG 23 to 13)
Degree of protection	IP 20
Weight	265 g
Protection class	1
Power supply	
Rated voltage U_e	24 V DC
Permissible range	20.4 to 28.8 V DC
Ripple voltage	$\leq$ 5 %
Electrical isolation	Yes
Inputs	
Number of inputs	8
Rated voltage U_e	24 V DC
For signal "0"	$\leq$ 5 V DC, limit value type 1
For signal "1"	$\geq$ 15 V DC, limit value type 1
Input current	Normally 6 mA at 24 V DC
Signal "1"	Normally 6 mA at 24 V DC
Delay time	
For "0" to "1"	Normally 0.2 ms
For "1" to "0"	Normally 0.2 ms
Electrical isolation of inputs from each other	No
Status display of inputs	LED

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Outputs	
Number of outputs	8
Voltage supply of outputs	
Rated voltage U_e	24 V DC
Permissible range	20.4 to 28.8 V DC
Max. ripple	$\leq 5 \%$
Reverse polarity protection	Yes
Max. supply current	100 mA
Electrical isolation	Yes
Rated current $_e$	
For signal "1"	0.5 A at 24 V DC
Utilization factor g	1
Relative duty factor DF	100 %
Interrupting voltage limit for inductive loads	Yes
Switching frequency	
at time constant $t \leq 72$ ms	4000 Ops/h
Status display of outputs	LED
Short-circuit protection	Yes, without manual reset

General Data on electromagnetic compatibility (EMC) of automation devices			
Emission	EN 55 011/22 Class A		
Interference immunity			
ESD	EN 61 000-4-2	Contact discharge Air discharge	4 kV 8 kV
RFI	EN 61 000-4-3	AM/PM	10 V/m
Burst	EN 61 000-4-4	Mains/digital I/O Analogue I/O, field bus	2 kV 1 kV
Surge	EN 61 000-4-5	Digital I/O, asymmetrical Mains DC, asymmetrical Mains DC, symmetrical Mains AC, asymmetrical Mains AC, symmetrical	0.5 kV 1 kV 0.5 kV 2 kV 1 kV
Line-conducted interference	EN 61 000-4-6	AM	10 V

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7 LE 4-116-DX1

The LE 4-116-DX1 is a local expansion module for 16 digital inputs.

Front view
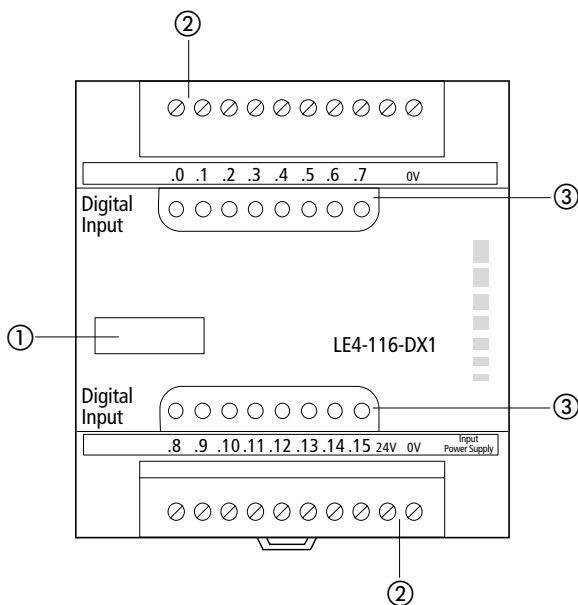
Figure 9: Front view of the LE 4-116-DX1

① Device designation in accordance with HAEG 18 × 6.5

② Plug-in screw terminal

③ LED status display of inputs

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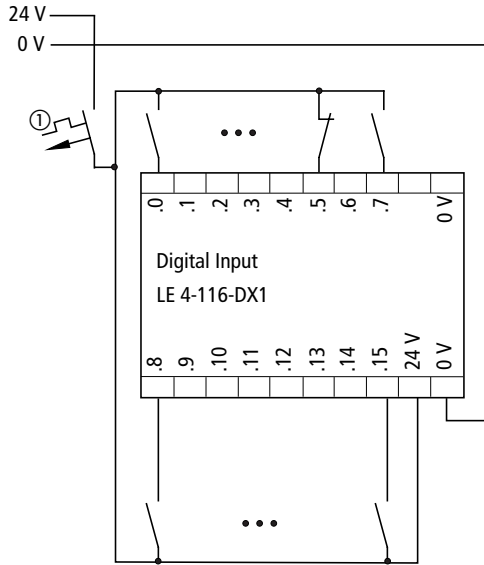
Wiring

Figure 10: Wiring of the LE 4-116-DX1

① Line protection device

☞ The 0 V lines are interconnected.

Breakdown of the input and diagnostic bytes

Addressing the inputs

1st input byte:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Input .0
to
Input .7

2nd input byte:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Input .8
to
Input .15

Inputs

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

LE 4-116-DX1

| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

Inputs

Access possible to: bit, byte, word

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Scanning the diagnostic byte

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

└ No/incorrect module

Access possible to: bit, byte

You will find the corresponding diagnostic scan command in the documentation for the master PLC.

