

PLC2011A0

<http://www.elkom.com.tw/?section=2&subid=19>

PLC2011B0

<http://www.elkom.com.tw/?section=2&subid=20>

PLC2011C0

<http://www.elkom.com.tw/?section=2&subid=21>

Intelligent house

Intelligent building

Home automation

Industrial control

Building automation

1-Wire, RS232, RS485, DS18B20

USB, ETHERNET, DMX512, DS18S20

HVAC, lighting control, DS1822

BMS CIRCUIT DIAGRAMS !

Flood sensors, fire sensors

C#, C++, Delphi DLL library

LabVIEW importable C# DLL

Astronomical clock / timer

AES256 encrypted transmission

Alarm system

Timestamping and salting

Motion sensors and detectors

Home Automation - How To Get Started

Building a Home Automation and Security System

How to Wire Your Home for Automation

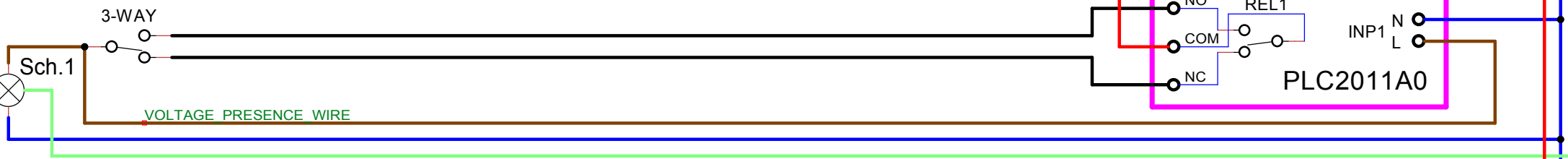
SHA256 hashing

**Monitoring via a smartphone
Internet operated from smartphone**

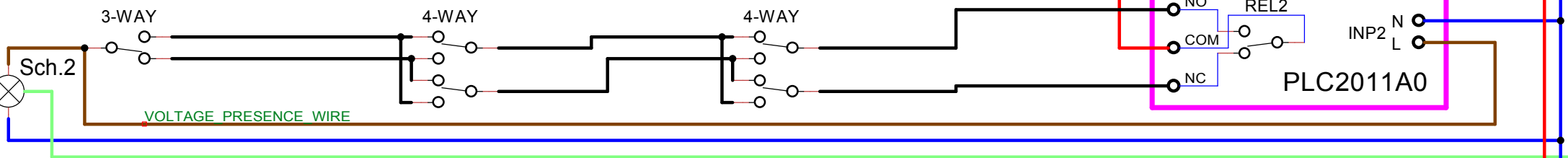
PLC2011A0 fail safe circuit diagrams. PLC failure will not bring down the light.

http://en.wikipedia.org/wiki/Multiway_switching

"NO", "LIKELY bistable", Smartphone / PC / DLL comands: ISL ICL. This circuit will consume 0.5W more power if the internal relay is turned on.

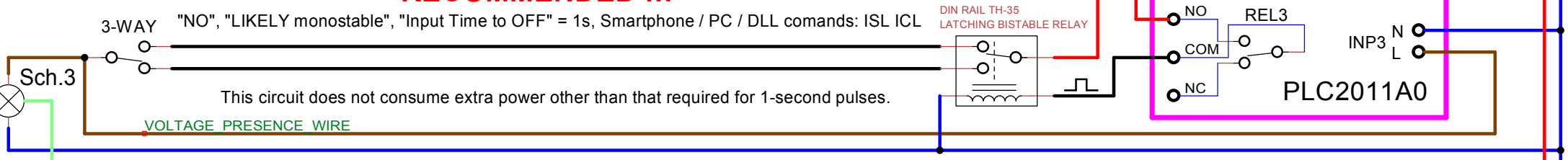


"NO", "LIKELY bistable", Smartphone / PC / DLL comands: ISL ICL. This circuit will consume 0.5W more power if the internal relay is turned on.



RECOMMENDED !!!

<http://en.wikipedia.org/wiki/Relay>

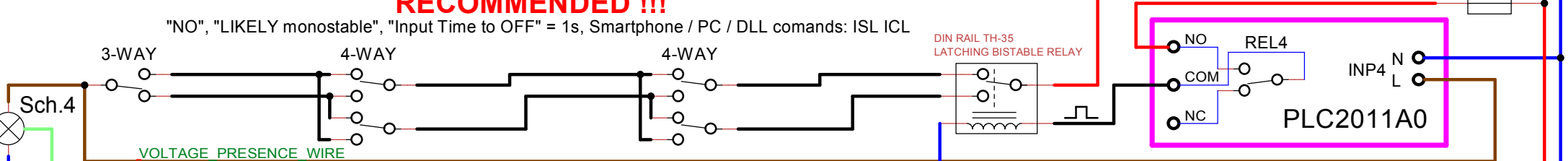


"NO", "LIKELY monostable", "Input Time to OFF" = 1s, Smartphone / PC / DLL comands: ISL ICL

This circuit does not consume extra power other than that required for 1-second pulses.

RECOMMENDED !!!

<http://en.wikipedia.org/wiki/Relay>



"NO", "LIKELY monostable", "Input Time to OFF" = 1s, Smartphone / PC / DLL comands: ISL ICL

This circuit does not consume extra power other than that required for 1-second pulses.

Live / HOT / 110 - 240VAC
NEUTRAL

EARTH / GROUND / PE

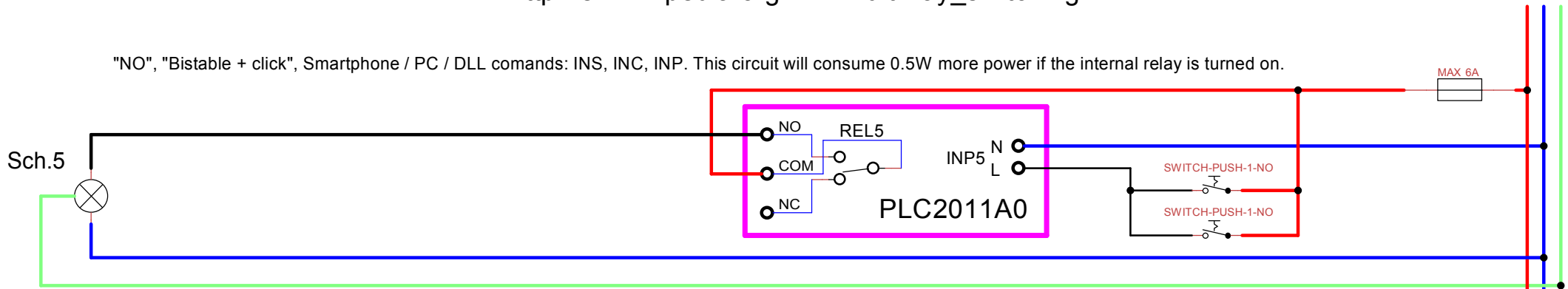
RCD

MAIN FUSE

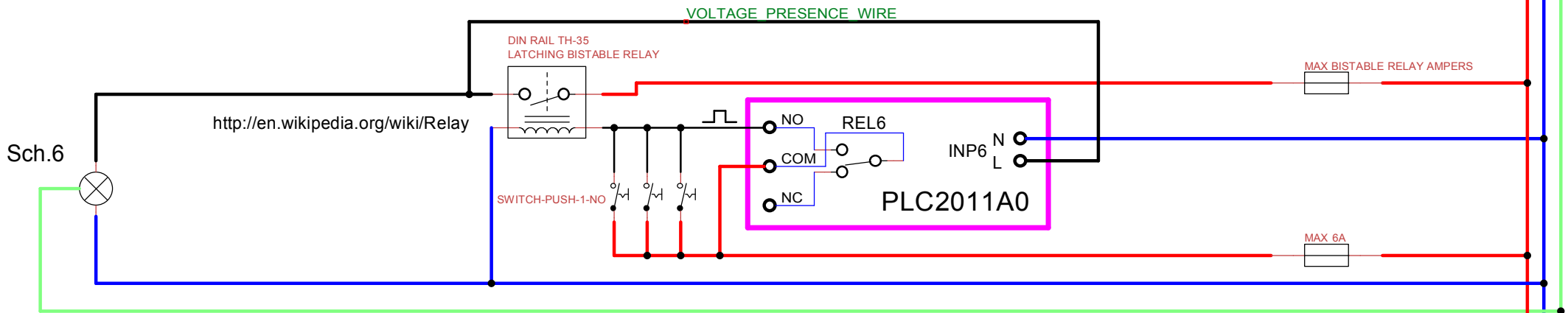
PLC2011A0 other circuits

http://en.wikipedia.org/wiki/Multiway_switching

"NO", "Bistable + click", Smartphone / PC / DLL comands: INS, INC, INP. This circuit will consume 0.5W more power if the internal relay is turned on.

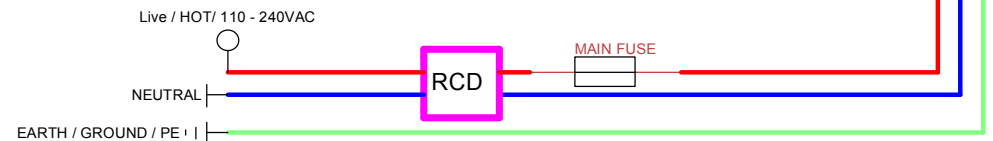


"NO", "LIKELY monostable", "Input Time to OFF" = 1s, Smartphone / PC / DLL comands: ISL ICL
This circuit does not consume extra power other than that required for 1-second pulses.

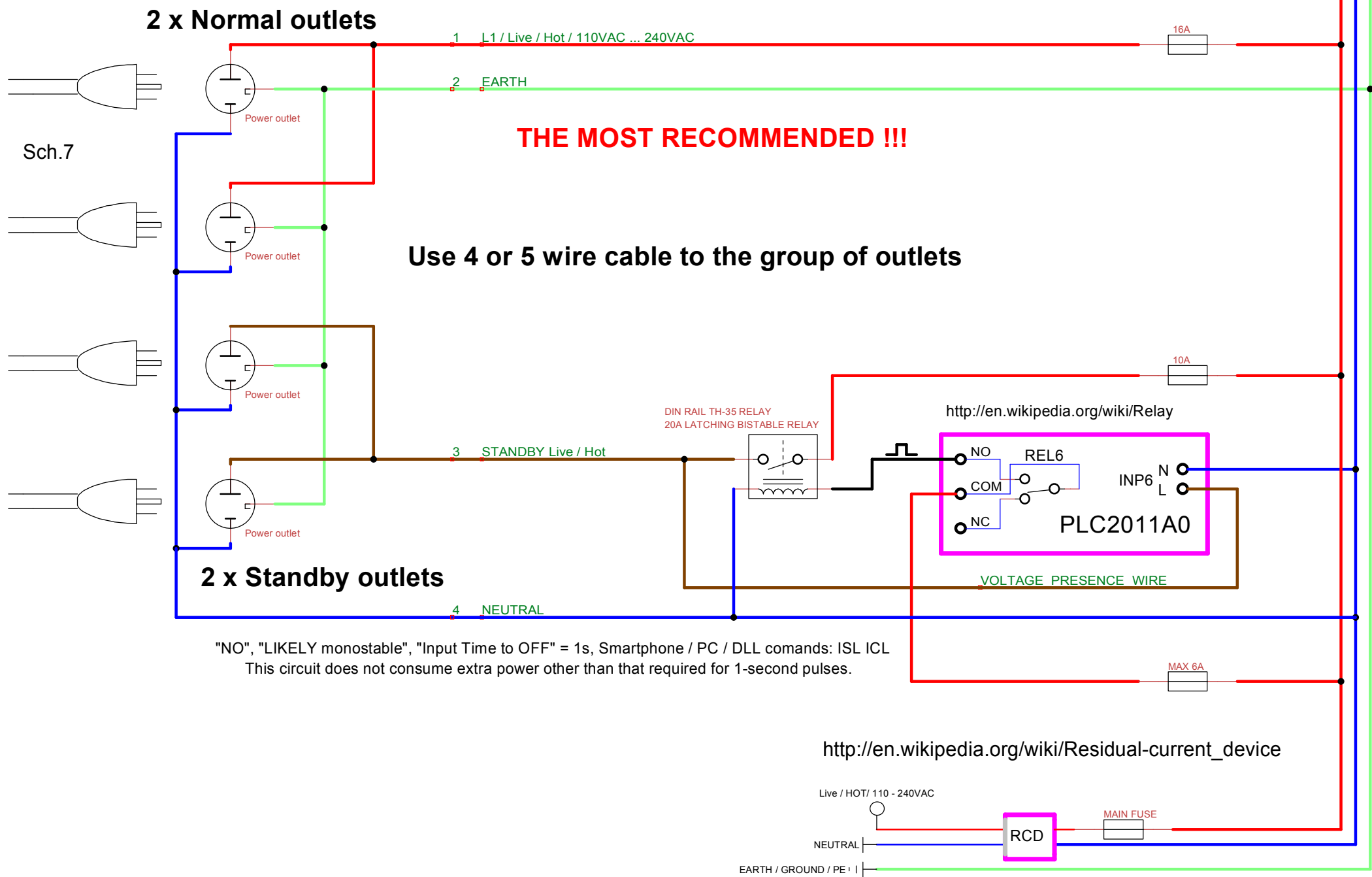


ON / OFF "Likely" means conditionally and depends on the state of the input.
"Likely" is applicable when sending commands with the "Likely" suffix and
"LIKELY monostable" or "LIKELY bistable" mode of operation is selected and
the "VOLTAGE PRESENCE WIRE" is used.

