ONLY SMART HOME

Automation

Installation Manual

Historial

Version	Date	Author	Changes
1.0	2011-11-16		-
1.1	2011-11-29		Chapter troubleshooting added
1.2	2015-05-13		Minor changes
1.3	2018-09-13		Branding actualization

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Rua Max Grundig 9
4705-820 Braga Portugal   info@only-smartbuildings.com
Tel: +351 253 221 484   www.only-smartbuildings.com

Introduction

This document is intended to guide the work on site of the installer ONLY automation system installer. The next chapters explain how the installation should be made, the precautions to take and the way to test and configure the system.
It is essential to respect it in order to achieve a proper and trouble-free installation.

ONLY Automation system

The modules of the ONLY automation system allow load switching, dimming, gate command by impulse and command of shutters, blinds, curtains or awnings.
The modules of the automation system derive their power directly from 230V, being the **Neutral** the ground of the system.
The ONLY modules communicate via a **BUS line**, by determining the presence or absence of tension on this referred line. This tension is generated in a BUS line feeder and is short-circuited with the neutral by the modules during a communication. The pulses in the BUS line codify a communication.
For all modules to communicate with each other, they must all be connected to the BUS. Connection is made as a star, i.e., all modules are connected to the same BUS.
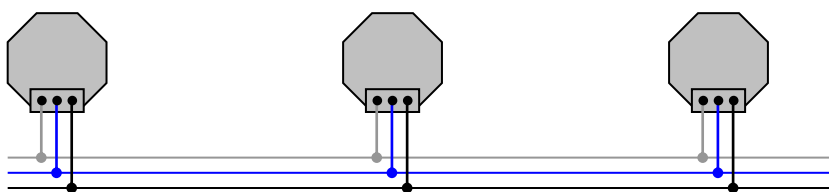
Fig. 1: Star type connection.

Since the ground of the system is the Neutral, the BUS line is also an active line. This fact simplifies the piping installation.

Electrical piping and threading

ONLY provides electronic commands for switching, dimming, shutter control, gate control or commands without function, all for in-wall box installation. It is therefore possible to replace mechanical commands by electronic ONLY commands with the condition that they can receive the lines **Phase**, **Neutral** and **BUS** in order to work.

Architecture of electrical conduits
The electrical piping of a house with ONLY is similar to a conventional installation because the switching is done on the in-wall commands, as if it were a mechanical switch.

The diagram below illustrates this situation.

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4705-820 Braga Portugal   info@only-smartbuildings.com
Tel: +351 253 221 484   www.only-smartbuildings.com
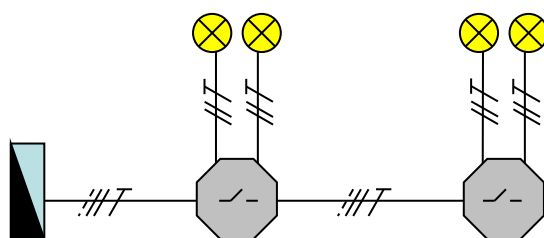
Figure 2: Distributed switching

ONLY also has switch box modules for the same functions and the commands of the loads can therefore also be done in the switchbox cabinet.
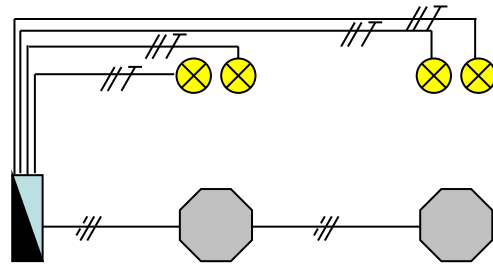

Figure 3: Centralized switching

The fact that the installer has both types of control modules allows you to optimize the installation, making the most of the switching on the in-wall commands and the rest of them in the switchbox cabinet so as not to increase the number of commands on the walls. It is therefore a mixed switching.
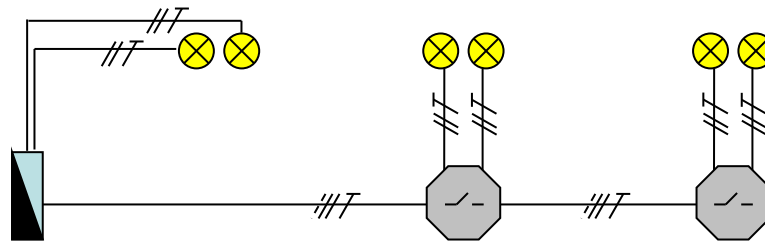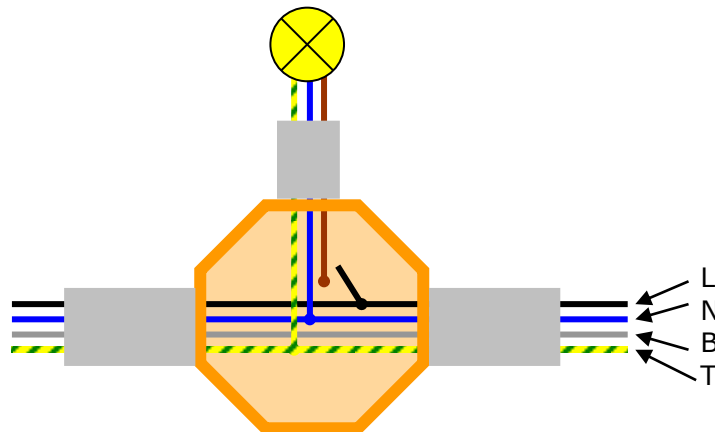

Figure 4: Mixed switching

The BUS line is connected to all ONLY distributed in-wall commands and switchbox modules, being put in the same piping as **Phase** and **Neutral**. So the same pipe should contain **Phase**, **Neutral**, **Earth** and **BUS**. In the figure, the symbol of the BUS line is dashed.

According to the actual regulations in Portugal, you can put up to 4 conductors of 1.5 mm^2 section in a VD16 tube or until 5 conductors of 1.5 mm^2 in a VD20 embedded tube (table 100 of Annex 2 of the CERTIEL regulation) as long as the isolation class is sufficient for the highest voltage in the pipe.

CERTIEL - Article 528.1 Neighbourhoods with electrical wiring
"The circuits of voltage domains I (U<= 50V) and II (U<=1000V) should not be included in the same conduits, except if each wire is isolated for the highest voltage existing in de pipe (…)"

ENANCER Electrónica S.A.
Rua Max Grundig 9
4705-820 Braga Portugal
Tel: +351 253 221 484

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www.only-smartbuildings.com

From the junction box to the load are used the same wires as in a conventional installation, which are **Lamp**, **Neutral** and **Earth**.

The circuits should meet the actual rules as far as protection, wire section, colours, isolation classes and maximum number of loads per circuit is concerned, just like in a conventional installation.

The BUS line should be a V wire with 1 mm2 section and we suggest a white colour to distinguish it from the rest of the installation. It must have the same kind of isolation as the phase and neutral wires.

