CLAIMS

1. Control device for a luminaire of a vehicle having:
- an operating power input (401) for receiving operating power,
- an illumination output (402) for directing illumination power to one or more light sources (403),
- a power converter (404) coupled between said operating power input (401) and said illumination output (402) for converting received operating power into illumination power, which is directed to said illumination output, the power converter (404) having a control connection (405),
- a control data connection (406) for conveying control data, and
- a controller circuit (407) coupled between said control data connection (406) and the control connection (405),
characterized in that it has
- a control power input (408) coupled to said controller circuit (407) and separate from said operating power input (401) and from said control data connection (406), for receiving control power to said controller circuit (407) independently of said operating power and of said control data,
- a galvanic isolation (409) between said controller circuit (407) and said power converter (404), wherein the connection from the controller circuit (407) to said control connection (405) passes through said galvanic isolation (409),
- said controller circuit (407) is arranged to perform a predetermined operation relating to processing of control data, only in response to a grant signal it has received through the control data connection (Ein),
- said control device has a control data output (Eout) connected to said controller circuit (407), and

- said controller circuit (407) is arranged to forward the grant signal through said control data output (Eout) after having performed said operation.

2. The control device according to claim 1, wherein:

- said power converter (404) is a controllable power converter, wherein the amount of said illumination power it generates is determined based on the control signals it receives through said control connection (405), and

- said controller circuit (407) is arranged to generate said control signals based on control data received through said control data connection (406).

3. The control device according to any one of the preceding claims, wherein:
- said controller circuit (407) is arranged to receive from said power converter (404) one or more diagnostic signals through said control connection (405) and to communicate diagnostic information resulting from the diagnostic signals it has received, via said control data connection (406).

4. The control device according to any one of the preceding claims, wherein:
- said controller circuit (407) is internally arranged to generate one or more diagnostic signals and to communicate diagnostic information resulting from the diagnostic signals it has generated, via said control data connection (406).

5. The control device according to any one of the preceding claims, wherein said control power input (408) is arranged to receive an extra low voltage as defined in electrical safety regulations.

6. The control device according to any one of the preceding claims, comprising a sensor (615) coupled to said controller circuit (407), which sensor is arranged to measure at least one environmental factor at the location of the luminaire.

7. The control device according to claim 6, wherein said sensor (615) comprises at least one of a temperature sensor, a gas sensor, a humidity sensor, an air pressure sensor, an acceleration sensor, a motion sensor, an occupancy sensor.

8. The control device according to any one of the preceding claims, comprising a sensor interface for connecting an external sensor (618) to said controller circuit (407).

9. The control device according to any one of the preceding claims, wherein said control data connection (406) is a bidirectional bus connection (406).

10. A luminaire for a vehicle, **characterized in that** it comprises a control device according to any one of the preceding claims, and connected to its illumination output, one or more light sources (403) which most preferably form a LED module.

11. A lighting arrangement for a vehicle, which has a central lighting controller (610) and a vehicle's lighting control bus (619) connected thereto for supplying control data to the luminaires (603, 604, 605, 606, 607, 608, 616), **characterized in that** it has at least one control device (614, 617) according to any one of claims 1 to 9 connected to said control bus (619) via the control data connection thereof, and one or more light sources connected to the illumination output of said control device(s).

12. The lighting arrangement for a vehicle according to claim 11, comprising:
- an operating power bus (620) to be connected to the vehicle's further power distribution system (613), to which operating power bus (620) said one or more control devices (614, 617) are connected via their operating power inputs, and
- a control power bus extending from the central lighting controller (610) to said one or more control devices (614, 617) to which control power bus said one or more control devices (614, 617) are connected via their control power inputs.

13. The lighting arrangement for a vehicle according to claim 11 or 12, which has one or more sensors (615, 618, 621), each of which is coupled to said central lighting controller (610) either directly (621) or via one of said lighting control devices (614, 617).

14. The lighting arrangement for a vehicle according to claim 13, wherein at least one of said sensors (615, 618, 621) is coupled to said central lighting controller (610) for supplying only operating voltage to said sensor, wherein said sensor is further in wireless data communication with a measuring arrangement.