http://en.wikipedia.org/wiki/Residual-current_device

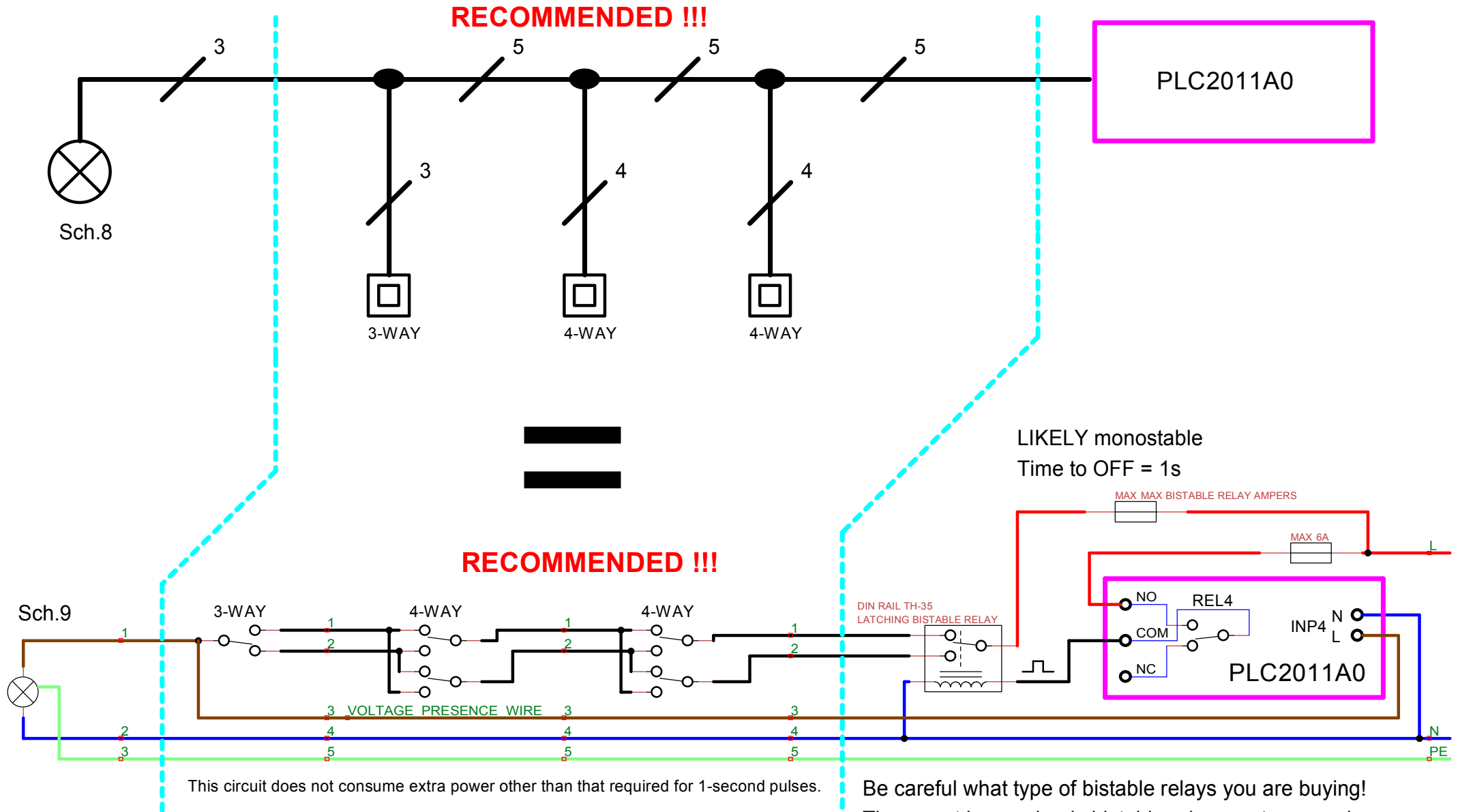


PLC2011A0 other circuits - power outlets - example



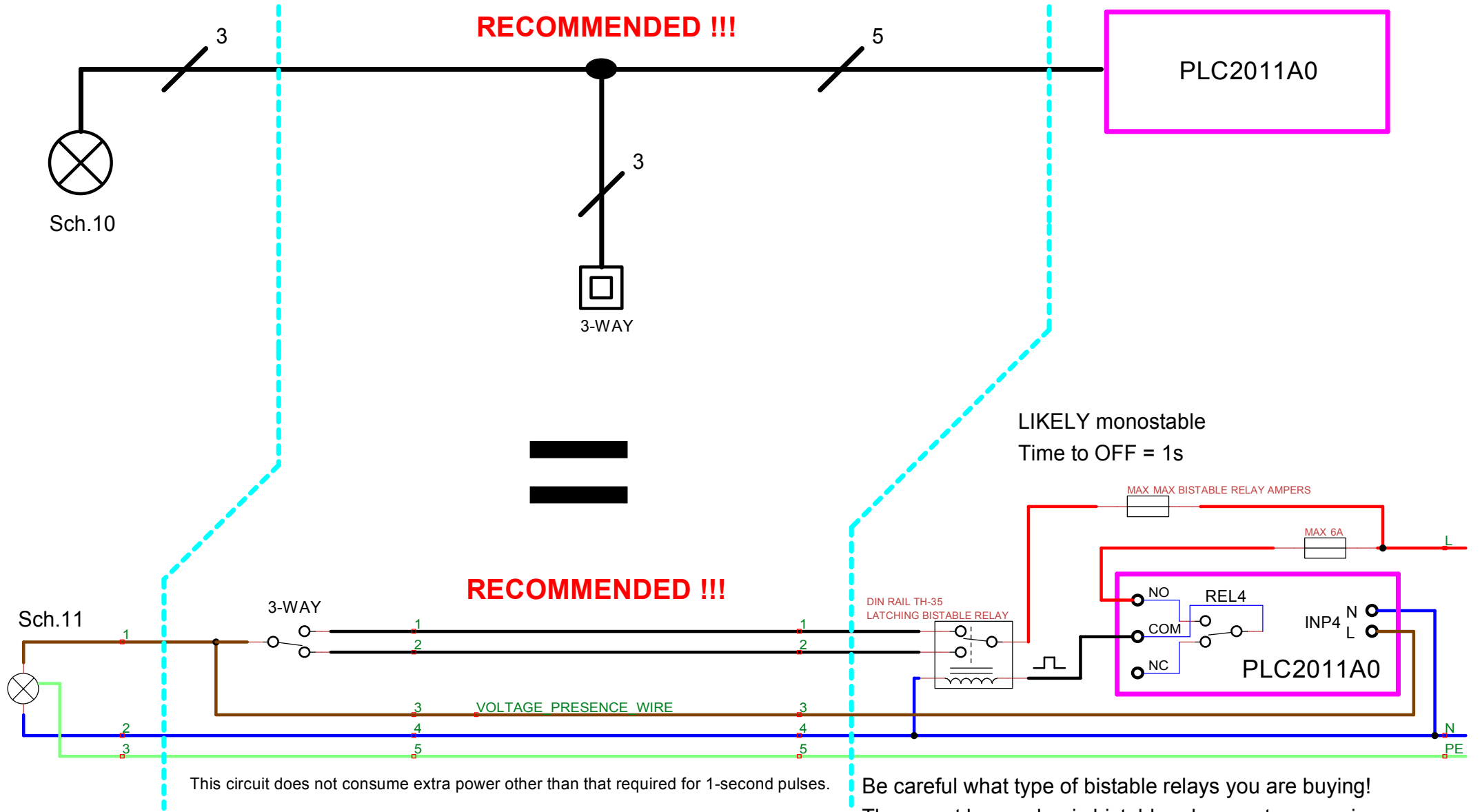
"NO", "LIKELY monostable", "Input Time to OFF" = 1s, Smartphone / PC / DLL comands: ISL ICL
This circuit does not consume extra power other than that required for 1-second pulses.

PLC2011A0 fail safe circuit - RECOMMENDED FOR BUILDING AUTOMATION !!!



Be careful what type of bistable relays you are buying!
They must be mechanic bistable relays, not consuming power.
They must sink 0.00 Watts of energy during standby.
Beware of electronic, so called "bistable" relays!

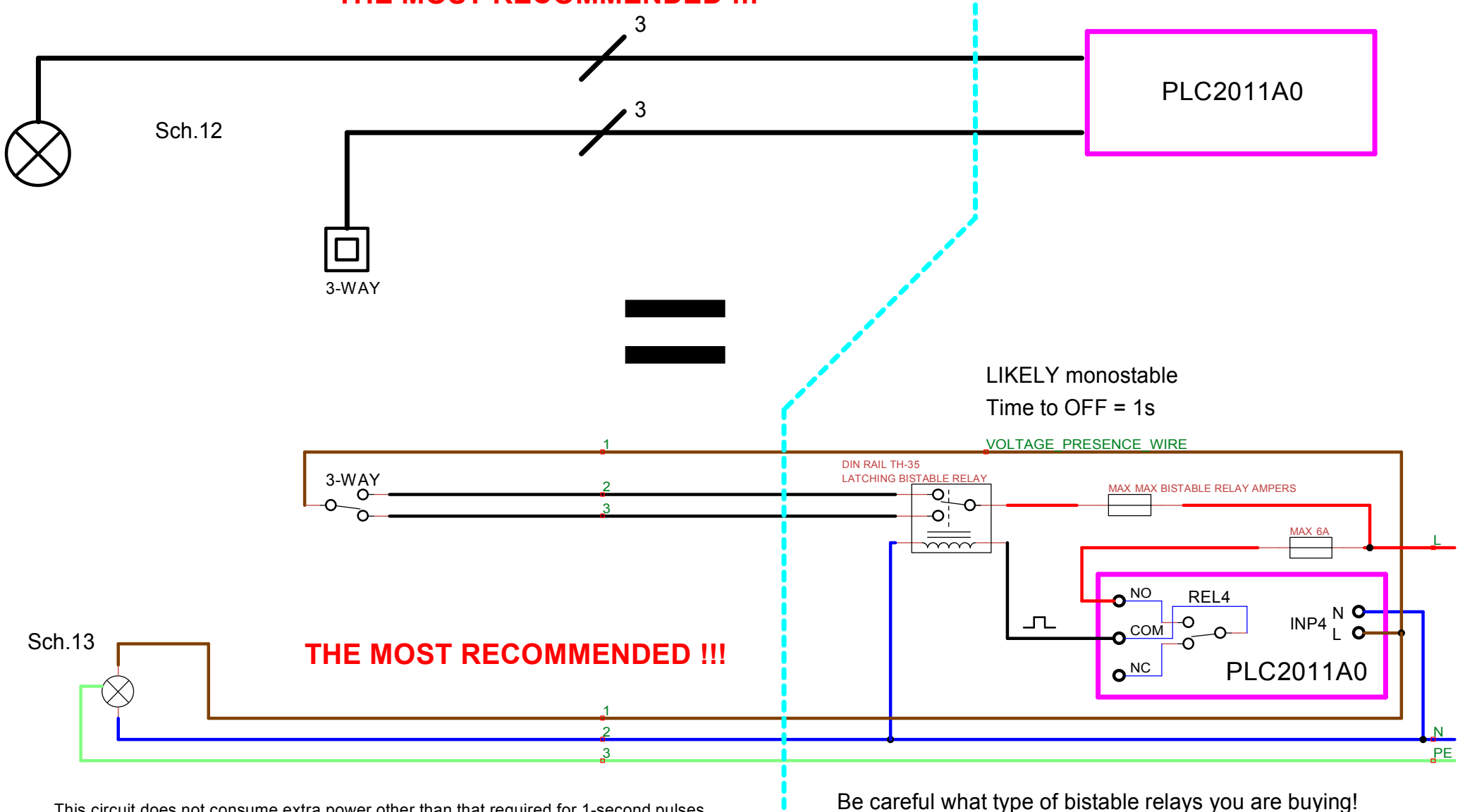
PLC2011A0 fail safe circuit - RECOMMENDED FOR BUILDING AUTOMATION !!!



Be careful what type of bistable relays you are buying!
 They must be mechanic bistable relays, not consuming power.
 They must sink 0.00 Watts of energy during standby.
 Beware of electronic, so called "bistable" relays!

PLC2011A0 fail safe circuit - RECOMMENDED FOR BUILDING AUTOMATION !!!

THE MOST RECOMMENDED !!!



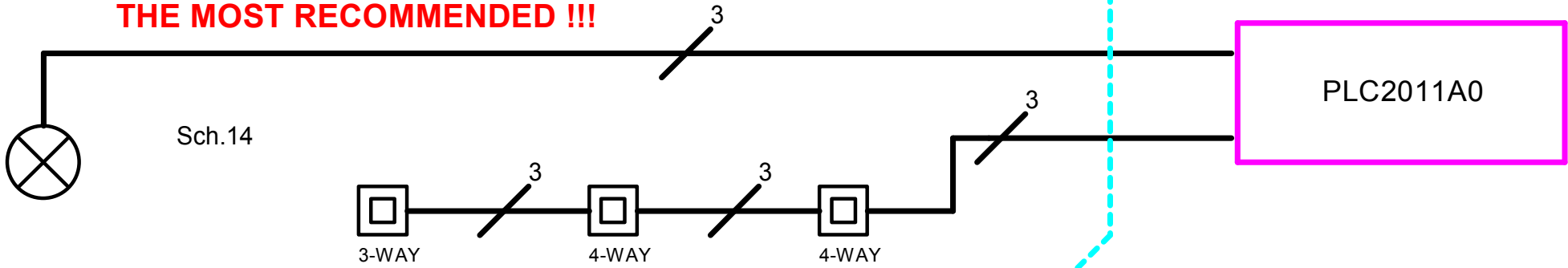
THE MOST RECOMMENDED !!!

This circuit does not consume extra power other than that required for 1-second pulses.

Be careful what type of bistable relays you are buying!
They must be mechanic bistable relays, not consuming power.
They must sink 0.00 Watts of energy during standby.
Beware of electronic, so called "bistable" relays!

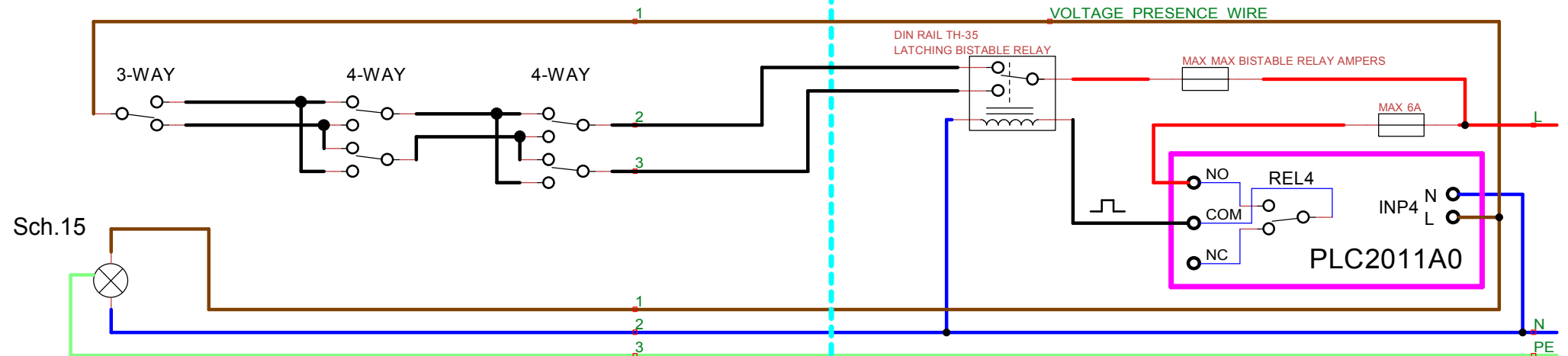
PLC2011A0 fail safe circuit - RECOMMENDED FOR BUILDING AUTOMATION !!!

THE MOST RECOMMENDED !!!



==

THE MOST RECOMMENDED !!!

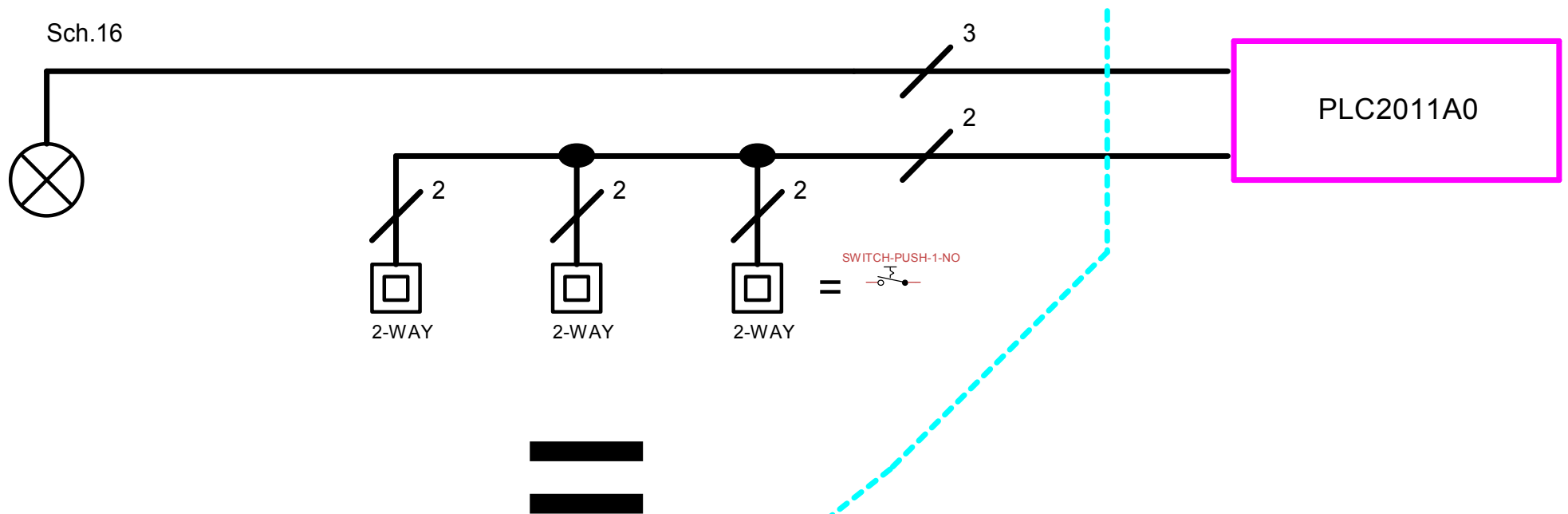


LIKELY monostable
Time to OFF = 1s

This circuit does not consume extra power other than that required for 1-second pulses.

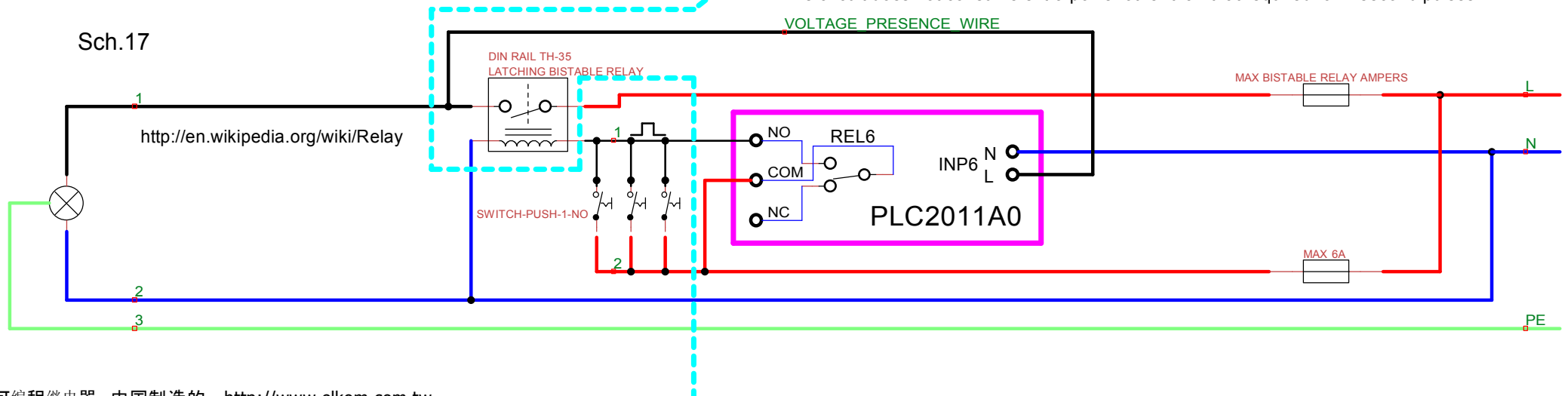
Be careful what type of bistable relays you are buying!
They must be mechanic bistable relays, not consuming power.
They must sink 0.00 Watts of energy during standby.
Beware of electronic, so called "bistable" relays!

PLC2011A0 fail safe circuit - RECOMMENDED FOR BUILDING AUTOMATION !!!

