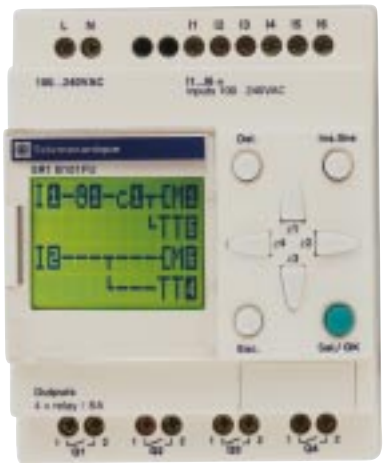
Telemecanique
Zelio,Logic module

Catalogue
February
2000



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"Zelio Logic" smart relay

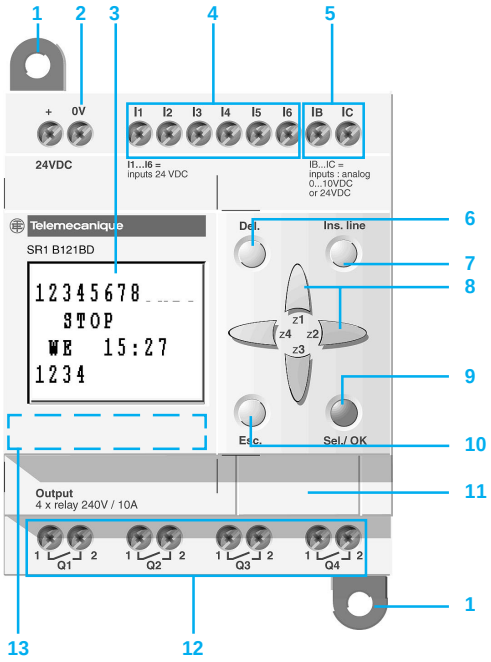
Summary

Presentation, description

Presentation

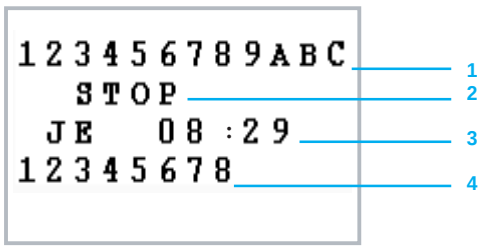
- The “Zelio Logic” smart relay is designed for use in small automated systems.
- It is suitable both for use in industrial sectors and commercial premises.
- Its compactness and ease of setting-up provides a competitive alternative to basic cable logic or specific card solutions.
- The ease of programming, ensured by the universality of the contact language, meets all automation requirements and also, the needs of the electrician.

Description



1 Retractable fixing lugs
2 Screw terminal supply connections
3 4 line, 12 character, LCD display
4 Screw terminal input connections
5 Screw terminal 0 – 10 V analogue input connections, suitable for discrete ⎓ 24 V
(only applicable to SR1-B●●●BD)
6 Cancellation button
7 Line insertion button
8 Navigation keys or Z button following configuration
9 Selection and validation button
10 Escape button (ESC.)
11 Slot for memory back-up and for transfer from one product to another (optional) or for smart relay/PC connecting cable
12 Screw terminal output relay connections
13 Location for changeable legends

Main “Zelio Logic” screen

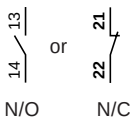
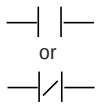


1 Status of inputs indication
2 Smart relay RUN or STOP mode indication
3 Indication of a parameter (date and time by default for smart relays with clock)
4 Status of outputs indication

Programming can be performed locally, using the smart relay keys, or by using “Zelio Soft” software.

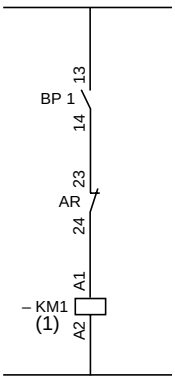
Presentation, description (continued)

Contact language

Function	Electrical scheme	Ladder language	Zelio smart relay symbol	Notes
Contact			Ix or ix	I corresponds to the real image of the contact connected to the input of the module. i (or I) corresponds to the reversed image of the contact connectd to the input of the module.
Standard coil			Qx	The coil is energised when the contacts to which it is connected are closed.
Latch coil (Set)			SQ	The coil is energised when the contacts to which it is connected are closed. It remains tripped when the contacts re-open.
Unlatch coil (Reset)			RQ	The coil is de-energised when the contacts to which it is connected are closed. It remains inactive when the contacts re-open.

