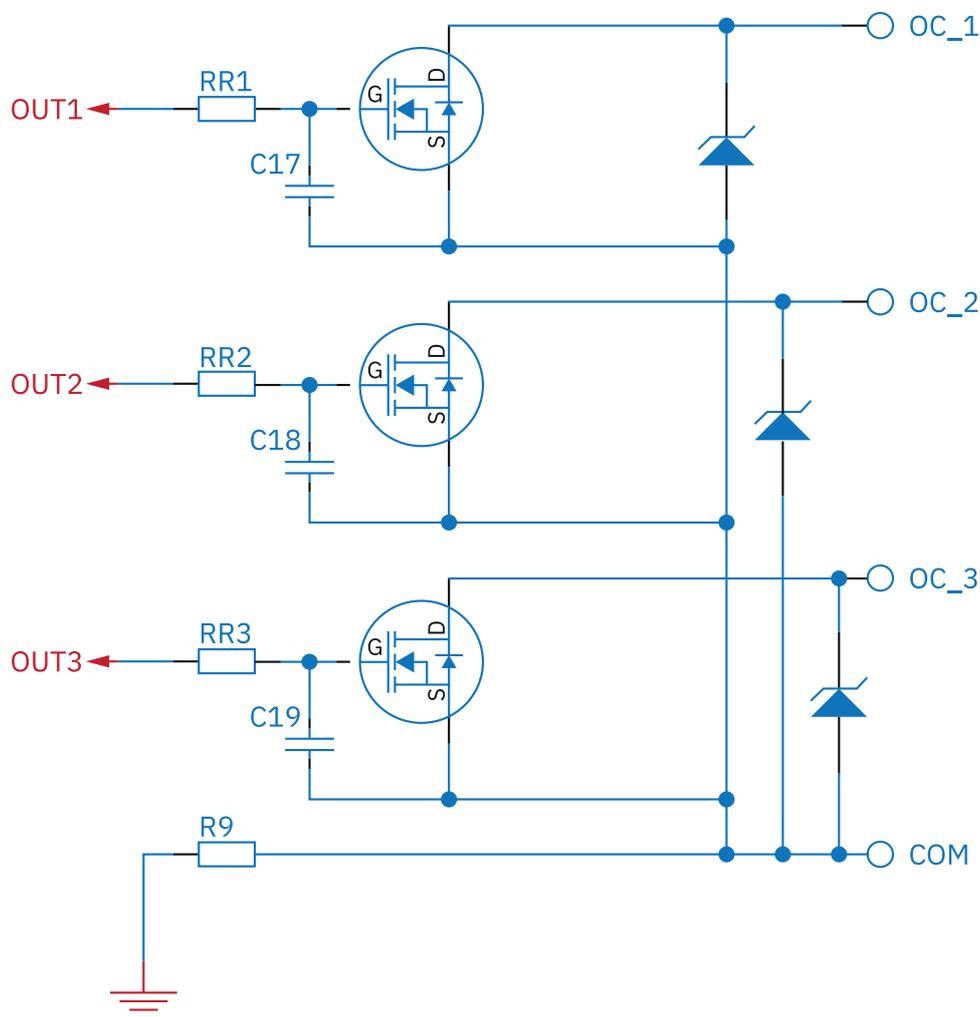


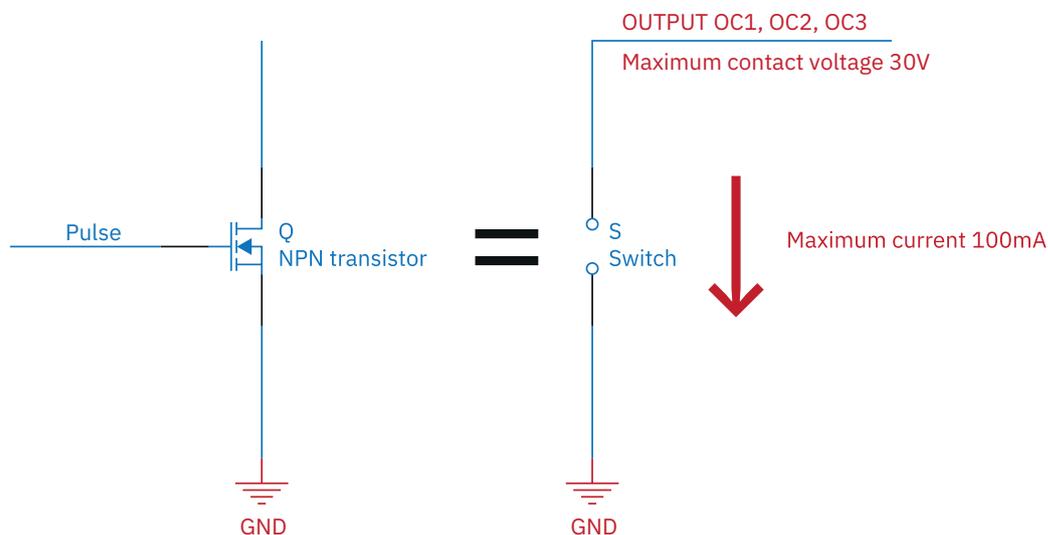
INSTRUCTIONS FOR CONNECTING THE IMPULSIVE OUTPUTS OF  
THE B METERS **IWM-PL3-IWM-PL4** MODULES