Technical data

General	
Standards, regulations	EN 61 131-2, EN 50 178
Ambient temperature	0 to 55 °C
Storage temperature	−25 to +70 °C
Vibration resistance	Constant 1 g/0 to 150 Hz
Shock resistance	15 g/11 ms
EMC	see page 26
Terminals	Plug-in screw terminal
Terminal cross-section	
Flexible with ferrule	0.22 to 1.5 mm^2 (AWG 23 to 16)
Solid	0.22 to 2.5 mm^2 (AWG 23 to 13)
Degree of protection	IP 20
Weight	230 g
Protection class	1
Power supply	
Rated voltage U_e	24 V DC
Permissible range	20.4 to 28.8 V DC
Ripple voltage	≤ 5 %
Electrical isolation	Yes

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Inputs

Number of inputs	16
Rated voltage U_e	24 V DC
For signal "0"	$\leq$ 5 V DC, limit value type 1
For signal "1"	$\geq$ 15 V DC, limit value type 1
Rated current $_e$	
For signal "1"	Normally 6 mA at 24 V DC
Delay time	
For "0" to "1"	Normally 0.2 ms
For "1" to "0"	Normally 0.2 ms
Electrical isolation of inputs from one another	No
Status display of inputs	LED

General data on the electromagnetic compatibility (EMC) of automation devices

Emission	EN 55 011/22 Class A		

Interference immunity

ESD	EN 61 000-4-2	Contact discharge Air discharge	4 kV 8 kV
RFI	EN 61 000-4-3	AM/PM	10 V/m
Burst	EN 61 000-4-4	Mains/digital I/O Analogue I/O, field bus	2 kV 1 kV
Surge	EN 61 000-4-5	Digital I/O, asymmetrical Mains DC, asymmetrical Mains DC, symmetrical Mains AC, asymmetrical Mains AC, symmetrical	0.5 kV 1 kV 0.5 kV 2 kV 1 kV
Line-conducted interference	EN 61 000-4-6	AM	10 V

8   LE 4-116-XD1

The LE 4-116-XD1 is a local expansion module
16 digital outputs.

Front view
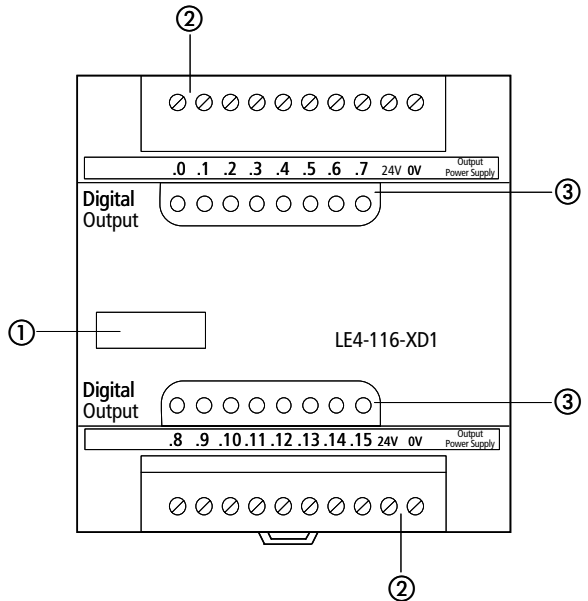
Figure 11: Front view of the LE 4-116-XD1

① Device designation in accordance with HAEG 18 × 6.5

② Plug-in screw terminal
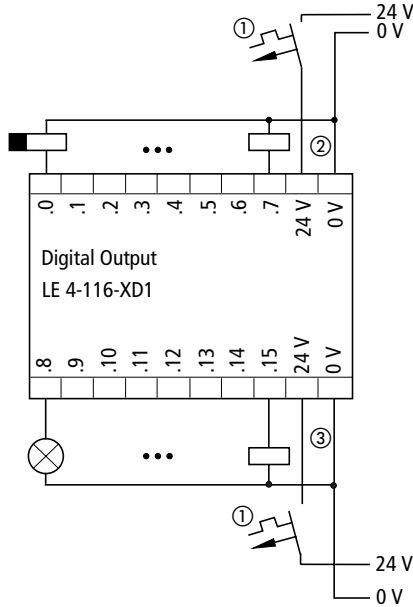
③ LED status display of outputs

Wiring

Figure 12: Wiring of the LE 4-116-XD1

① Miniature circuit-breaker

② 24 V DC supply of the outputs Q 0.0 to Q 0.7
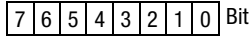
③ 24 V DC supply of the outputs Q 0.8 to Q 0.15

☞ | The voltage supplies are isolated.

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**Breakdown of the
output and
diagnostic bytes**

Addressing the outputs

1st output byte:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Output .0
to
Output .7

Outputs

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

LE 4-116-XD1

| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

2nd output byte:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Output .8
to
Output .15
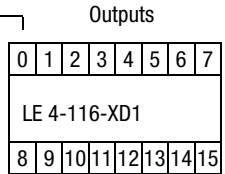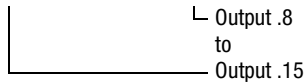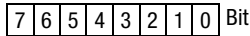
Outputs

Access possible to: bit, byte, word

Scanning the diagnostic byte

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

No/incorrect module
Short-circuit
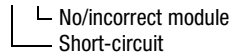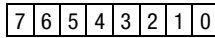
Access possible to: bit, byte

In order to ensure safe operation of the LE 4, you
need to monitor the outputs using the user
program and switch off the module in the event
of a short-circuit. For this you need to scan the
short-circuit bit of the diagnostic byte.
If a short-circuit occurs at one of the 16 outputs
(short-circuit - bit has the status "1"), all outputs
of the LE 4 must be set to "0".