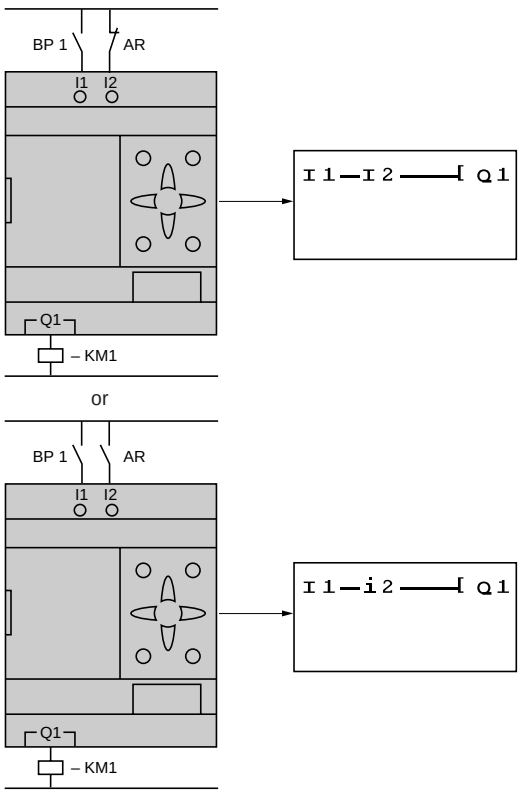
Example

Cabled logic



(1) KM1 = Q1

2 alternatives with Zelio module

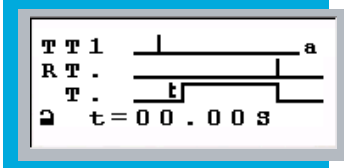


Functions

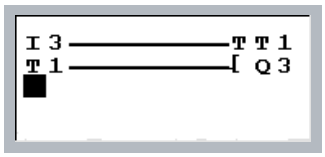
Functions

The “Zelio Logic” smart relay comprises :
- 8 **Time delay function** blocks, each with 8 choices of parametering,
- 8 **Counter function** blocks,
- 8 **Analogue function** blocks, each with 7 choices of comparator parametering,
- 4 **Clock function** blocks, each comprising 4 channels.

Time delay function block

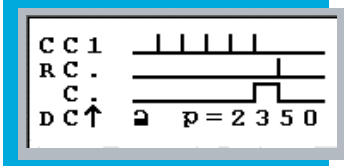


TT● : time delay control input
RT● : time delay reset to zero
T● : time delay output
a : Zelio symbol/type of time delay
s : time base
t 00.00 : time delay value
🔒 : locking of time delay value

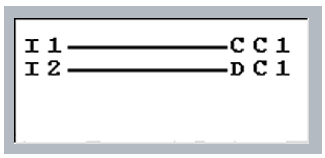


When inputting data to the **time delay function** block TT1, a window automatically opens for the inputting of the various parameters.

Counter function block

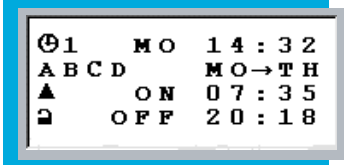


CC● : counting input
RC● : counter reset to zero
C● : counter output
DC● : count up/down selection
p : preset value
🔒 : locking of preset counter value

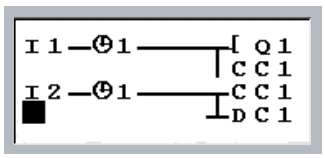


In the first programming line, each pulse at input I1 increases or decreases the counter C1.
Input I2 determines the counting direction, either up or down.

Clock function block



⏲1 : clock block output
ABCD : time zones
MO 14 : 32 : current date and time
MO –>TH : first day/last day
ON : start time
OFF: off time
🔒 : locking of time zones



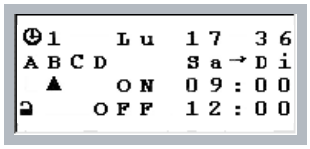
The insertion of the clock block enables a change of state of output Q1 in accordance with the preset time zones.

Programming example with 2 time zones

Channel A time zone

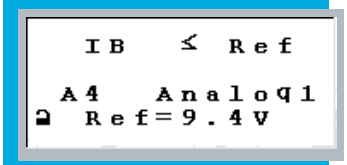
From Monday to Friday, the active time zone will be from 8 : 00 (ON) until 21 : 00 (OFF).

Channel B time zone



For Saturday and Sunday, the active time zone will be from 9 : 00 (ON) until 12 : 00 (OFF).

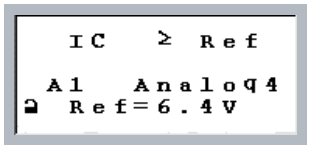
Analogue function block



A4 : analogue block output
Ref : reference voltage
IB ≤ Ref : type of operation available

🔒 : locking of analogue block reference value

The analogue function block controls output Q 4 according to the resulting comparison.

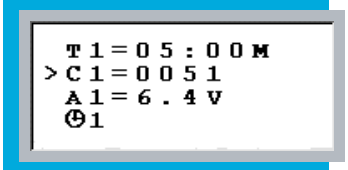


In this example, output Q 4 changes state when the value of the analogue input IC is greater than the 6.4 V reference voltage.

Functions (continued)

Modes

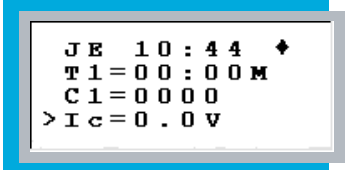
Parametering mode

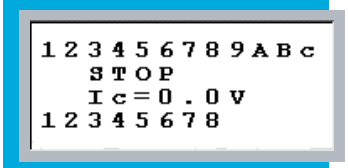


This mode centralises all the parameters relating to unlocked function blocks that are used in the programme. Any of these parameters can be modified.

In this example, the user can modify :
- the preset time delay value T1,
- the preset counter value C1,
- the reference voltage of analogue block A1,
- the parameters of clock block n°1 (date, time zones).

Display mode





This mode enables display of the current values of the various function blocks used in the programme. It is also possible to select one of these values for display on the screen instead of the date and time.

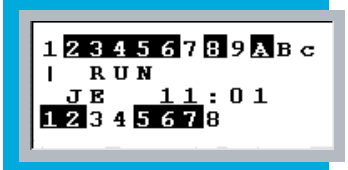
In this example, the user has the option of displaying the current values of :
- the time delay T1,
- the analogue input IC,
- the counter C1.

