

# Connectors & Cables

Doing things right is hard, especially when it comes to connectors. That is why this summary was created to help out.

## Power connectors

- Barrel jacks are extremely common because they are simple, can handle high currents and can survive many mating cycles. Downside is that they are easy to accidentally disconnect and the thickness of wire you can get into the connector is limited. Furthermore, if you solder these connectors yourself then they will have very little strain relief, so unplugging it by pulling on the cable is an extremely bad idea.
- GX12/16-2 connectors are also very common and come with the advantage that they can be screwed on to prevent accidental unplugging. These connectors can also handle high currents like barrel jacks. Their main downside is that they can be picky when it comes to cable thickness and their strain relief isn't very good.
- XT-series connectors are more common in the world of batteries in RC toys, but since they are easy to solder and can handle extremely high currents they also have a place in the world of astronomy. Chassis and PCB mounted connectors are harder to find than the previously mentioned connectors, but they do exist. They can be difficult to disconnect when grabbing the connector itself, so make sure you have good solder connectors if you do have to pull on the cable.
- (mini)XLR connectors can't handle as much current as the other connectors, so in this case they are more of an honorable mention. They are easy to solder, generally offer good strain relief and are easy to get for cheap.
- The least common would probably be speakON connectors. Like XLR these are mainly used in the world of audio, but they can handle high currents, are easy to solder and also offer good strain relief. They are a bit more expensive than XLR.

It is recommended to standardise the connectors you use on your rig. If you ever forget a cable, you might have a spare one.

Always use the correct thickness wire for the amount of current you expect to pass through. Take a safety margin of at least 25%. Use heat shrink where possible to prevent short circuit connection if something comes loose.

Mini-XLR connectors have a limited current rating, they are not recommended for power or motor connectors.

# Motor connectors

- GX-series connectors are the most popular option. As mentioned before they can be screwed on to prevent accidental unplugging, can handle high currents but come with the downside that their strain relief isn't very good.
- XLR connectors are also a good option, but 4 pole connectors aren't very common.

RJ45/RJ12 connectors aren't recommended because of their low current rating and inability to handle many mating cycles.

# USB connectors

Use USB-A and B as much as possible and use off the shelf cables. This is the most robust option. USB-C can be used, but it is harder to implement in some applications and aren't as robust as A and B. USB-C is also hard to plug in when it is dark.

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