The pulse emitter **IWM-PL3** and **IWM-PL4** modules with inductive principle provide polarized Open Drain (OD) N-MOS type outputs (mosfet, they do not provide a “clean” contact).  
The reference scheme is the following:



The figure shows that the OC\_1, OC\_2, OC\_3 outputs (where we'll connect the PLC input or any device that receives the pulses) are connected to an N-MOS type transistor (J1, J2, J3 in the figure). The output operation is as follow:

“When a pulse is generated the output transistor is a switch that closes the contact to ground”.



This type of output (Open Drain) is usually accepted as valid for devices such as PLCs. However, it's necessary to check that the voltage applied to the contact, by the external device, does not exceed the maximum bearable voltage. For **IWM-PL3** and **IWM-PL4** products this voltage is 30V in continuous electric current (DC).

**NOTE:** remember that the voltage applied to the contact is supplied by the external device, not by the B METERS **IWM-PL3/PL4** module.

It's necessary to verify that the input of the device to which we will connect our output is:

1. Open Drain type (NO normally open clean contact or DRY CONTACT)
2. The voltage applied to the contact is less than 30VDC. This voltage coincides with the supply voltage of the external reading device. Usually these voltage values are present:
  - 3.3VDC
  - 5VDC
  - 12VDC
  - 24VDCtherefore lower than 30VDC
3. The type of input accepted is a 'contact close to ground' (N-MOS, BJT NPN type or switch)

The last point is necessary because the contact is linked to a type of transistor which can be of two "polarities" PNP or NPN. The possibilities that can occur for an Open Drain output are two:

- NPN type Open Drain input: when there is an impulse the output jump to ground (which must be in common between the **IWM-PL3** or **IWM-PL4** device and the external device).
- PNP type Open Drain input: when there is a pulse the output jump to the supply voltage (which must be in common between the **IWM-PL3** or **IWM-PL4** device and the external device).

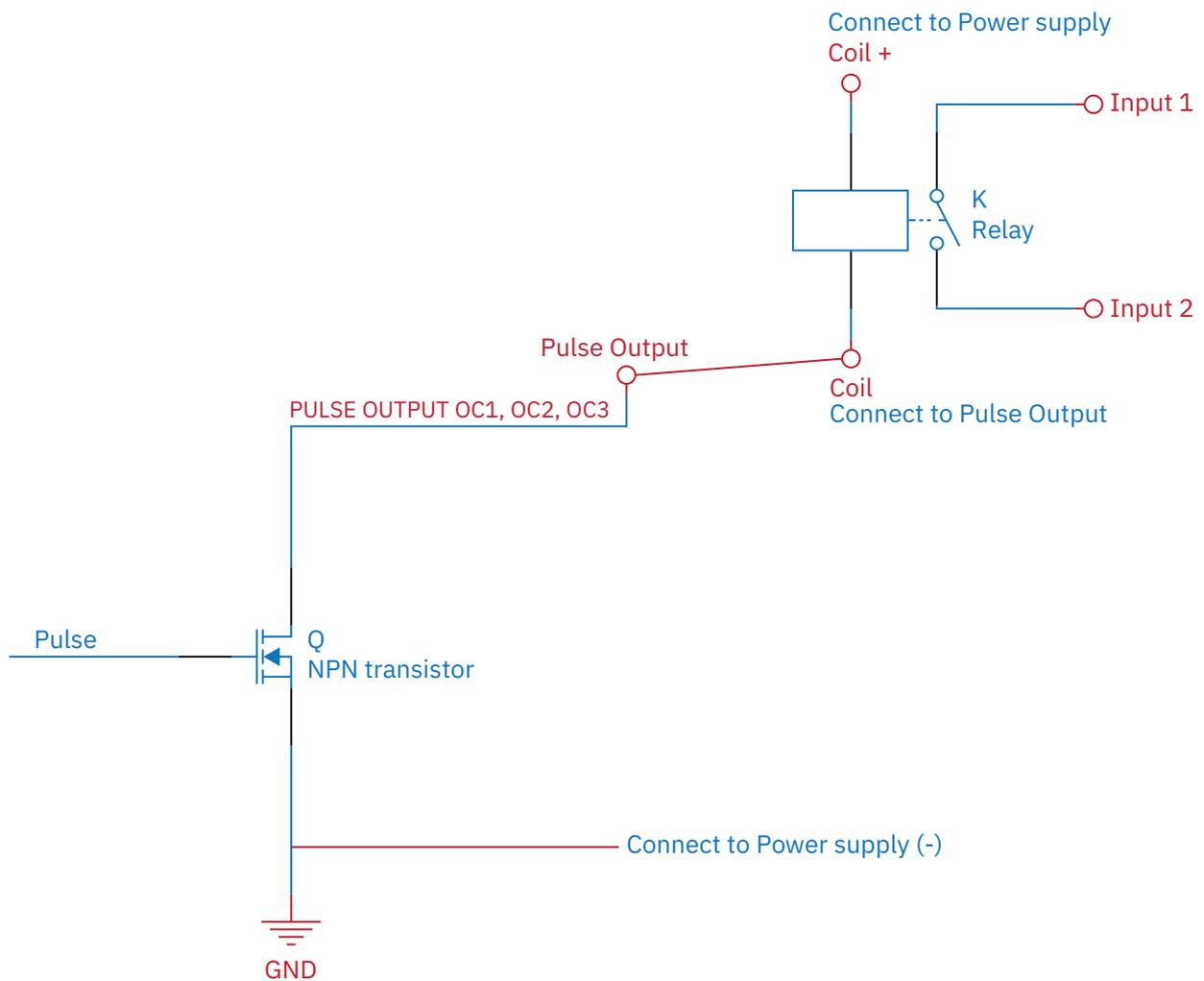
The outputs of the **IWM-PL3** and **IMW-PL4** modules are of the first type: N-MOS (NPN).