Protections

The distributed ONLY commands receive power supply from the load circuit, making the switching of the power in the module itself. Its protection should therefore be guaranteed in the switchbox as usually made (e.g. 10 amp circuit breaker for lighting circuits).

In the case of DIN rail modules, the power supply of the module is independent of the load, and therefore a specific protection by a circuit breaker is needed for them.
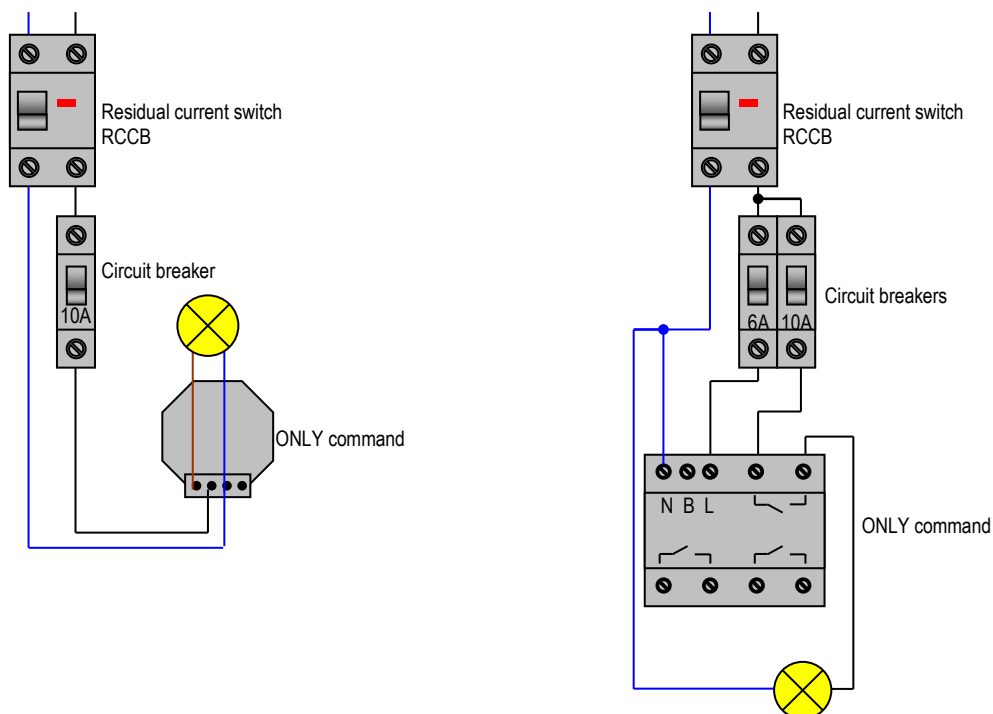

Fig. 4: Protection of distributed commands and switchboard commands (DIN)

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The ONLY modules have a consumption varying between 0.5W and 1.5W depending on the type. This means that a 6 amp circuit breaker can protect several DIN rail modules.
The designer must take into consideration the characteristics of the switching relays of each ONLY module and size circuit breakers to protect circuits in accordance with these values.
Thus, the lighting circuits must be protected at 10 amperes, the shutter circuits with 8 amperes (relays are 8 amps), the circuits of fan coil units with 5 amps (relays are 5 amps).

Protection of ONLY modules
The ONLY modules have to be protected by circuit breakers. The distributed commands are protected by the circuit breakers of the loads, the commands in the switchbox by dedicated circuit breakers.

VERY IMPORTANT: The switching of capacitive or inductive loads reduces significantly the cutting capacity of the commands because of the start-up or cutting current. A good rule of calculation is to switch ONLY 5% of the rated load. Like this, an ONLY command can ONLY switch 500mA instead of 10 amps where the loads are not inductive or capacitive.
In practice, an ONLY output can ONLY switch 2x56W tube lamps, whether they are electronic or magnetic ballasts.

Switchboards
The BUS line allows simultaneous communication of a command with all the others. The BUS line is fed by the feeder that provides current and tension necessary for communication. The return current is made by the neutral line. This requires a careful preparation of electrical switchboards.
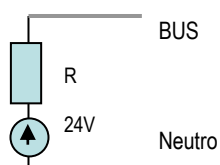

In an electrical switchboard, all circuits with ONLY commands must be protected by the same residual current circuit breaker. This way you avoid imbalances in the RCCB by BUS current appearance in the neutral.
There are however situations where this is not desirable or where it is even required to divide the circuits in several switchboards. In this case the connection of the BUS line between the several boards or differential circuits must be made in a way not to disrupt the RCCB´s.

Single phase supplies with ONLY 1 switchboard

As we have seen, to avoid imbalances in the RCCB, all circuits with ONLY commands must be protected by the same RCCB. This is simple to accomplish in an installation with ONLY one switchboard, concentrating everything that is lighting, shutters, security central and climatization commands in one RCCB. The other loads can be concentrated in another RCCB.

The scheme of this type of switchboard should be as follows:
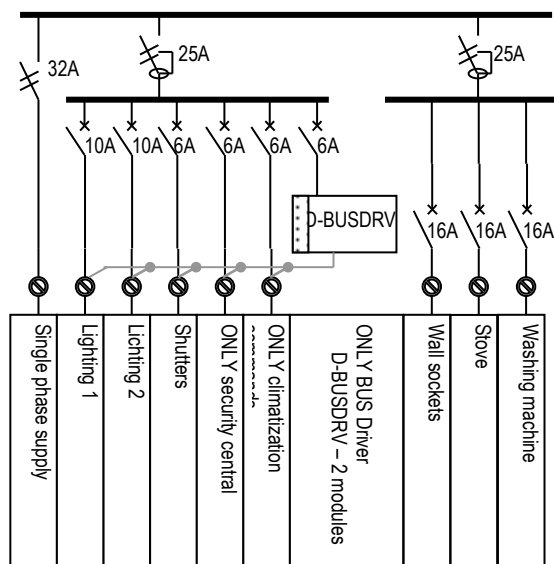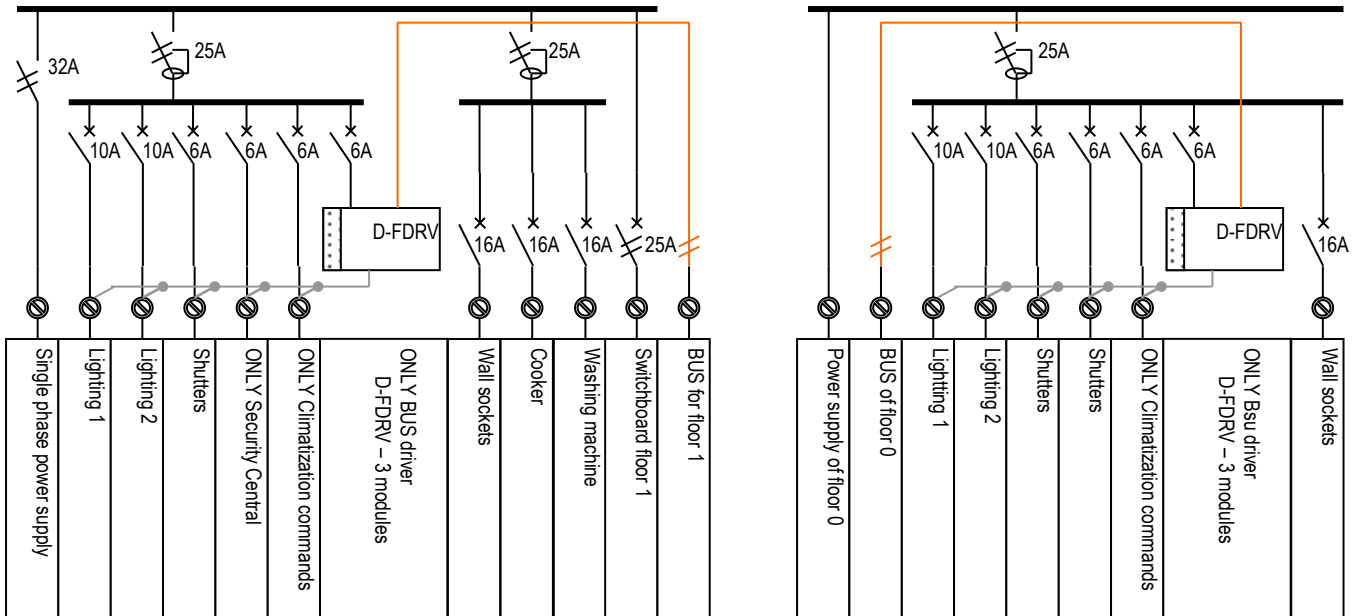