The value IC has been selected for being permanently displayed on the main screen instead of the date and time.

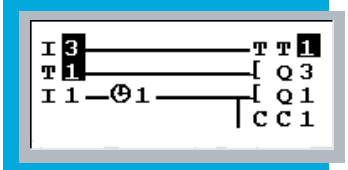
Diagnostic mode

This mode is accessible after the Zelio smart relay is set to RUN.

Main screen



Programming screen



Transfer to programming mode provides indication of all the active and inactive elements of the programme. All active elements appear in reversed colours.

Characteristics

Environmental characteristics

Product certifications				UL, CSA
Degree of protection				IP 20
Temperature		Operation	°C	0...+ 55 conforming to IEC 68-2-1 and 68-2-2
		Storage	°C	- 25...+ 70 (conforming to IEC 1131-2)
Maximum relative humidity			%	95 without condensation or dripping water
Altitude			m	0…2000
Mechanical resistance		Immunity to vibration		Conforming to standard IEC 68-2-6, test Fc
		Immunity to mechanical shock		Conforming to standard IEC 68-2-27, test Ea
Resistance to electrostatic discharges		Immunity to electrostatic discharges		Conforming to standard IEC 61000-4-2, level 3 (1)
Resistance to HF interference		Immunity to electromagnetic radiated fields		Conforming to standard IEC 61000-4-3, level 3 (1)
		Immunity to rapid, pulsed, transients		Conforming to standard IEC 61000-4-4, level 3 (1)
		Immunity to surges		Conforming to standard IEC 61000-4-5
		Immunity to damped oscillatory waves		Conforming to standard IEC 61000-4-12

Supply characteristics

Module type				**SR1-●●●1BD**	**SR1-●●01FU**
Primary	Voltage	Nominal	**V**	⎓ 24	∿ 100...240
		Limits (including ripple)	**V**	⎓ 19.2…30 V	∿ 85…264
	Frequency	Nominal (limits)	**Hz**	–	50-60 (47-63)
	Current	Nominal of input	**mA**	**SR1-●1●1BD** : 67 **SR1-●201BD** : 143	**SR1-●101FU** : ∿ 100 V ≤ 50, ∿ 240 V ≤ 27 **SR1-●201FU** : ∿ 100 V ≤ 80, ∿ 240 V ≤ 40
	Heat dissipation	Nominal of input	**W**	**SR1-●1●1BD** : 1.6 **SR1-●201BD** : 2.9	**SR1-●101FU** : 3 **SR1-●201FU** : 5.3
	Micro-breaks	Acceptable duration		≤ 1 ms, repeated 20 times	≤ 10 ms, repeated 20 times
Isolation	Primary/earth		**V rms**	–	2000/50-60 Hz
Protection				Against phase inversion	–

Discrete ⎓ 24 V input characteristics

Module type				**SR1-●●●1BD**	
		Input		**I1 to IA**	**IB and IC**
Connection				Screw terminals	Screw terminals
Nominal values of inputs		Voltage	**V**	24	24
		Current	**mA**	3	0.62
Input switching limit values	At state 1	Voltage	**V**	≥ 15	≥ 9.9
		Current	**mA**	> 1.8	0.16
	At state 0	Voltage	**V**	< 5	< 5
		Current	**mA**	< 0.5	0.08
Input impedance at state 1			**kΩ**	8	38
Configurable response time		State 0 to state 1	**ms**	0.3 (fast)…3 (slow)	3 (non configurable)
		State 1 to state 0	**ms**	0.5 (fast)…5 (slow)	5 (non configurable)
Conformity to IEC 1131-2				Yes, type 1	No
3-wire sensor compatibility				Yes	Yes
Type of input				Resistive	Resistive
Isolation		Between supply and inputs		None	None
		Between inputs		None	None

(1) Minimum level under test conditions defined by the standards.

Characteristics (continued)

AC (∿ 100…240 V) input characteristics

Relay type			**SR1-●●01FU**	
Connection				Screw terminals
Nominal values of inputs	Voltage		**V**	∿ 100…240
	Current	115 V	**mA**	0.65
		240 V	**mA**	1.3
	Frequency		**Hz**	47…63
Input switching limit values	At state 1	Voltage	**V**	≥ 79
		Current	**mA**	≥ 0.4 (for U = 240 V)
	At state 0	Voltage	**V**	< 40
		Current	**mA**	< 0.3
Response time	State 0 to state 1	50/60 Hz	**ms**	45…50 (U = 110 V), 85…90 (U = 240 V)
	State 1 to state 0	50/60 Hz	**ms**	45…50 (U = 110 V), 18…22 (U = 240 V)
Isolation	Between supply and inputs			None
	Between inputs			None

Integral analogue input characteristics

Relay type			**SR1-B●●●1BD**	
Analogue inputs	Number of channels			2
	Voltage range of input		**V**	0…10
	Input impedance		**kΩ**	62.5
	Maximum non destructive voltage		**V**	± 30
Conversion	Resolution			8 bits
	Conversion time			Relay cycle time
	Precision	at 25 °C		± 1.6 % of the full range
		at 60 °C		± 2.9 % of the full range
	Repeat accuracy	at 55 °C		< 0.1 % of the full range
Isolation	Between analogue channel & supply		**V**	None
Cabling distance			**m**	10 maximum with screened cable (sensor non isolated)

Characteristics (continued)

Relay output characteristics (screw terminal connections) (1)

