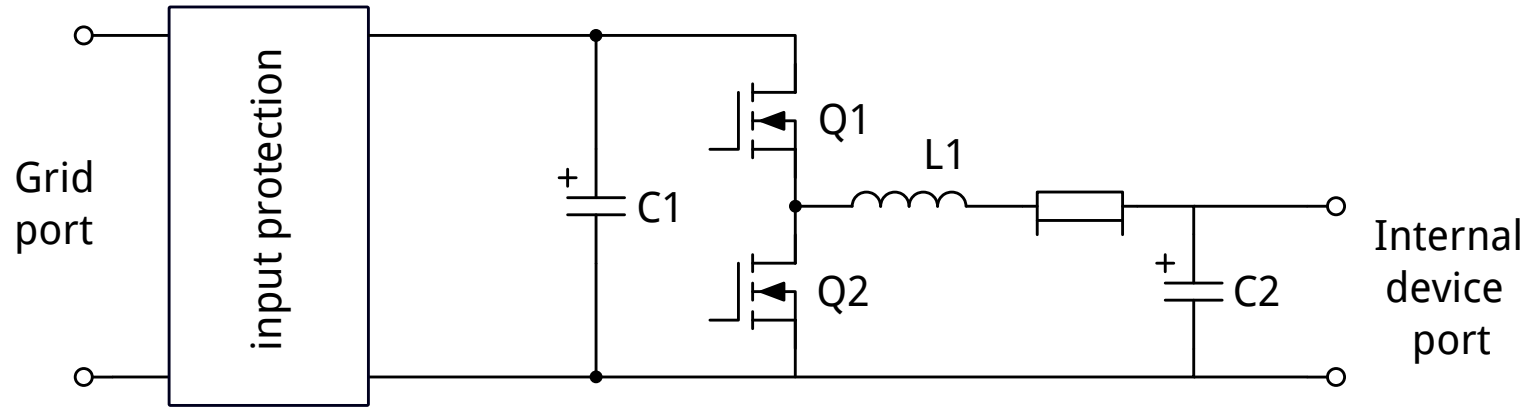




LIBRESOLAR

DC Grid Topologies

DC/DC grid interface (nanogrid controller)



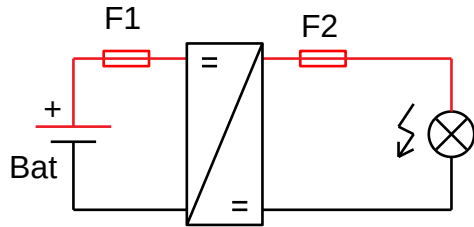
■ Input protection

- Overcurrent and short circuit (electronic and/or fuse)
- Reverse polarity
- Voltage surges

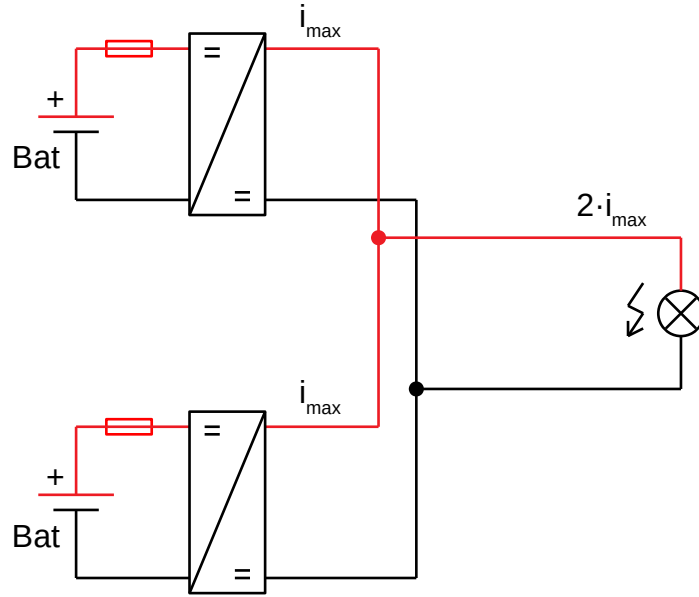
Circuit breakers / fuses in voltage weak grids with multiple sources