The connections of the switchboard should be as follows:
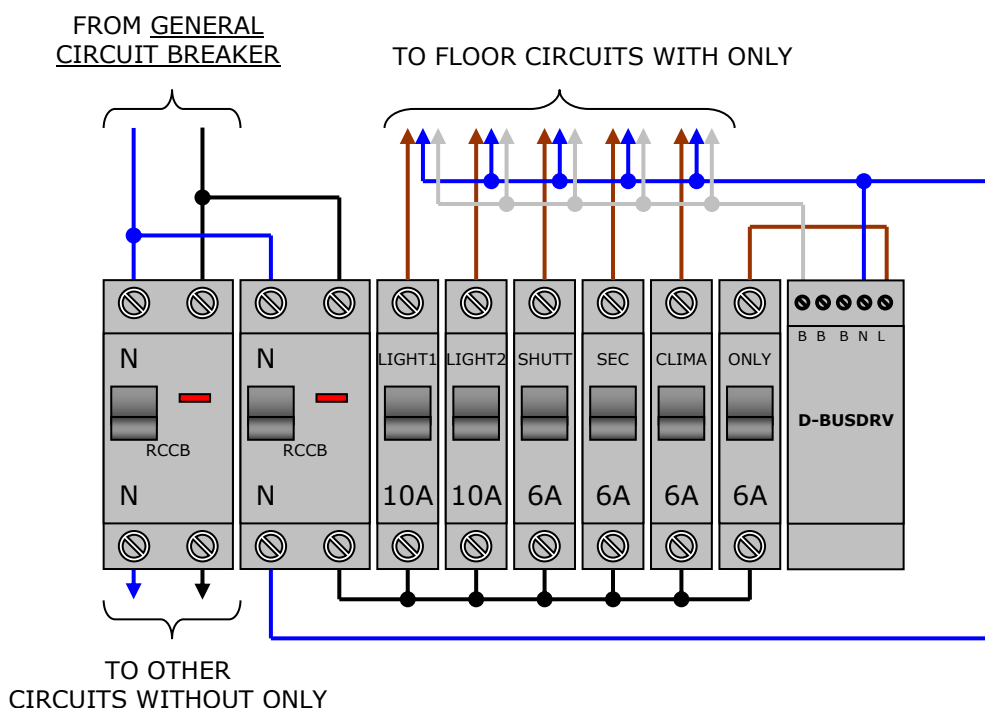
In the switchboard, a D-BUSDRV is used, a BUS driver without any connection to other switchboards. The maximum number of modules that the D-BUSDRV can feed is 50. Normally, one BUS driver for a single phase installation with one switchboard is sufficient.

ENANCER Electrónica S.A.
Rua Max Grundig 9
4705-820 Braga Portugal
Tel: +351 253 221 484

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www.only-smartbuildings.com

Single phase installations with more than one switchboard

When we have more than 1 switchboard with ONLY it is necessary to connect a BUS line between the switchboards. This connection must be made using a floor driver for each switchboard. The scheme of a switchboard of this type is as follows:

The connections in the switchboards will be as the scheme below, where ONLY the domotics part is indicated.
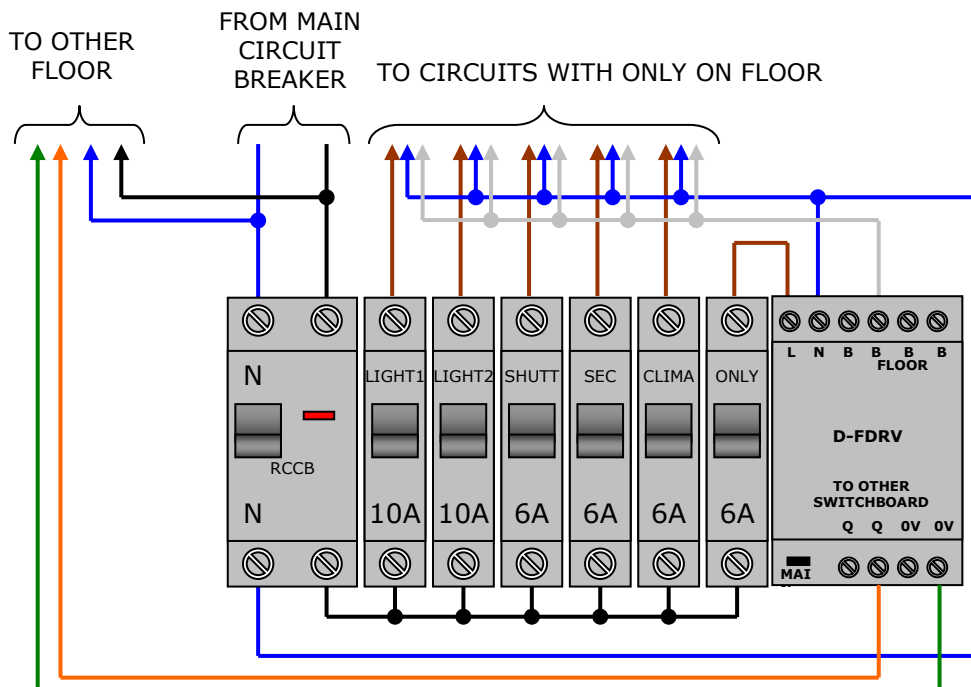