You will find the corresponding diagnostic scan
command in the documentation for the master PLC.

Technical data

General	
Standards, regulations	EN 61 131-2, EN 50 178
Ambient temperature	0 to 55 °C
Storage temperature	−25 to +70 °C
Vibration resistance	Constant 1 g/0 to 150 Hz
Shock resistance	15 g/11 ms
EMC	see page 31
Terminals	Plug-in screw terminal
Terminal cross-section	
Flexible with ferrule	0.22 to 1.5 mm^2 (AWG 23 to 16)
Solid	0.22 to 2.5 mm^2 (AWG 23 to 13)
Degree of protection	IP 20
Weight	275 g
Protection class	1
Outputs	
Number of outputs	16
Voltage supply of outputs	
Rated voltage U_e	24 V DC
Permissible range	20.4 to 28.8 V DC
Max. ripple	$\leq$ 5 %
Reverse polarity protection	Yes
Max. supply current	130 mA
Electrical isolation	in 2 groups of 8 outputs each
Rated current $_e$	
For signal "1"	0.5 A at 24 V DC
Utilization factor g	1
Relative duty factor DF	100 %
Interrupting voltage limit for inductive loads	Yes

Switching frequency	
For time constant t ≤ 15 ms	10 000 Ops/h
at time constant t ≤ 72 ms	3000 Ops/h
Status display of outputs	LED
Short-circuit protection	Yes, without manual reset

General data on the electromagnetic compatibility (EMC) of automation devices

Emission	EN 55 011/22 Class A		

Interference immunity

ESD	EN 61 000-4-2	Contact discharge Air discharge	4 kV 8 kV
RFI	EN 61 000-4-3	AM/PM	10 V/m
Burst	EN 61 000-4-4	Mains/digital I/O Analogue I/O, field bus	2 kV 1 kV
Surge	EN 61 000-4-5	Digital I/O, asymmetrical Mains DC, asymmetrical Mains DC, symmetrical Mains AC, asymmetrical Mains AC, symmetrical	0.5 kV 1 kV 0.5 kV 2 kV 1 kV
Line-conducted interference	EN 61 000-4-6	AM	10 V

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9 LE 4-108-XD1

The LE 4-108-XD1 is a local expansion module for 8 digital outputs with a maximum output current of 2 A per output.

Front view
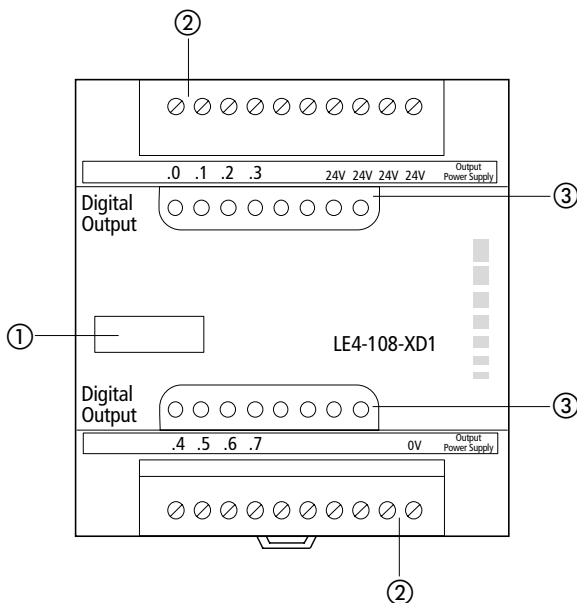
Figure 13: Front view of the LE 4-108-XD1

① Device designation in accordance with HAEG 18 × 6.5

② Plug-in screw terminal

③ LED status display of outputs

For Immediate Delivery call KMParts.com at (866) 595-9616
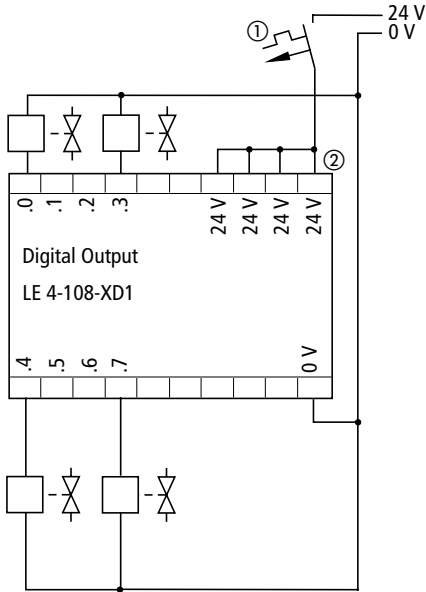
Wiring

Figure 14: Wiring of the LE 4-118-XD1

① Miniature circuit-breaker
② 24 V DC supply of the outputs
All 24 V connections need to be wired

Breakdown of the output and diagnostic bytes

Addressing the outputs

Output byte:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Output .0
to
Output .7

Outputs

| 0 | 1 | 2 | 3 | | | | |

LE 4-108-XD1

| 4 | 5 | 6 | 7 | | | | |

Outputs

Access possible to: bit, byte, word

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Scanning the diagnostic byte

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

└─ No/incorrect module
└── Short-circuit

Access possible to: bit, byte

You will find the corresponding diagnostic scan command in the documentation for the master PLC.