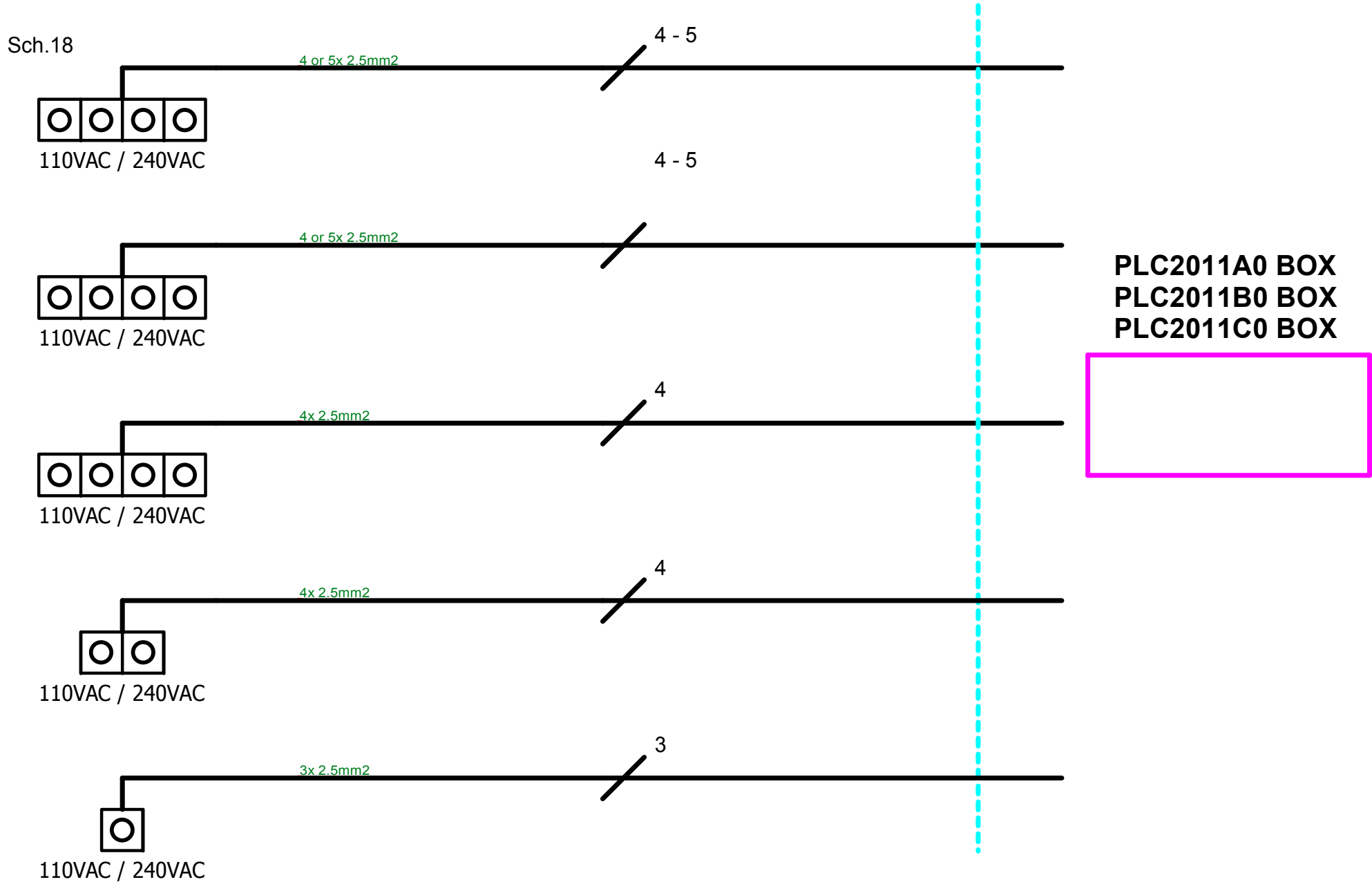


LIKELY monostable
Time to OFF = 1s

"NO", "LIKELY monostable", "Input Time to OFF" = 1s, Smartphone / PC / DLL comands: ISL ICL
This circuit does not consume extra power other than that required for 1-second pulses.

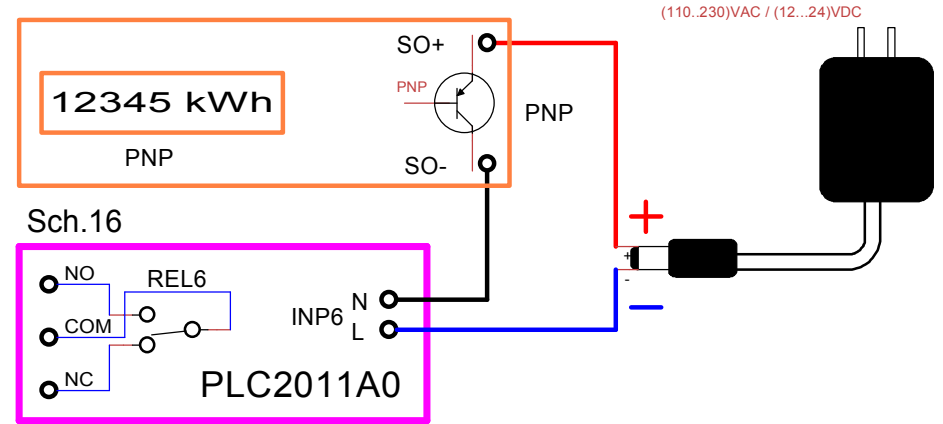
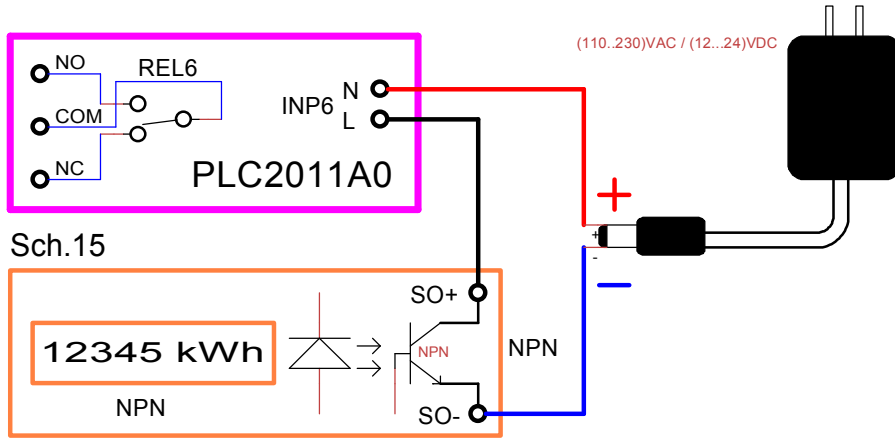


PLC2011A0 other circuits - power outlets - example



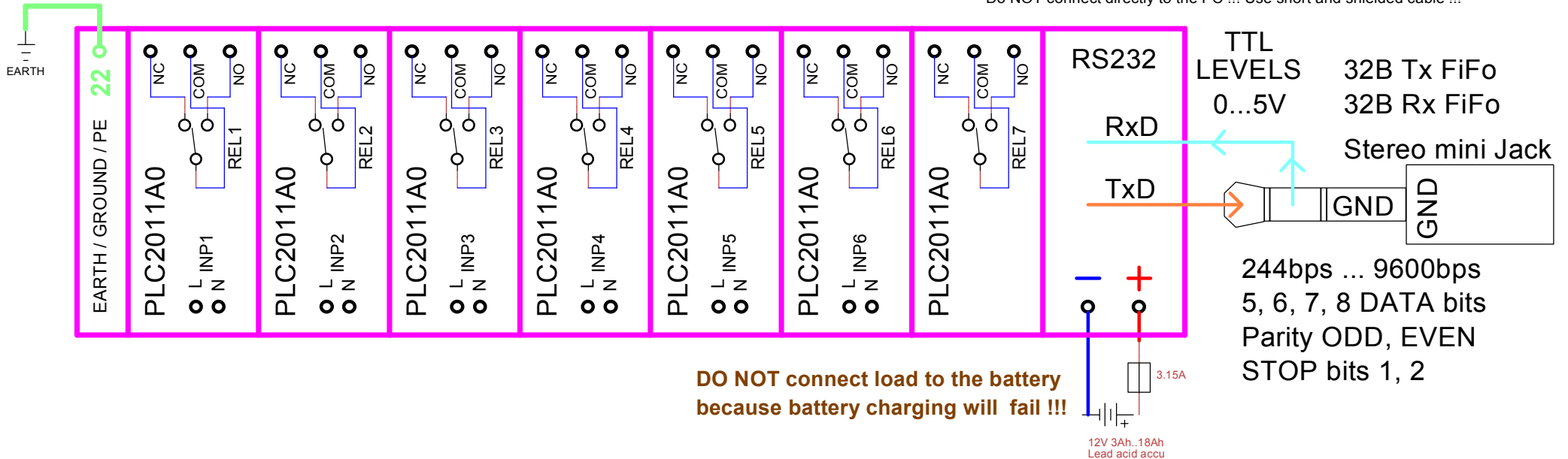
PLC2011A0 other circuits

Connecting pulse counters / power meters and similar devices with NPN or PNP transistor output
 PLC2011A0 input must be low voltage type. Use only external, additional power supply unit.
 Don't use any extra resistors. They are already inside PLC2011A0 (~5k)
 Never use PLC's power supply unit nor PLC's accu / battery as a voltage source!

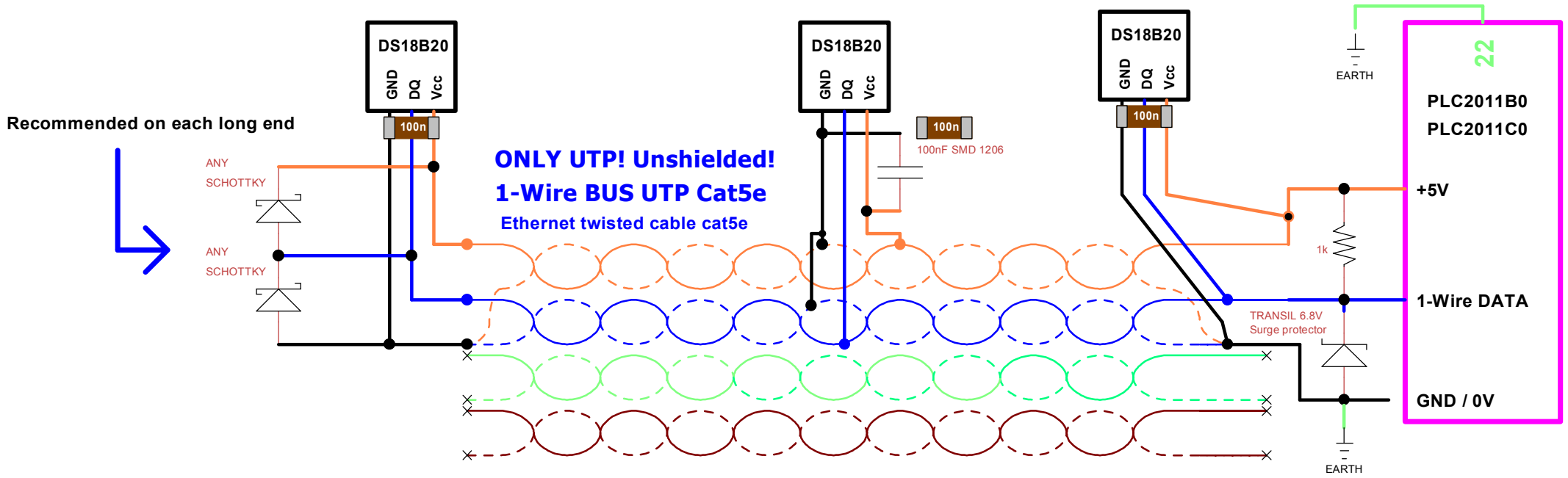


http://en.wikipedia.org/wiki/Shielded_cable

RS232 needs a level converter and a separate power supply for this level converter !!!
 Do NOT connect directly to the PC !!! Use short and shielded cable !!!



Recommended placement of 100nF size:1206 capacitor
Solder directly to "legs"



Leave two remaining pairs of the ethernet Cat5e cable unconnected, floating.
Do not use them for any purpose. Don't ground them nor use them as a power supply
because it will increase capacitive coupling between wires and will reduce reach of the one wire bus.

3 signals: +5V, 1-Wire BUS, 2xGND on any two pairs of wires.
Colors of pairs are not important.
USE: 1-Wire bus and GND in one pair
USE: +5V and GND in another pair

Shielded or unshielded UTP?

Unshielded UTP Cat5e has lower capacitance than shielded Cat5e.

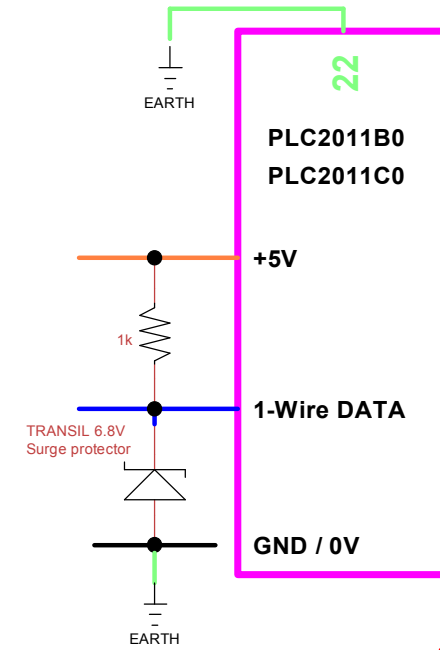
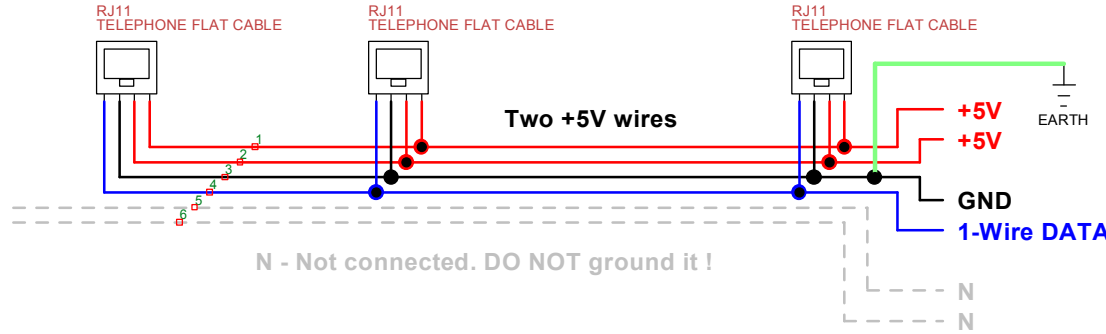
On the other hand Shielded UTP is more immune to the electrical noise than unshielded UTP.

If the environment is quiet and 1-wire cable is far from electric cables then unshielded UTP will give a higher reach than unshielded UTP.

In numbers unshielded UTP in quiet environment and proper topology will allow you to install all 32 thermometers on a long 150-200m cable.

The same but shielded cable will allow only 100m but with higher immunity.

Flat cable gives much lower reach then ethernet CAT5e cable !!!
If telephone type, four/six wire flat cable is used, arrange signal order as follows:
Such cable is not recommended for longer networks.

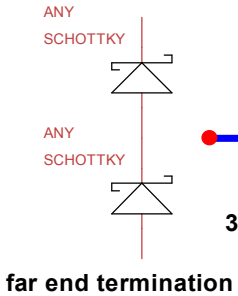


1-Wire BUS UTP Cat5e

1-Wire BUS topology. Do not route separate cable for each sensor!
In general route cable as you want but avoid star topology
Optimize cable length, minimize fanout, avoid subnets
1x32 .. 2x16 sensors to max 4x8 sensors in 4 subnets of the equal lengths

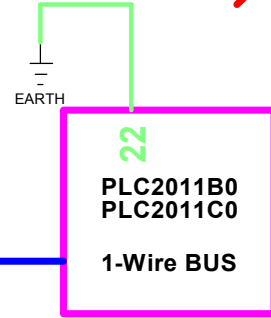
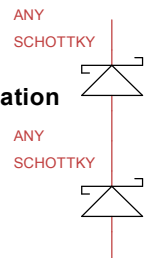
Max total length of the bus 150m

In practice it works up to 200 meters
in quiet enviroments, far from power
cables, inverters, radio transmitters.