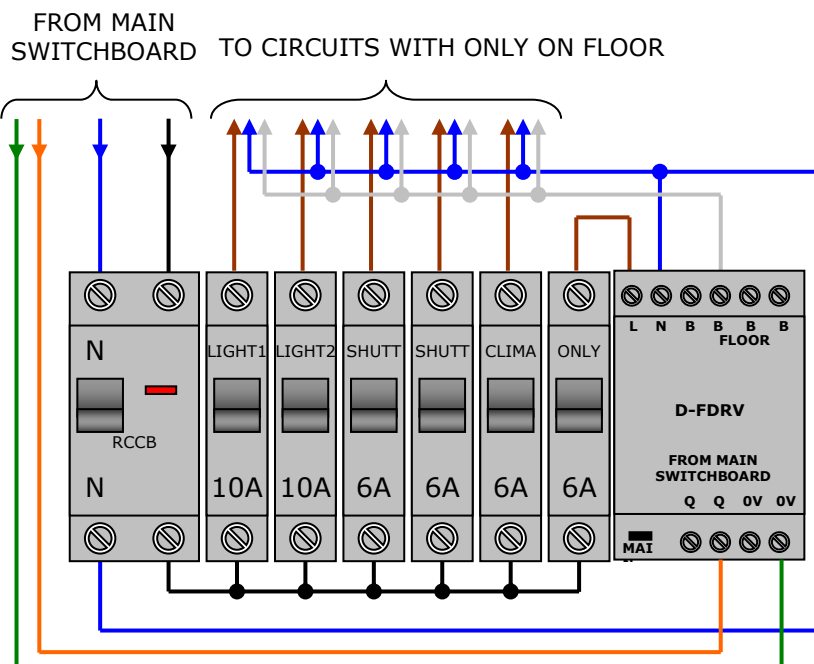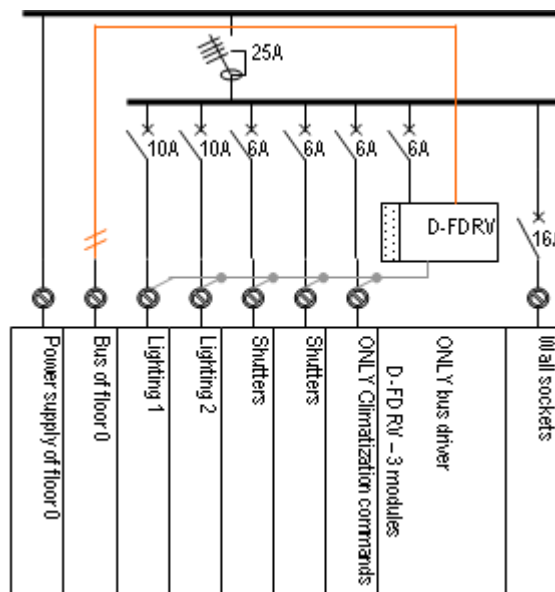Fig. X: Solution with floor BUS driver: Main Switchboard

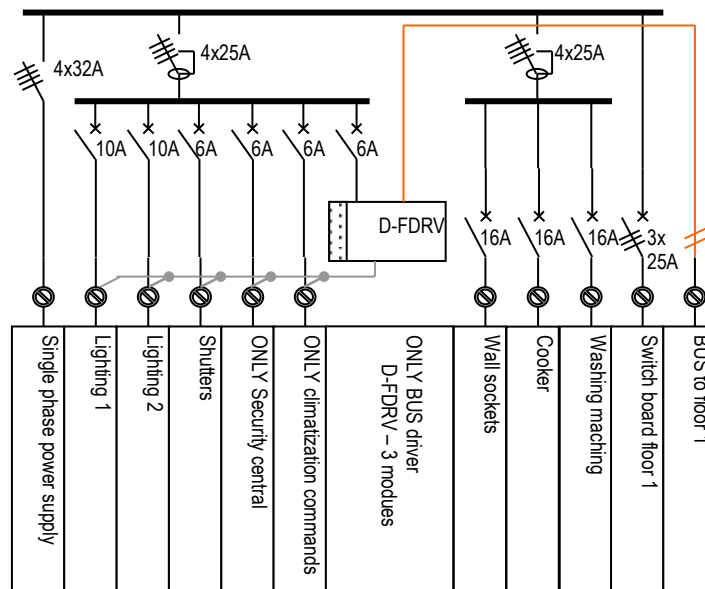Fig. X: Solution with floor BUS driver: Floor switchboard

The green and orange lines are 24V lines isolated from the mains supply. They are as such no active lines and therefore do not need to be switched off by a power cut of the floor.

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Rua Max Grundig 9
4705-820 Braga Portugal
Tel: +351 253 221 484

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Three-phase installations with more than one switch board

The three-phase installations with ONLY one switchboard should concentrate all the circuits with ONLY protected with the same RCCB. Like this ONLY a D-BUSDRV is necessary for the installation.

If there are more than one switchboard or ONLY modules are divided by more than one RCCB, it is necessary to use a floor driver D-FDRV, that provides not ONLY the BUS drive for the floor but also an isolated BUS connection to another floor.

The electrical diagrams of the switchboards are as follows:

The connections in the switchboards are as follows (note that ONLY the automation part is indicated):
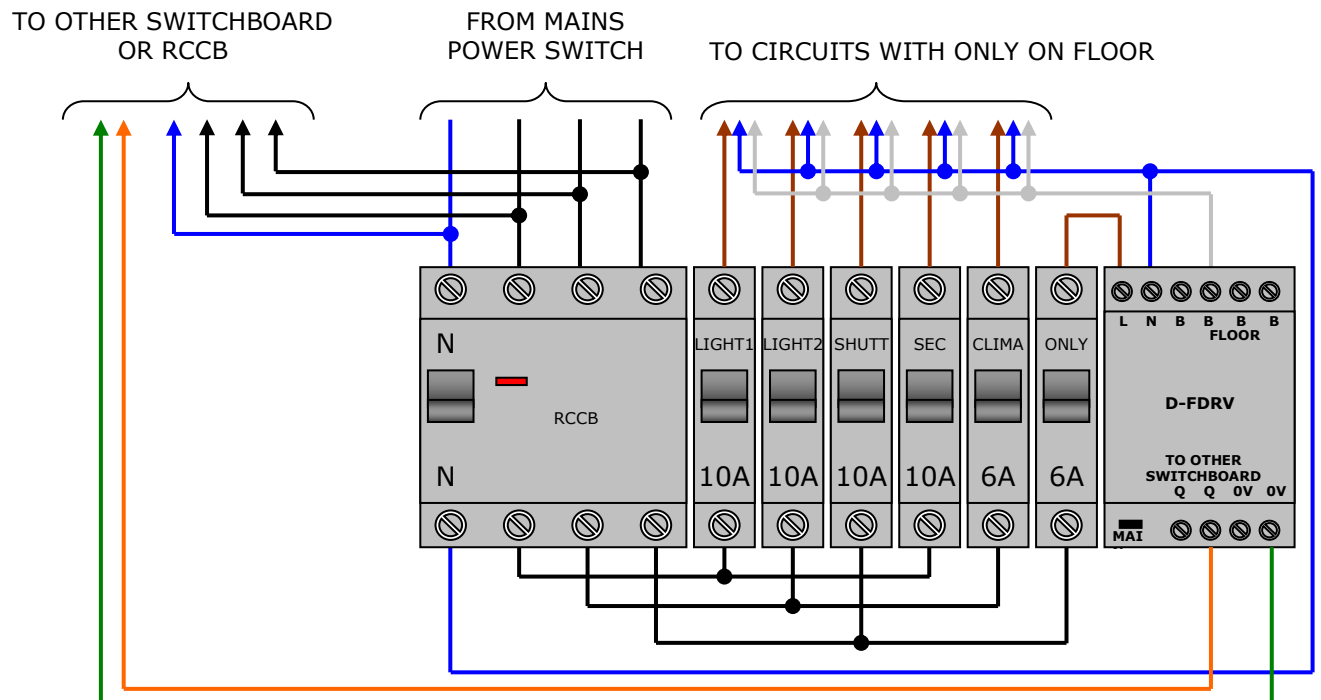

