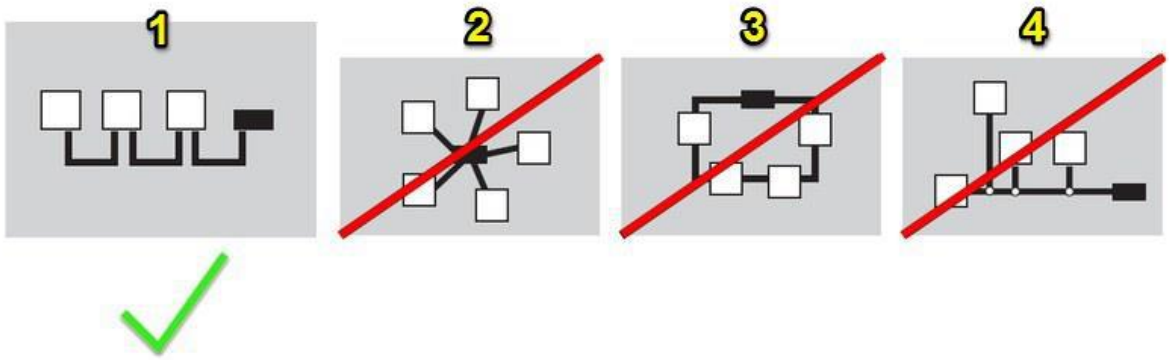
# Manual - Connection of the LG inverters over communication port RS485

## 1. Modbus Topology

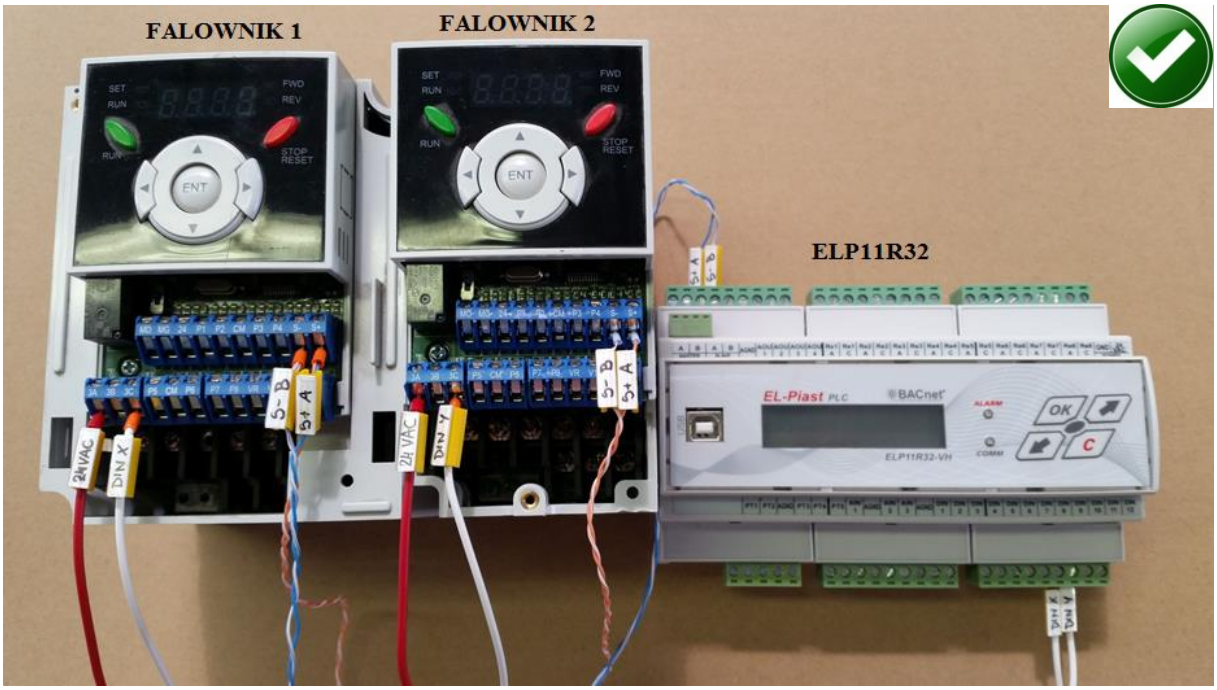
There is only one connection topology in Modbus what can be used (pic. 1, topology 1). Only proper/right connection topology between controller and frequency drive guarantee the proper communication. Topology 1 on the picture is right, any other connections are not allowed.