3m stubs acceptable

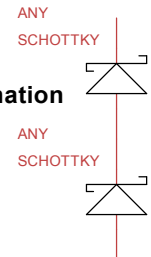
far end termination



3m stubs acceptable

3m stubs acceptable

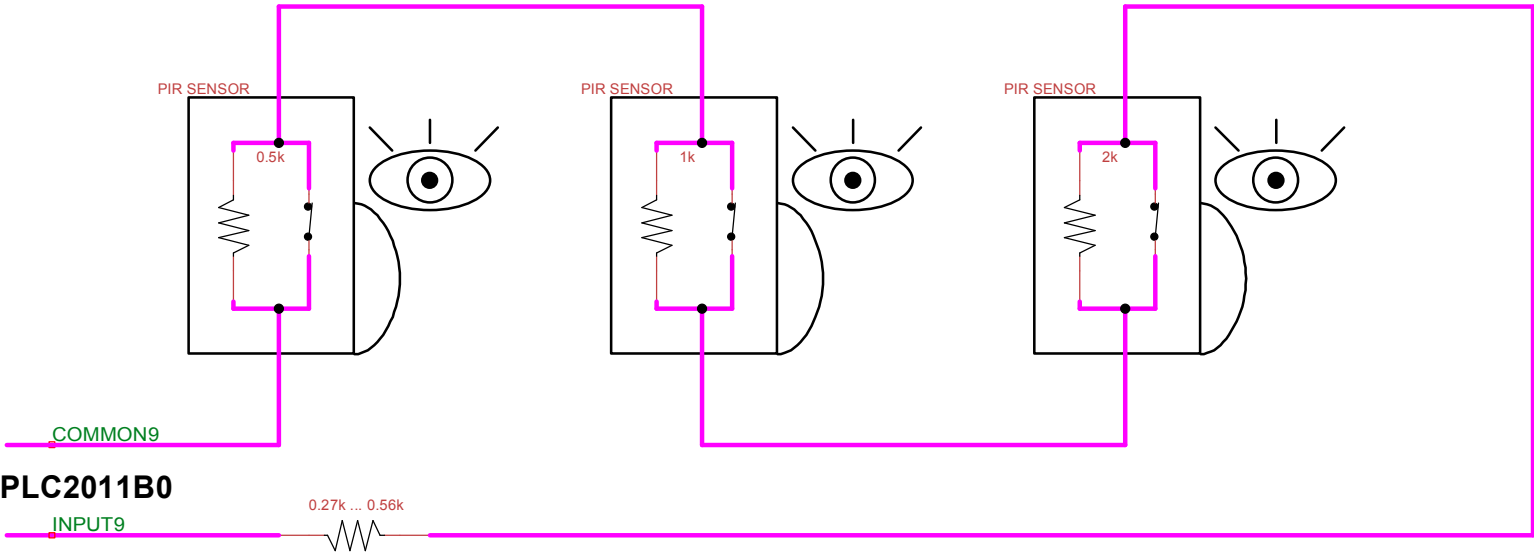
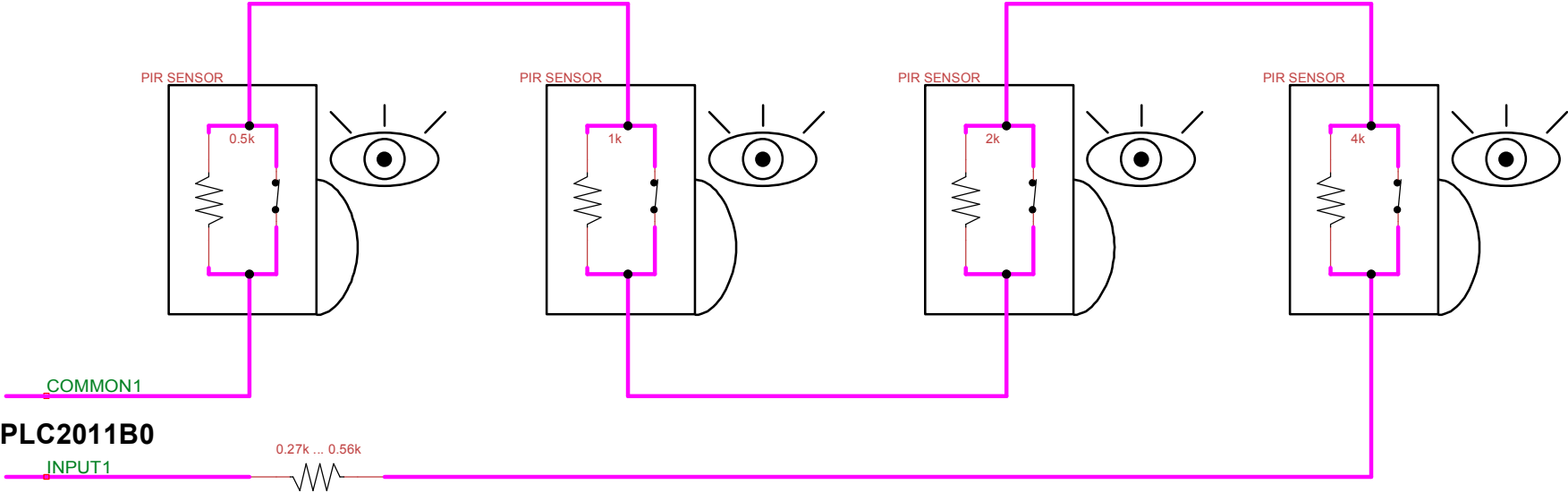
far end termination



PLC2011B0 circuits ALARM SENSORS

ALL switches and sensors are NC

Avoid mixing PIR sensors with Windows for further clarity !



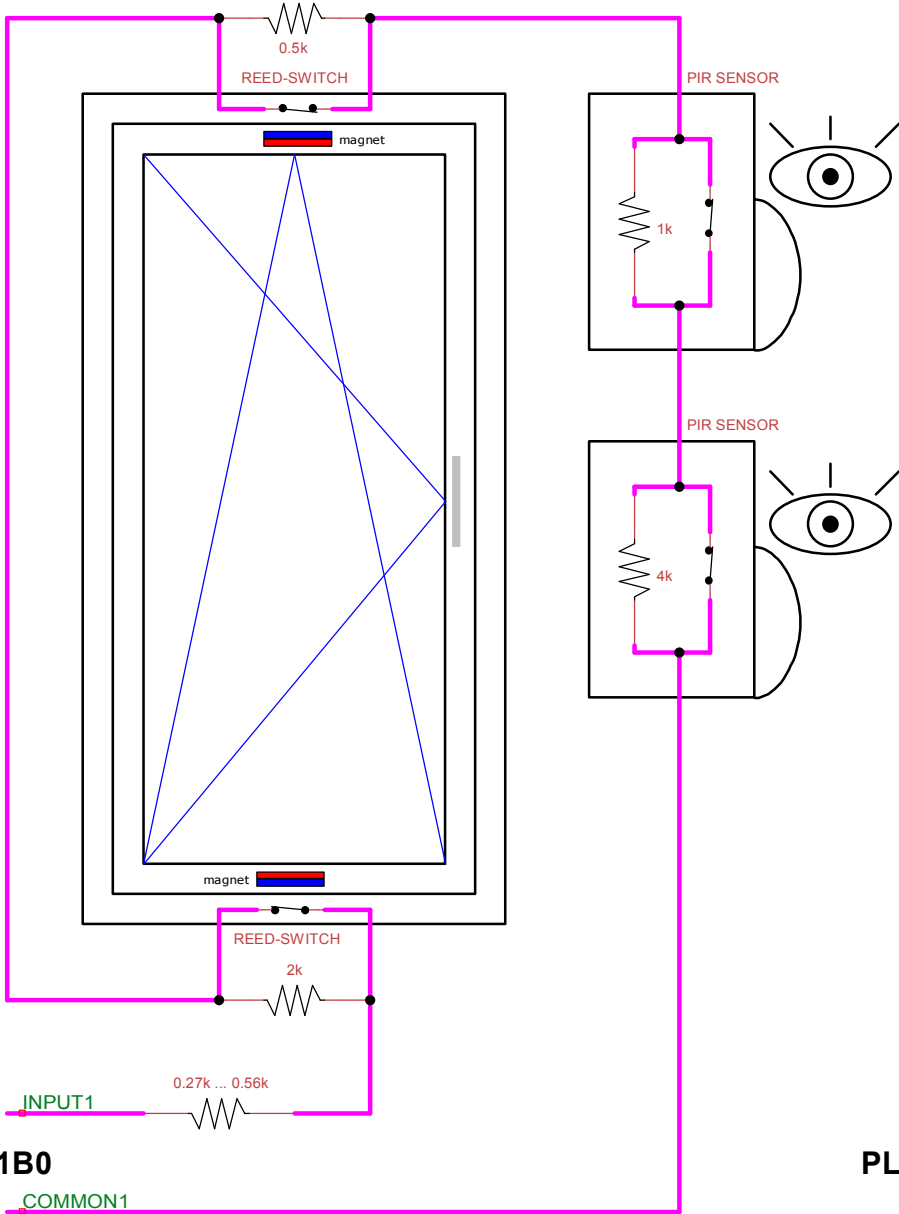
PLC2011B0 circuits ALARM SENSORS

http://en.wikipedia.org/wiki/Reed_switch

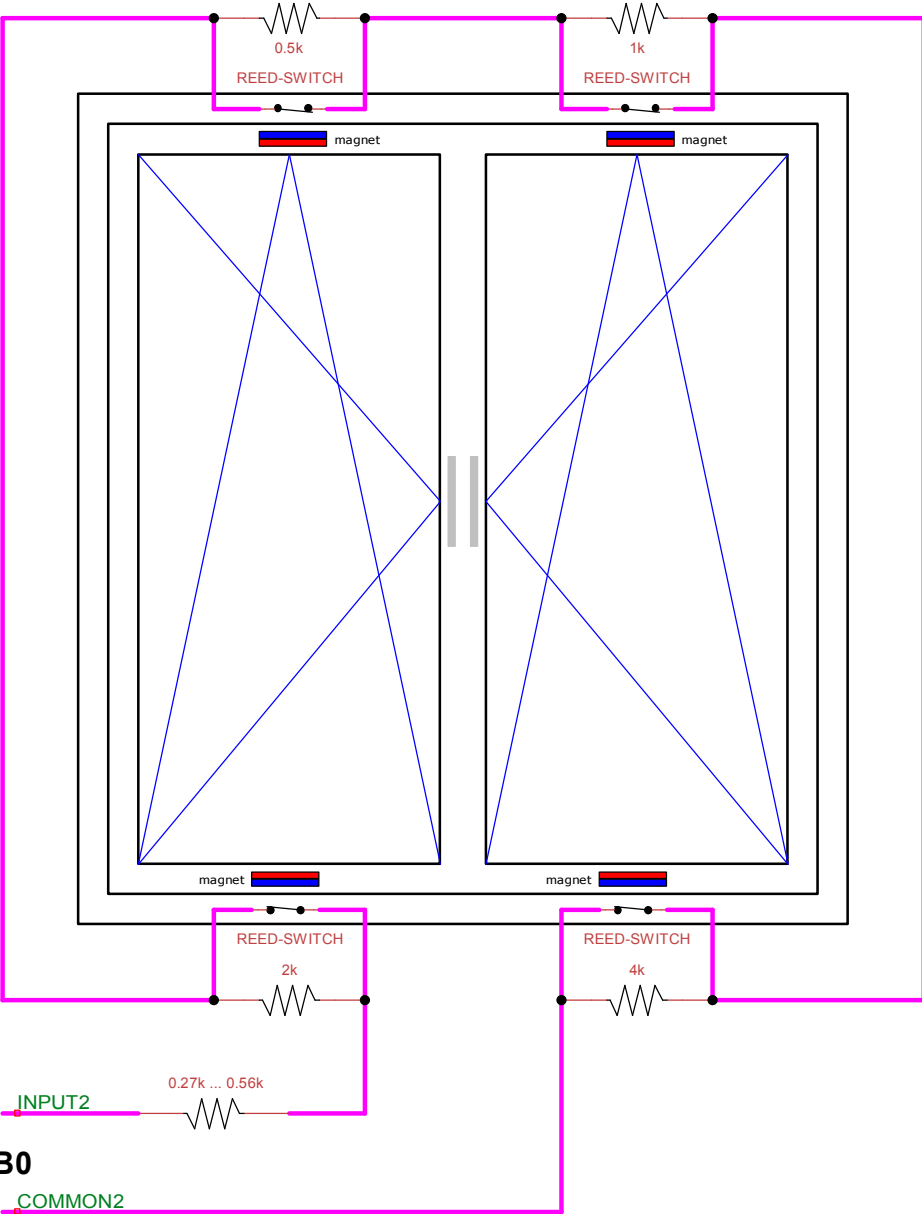
http://en.wikipedia.org/wiki/PIR_sensor

Avoid mixing PIR sensors with Windows for further clarity !