Relay type				**SR1-●1●1BD, SR1-●101FU**	**SR1-●201BD, SR1-●201FU**
Number of outputs	Without common potential			4	8
Operating limit values			**V**	⎓ 5…150, ∿ 24…250	
Contact type				N/O	
Thermal current			**A**	8	
Electrical durability for 500,000 operating cycles	Utilisation category	DC-12	**V**	24	
			A	1.5	
		DC-13	**V**	24 V L/R = 10 ms	
			A	0.6	
		AC-12	**V**	230	
			A	1.5	
		AC-15	**V**	230	
			A	0.9	
Minimum switching capacity	At 5 V minimum voltage		**mA**	10	
Low power switching reliability of contact				17 V - 5 mA Failure rate for 100 million operating cycles : 1	
Maximum operating rate	No-load		**Hz**	10	
	At Ie		**Hz**	0.5	
Mechanical life	In millions of operating cycles			10	
Rated impulse withstand voltage	Conforming to IEC 947-1		**kV**	2.5	
Response time	Trip		**ms**	10	
	Reset		**ms**	5	
Incorporated protection	Against short-circuit			None. The use of a protection device (fuse or circuit- breaker) is recommended for each channel or group of channels	
	Against overvoltage and overload			None. Connect in parallel to the terminals of each preactuator an RC, MOV (ZNO) suppression, circuit or an appropriately sized diode for the voltage	
Connection			**mm²**	Screw terminals Tightened using Ø 3.5 screwdriver (tightening torque : 0.6 N.m) - Flexible cable with cable end 1 conductor : 0.14…1.5, cable : AWG26…AWG16 2 conductors : 0.14…0.75, cable : AWG26…AWG18 - Semi flexible cable 1 conductor : 0.14…2.5, cable : AWG26…AWG14 - Solid cable 1 conductor : 0.14…2.5, cable : AWG26…AWG14 2 conductors : 0.14…1.5, cable : AWG26…AWG16	

Processing characteristics

Relay type			**SR1-●1●1BD, SR1-●101FU**	**SR1-●201BD, SR1-●201FU**
Number of control scheme lines			60	80
Maximum cycle time		**ms**	6	8
Response time (2)		**ms**	12 to 24 (**SR1-●1●1BD**) 20 to 40 (**SR1-●101FU**)	14 to 26 (**SR1-●201BD**) 22 to 42 (**SR1-●201FU**)
Back-up time (3)	Day/time	**H**	≥ 72 at 40 °C only applicable to **SR1-B●●●●●**	
Programme memory checking			At each power-up	

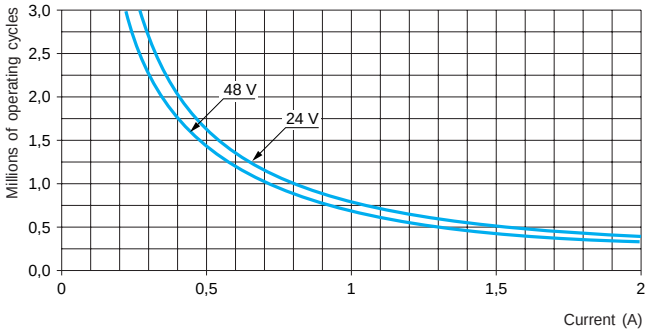
(1) Characteristics at 55 °C for 60 % loading of inputs/outputs or at 45 °C for 100 % loading of inputs/outputs.
(2) Time between change of state of an input and the change of state of an output directly linked by the programme in the same cycle.
(3) In the event of supply failure.

Operating curves

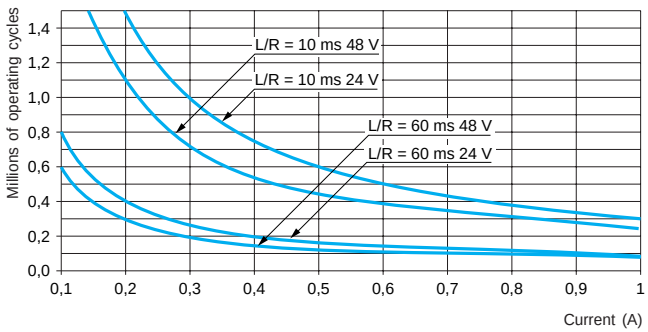
Electrical durability (in millions of operating cycles) (conforming to IEC 947-5-1)

d.c. loads

DC-12 (1)

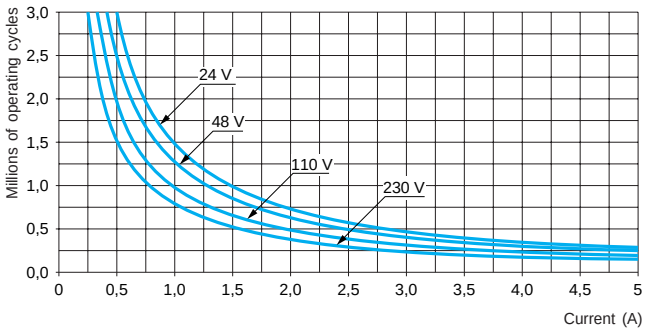


DC-13 (2)