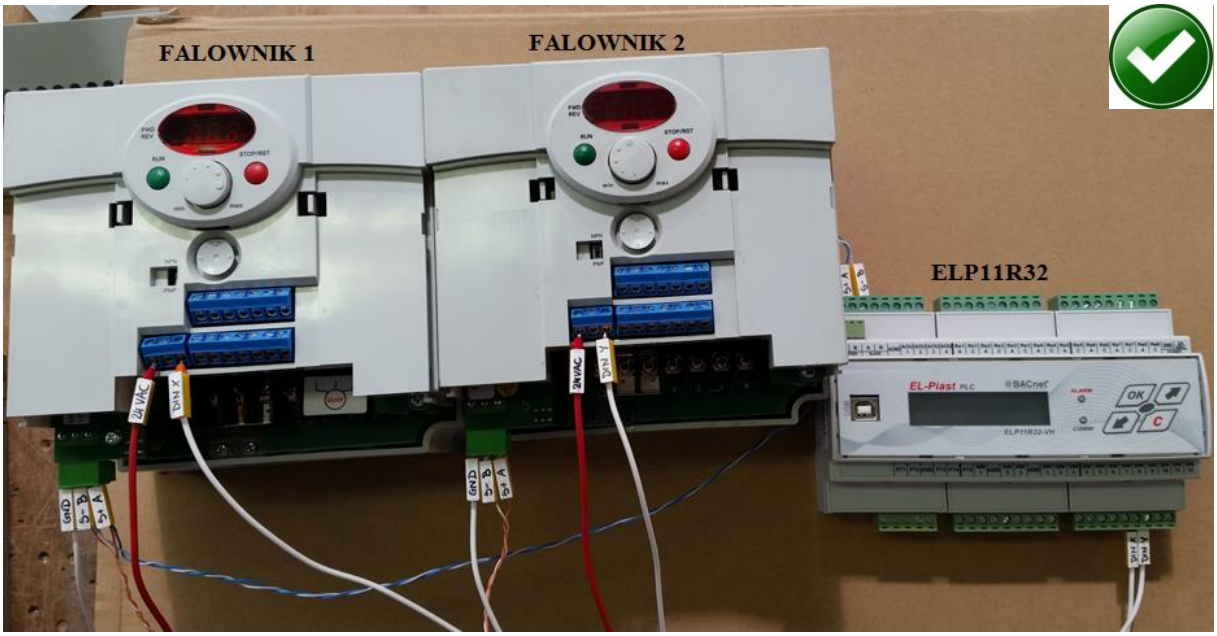

**Pic.1 Modbus topology**
**Black block – PLC Controller**
**White blocks – Frequency Drives**

## 2. Right connection.

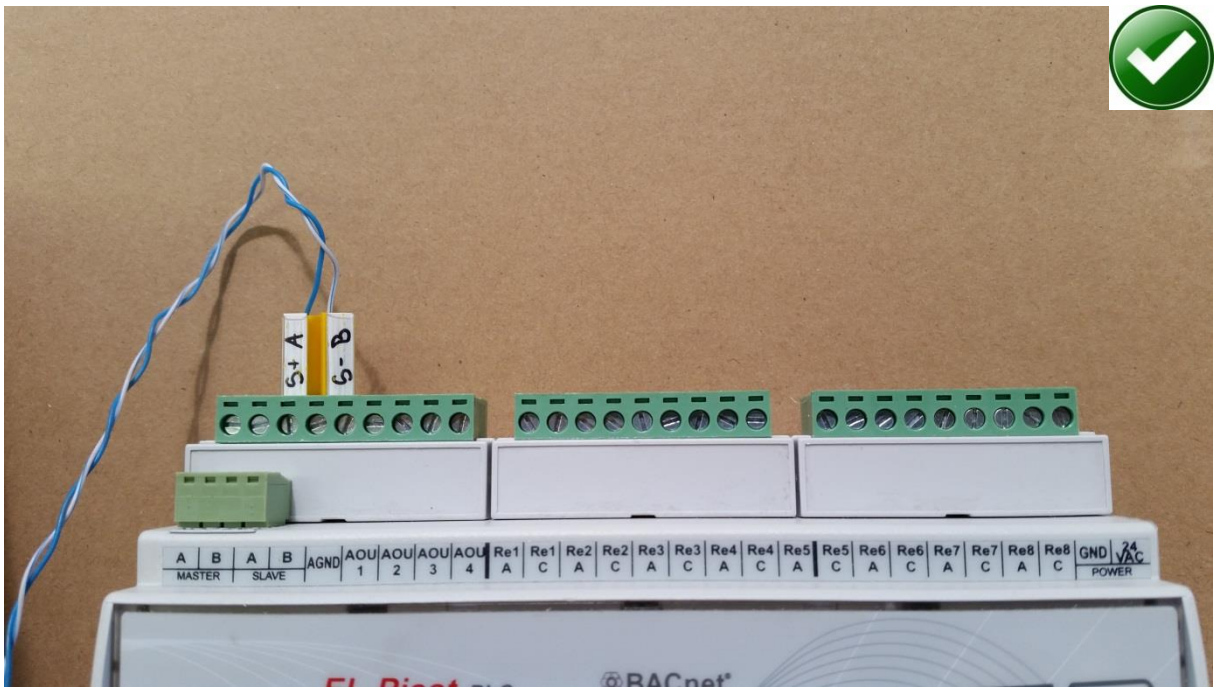
In case of right connection twisted pair of cables should be (colors examples IG5A):
Signals (S+ A) and (S- B) should be twisted only in that way! Only in that way it makes sense.
Right wiring connection should be done like on the pictures below:



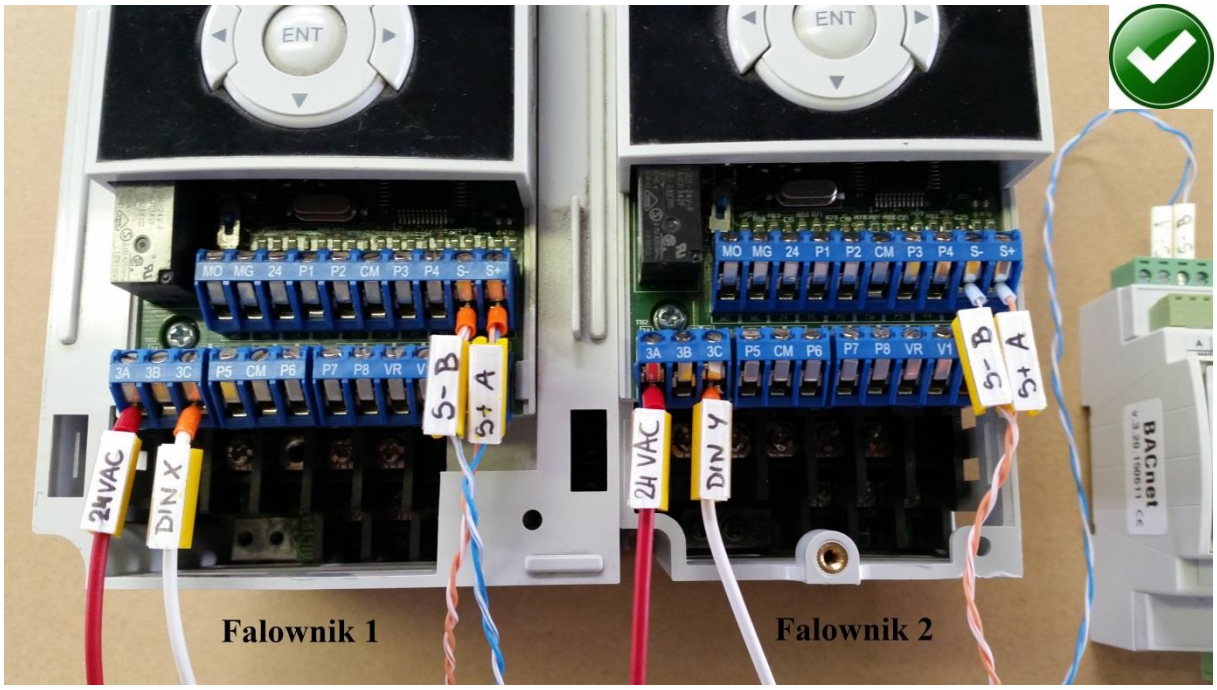

IG5A



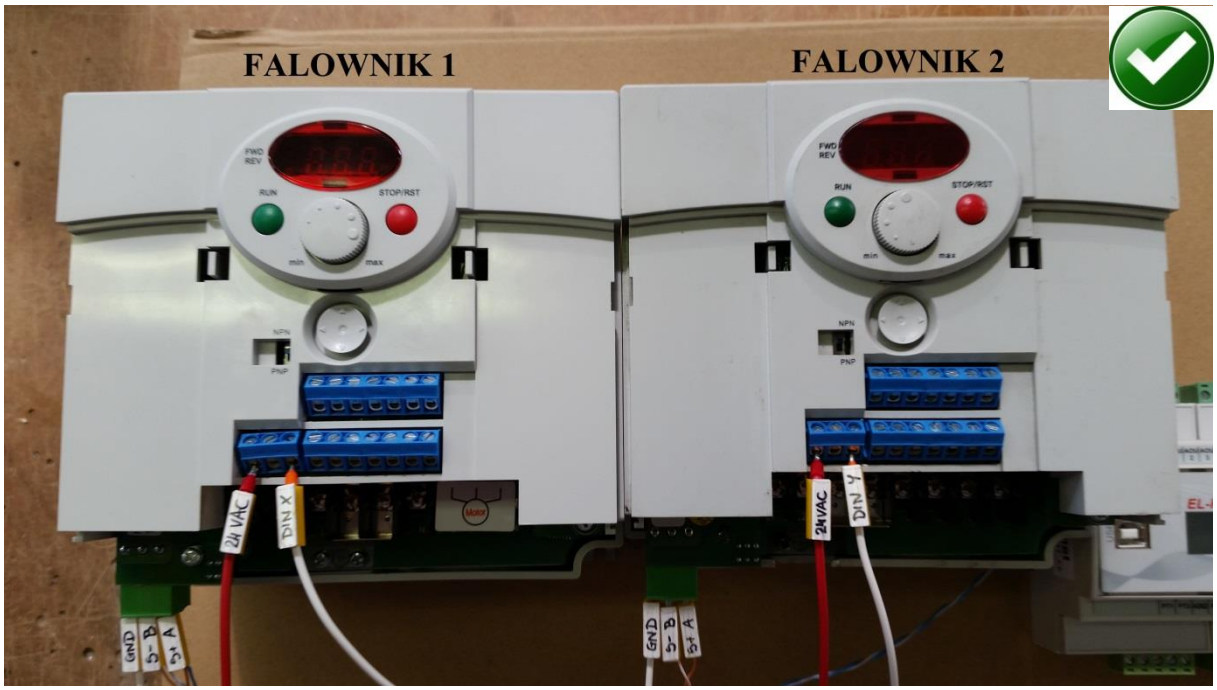

IC5




Controller ELP11R32




IG5A

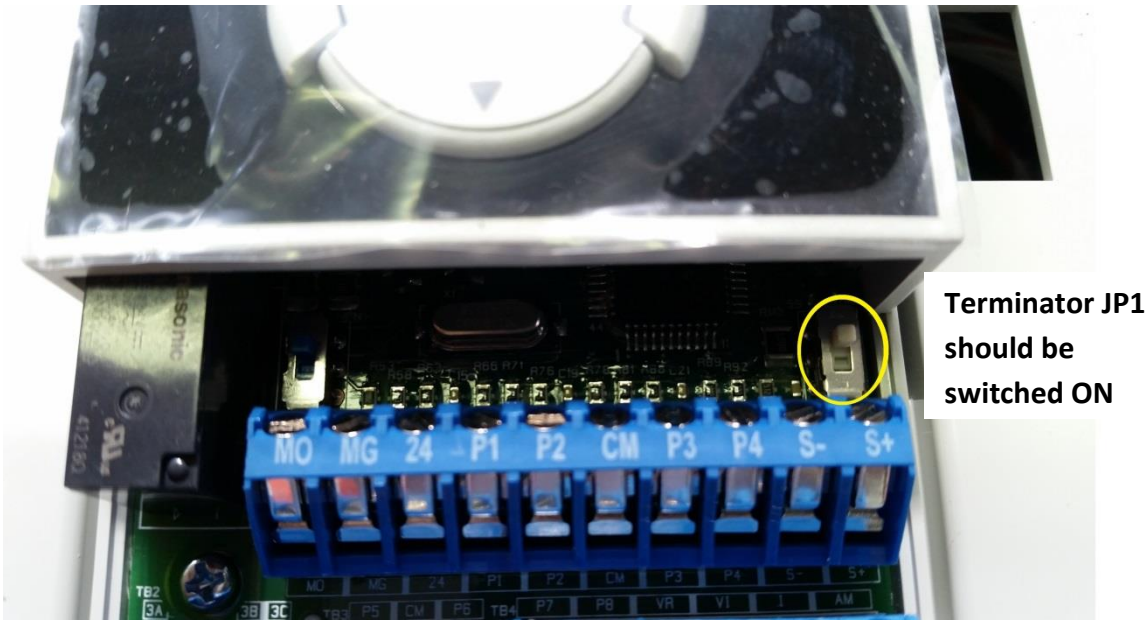



IC5

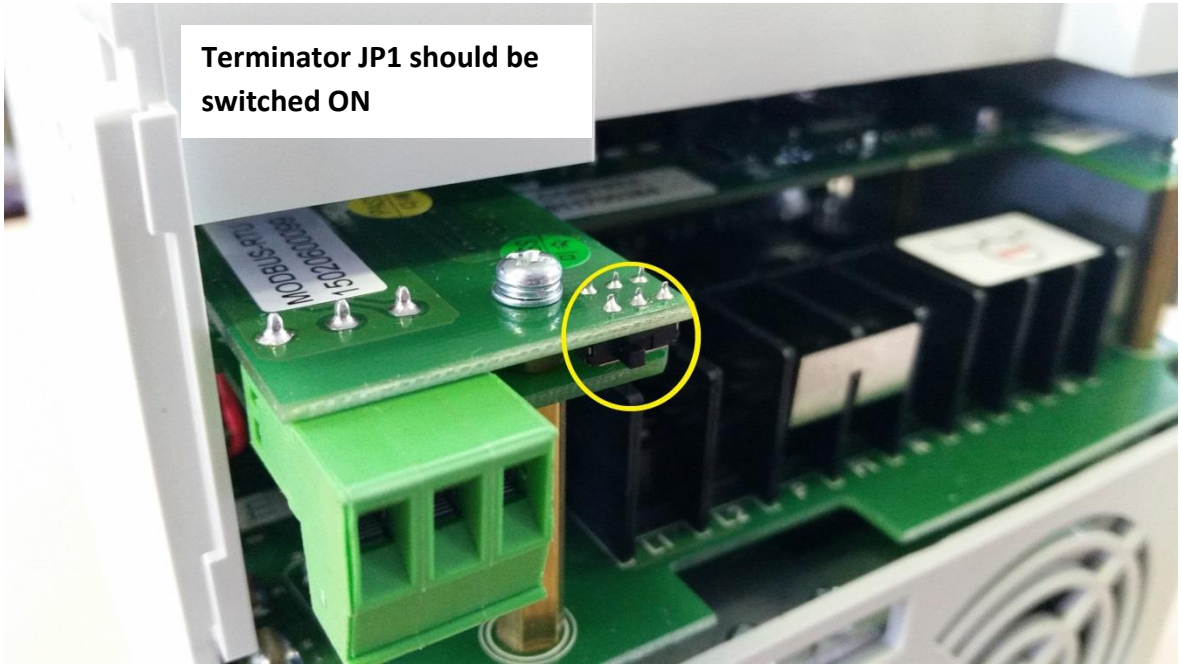
Right topology of connection (type 1) must be done like this:
Controller PLC (A+) Slave »FDrive 1 (S +)» FDrive 2 (S +) »...» FDrive n (S +)
Controller PLC (B-) Slave »FDrive 1 (S-)» FDrive 2 (S-) »...» FDrive n (S-)

### 3. Terminator

Last, but the most important thing in Modbus communication is termination of the Modbus communication line. Termination of the Modbus lines we are using in long Modbus lines to improve the Modbus digital signal levels. Should be remembered that terminator should be switched ON in the most distant SLAVE device.