ALL switches and sensors are NC



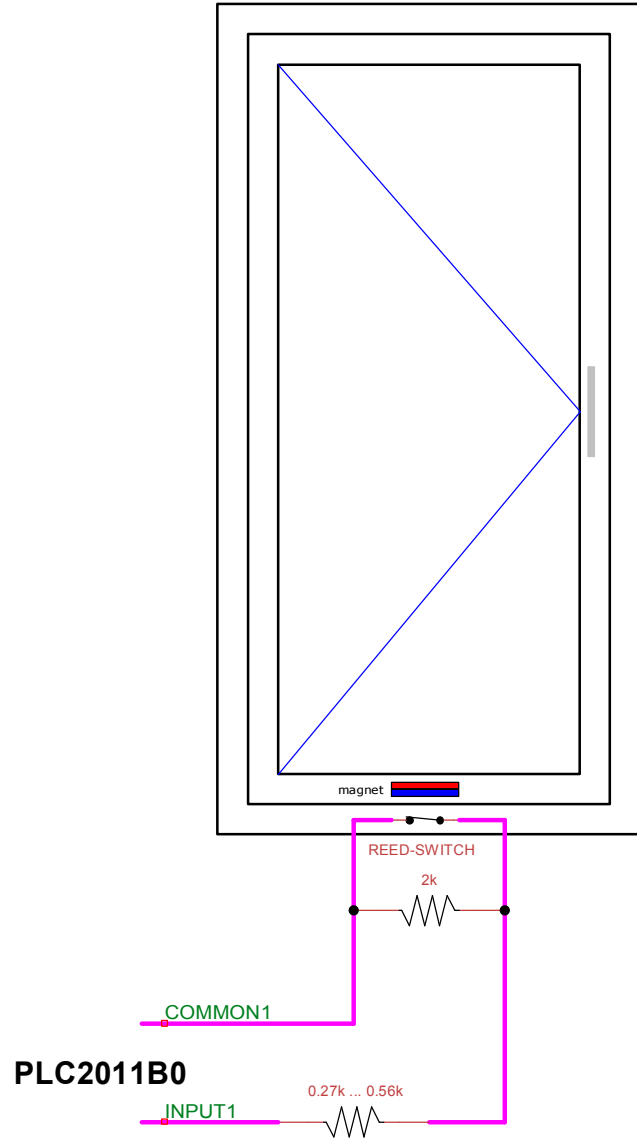
PLC2011B0



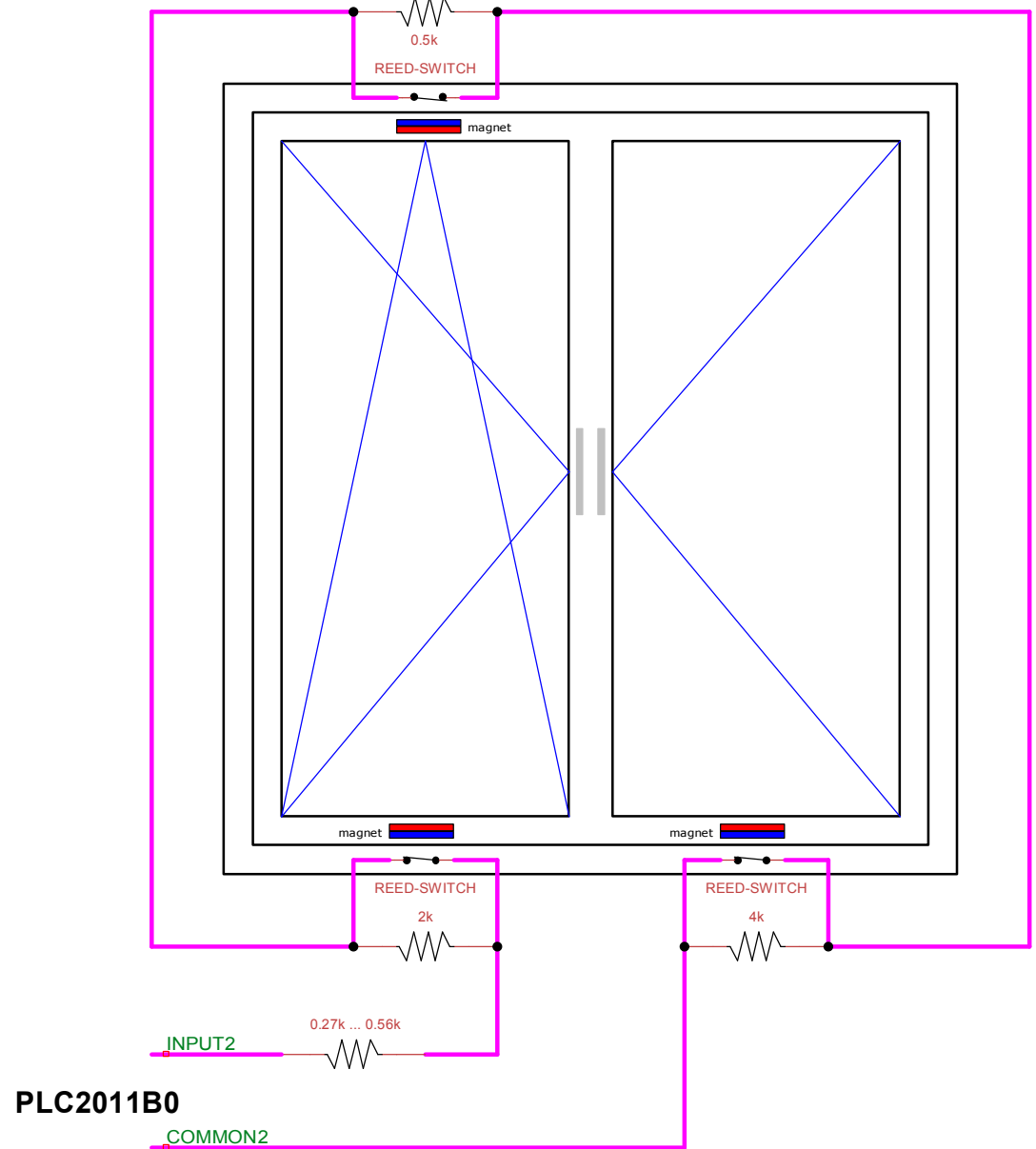
PLC2011B0

PLC2011B0 circuits ALARM SENSORS

Example: only 1 reed switch

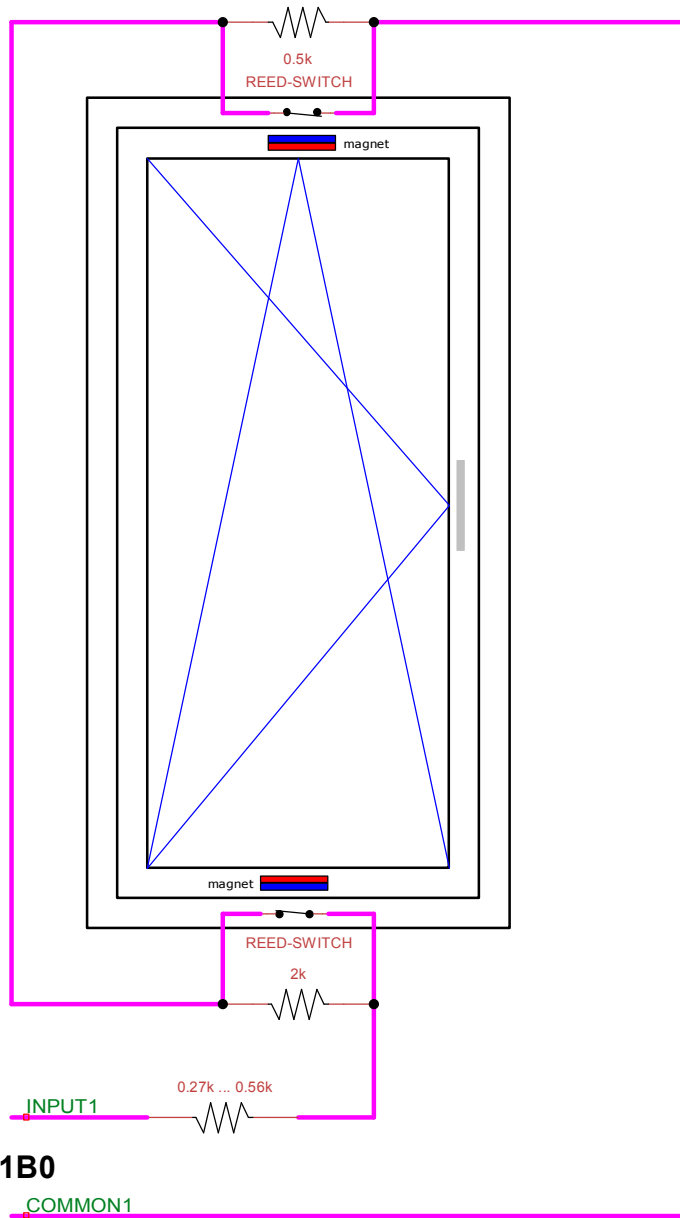


Example: only 3 reed switches



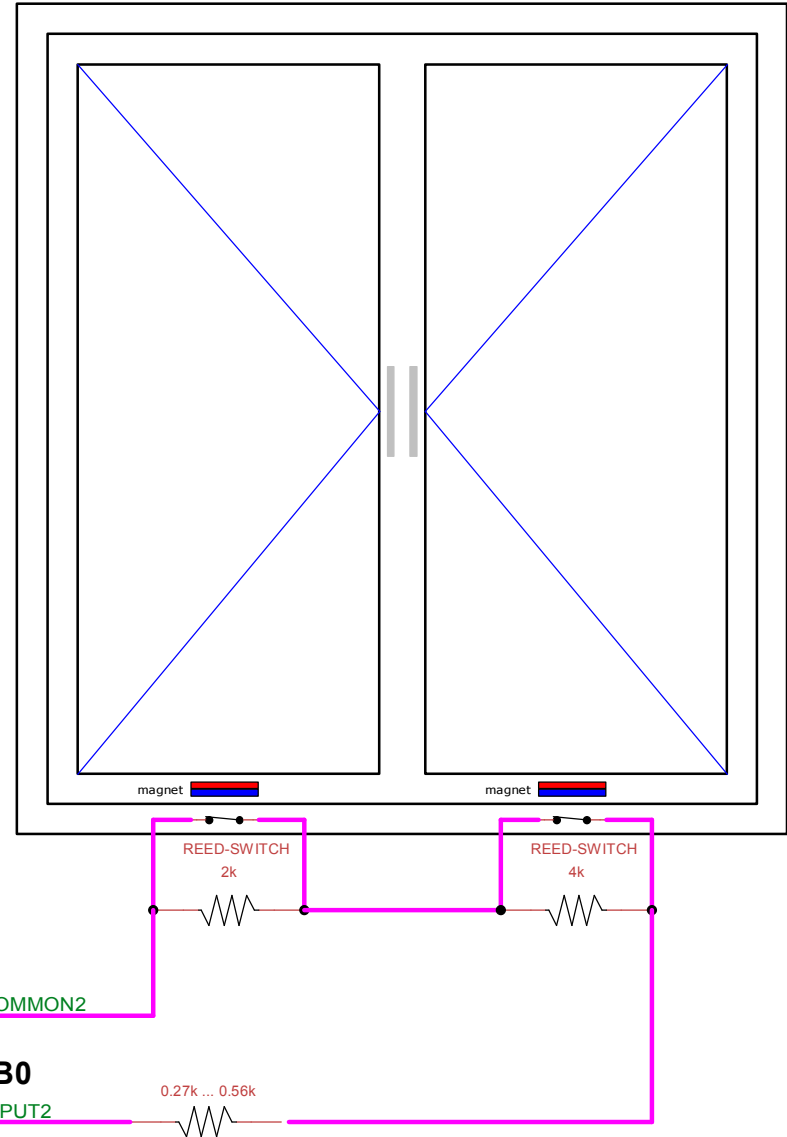
PLC2011B0 circuits ALARM SENSORS

Example: only 2 reed switches



PLC2011B0

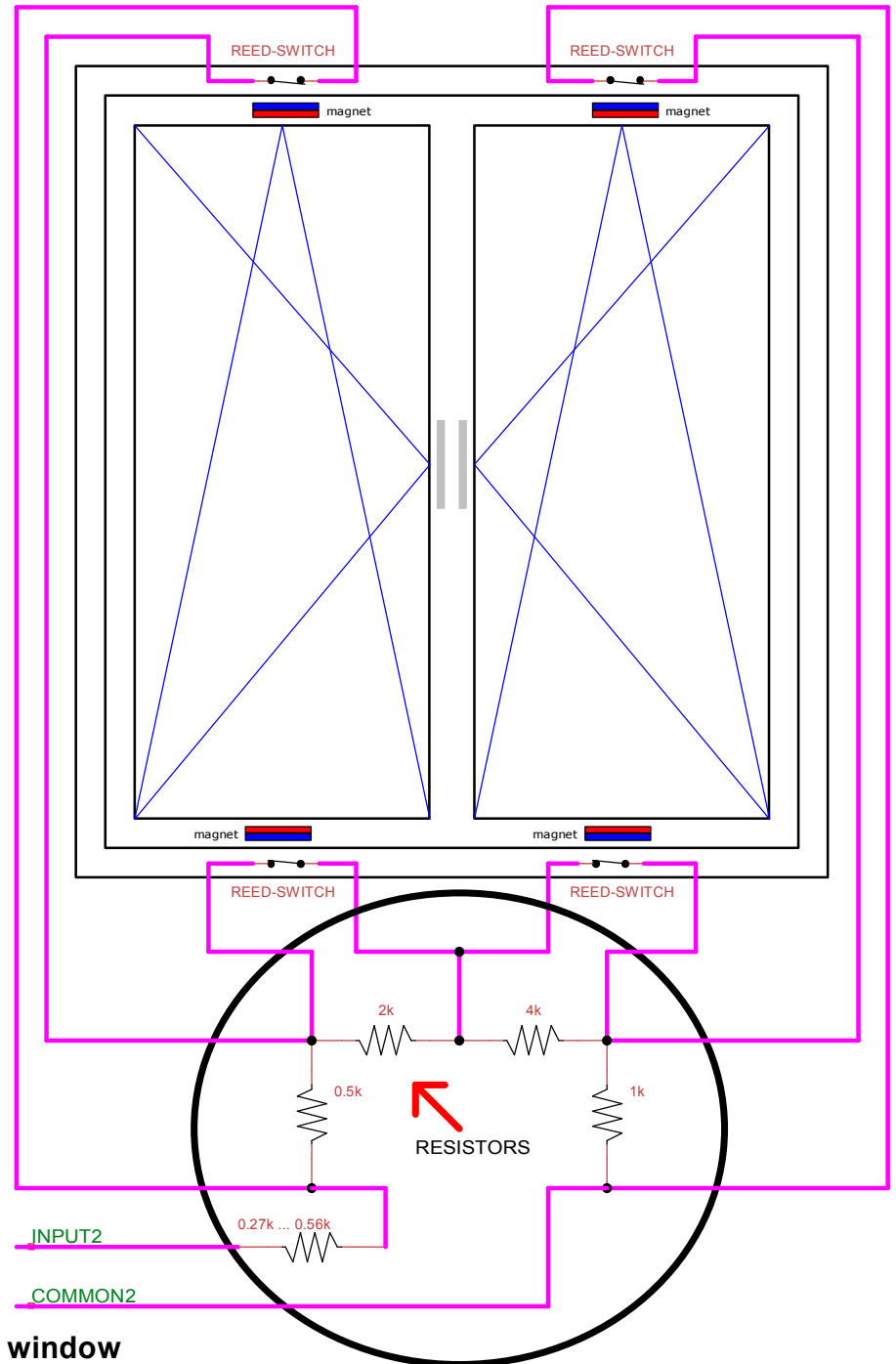
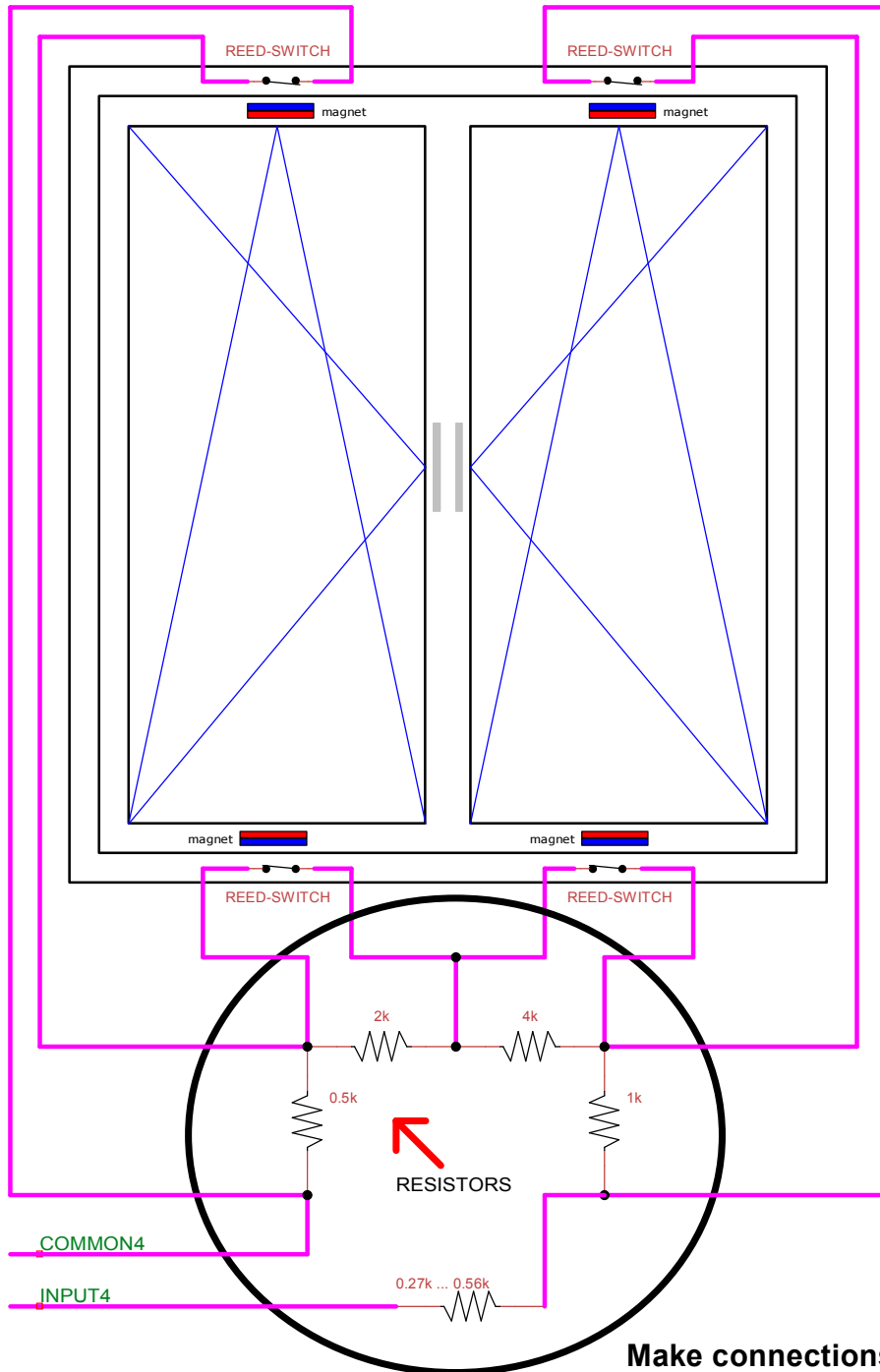
Example: only 2 reed switches



PLC2011B0

PLC2011B0 circuits ALARM SENSORS

ALL switches and sensors are NC

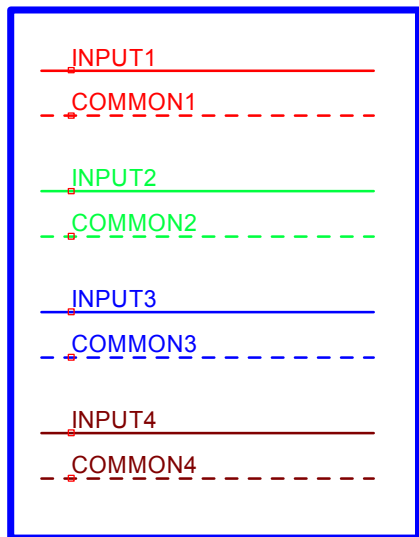
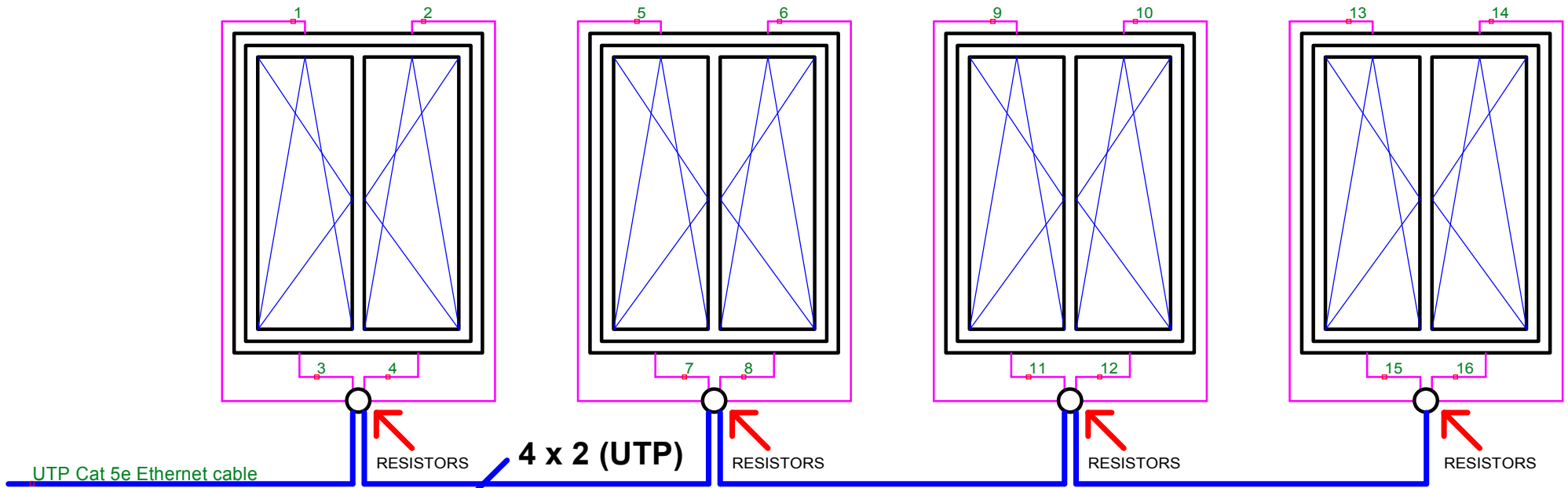