Technical data

General	
Standards, regulations	EN 61 131-2, EN 50 178
Ambient temperature	0 to 55 °C
Storage temperature	−25 to +70 °C
Vibration resistance	Constant 1 g/0 to 150 Hz
Shock resistance	15 g/11 ms
EMC	see page 36
Terminals	Plug-in screw terminal
Terminal cross-section	
Flexible with ferrule	0.22 to 1.5 mm^2 (AWG 23 to 16)
Solid	0.22 to 2.5 mm^2 (AWG 23 to 13)
Degree of protection	IP 20
Weight	275 g
Protection class	1

LE 4-108-XD1

Outputs	
Number of outputs	8
Voltage supply of outputs	
Rated voltage U_e	24 V DC
Permissible range	20.4 to 28.8 V DC
Max. ripple	$\leq 5\,\%$
Reverse polarity protection	Yes
Max. supply current	160 mA
Electrical isolation	No
Rated current $_e$	
For signal "1"	0.5 A at 24 V DC
Utilization factor g	1
Relative duty factor DF	100 %
Interrupting voltage limit for inductive loads	Yes
Switching frequency	
for time constant t $\leq$ 60 ms	2500 Ops/h
for time constant t $\leq$ 300 ms	360 Ops/h
Status display of outputs	LED
Short-circuit protection	Yes, without manual reset

General data on the electromagnetic compatibility (EMC) of automation devices			
Emission	EN 55 011/22 Class A		
Interference immunity			
ESD	EN 61 000-4-2	Contact discharge Air discharge	4 kV 8 kV
RFI	EN 61 000-4-3	AM/PM	10 V/m
Burst	EN 61 000-4-4	Mains/digital I/O Analogue I/O, field bus	2 kV 1 kV
Surge	EN 61 000-4-5	Digital I/O, asymmetrical Mains DC, asymmetrical Mains DC, symmetrical Mains AC, asymmetrical Mains AC, symmetrical	0.5 kV 1 kV 0.5 kV 2 kV 1 kV
Line-conducted interference	EN 61 000-4-6	AM	10 V

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10 LE 4-108-XR1

The LE 4-108-XR1 is a local expansion module for 8 relay outputs.

Front view
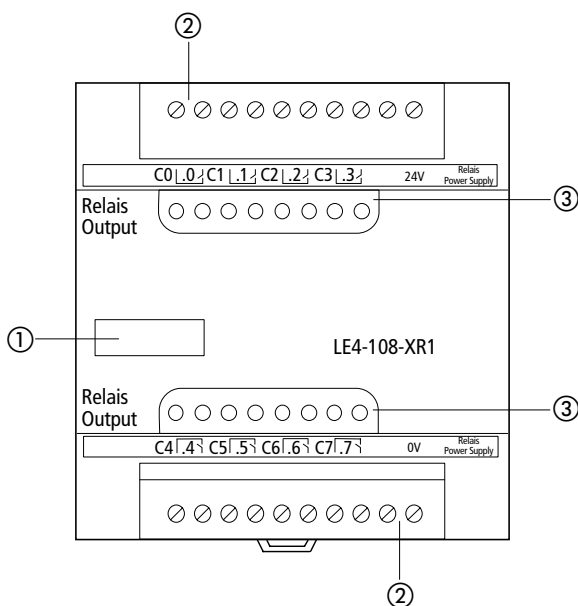
Figure 15: Front view of the LE 4-108-XR1

① Device designation in accordance with HAEG 18 × 6.5

② Plug-in screw terminal

③ LED status display of outputs

Wiring

Figure 16: Wiring of the LE 4-108-XR1

① Fuse (4 A fast) for protection of relay contacts

② Miniature circuit-breaker

③ 230 V AC relay outputs in the same row must be connected to the same phase (e.g. L1) (max. 250 V AC potential difference).

④ If both 230 V AC and 24 V DC are used for operation, one output in between must remain unconnected.

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**Breakdown of the
output and
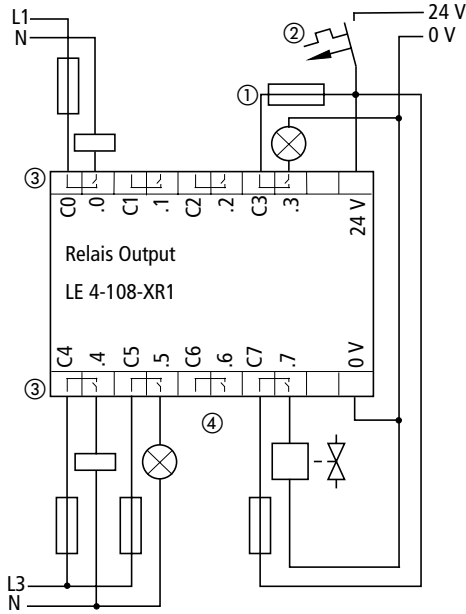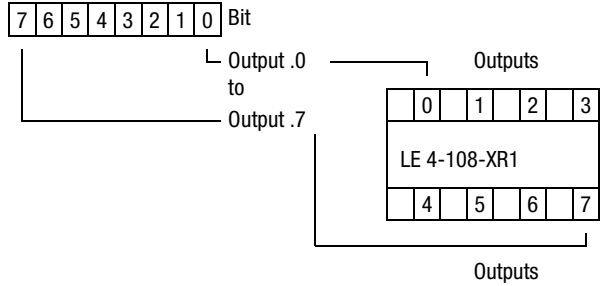diagnostic bytes**