Fuse works as intended in case of load short circuit

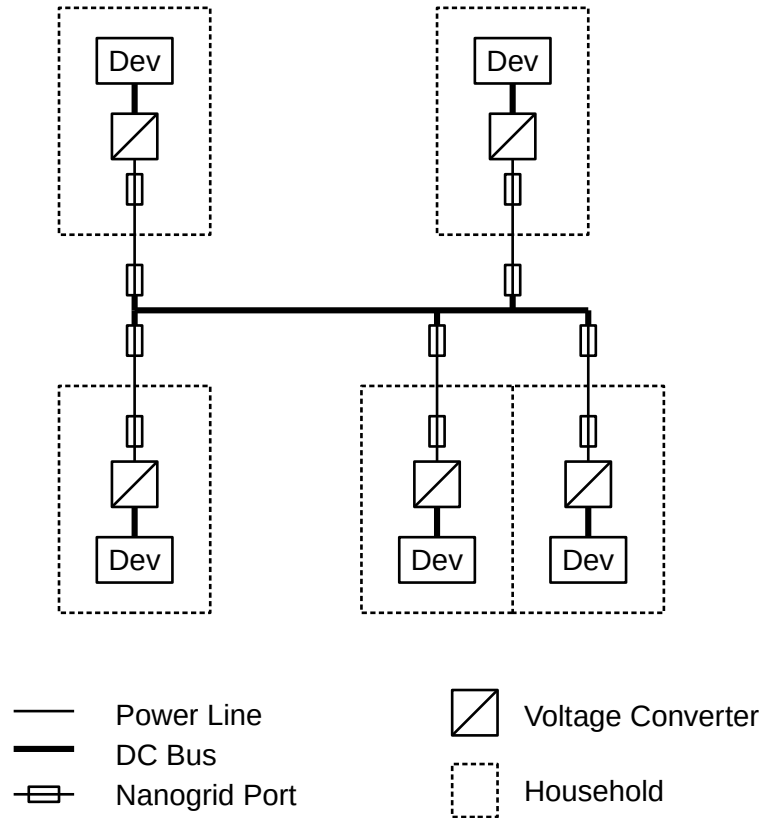


Fuse F2 does not trip, current limited by DC/DC



Load failure might overload wires:
One fuse at each end of wire necessary!?