OR

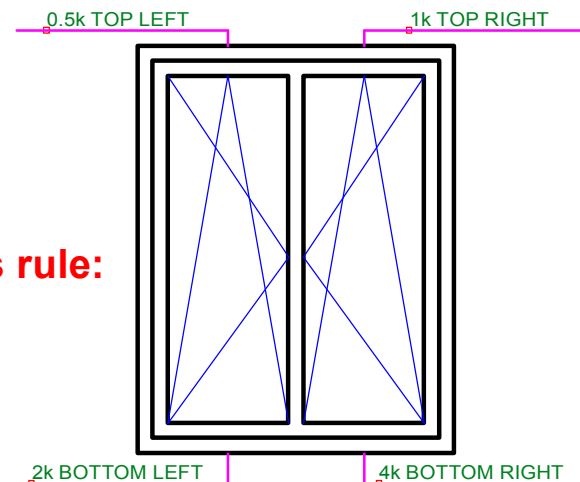
Make connections close to the window

PLC2011B0 circuits ALARM SENSORS

1 ETHERNET Cable = 16 sensors = 4 Windows !



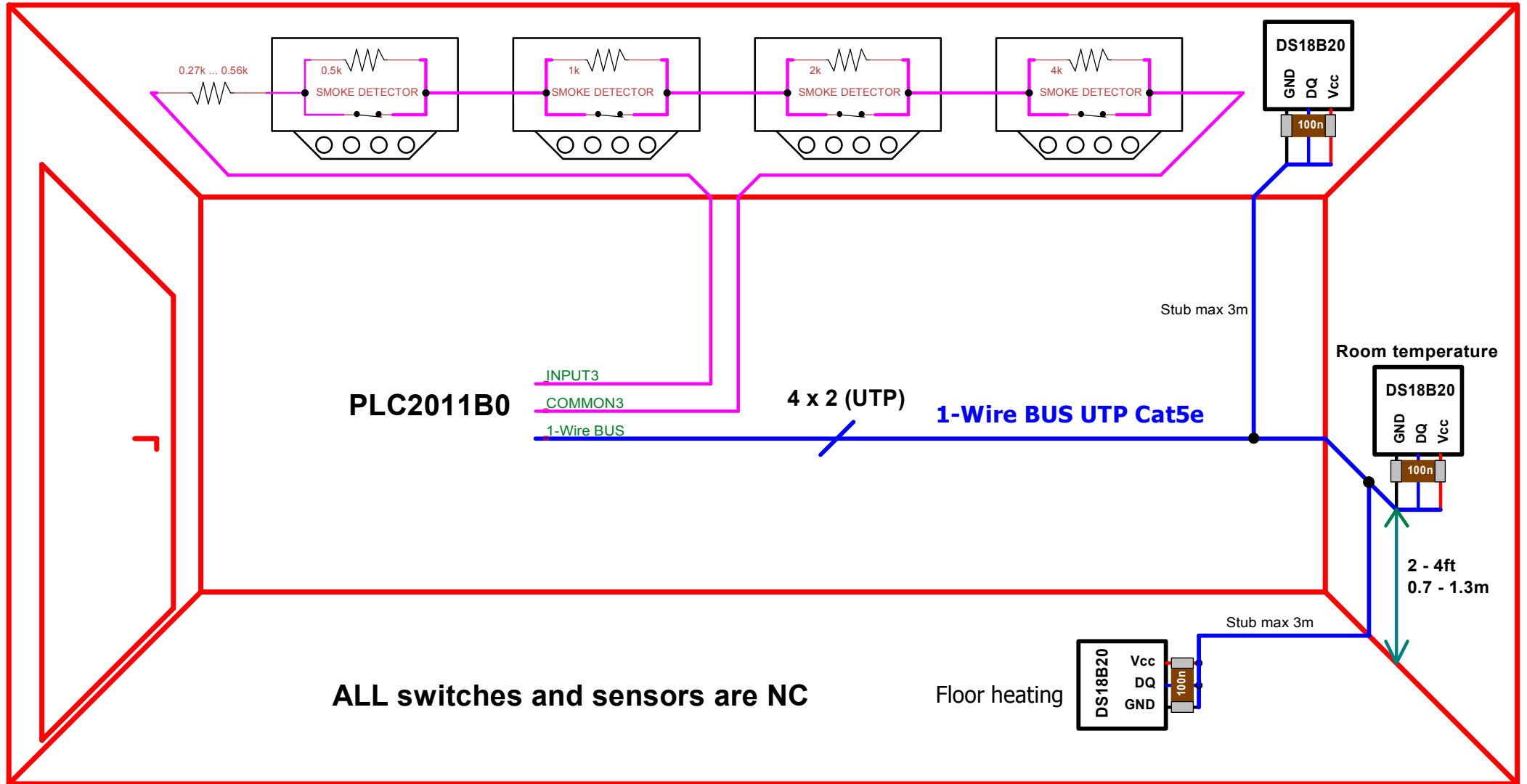
For clarity follow this rule:



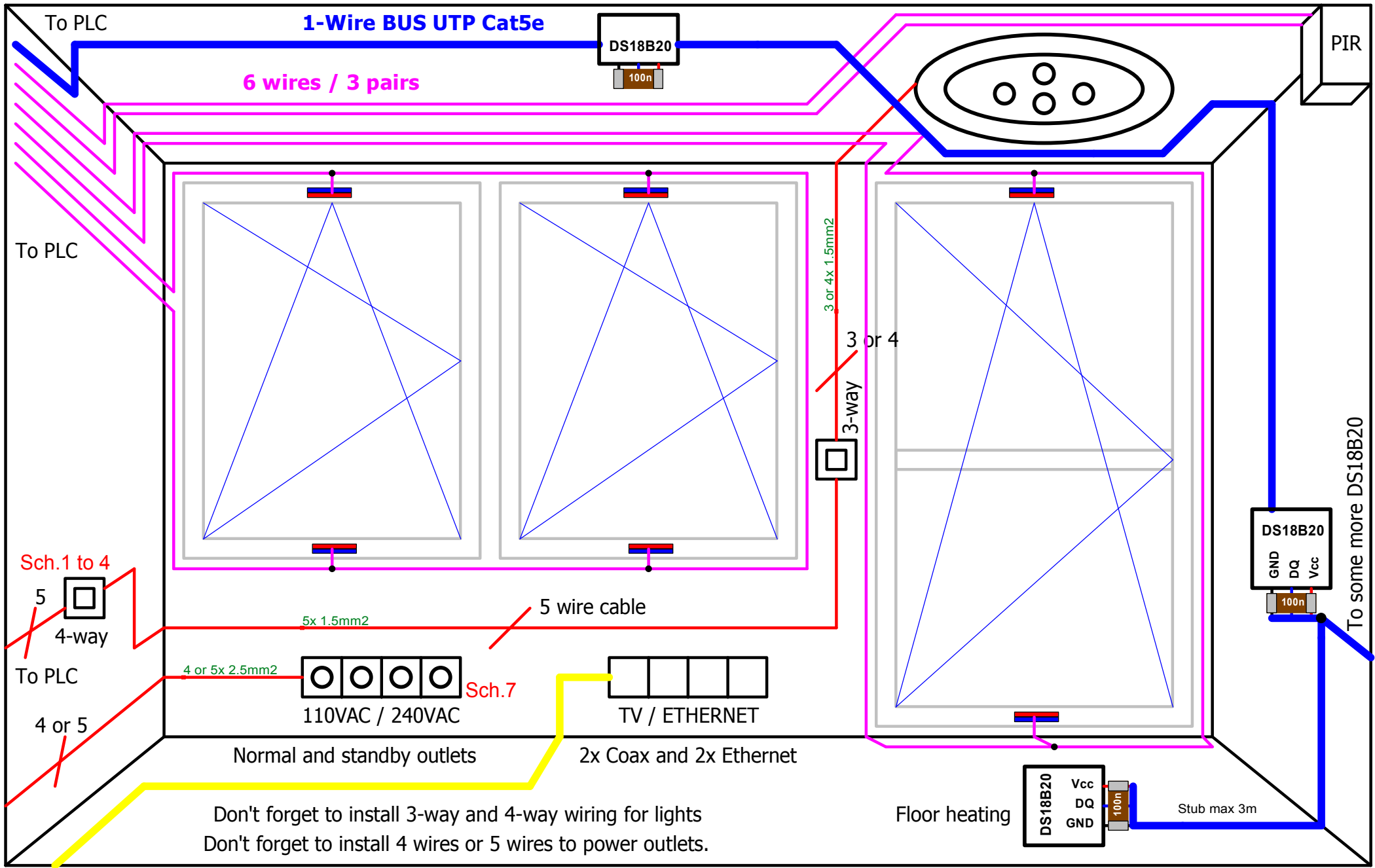
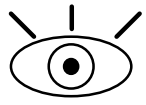
PLC2011B0 circuits Example of smoke detectors / indicators of fire...

http://en.wikipedia.org/wiki/Smoke_detector

DS18B20 on the ceiling can be used as an additional flame / overtemperature detector / sensor.



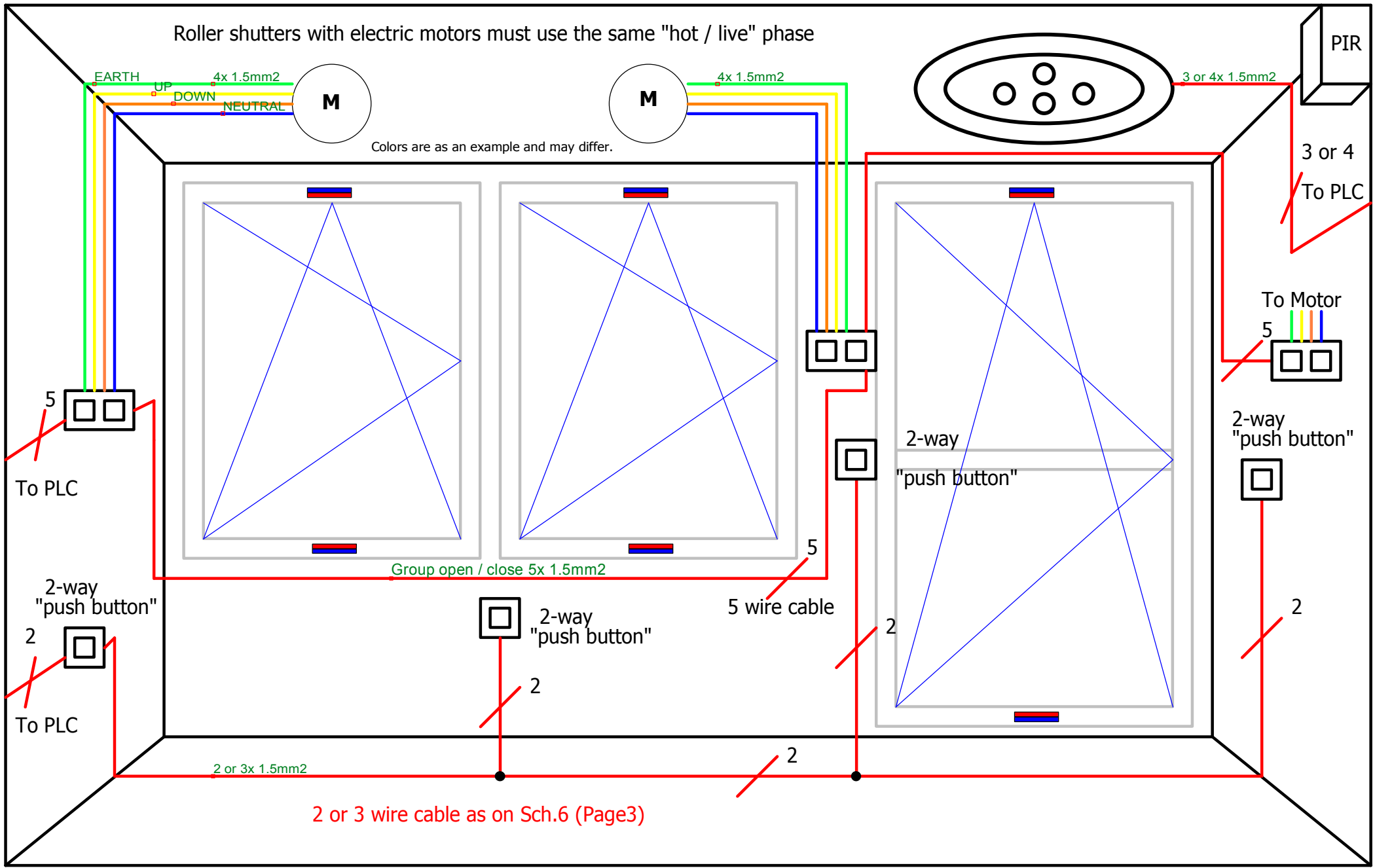
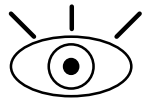
PLC2011A0 PLC2011B0 PLC2011C0 room example part 1



Don't forget to install 3-way and 4-way wiring for lights
 Don't forget to install 4 wires or 5 wires to power outlets.

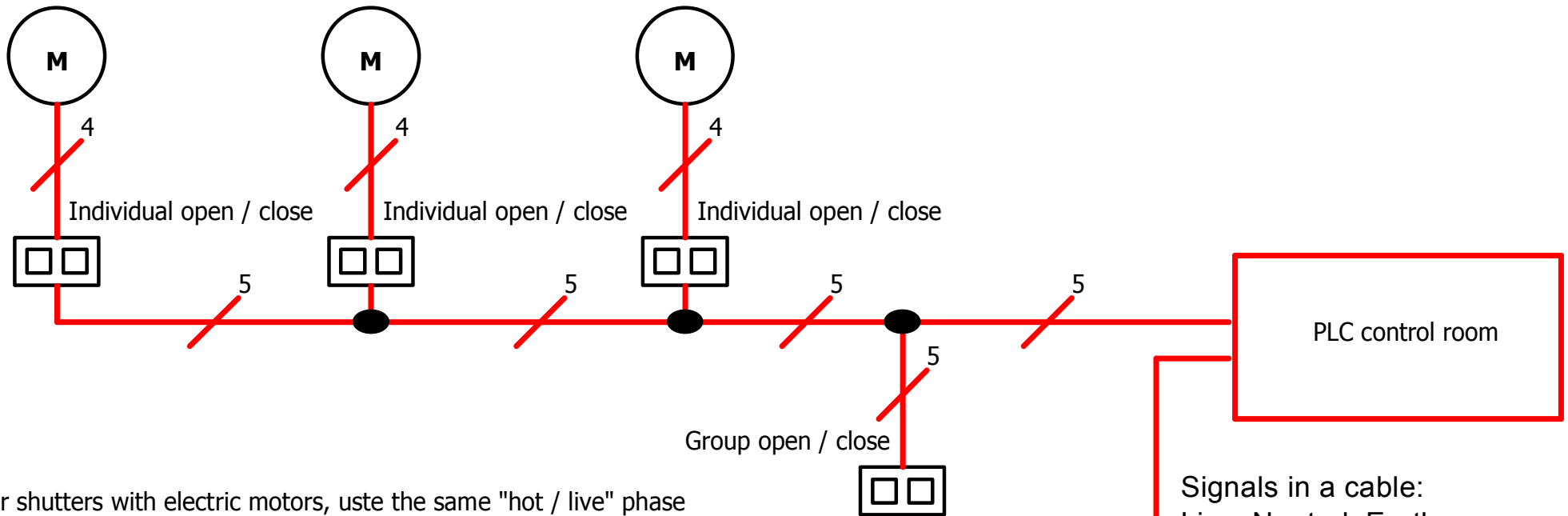
More cables and sensors can be added. For example for roller shutters, more switches etc...