Fig. 5: Solution with floor BUS driver: Main switchboard

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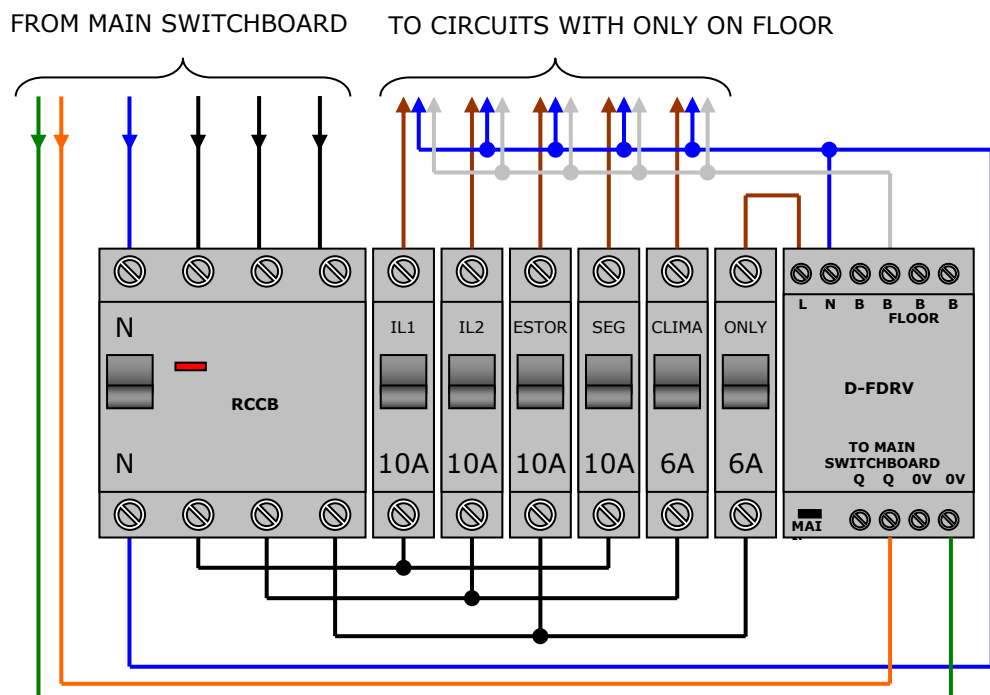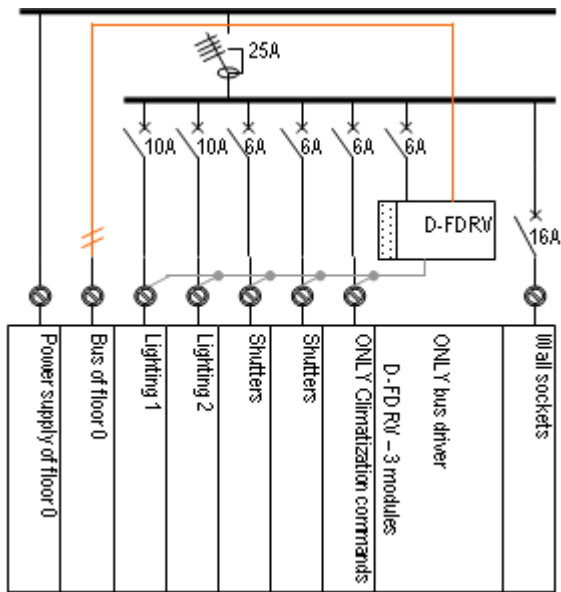## FROM MAIN SWITCHBOARD   TO CIRCUITS WITH ONLY ON FLOOR

Fig. X: Solution with floor BUS coupler: floor switchboard

Also in this case the RCCB can be named GENERAL because it cuts all active lines in one movement. The green and orange lines are isolated from mains, therefore they are not active lines.

BUS LINE

The BUS line of the floor accompanies each circuit and should be a white V line with 1 mm² section.
For interconnection between switchboards a FXG 2x1.0 cable should be used.

BUS line

The BUS line of the floor is an active line as it is referred to Neutral. The current is considerably small, being maximum 0.02 A.
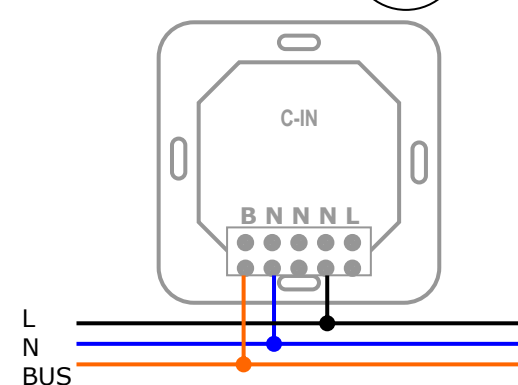*The BUS line between switchboards is isolated from the mains and has a voltage around 20VDC.*
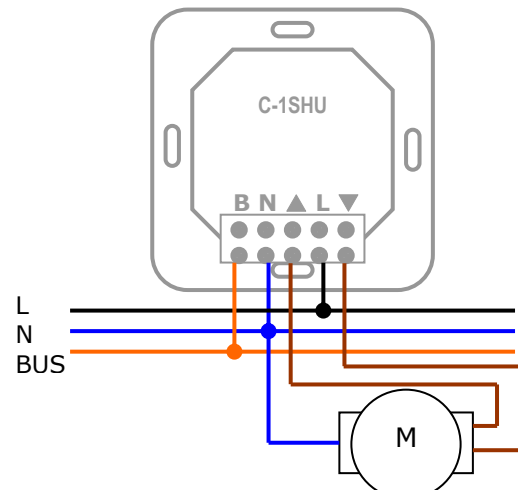
In case the number of ONLY commands in one segment of the BUS is higher than 50, it is necessary to introduce a coupler. This receives the BUS at the first segment and creates a new one for the second segment.
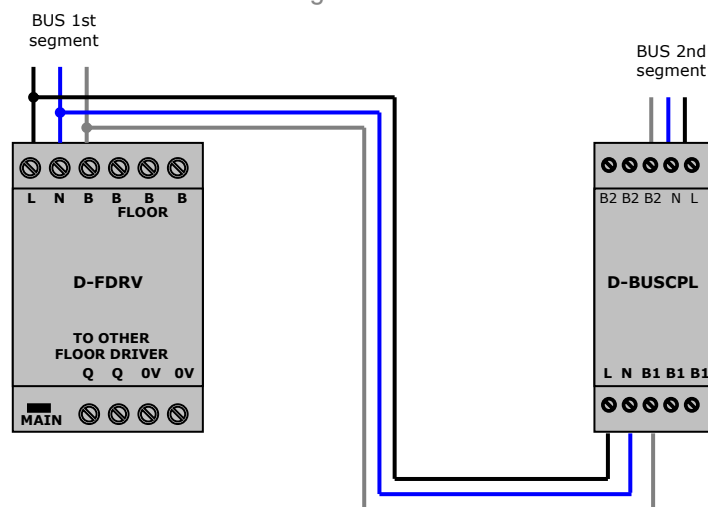
CONNECTION SCHEMES