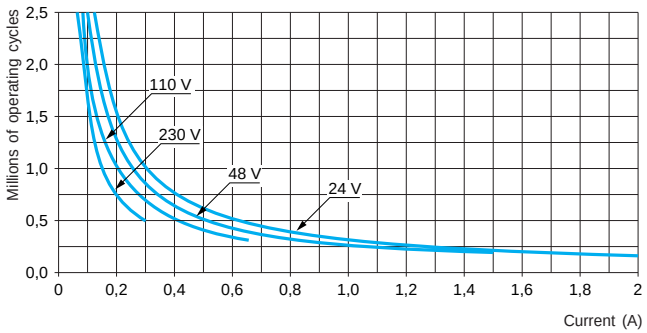


a.c. loads

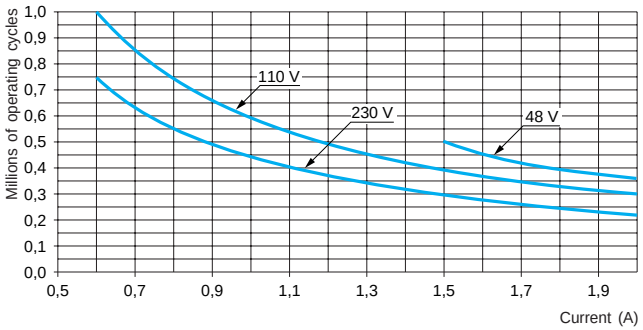
AC-12 (3)



AC-14 (4)



AC-15 (5)



(1) DC-12 : switching resistive loads and photo-coupler isolated solid state loads, L/R ≤ 1 ms.
(2) DC-13 : switching electromagnets, L/R ≤ 2 x (Ue x Ie) in ms, Ue : rated operational voltage, Ie : rated operational current (with protection diode on load, use the DC-12 curves and apply a coefficient of 0.9 to the million of operating cycles value).
(3) AC-12 : switching resistive loads and photo-coupler isolated solid state loads, cos ≥ 0.9.
(4) AC-14 : switching electromagnetic loads whose power drawn with the electromagnet closed is ≤ 72 VA, making : cos = 0.3, breaking : cos = 0.3.
(5) AC-15 : switching electromagnetic loads whose power drawn with the electromagnet closed is > 72 VA, making : cos = 0.7, breaking : cos = 0.4.

References

SR1-●121BD

SR1-●101FU

Smart relays

Number of I/O	Discrete inputs	Relay outputs	Clock	Reference	Weight kg
Supply ⎓ 24 V					
10	6 I ⎓ 24 V	4 O	No	**SR1-A101BD**	0.290
12	8 I ⎓ 24 V (1)	4 O	Yes	**SR1-B121BD**	0.290
20	12 I ⎓ 24 V	8 O	No	**SR1-A201BD**	0.350
	12 I ⎓ 24 V (1)	8 O	Yes	**SR1-B201BD**	0.350
Supply ∿ 100/240 V					
10	6 I ∿ 100/240 V	4 O	No	**SR1-A101FU**	0.290
			Yes	**SR1-B101FU**	0.290
20	12 I ∿ 100/240 V	8 O	No	**SR1-A201FU**	0.350
			Yes	**SR1-B201FU**	0.350

Separate accessory

Description	Reference	Weight kg
EEPROM memory	**SR1-MEM01**	0.001

Documentation

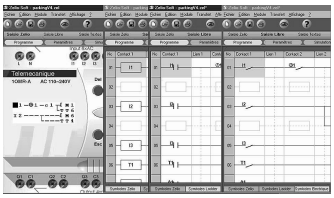
Description	Language	Reference	Weight kg
Users guide	English	**SR1-MAN01EN**	0.100
	French	**SR1-MAN01FR**	0.100
	German	**SR1-MAN01DE**	0.100
	Italian	**SR1-MAN01IT**	0.100
	Spanish	**SR1-MAN01ES**	0.100

(1) 2 configurable analogue inputs.

Description, references (continued)

“Zelio Soft” software

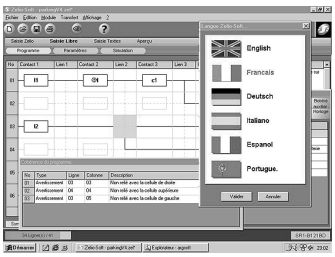
“Zelio Soft” software enables :
- the inputting of control schemes,
- the monitoring of applications, using its intermediate coherence test feature,
- the inputting of messages for display on the “Zelio Logic”,
- simplification of setting-up.



Input modes for control schemes

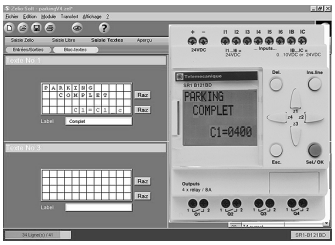
The “Zelio input” mode enables the user, having directly programmed the Zelio smart relay, to yet again find the same ergonomics, even when using the software for the first time.
The “free input” mode, which is more intuitive, is very user friendly and incorporates several additional features.
Using Zelio Soft in “free mode” enables the user to select their preferred symbol language from the following 3 alternatives :
- Zelio symbols,
- Ladder symbols,
- electrical symbols.

The “free input” mode also enables the creation of mnemonics and notes associated to each line of the programme.
Instant switching between one input mode and another is simply obtained by clicking the mouse.



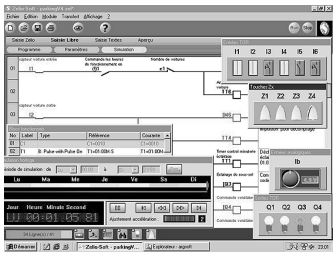
Coherence test and applicative language

The coherence test feature of Zelio Soft monitors the applications and the slightest input error will result in it turning red. A mouse click is all that is required to locate the problem.
At any instant, Zelio Soft can be switched between 6 applicative languages (English, French, German, Italian, Portuguese and Spanish) and also, to the editing of the application file in the selected language. It enables selection of the representation mode (Zelio, Ladder or electrical) for editing the file.