PLC2011A0 PLC2011B0 PLC2011C0 room example part 2

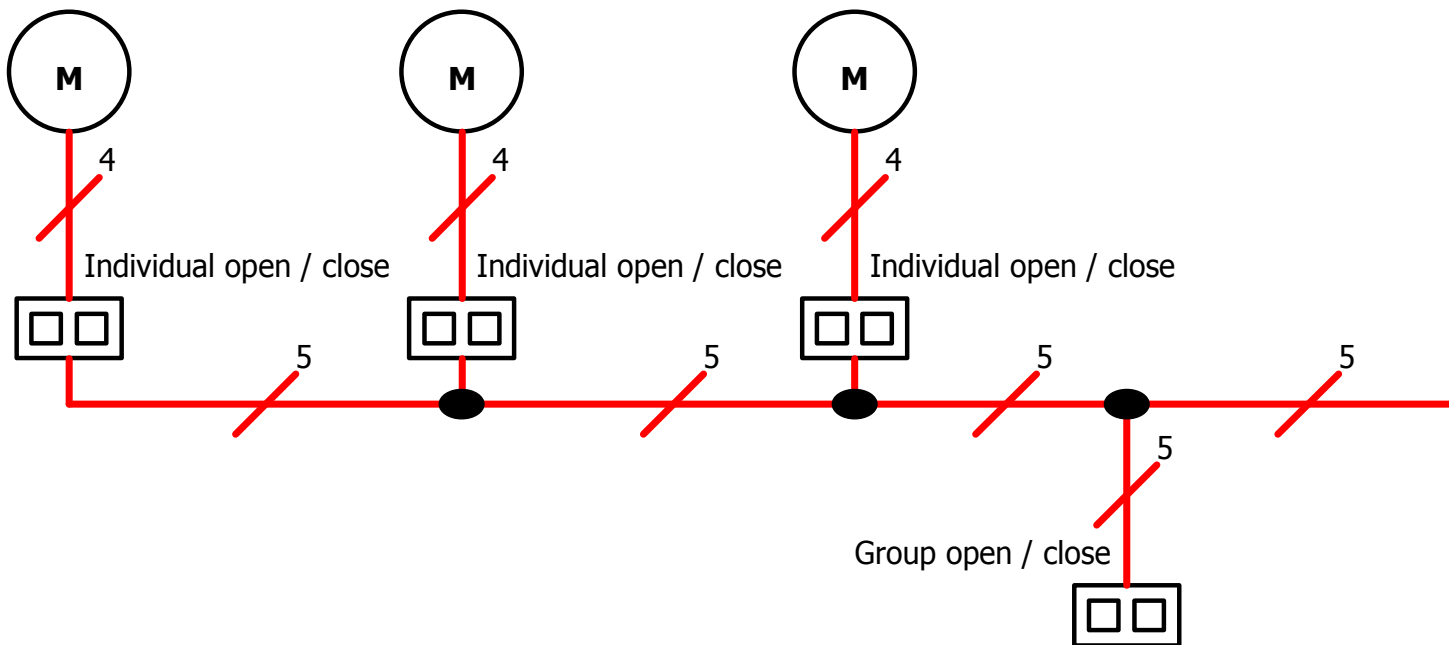


PLC2011A0 PLC2011B0 PLC2011C0

Roller shutters with electric motors must use the same "hot / live" phase



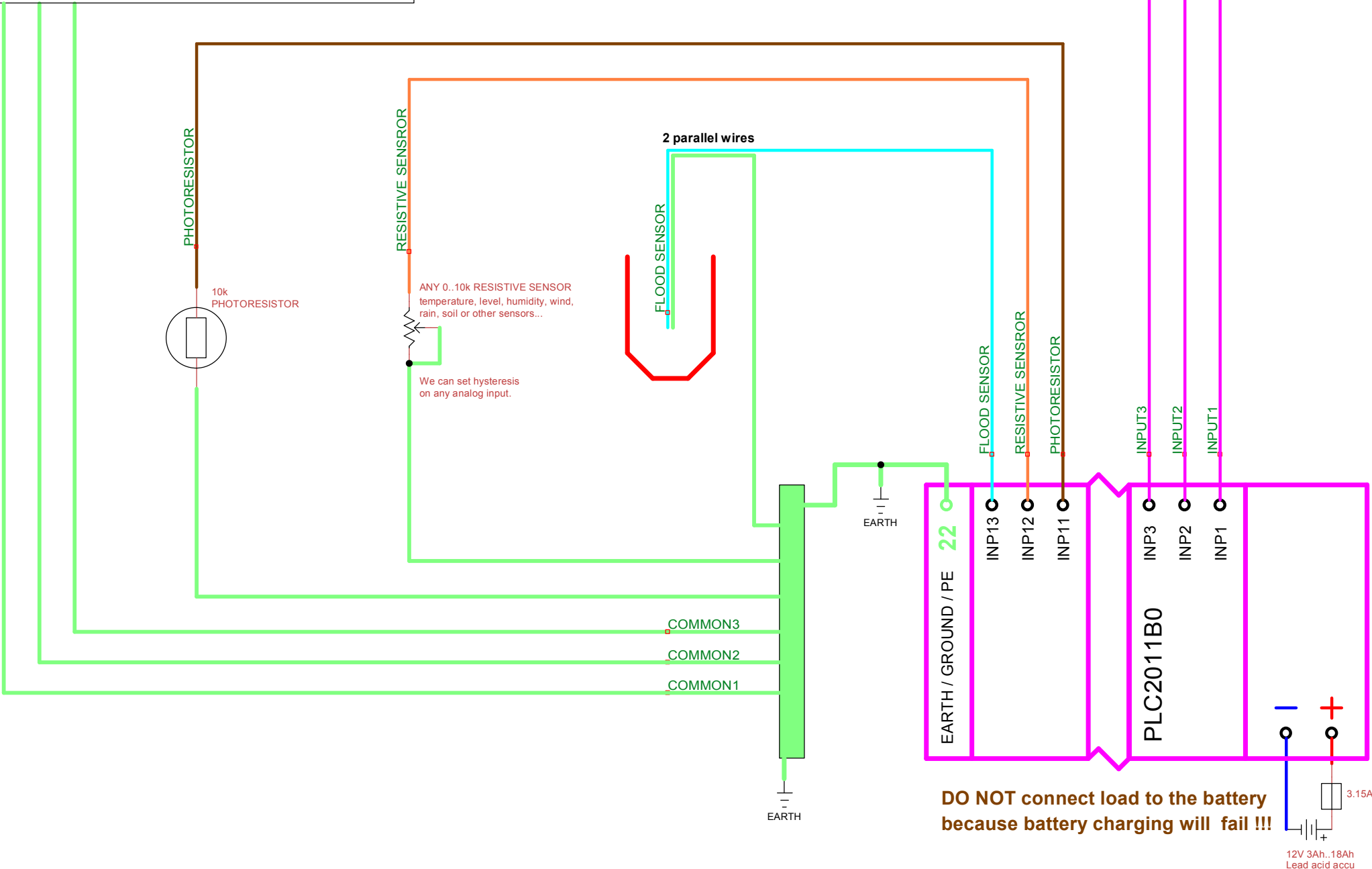
Roller shutters with electric motors, use the same "hot / live" phase



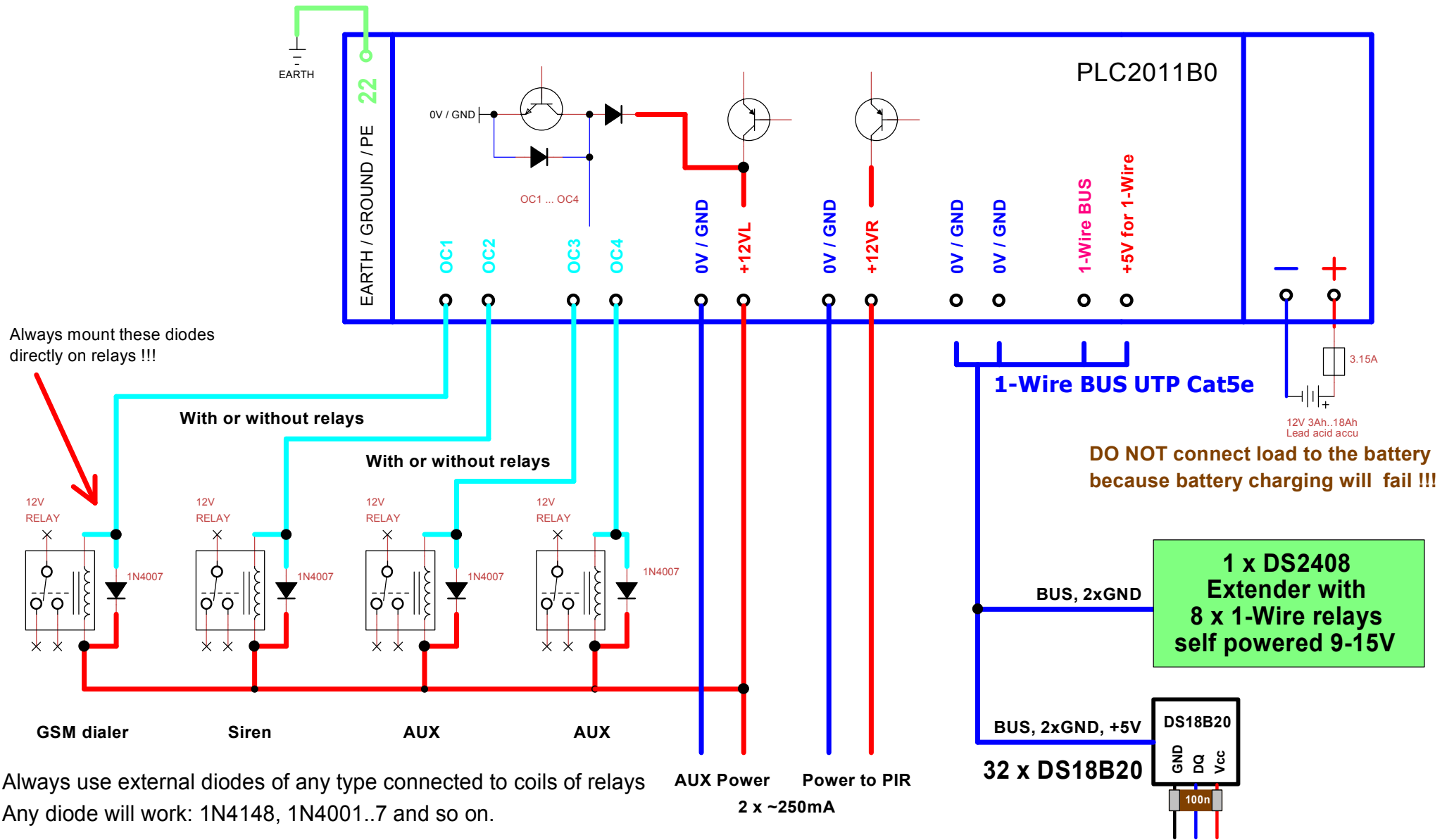
Signals in a cable:
Live, Neutral, Earth
Live for Open, Live for Close
(L, N, PE, OPEN, CLOSE)

PLC2011B0 circuits ALARM INPUTS

From windows and PIR sensors

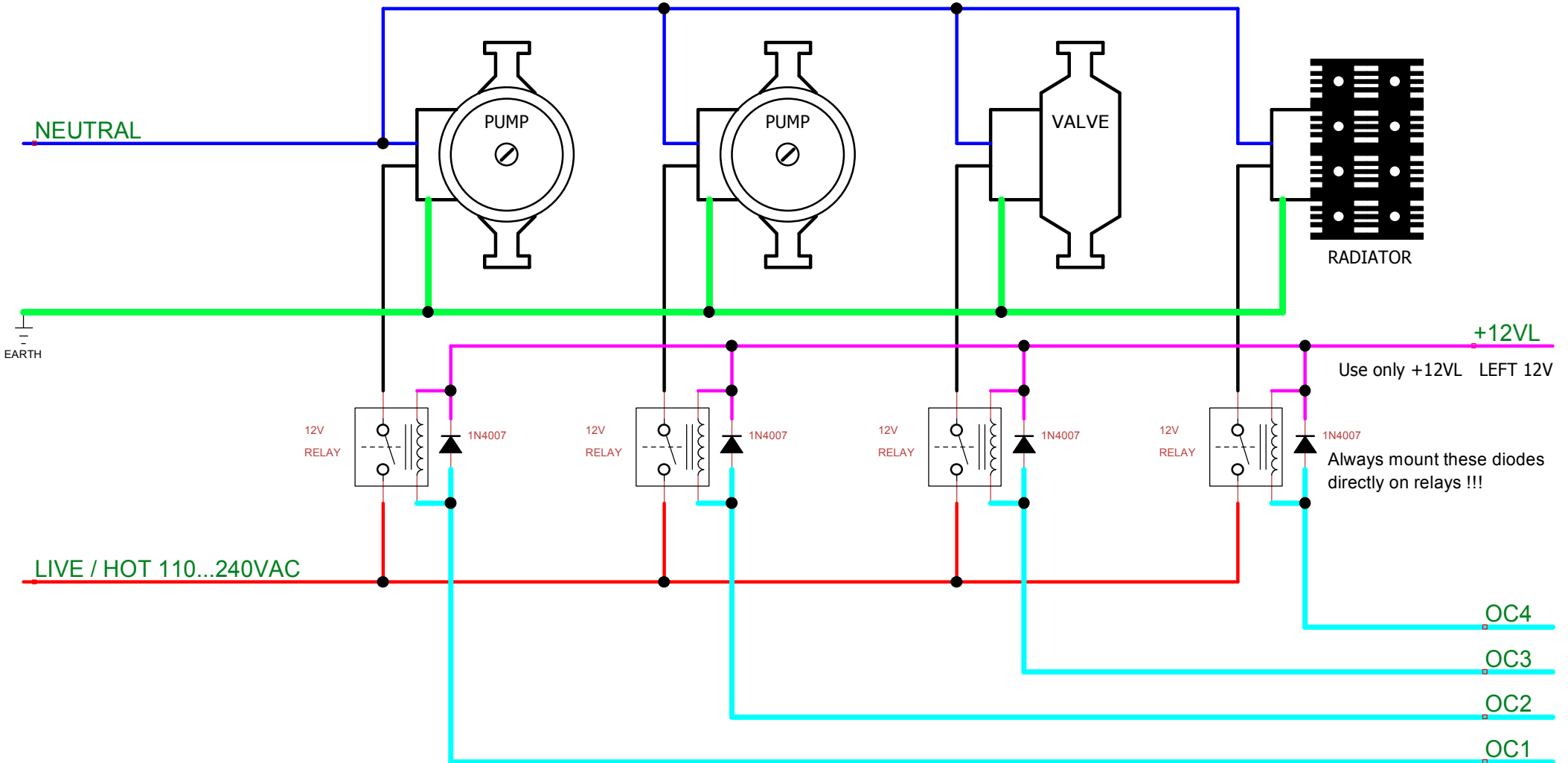
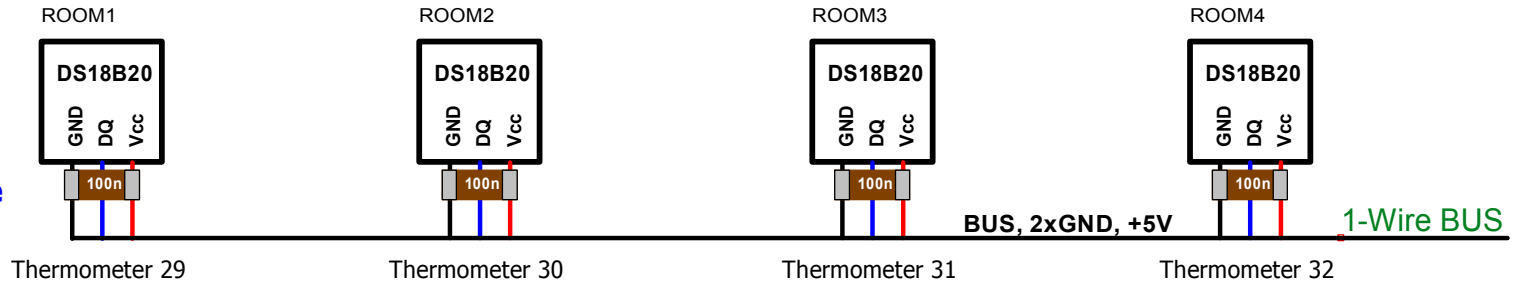


PLC2011B0 circuits - OUTPUTS



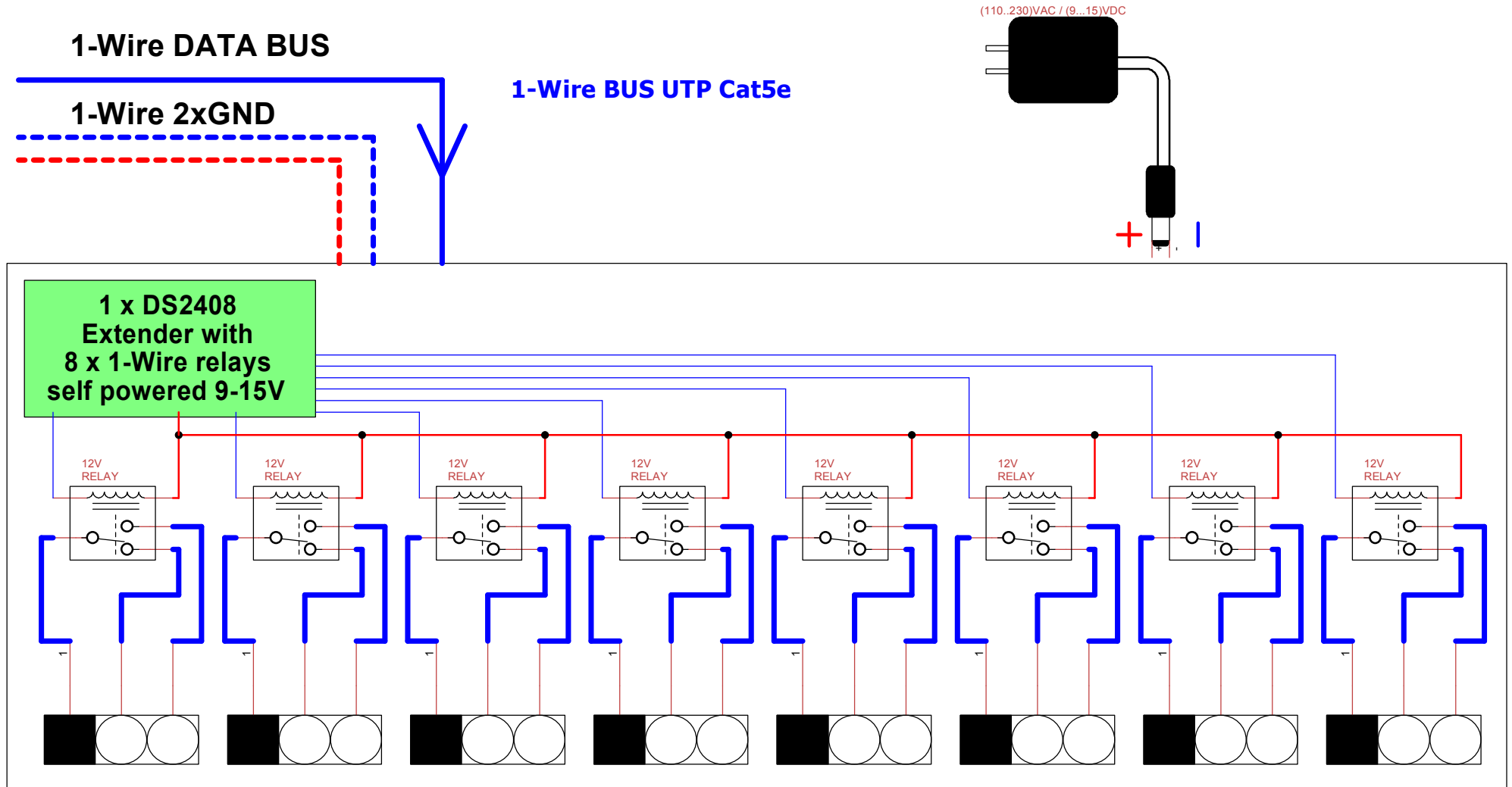
PLC2011B0 circuits THERMOSTATS and Temperature regulators