Addressing the outputs

Output byte:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Output .0
to
Output .7

Outputs

| 0 | 1 | 2 | 3 |

LE 4-108-XR1

| 4 | 5 | 6 | 7 |

Outputs

Access possible to: bit, byte

Scanning the diagnostic byte

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

└ No/incorrect module
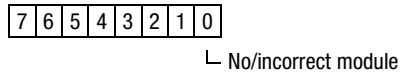
Access possible to: bit, byte

You will find the corresponding diagnostic scan
command in the documentation for the master PLC.

Technical data

General	
Standards, regulations	EN 61 131-2, EN 50 178
Ambient temperature	0 to 55 °C
Storage temperature	−25 to +70 °C
Shock resistance	15 g/11 ms
Vibration resistance	Constant 1 g/0 to 150 Hz
EMC	see page 41
Rated insulation voltage U_i	1800 V AC
Terminals	Plug-in screw terminal

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Terminal cross-section	
Flexible with ferrule	0.22 to 1.5 mm^2 (AWG 23 to 16)
Solid	0.22 to 2.5 mm^2 (AWG 23 to 13)
Degree of protection	IP 20
Weight	305 g
Protection class	1
Power supply	
Rated voltage U_e	24 V DC
Permissible range	20.4 to 28.8 V DC
Ripple voltage	$\leq 5 \%$
Electrical isolation	Yes
Outputs	
Number of outputs	8
Electrical isolation	Yes
Utilization factor g	1
Relative duty factor DF	100 %
Opening time	Max. 10 ms
Closing time	Max. 15 ms
Service life (mechanical)	Switching cycles 20 000 000
Switching current (resistive load)	
2 A/230 V AC	Switching cycles 800 000
2 A/24 V DC	Switching cycles 2 000 000
Switching current (inductive load)	
1 A/230 V AC 11	Switching cycles 1 000 000
1 A/24 V DC	Switching cycles 300 000
Short-circuit protection	No, external protection of relay contacts with fuse, max. 4 A fast fuse required
Creepage and clearance (relay)	≥ 8 mm
Test voltage (contact/coil)	4 kV
Status display of outputs	LED

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General data on the electromagnetic compatibility (EMC) of automation devices

Emission	EN 55 011/22 Class A		

Interference immunity

ESD	EN 61 000-4-2	Contact discharge Air discharge	4 kV 8 kV
RFI	EN 61 000-4-3	AM/PM	10 V/m
Burst	EN 61 000-4-4	Mains/digital I/O Analogue I/O, field bus	2 kV 1 kV
Surge	EN 61 000-4-5	Digital I/O, asymmetrical Mains DC, asymmetrical Mains DC, symmetrical Mains AC, asymmetrical Mains AC, symmetrical	0.5 kV 1 kV 0.5 kV 2 kV 1 kV
Line-conducted interference	EN 61 000-4-6	AM	10 V

11   LE 4-308-HX1

The LE 4-308-HX1 is a local expansion module for 8 digital AC inputs.

Front view

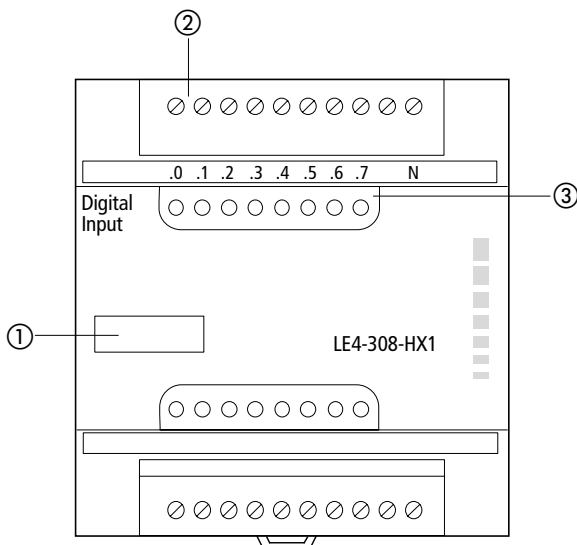*Figure 17: Front view of the LE 4-308-HX1*