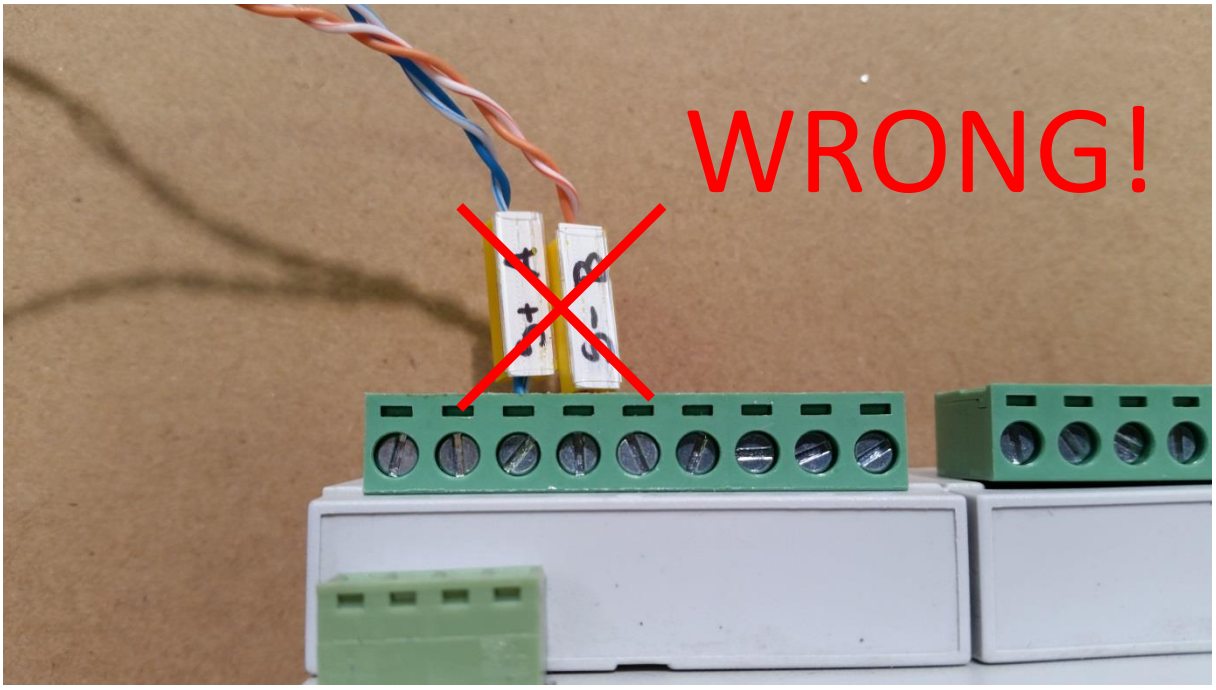

IG5A



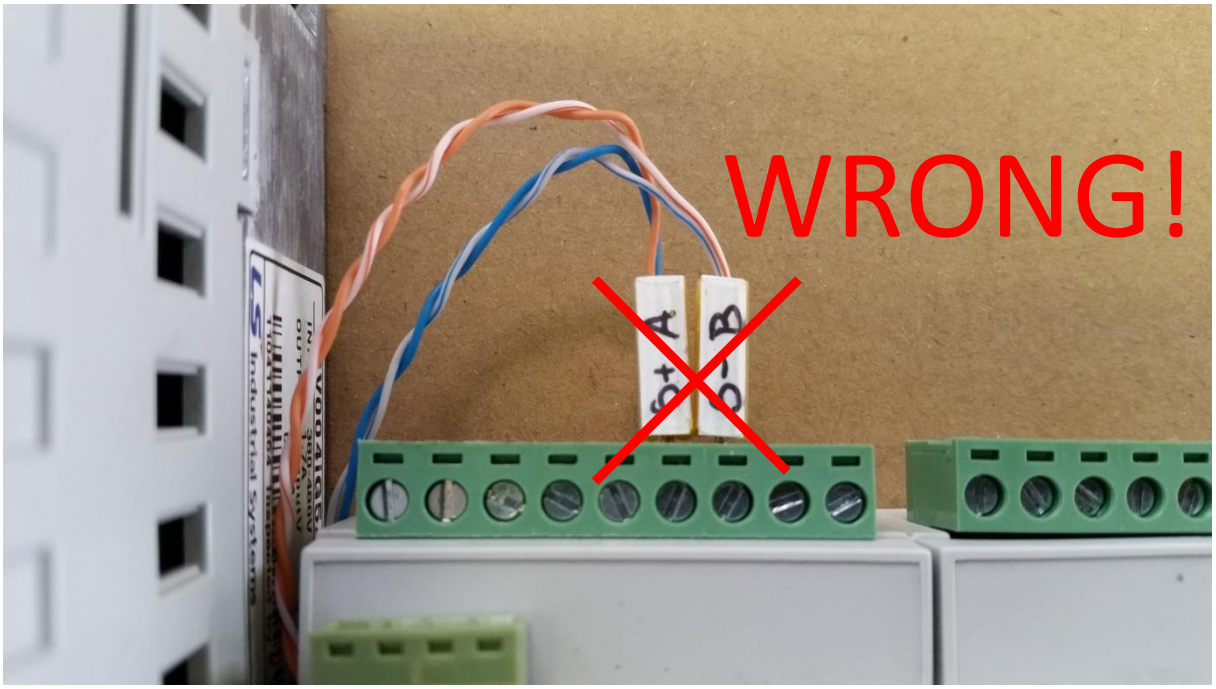

IC5

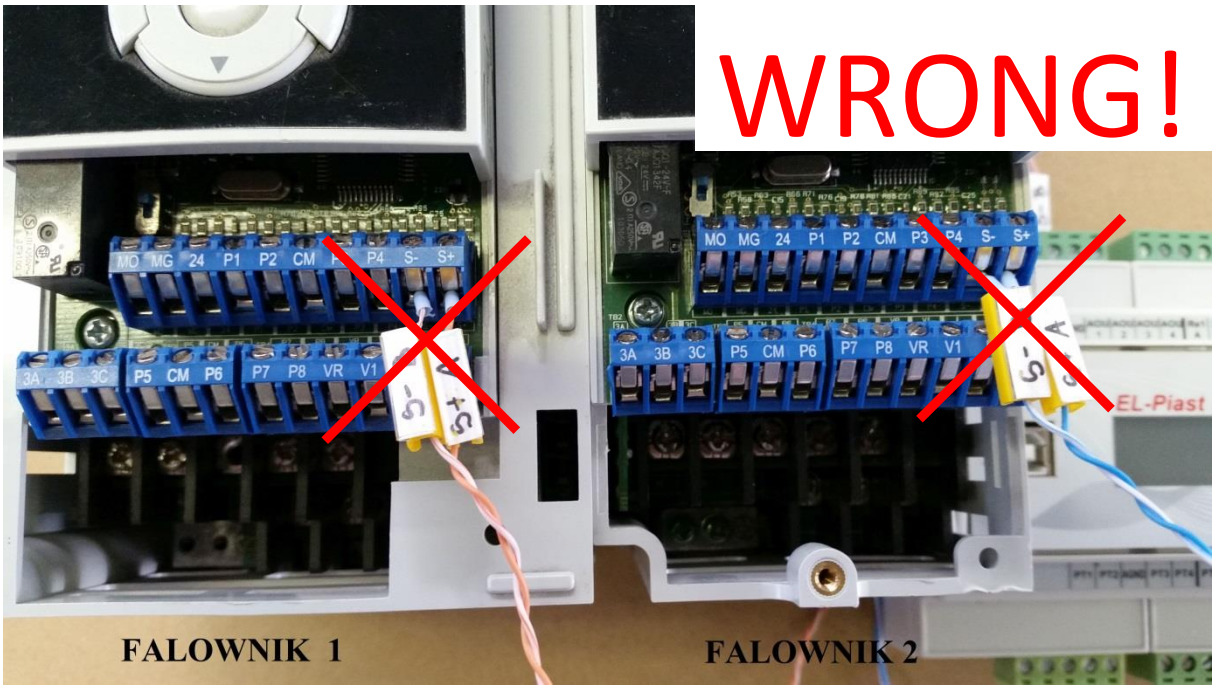
Sample configuraion of the JP1 jumpers in case of 2, 3 or 4 frequency drives in use:
PLC »FDrive 1 (JP1 = OFF)» FDrive 2 (JP1 = ON)
PLC »FDrive 1 (JP1 = OFF)» FDrive 2 (JP1 = OFF) »FDrive 3 (JP1 = ON)
PLC »FDrive 1 (JP1 = OFF)» FDrive 2 (JP1 = OFF) »FDrive 3 (JP1 = OFF)» FDrive 4 (JP1 = ON)

## 4. Wrong connection




According to the picture above, two twisted wires (color and white-color) have been used for connetion of one signal. Such a connection is totally wrong, because we are using two twisted wires for the same signal.






Using topology like on the picture above (topology type 2) is not allowed. All the frequency converters have been connected directly to the PLC controller.
Because of that, right ModBus connection is impossible.
Solution above we can described in that way:
Controller PLC (+) Slave » FDrive 1 (S +)
Controller PLC (B-) Slave » FDrive 1 (S-)
Controller PLC (+) Slave » FDrive 2 (S +)
Controller PLC (B-) Slave » FDrive 2 (S-)
Controller PLC (+) Slave » FDrive 3 (S +)
Controller PLC (B-) Slave » FDrive 3 (S-)