Inputting messages for display on Zelio Logic

Zelio Soft allows 4 Text function blocks to be configured, corresponding to 4 screens of 4 lines x 12 characters, which can be displayed on all the smart relays. These screens are activated in the same simple manner as a coil in the control scheme. It is then possible to display messages as text only or to associate them with 1 or 2 variables, the latter being current values and/or setting of function blocks used in the programme.



Simplification of setting-up

The Zelio Soft simulator enables testing of all the programmes, i.e. :
- activating the discrete inputs and their N/O or N/C contact modes (fleetingly and permanent),
- indicating the output states,
- varying the voltage of the analogue inputs IB and IC,
- activating the pushbuttons,
- simulating the application programme in real time and accelerated time,
- dynamically indicating in red the various active elements of the programme.

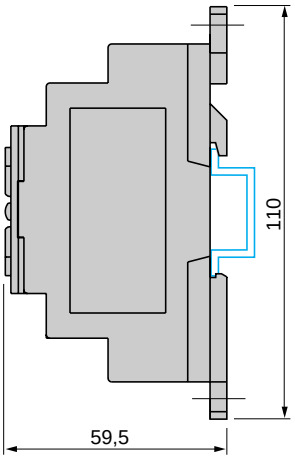
References

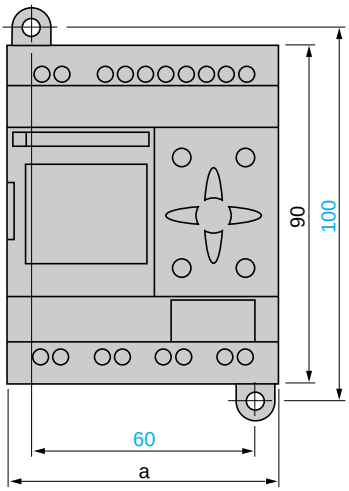
Description	Reference	Weight kg
Smart relay - PC connecting cable length 1.8 m	**SR1-CBL01**	0.350
Kit comprising : - “Zelio Soft” autonomous programming software, - cable.	**SR1-KIT01**	0.500
“Zelio Soft” programming software	**SR1-SFT01**	0.150