Bus topology



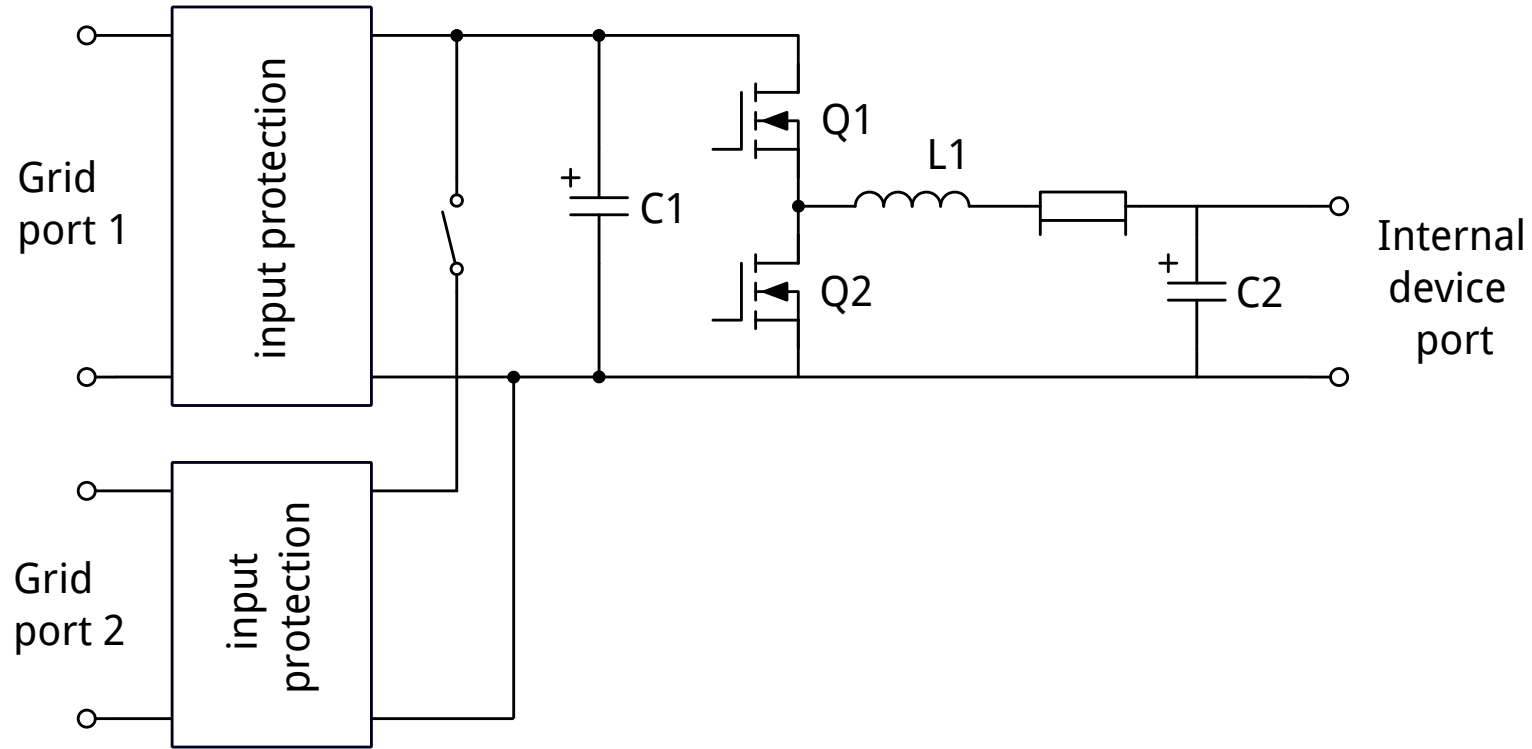
■ Pros

- Simple grid interface protection in nanogrid controller (single port)
- Junction boxes can be passive (fuses only)

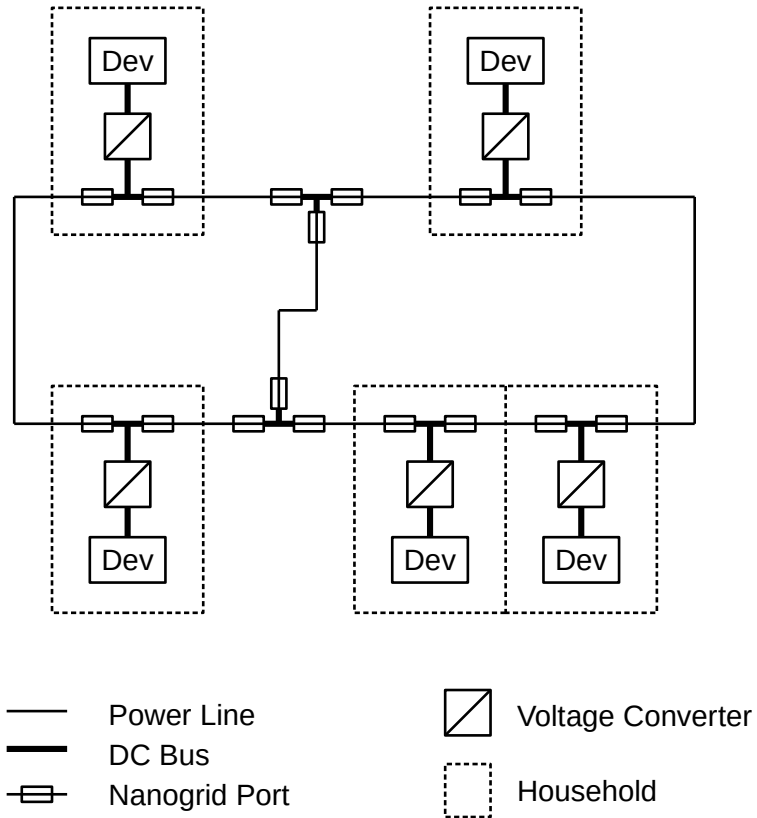
■ Cons

- Distribution bus needs proper sizing depending on actual grid
- Junction boxes outside households are not tamper-proof

Nanogrid controller grid interface (dual port design)



Meshed grid topology



■ Pros

- Plug-and-play installation
- Increased reliability because of multiple current paths
- May be used w/o junction boxes

■ Cons

- Grid ramp-up more complicated
- If needed, junction boxes (current routers) may have to be smart and include current measurement

Open Question

- Which topology is more feasible and should be proposed as the default?
 - Bus topology potentially cheaper, but more knowledge necessary during installation
 - Mesh topology more complicated to develop, but could allow plug & play installation and increased reliability
-