The **IWM-PL3** and **IWM-PL4** modules are connected as follows:

1. Ground (**BROWN**) wire connected to the negative reference (Ground) of the output device that reads the pulses. PLCs usually have opto-isolated inputs therefore sharing the masses does not create anomalous currents.
2. Pulse output wire (**WHITE, YELLOW, GREEN** and **GRAY**) connected to the input of the device that reads the pulses (PLC for example). Please note that this input must accept an N-MOS polarized Open Drain output with a voltage not exceeding 30VDC, current limited to 100 mA.

Sometimes it is necessary to connect the output of the **IWM-PL3** or **IWM-PL4** device with a device that only accepts “clean” contacts. The clean contacts have thin name because they are not related to the mass (NPN or N-MOS) to the supply voltage (PNP). In this case, to make the two devices “talk” it is necessary to insert an interface relay between the output and the input.

The principle connection scheme is as follows:



It's necessary to select an appropriate relay:

- With NO (normally open) or NC (normally closed) output depending on the type of input you want.
- With an excitation coil voltage compatible with the available voltage. The voltage will normally be the one supplied by the reading device (PLC for example) and must NOT be greater than 30VDC.
- With a coil excitation current not exceeding 100mA.

These data are provided by the device manufacturer and are generally indicated by the relay technical sheet.

Then proceed as follows:

1. Connect the relay input (excitation coil) to the **IWM-PL3** or **IWM-PL4** output as shown in the diagram. One terminal of the coil must be connected to the supply voltage and the other must be connected to the output of the **IWM-PL3** or **IWM-PL4**. The **IWM-PL3/IWM-PL4** negative (ground, brown cable) must be connected to the negative power supply (relay).
2. Connect the relay output (the "clean" contact) to the inputs of the external device (there is no polarity).

In the example we referred to an electromechanical relay. There are semiconductor devices on the market, called solid-state relays, which can be used.

The advantages are:

- ↑ less switching noise (no bounces, no noise emission, noiselessness)
- ↑ smaller footprint
- ↑ higher switching speed

The disadvantages are:

- ↓ greater cost
- ↓ minimum consumption but not zero even at rest

When switching speeds are high it's preferable to use a suitably sized solid-state relay.

## GENERAL INDICATIONS FOR IWM-PL3-IWM-PL4 CABLE EXTENSION

Further explanations are provided below in case of extend the cable supplied needed (1.5 meters by default). To extend the default cable it is possible to use a braided shielded cable with the following characteristics:

- maximum length 7.5 meters, for a total length of maximum 10 meters (including the 1.5 meters by default)
- cable section 4 (poles) x 0.25 mmq
- maximum applicable current 100 mA (absorbable), 30 VDC
- copper shielding > 70%