① Device designation in accordance with HAEG 18 × 6.5
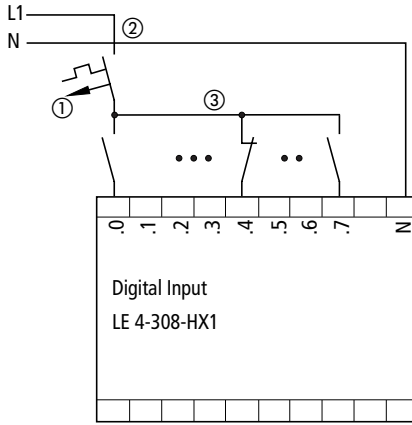② Plug-in screw terminal
③ LED status display of inputs

Wiring

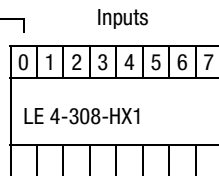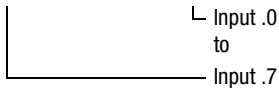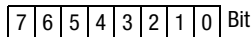*Figure 18: Wiring of the LE 4-308-HX1*

① Miniature circuit-breaker

② Voltage supply of the digital inputs
120 V AC at 50/60 Hz
240 V AC at 50 Hz

③ The inputs must be connected over the same phase
(e.g. L1).

Breakdown of the input and diagnostic bytes

Addressing the inputs

Input byte:

Access possible to: bit, byte

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Scanning the diagnostic byte

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

└ No/incorrect module

Access possible to: bit, byte

You will find the corresponding diagnostic scan command in the documentation for the master PLC.

Technical data

General	
Standards, regulations	EN 61 131-2, EN 50 178
Ambient temperature	0 to 55 °C
Storage temperature	−25 to +70 °C
Vibration resistance	Constant 1 g/0 to 150 Hz
Shock resistance	15 g/11 ms
EMC	see page 46
Rated insulation voltage	1800 V AC
Terminals	Plug-in screw terminal
Terminal cross-section	
Flexible with ferrule	0.22 to 1.5 mm^2 (AWG 23 to 16)
Solid	0.22 to 2.5 mm^2 (AWG 23 to 13)
Degree of protection	IP 20
Weight	250 g
Protection class	1
Overvoltage category	II, basic insulation

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Inputs	
Number of inputs	8
Rated voltage U_e	120/240 V AC
For signal "0"	$\leq$ 40 V AC
For signal "1"	$\geq$ 79 V AC
Rated current $_e$	
For signal "1"	Normally 6 mA at 120 V AC/50 Hz; Type 12 mA at 240 V AC/50 Hz
Delay time	
For "1" to "0"	Normally 30 ms/50 Hz
For "0" to "1"	Normally 10 ms/50 Hz
Electrical isolation of inputs from one another	No
Status display of inputs	LED
Permissible voltage ranges	120 V AC at 47 to 63 Hz 240 V AC at 47 to 55 Hz
Different phases at adjacent inputs	not permissible

General data on the electromagnetic compatibility (EMC) of automation devices

Emission	EN 55 011/22 Class A		
Interference immunity			
ESD	EN 61 000-4-2	Contact discharge Air discharge	4 kV 8 kV
RFI	EN 61 000-4-3	AM/PM	10 V/m
Burst	EN 61 000-4-4	Mains/digital I/O Analogue I/O, field bus	2 kV 1 kV
Surge	EN 61 000-4-5	Digital I/O, asymmetrical Mains DC, asymmetrical Mains DC, symmetrical Mains AC, asymmetrical Mains AC, symmetrical	0.5 kV 1 kV 0.5 kV 2 kV 1 kV
Line-conducted interference	EN 61 000-4-6	AM	10 V

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12 LE 4-308-XH1

The LE 4-308-XH1 is a local expansion module for 8 digital outputs (triacs) with a maximum output current of 0.5 A per output.
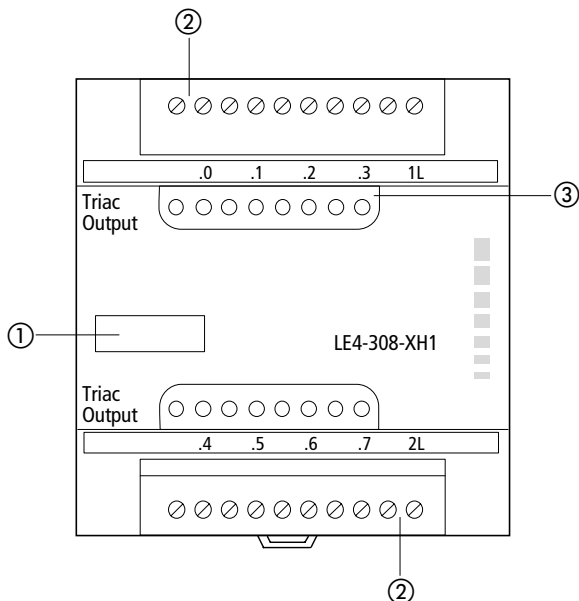
Front view

