

Q&A: DALI cabling

- DALI cabling topology
 - The DALI allows any kind of cable topology like line, star or tree. Only a ring topology is forbidden! Maximum cable length is in total 300m depending on the following parameters: type of cable, communication speed, maximum number of connected DALI devices!
- Maximum DALI cable length
 - The maximum cable length results from the maximum permitted voltage drop on the DALI cable; it is defined as a maximum of 2 V.
 - This corresponds to a maximum cable length of 300 m with a cable cross-section of 1.5 mm².
 - CAUTION: When designing the maximum cable length, the contact resistances must also be observed! 2 V voltage drop must not be exceeded!
- Do you have more than 64 DALI ballasts on a DALI line with a DALI power supply?
 - DALI only allows a maximum of 64 ballasts on a bus line!
 - Divide the DALI bus into two separate bus lines and use two DALI power supplies
- Is your bus system longer than 300m?
 - Separate the bus system into several separate segments with your own DALI power supplies and DALI master
- Measure the DALI output voltage on the DALI-MASTER. This must be around 14V!
 - Too many lights with ballasts on the DALI bus?
 - Do the ballasts use more power than the DALI power supply can deliver?
 - Usually the DALI power supplies deliver 200mA or 250mA of current
- Does the DALI voltage drop at the ballasts?
 - There may be a maximum voltage drop on the DALI bus of 2V between the DALI supply and the DALI ballast.
 - In the event of a large voltage drop, DALI communication no longer works reliably!
 - Measure this with EVERY ballast using a voltmeter!
 - First check whether all DALI devices are working.
 - Make sure that there is no communication on the DALI line.
 - Measure the voltage on the DALI power supply.
 - The value must be between 11.5 V and 22.5 V; a typical value is 14-16 V.
 - A significantly lower value could indicate a short circuit.
 - Measure the voltage on the DALI device that is furthest away from the DALI power supply.
 - The value must be between 9.5 V and 20.5 V.
 - A much lower value indicates that there is a short circuit somewhere.
 - Create a short circuit between the two DALI bus lines on the DALI device that is furthest away from the DALI power supply.
 - Measure the voltage on the DALI power supply. The value you measure is the DALI voltage drop.
 - This value must not be higher than 2 V.
 - If it is higher than 2 V, check whether the following events have occurred:
 - DALI line too long (over 300m with 1.5mm² cross-section)
 - Cross section too small
 - High contact resistance
 - The value must be brought below 2 V.
 - Remove the short circuit between the two DALI bus lines furthest away from the DALI device.
 - This can be solved by dividing the DALI bus system into two separate DALI bus systems
- Your DALI bus cabling must be a tree structure
 - There must be no ring or loop. If so, cut this loop open!
- Recommendations of DALI cable lengths for different conductor cross-sections: DALI cable length
 - at Ø 1.5mm² max. 300m
 - at Ø 1.0mm² max. 238m
 - at Ø 0.75mm² max. 174m
 - at Ø 0.5mm² max. 116m