In this chapter you will find the connection schemes of almost all types of ONLY commands.

ENANCER Electrónica S.A.
Rua Max Grundig 9
4705-820 Braga Portugal
Tel: +351 253 221 484

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L
N
L
N
BUS

B N L

D-4OUT

L
L
N
L
N
BUS

B N L

D-8OUT

L
N
L
N
BUS

B N L

D-4SHU

D-1DIM

B N L

L
N
BUS

L
N
BUS

B N L

D-1DIM010V

L 1 − +

+ DC

Balastro 1-10V

− 230V~

L
N
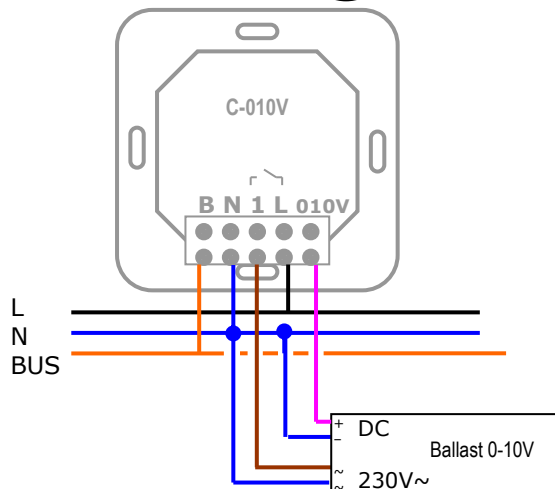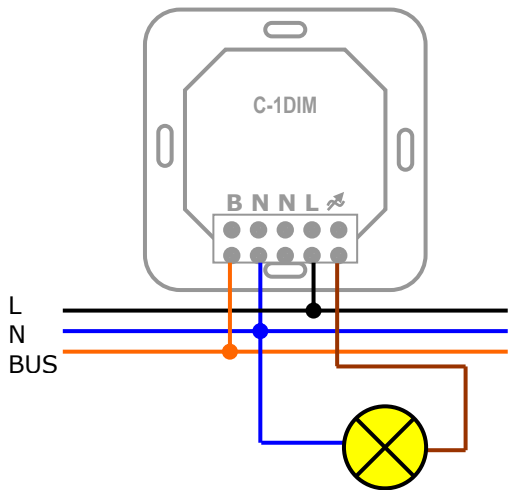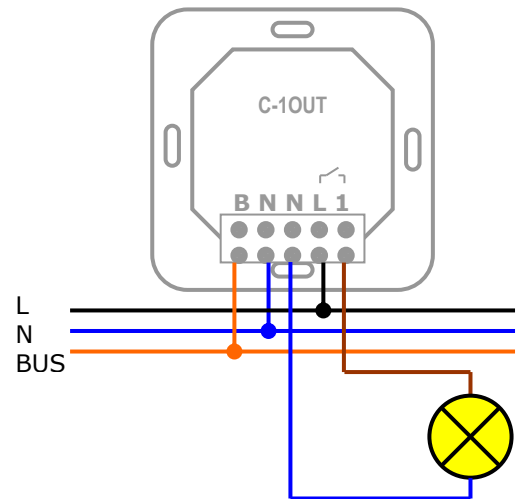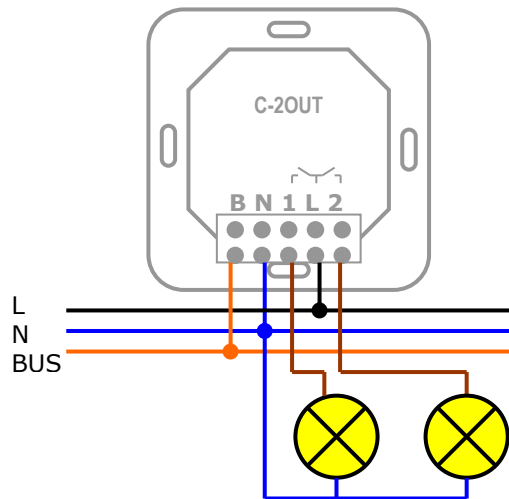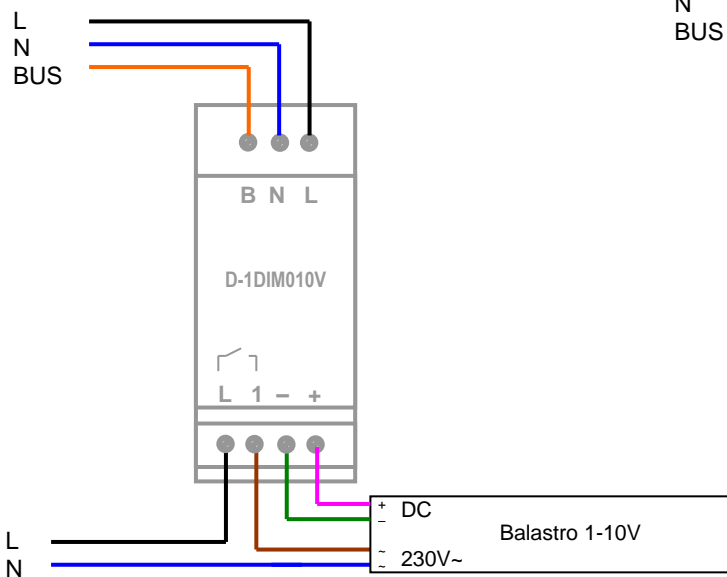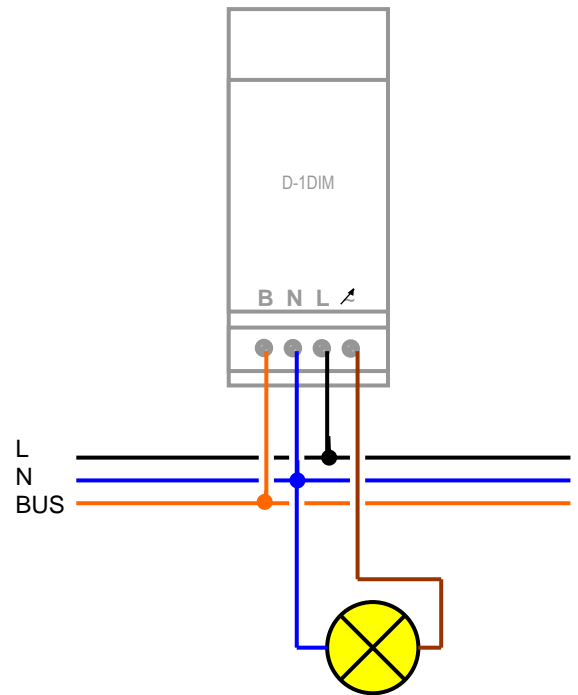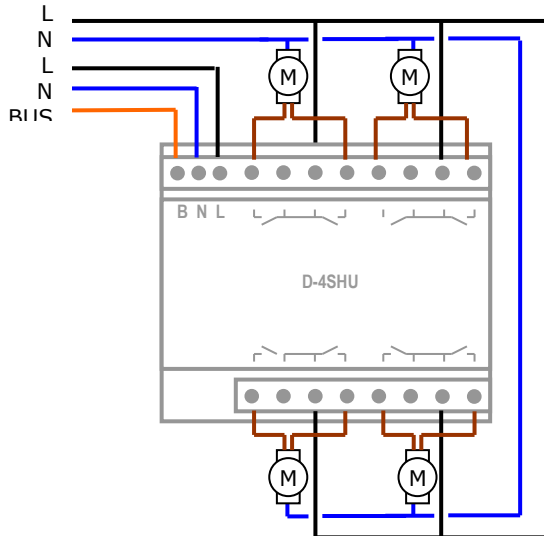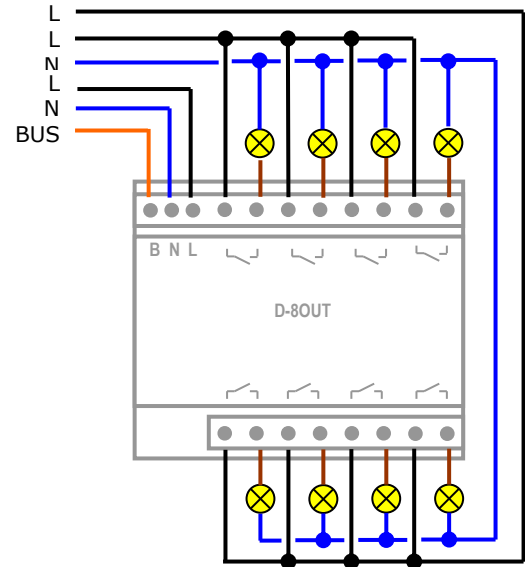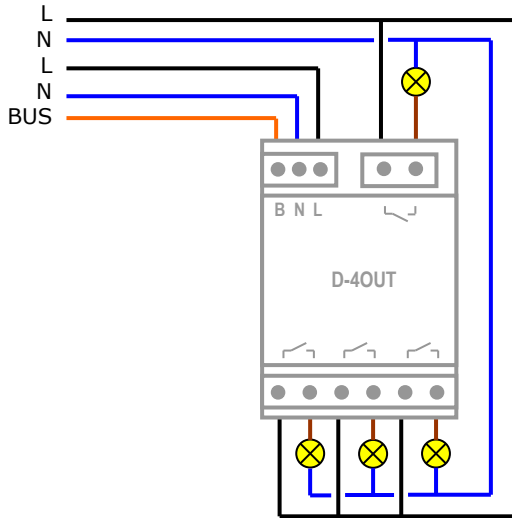
CONFIGURATION