Figure 19: Front view of the LE 4-308-XH1

① Device designation in accordance with HAEG 18 × 6.5

② Plug-in screw terminal

③ LED status display of outputs

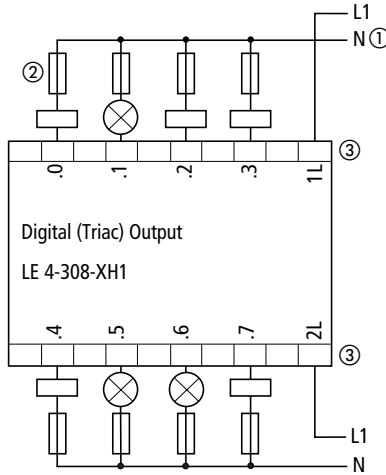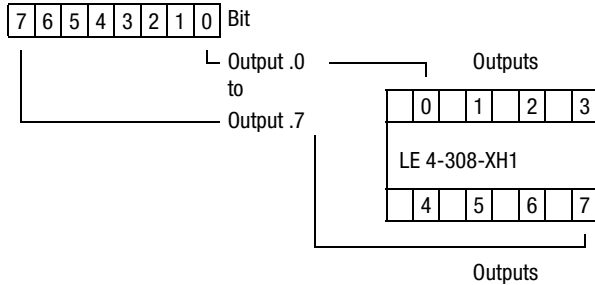For Immediate Delivery call KMParts.com at (866) 595-9616

Wiring

Figure 20: Wiring of the LE 4-308-XH1

① Fuse (0.6 A slow) for the protection of triac outputs

② Power supply of the triac outputs
120 to 240 V AC, 50/60 Hz, 0.5 A

③ The triac outputs must be connected over the same
phase (e.g. L1).

**Breakdown of the
output and
diagnostic bytes**

Addressing the outputs

Output byte:

Access possible to: bit, byte

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Scanning the diagnostic byte

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

└ No/incorrect module

Access possible to: bit, byte

You will find the corresponding diagnostic scan command in the documentation for the master PLC.

Technical data

General	
Standards, regulations	EN 61 131-2, EN 50 178
Ambient temperature	0 to 55 °C
Storage temperature	−25 to +70 °C
Vibration resistance	Constant 1 g/0 to 150 Hz
Shock resistance	15 g/11 ms
EMC	see page 50
Rated insulation voltage	1800 V AC
Terminals	Plug-in screw terminal
Terminal cross-section	
Flexible with ferrule	0.22 to 1.5 mm^2 (AWG 23 to 16)
Solid	0.22 to 2.5 mm^2 (AWG 23 to 13)
Degree of protection	IP 20
Weight	275 g
Protection class	1
Overvoltage category	II, basic insulation

Outputs	
Number of outputs	8
Voltage supply of outputs	240 V AC
Rated voltage U_e	240 V AC
Permissible range	120 to 240 V Hz
Electrical isolation	Yes, outputs 0 to 3 from outputs 4 to 7, and outputs from the bus
Rated current $_e$	
For signal "1"	0.5 A
Utilization factor g	1
Relative duty factor DF	100 %
Short-circuit protection	No, external protection using 0.6 A slow fuse required
Status display of outputs	LED
Frequency range	47 to 63 Hz
Minimum load current	10 mA
Residual current	Normally 2 mA
Opening/closing delay	Normally 1/2 line period duration
Making/breaking capacity to EN 60 947-5-1	AC 15, normal conditions

General data on the electromagnetic compatibility (EMC) of automation devices			
Emission	EN 55 011/22 Class A		
Interference immunity			
ESD	EN 61 000-4-2	Contact discharge Air discharge	4 kV 8 kV
RFI	EN 61 000-4-3	AM/PM	10 V/m
Burst	EN 61 000-4-4	Mains/digital I/O Analogue I/O, field bus	2 kV 1 kV
Surge	EN 61 000-4-5	Digital I/O, asymmetrical Mains DC, asymmetrical Mains DC, symmetrical Mains AC, asymmetrical Mains AC, symmetrical	0.5 kV 1 kV 0.5 kV 2 kV 1 kV
Line-conducted interference	EN 61 000-4-6	AM	10 V

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13   LE 4-104-XP1

Pneumatics

A pneumatic output stage is integrated in the LE 4-104-XP1. This is a valve block with four micro magnetic valves (MMVs) with central connection for the compressed air supply and ventilation. The four 3/2-way valves are directly controlled in the ZC function (ZC = zero position closed). Due to the joint pressure connection in the connection base of the valve block, the valves of an LE 4-104-XP1 can only be operated with the same supply pressure.

No tools are required to connect the PE hose and the valve block. The hose is fitted over the hose nipple manually.

☞ When installign the LE 4-104-XP1 in a control cabinet, the ventilation cable must be routed out of the cabinet.

Front view

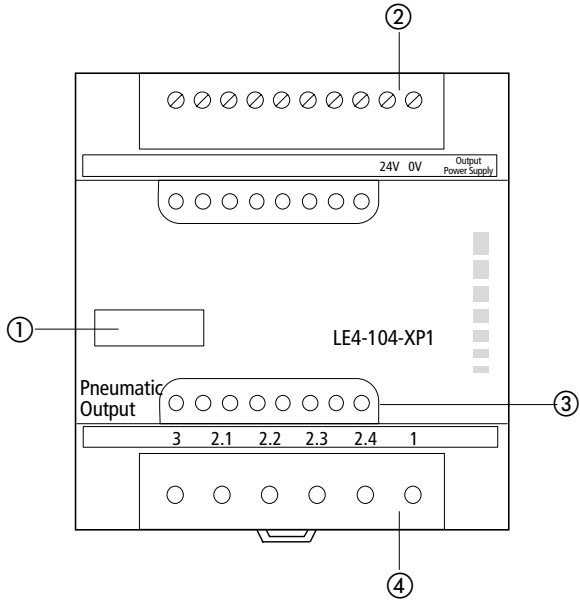*Figure 21: Front view of the LE 4-104-XP1*