Dimensions, schemes

Dimensions

Smart relays SR1-●●●1●●

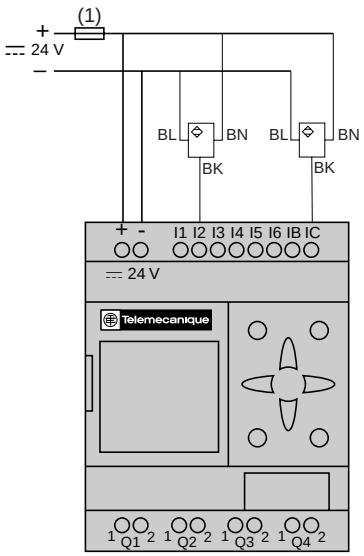




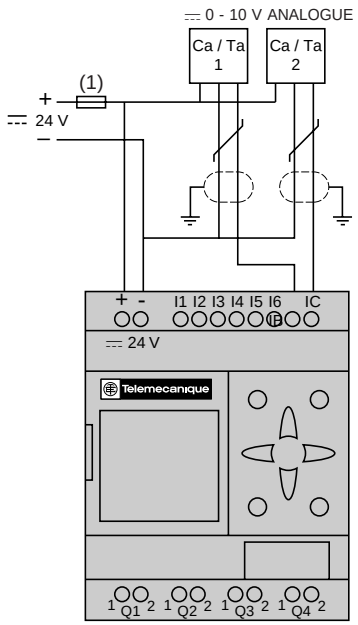
	a
SR1-●1●●●●	72
SR1-●2●●●●	126

Schemes

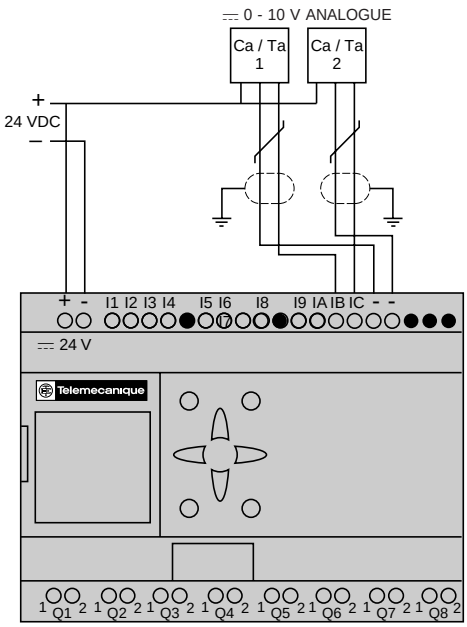
3-wire sensor
on SR1-●●●1BD



Analogue inputs
on SR1-●101BD



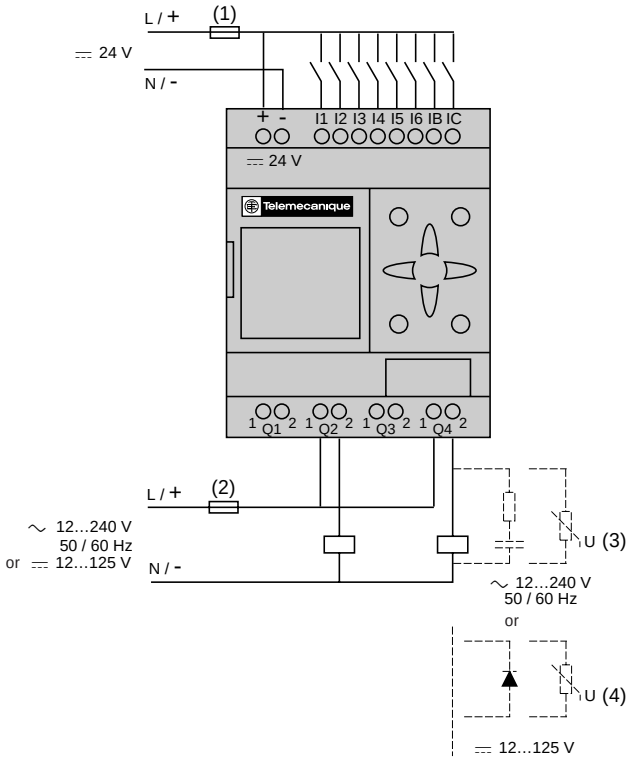
on SR1-●201BD



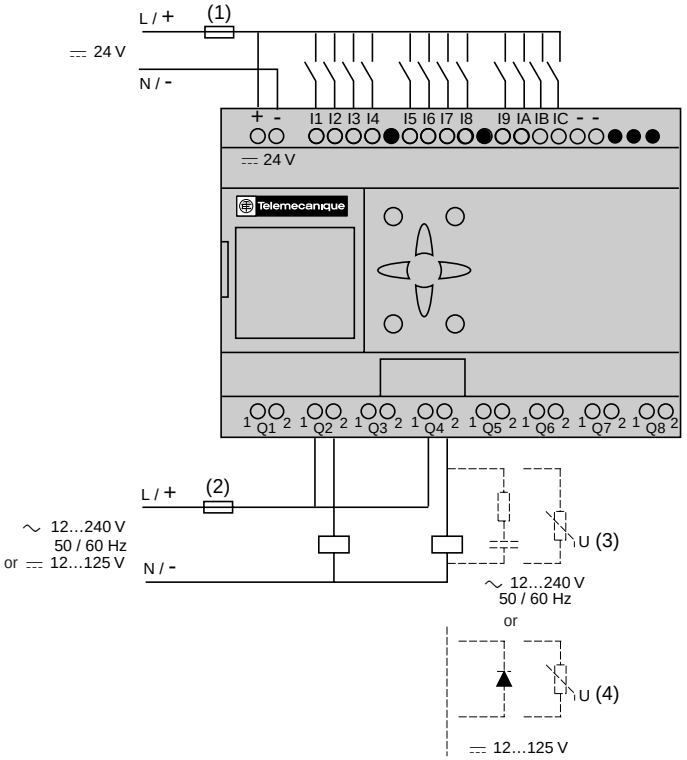
(1) 1 A ultra fast fuse or circuit-breaker.