1-Wire BUS UTP Cat5e

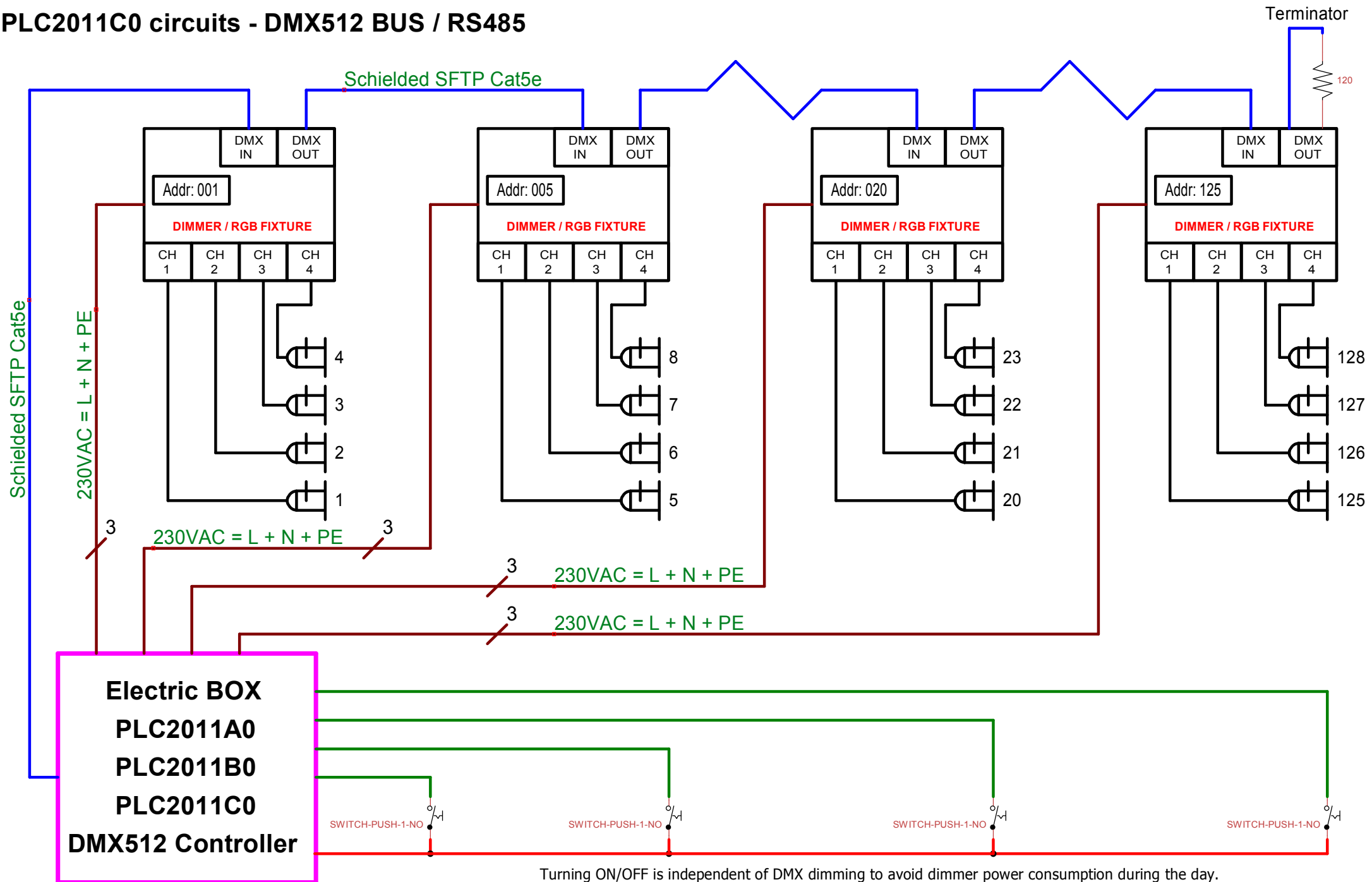


PLC2011B0 / PLC2011C0 circuits - DS2408 1-Wire extender with eight relays.

It allows to connect additional eight devices, lights, motors, gates, outlets, window shutters etc.



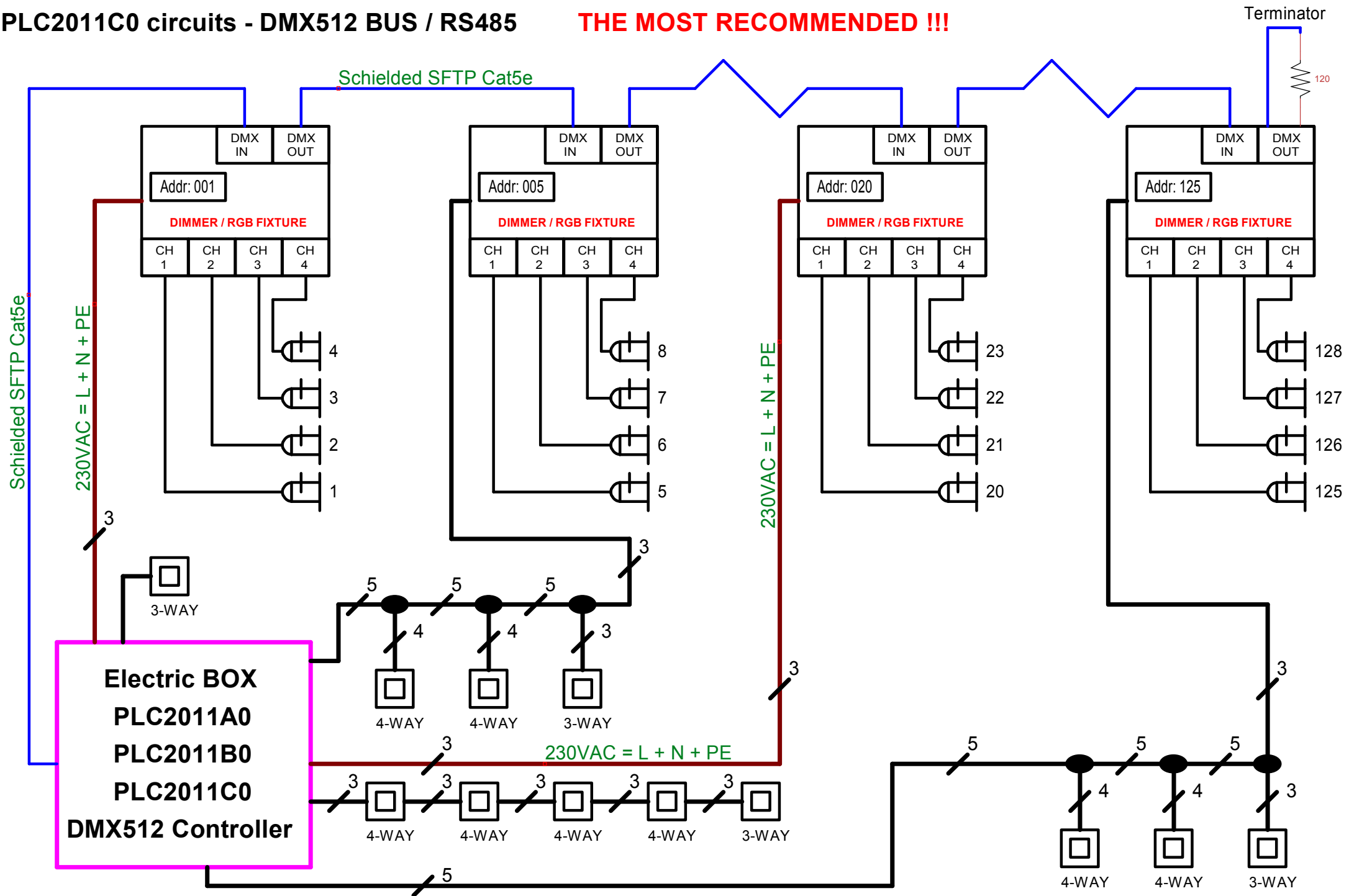
PLC2011C0 circuits - DMX512 BUS / RS485



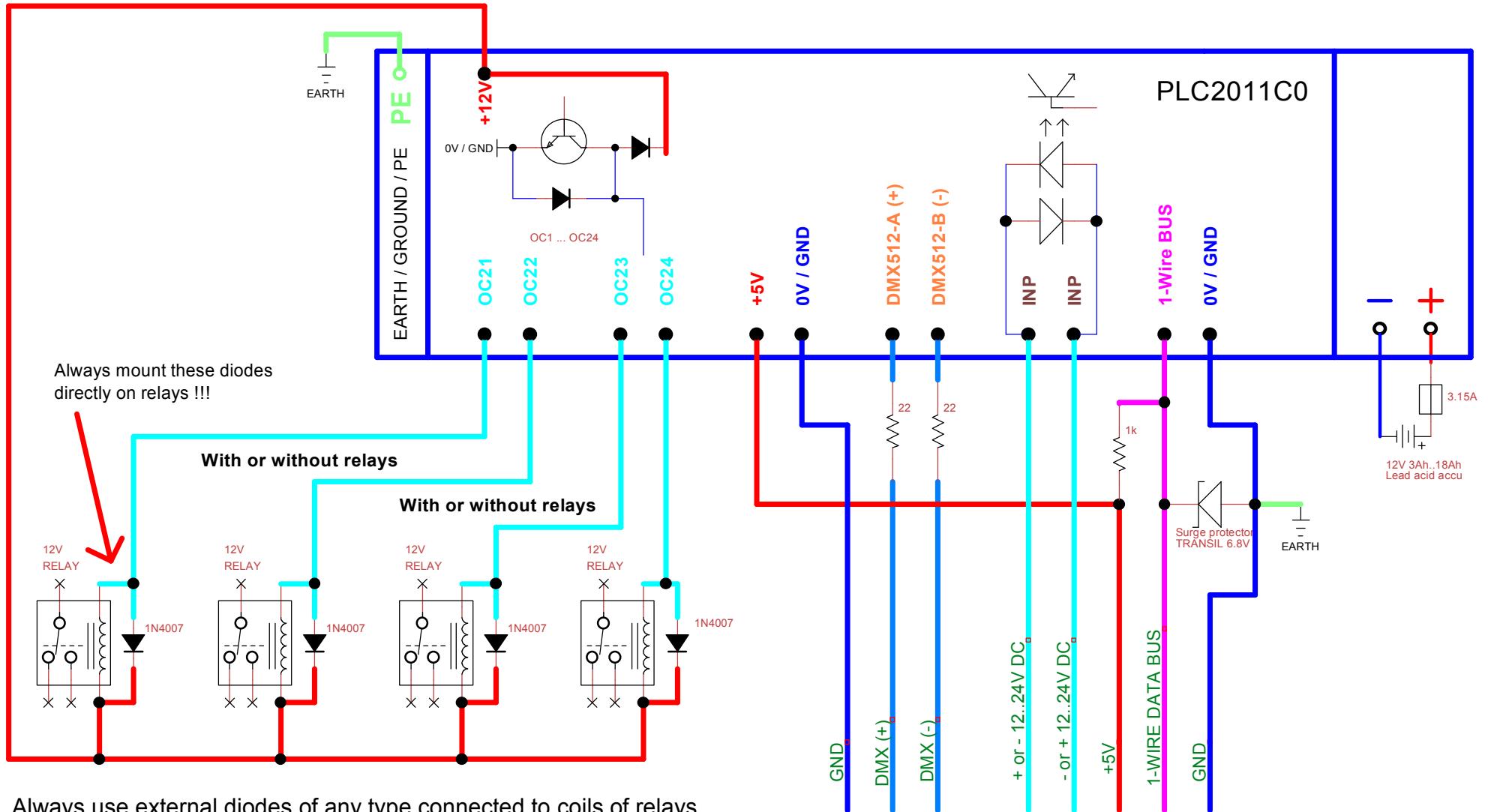
Turning ON/OFF is independent of DMX dimming to avoid dimmer power consumption during the day.

PLC2011C0 circuits - DMX512 BUS / RS485

THE MOST RECOMMENDED !!!



PLC2011C0 circuits - DMX512 BUS / RS485 / 1-WIRE



Always mount these diodes directly on relays !!!

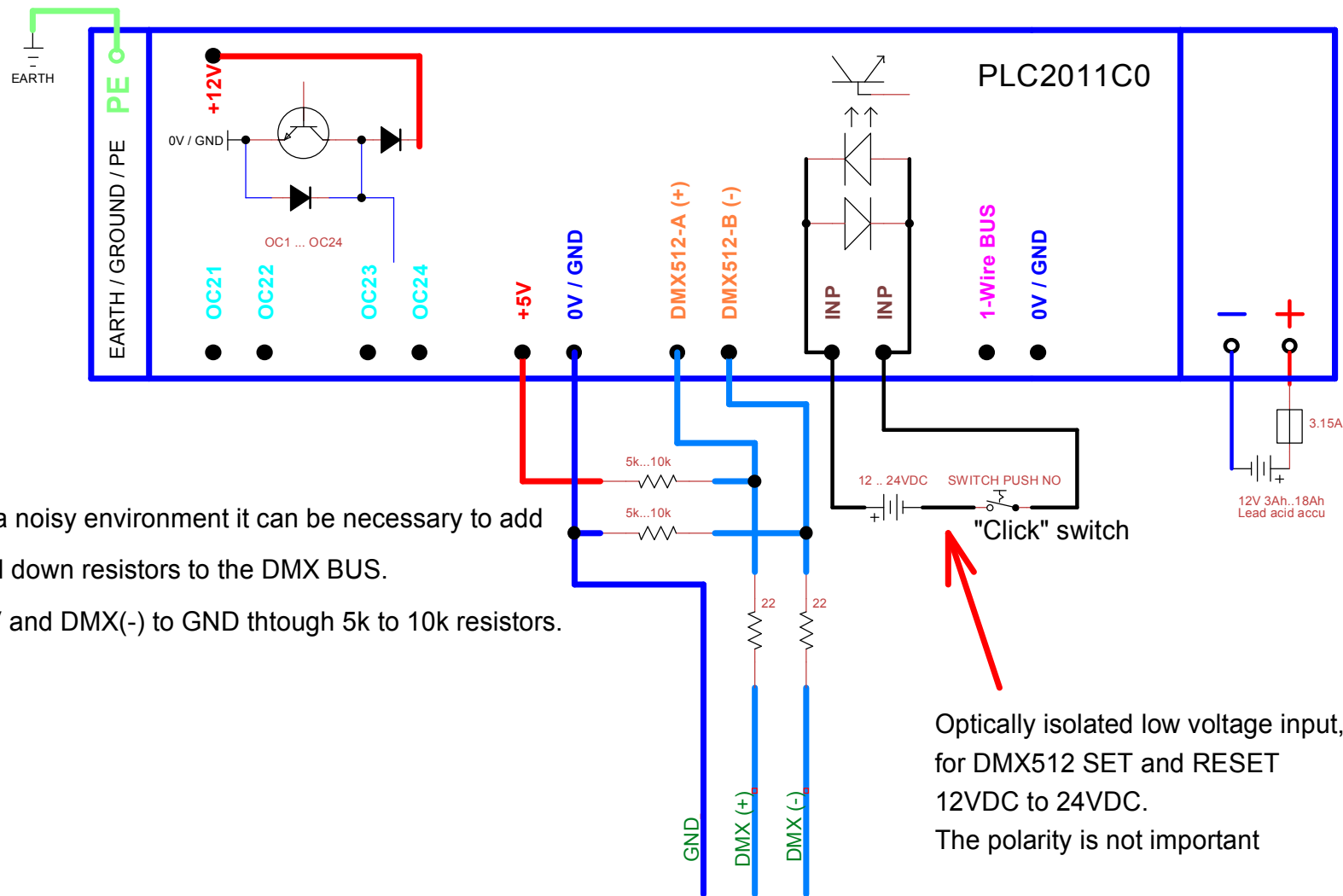
With or without relays

With or without relays

Always use external diodes of any type connected to coils of relays
Any diode will work: 1N4148, 1N4001..7 and so on.

**DO NOT connect load to the battery
because battery charging will fail !!!**

PLC2011C0 circuits - DMX512 BUS / RS485



Sometimes in a noisy environment it can be necessary to add pull up and pull down resistors to the DMX BUS.
DMX(+) to +5V and DMX(-) to GND through 5k to 10k resistors.

Optically isolated low voltage input, for DMX512 SET and RESET 12VDC to 24VDC. The polarity is not important

DO NOT connect load to the battery because battery charging will fail !!!