This chapter explains briefly how to configure the ONLY automation system. We recommend you to consult the User Manual for more details on the configuration.

The configuration must be done in the following order:
1. Choose the desired command for each button
2. Associate the buttons to the outputs in each room
3. Configure the scenarios
The diagram below summarizes the programming of ONLY inputs and outputs.

ENANCER Electrónica S.A.
Rua Max Grundig 9
4705-820 Braga Portugal
Tel: +351 253 221 484

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www.only-smartbuildings.com
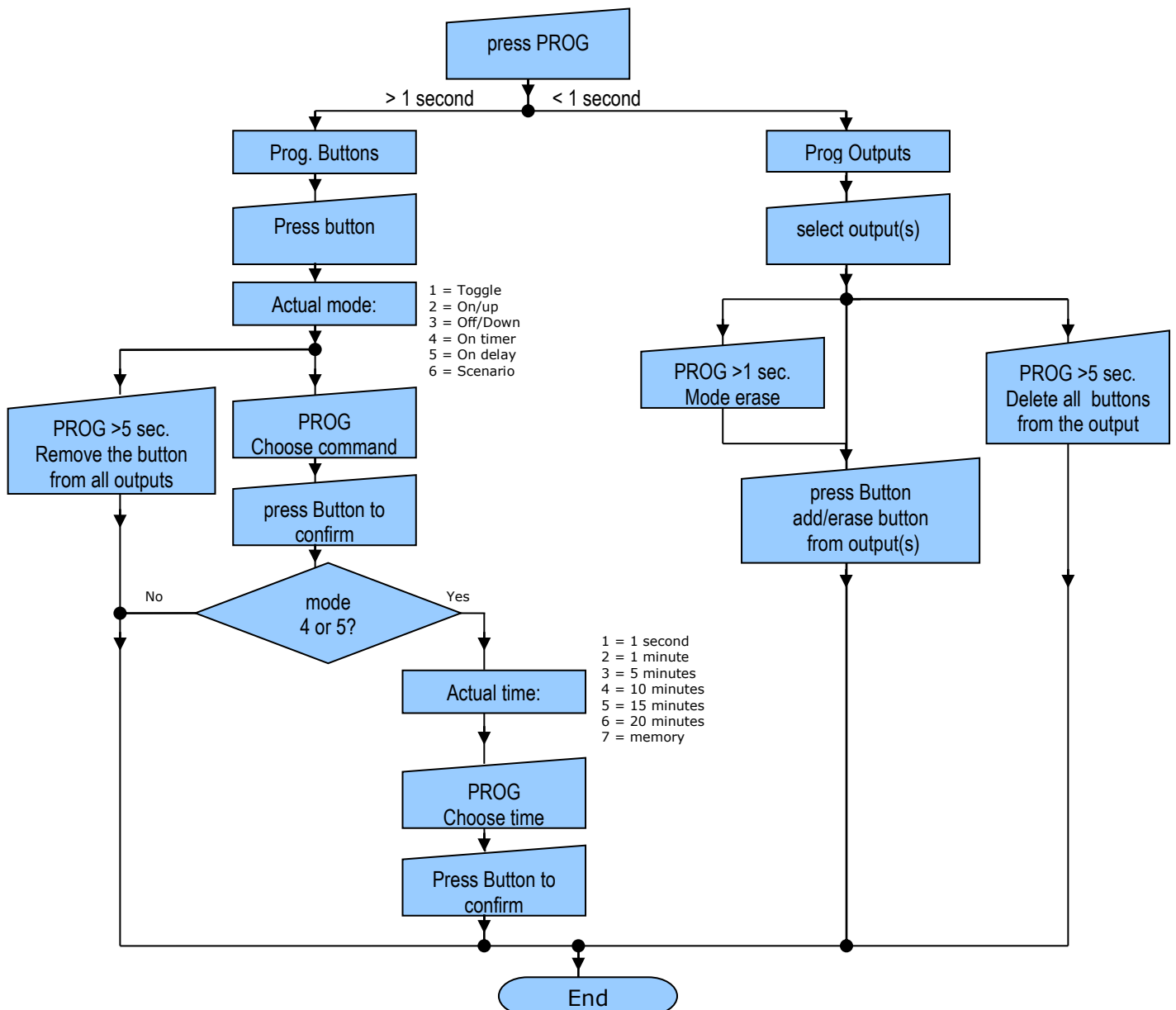
Very often it is necessary to have a button to control exactly the same outputs as another, for example, the button for switching on/off the ceiling light from both sides of the bed.