Schemes

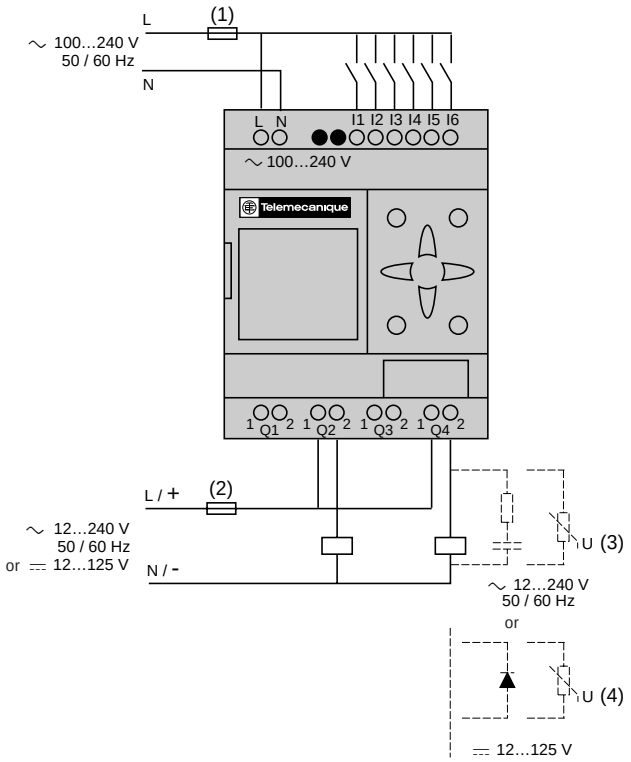
SR1-●101BD



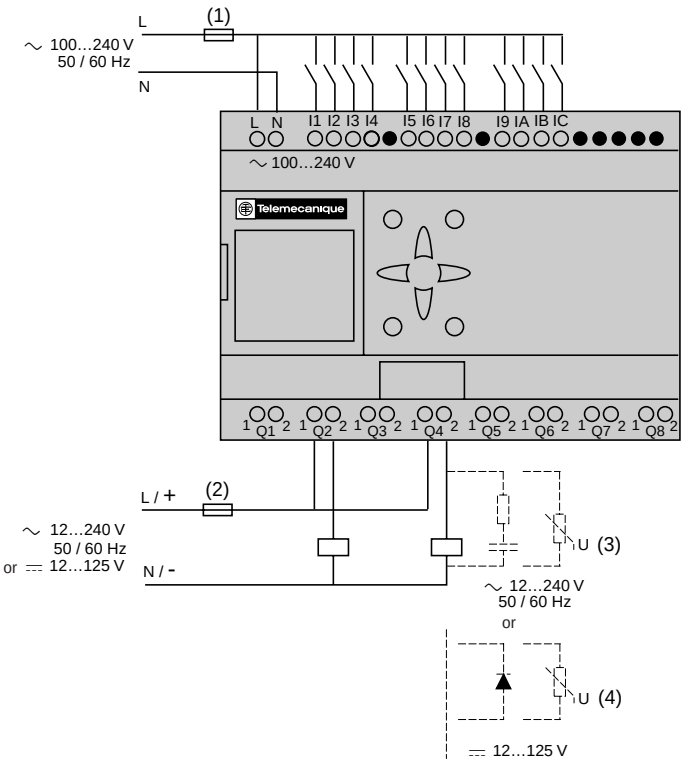
SR1-●201BD



SR1-●101FU



SR1-●201FU



(1) 1 A ultra fast fuse or circuit-breaker.
(2) 16 A fuse or circuit-breaker (B16).
(3) Resistive load.
(4) Inductive load.

Telemecanique

Zelio Logic, un simple passage vers *la logique*.

Zelio Logic, a simple path to *the logic*

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d’un cordon et d’un produit
(SR1B121BD)

Pack alimentation ∿ 240V
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composé d’un logiciel,
d’un cordon et d’un produit
(SR1B101FU)

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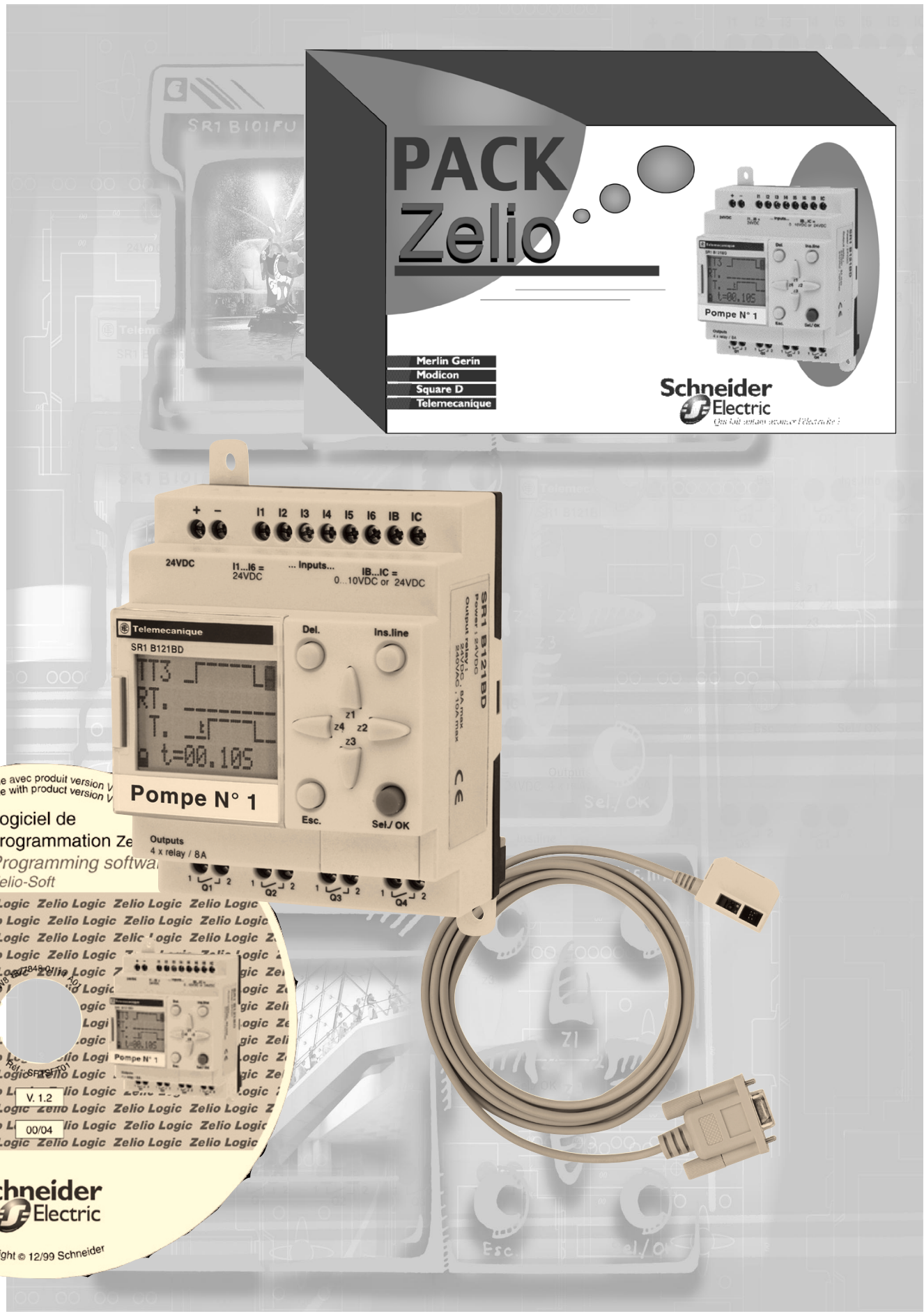
SR1PACKBD
including a software,
a cable and a product
(SR1B121BD)

Supply Pack ∿ 240V
SR1PACKFU
including a software,
a cable and a product
(SR1B101FU)



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We do more with electricity.