① Device designation in accordance with HAEG 18 × 6.5

② Plug-in screw terminal

③ LED status display of the pneumatic outputs
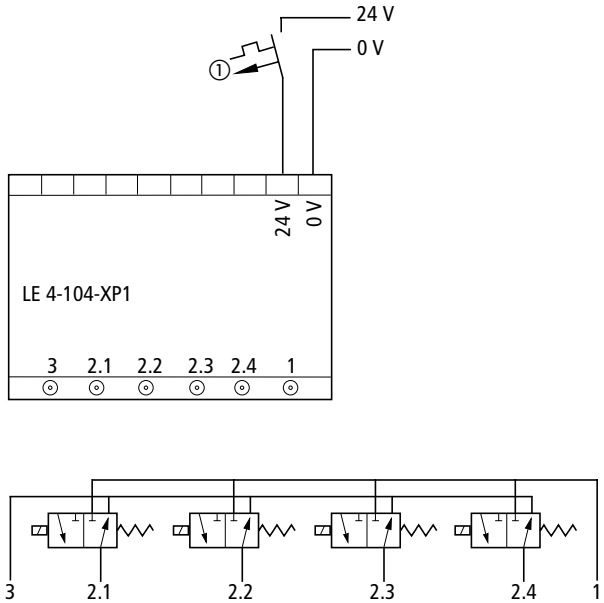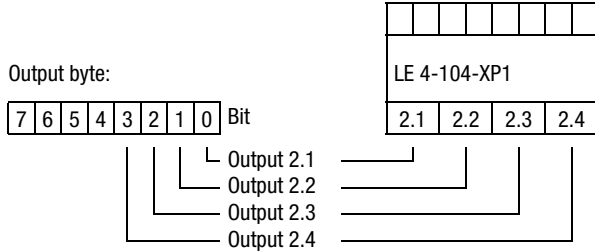
④ Connection plate for the PE hoses

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Wiring

Figure 22: Wiring of the LE 4-104-XP1

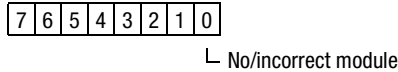| ①	Line protection device
1	Collective inlet air (P channel)
2.1–2.4	Valve outputs
3	Collective outlet air (R channel), the outlet air must be routed from the control cabinet into the open air

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Breakdown of the output and diagnostic bytes

Addressing the outputs

Output byte:

7	6	5	4	3	2	1	0	Bit

LE 4-104-XP1

2.1	2.2	2.3	2.4

└ Output 2.1
Output 2.2
Output 2.3
Output 2.4

Access possible to: bit, byte

Scanning the diagnostic byte

7	6	5	4	3	2	1	0

└ No/incorrect module

Access possible to: bit, byte

You will find the corresponding diagnostic scan command in the documentation for the master PLC.

Technical data

General	
Standards, regulations	EN 61 131-2, EN 50 178
Ambient temperature	0 to 55 °C
Storage temperature	−25 to +70 °C
Vibration resistance	Constant 1 g/0 to 150 Hz
Shock resistance	15 g/11 ms
EMC	see page 56
Rated insulation voltage	600 V AC
Terminals	Plug-in screw terminal

Terminal cross-section	
Flexible with ferrule	0.22 to 1.5 mm^2 (AWG 23 to 16)
Solid	0.22 to 2.5 mm^2 (AWG 23 to 13)
Degree of protection	IP 20
Weight	305 g
Protection class	1
Power supply	
Rated voltage U_e	24 V DC
Permissible range	20.4 to 28.8 V DC
Ripple voltage	$\leq$ 5 %
Electrical isolation	Yes
Outputs	
Number of outputs	4
Valve function	3/2-way
Zero position	Closed
Pressure range	0 to 7 bar
Nominal width per valve	0.7 mm
Flow rate at 6 bar/valve	25 l/min ($\pm$10 %)
Connection	Hose nipple for PE hose 5×1
Media	Compressed air or neutral gases; the medium must be sufficiently maintained: In the case of air, this means: filtered; pore volume: 5 μm
Switching frequency	10 Hz
Service life	10 000 000 switching cycles

LE 4-104-XP1

General data on the electromagnetic compatibility (EMC) of automation devices

Emission	EN 55 011/22 Class A		
Interference immunity			
ESD	EN 61 000-4-2	Contact discharge Air discharge	4 kV 8 kV
RFI	EN 61 000-4-3	AM/PM	10 V/m
Burst	EN 61 000-4-4	Mains/digital I/O Analogue I/O, field bus	2 kV 1 kV
Surge	EN 61 000-4-5	Digital I/O, asymmetrical Mains DC, asymmetrical Mains DC, symmetrical Mains AC, asymmetrical Mains AC, symmetrical	0.5 kV 1 kV 0.5 kV 2 kV 1 kV
Line-conducted interference	EN 61 000-4-6	AM	10 V

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