In this case a copy button procedure is available. This procedure just adds the address of the new button to the outputs that already had the first button. The procedure does not update the function (Toggle/Set/Reset/Time/Delay/Scenario) of the new button, which should be set manually.

The method is as follows:

1.Ensure that both buttons have the same function.

2.Press the PROG key for > 1 second (on the module where the key to be copied is located) to enter programming buttons mode: the green LED lights on.

3.Briefly press PROG again: the green LED blinks 1 time per second.
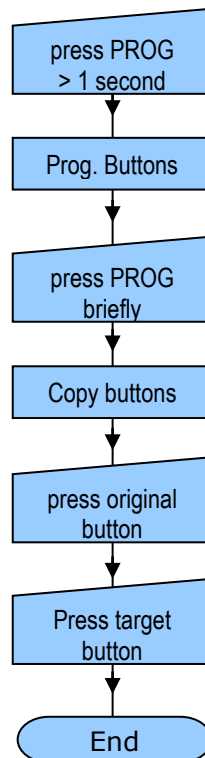
4.Press the button you want to copy (source).

5.Then press the target button (destination): the second button now actuates the same outputs as the first button.

Important Note: ONLY modules marked with firmware version V2.0 or later have this function built-in. Modules with older firmware versions ignore this function not making the copy.

The following scheme explains how to activate the copy buttons procedure:

```
┌─────────────────┐
│  press PROG     │
│  > 1 second     │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  Prog. Buttons  │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  press PROG     │
│  briefly        │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  Copy buttons   │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  press original │
│  button         │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  Press target   │
│  button         │
└─────────────────┘
         │
         ▼
     (   End   )
```

Finally, modules marked with firmware version V2.0 or later are able to accept general commands to set their own outputs in programming mode.

For this purpose, the BUS drivers are able to send the following commands:

PROG_ALL...sets all outputs in programming mode outputs of modules for motor and climatization control are not included

PROG_SHU...sets all shutter modules in programming mode

PROG_LIGHT..sets all on/off modules and dimmers in programming mode

ERASE_ALL...sets all outputs in erasing mode outputs of modules for motor and climatization control are not included.

ERASE_SHU...sets all shutter modules in erasing mode

ERASE_LIGHTS..sets all on/off modules and dimmers in erasing mode

Afterwards, the desired button should be pressed.

These commands let you save yourself the trouble of setting each of the outputs in programming mode.
The instructions provided with the BUS drivers explain how to generate these commands.

MEASURING AND TROUBLESHOOTING

When all units of the system are installed and connected the system is ready to receive power.

ATTENTION: a failure in the connection of neutral on a three-phase installation is very critical as it may cause the appearance of composed voltage (400 V). The ONLY modules do not support that level of supply voltage.
Therefore, it is crucial to verify that the connections are well made before applying power to the installation.
The voltages in the BUS line should be verified with an AC/DC voltmeter. The measurements should be as follows:
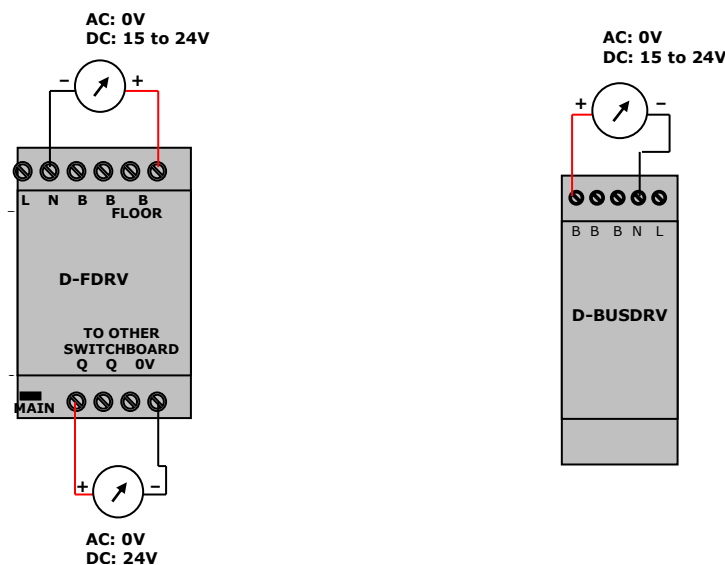
The supply voltage on the side of the floor will become lower as you increase the number of modules on the BUS.
For each unit added to the BUS you will notice a drop of 150 mV.
On the side BETWEEN SWITCHBOARDS the voltage is around 24V. This voltage is isolated from the mains supply.

If the floor BUS voltage drops below 12VDC it's because there is a leakage somewhere. Please verify the connections or the state of the modules.
There should never be any AC voltage between the BUS line and the neutral.
If the LEDs of the ONLY units blink rapidly it is because there is AC voltage in the floor BUS line. In this case there is a wrong connection that needs correction.

When the DC voltage in the BUS line is low, you should proceed as follows:
1.Disconnect all BUS lines from the driver.
2.Measure the voltage at the driver terminals between floor BUS and Neutral as shown above: the voltage should be around 24V. If this is not the case, the driver is faulty.
3.Now add one by one the segments of the BUS line, always monitoring the BUS voltage. If by adding a segment the voltage drops significantly then the problem lays in this segment.
4.In this segment, disconnect the modules and connect them one by one while monitoring the BUS voltage. This voltage drops when the defective module is connected.
There are cases in which a faulty connection of the neutral of a module may cause malfunctioning of the whole system by introducing noise or interruption of a communication.