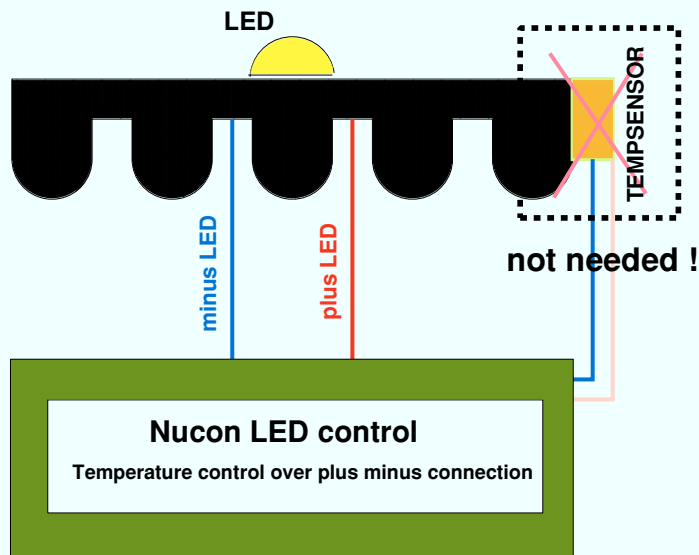# NUCON
DEVELOPMENT IN GERMANY

NUC-LED
SOFTWARE FOR LED PWM AND TEMP CONTROL

The NUCON software for generating PWM pattern for DCDC regulators was developed based on HID ballast regulation. Both LED and HID is a device which has a relative constant operating voltage and an extended range of current.

LED is a light source based on a chip, which has a maximum operating temperature which must not be exceeded, otherwise non recoverable chip damage will take place.

LED

TEMPSENSOR

not needed !

minus LED

plus LED

Nucon LED control

Temperature control over plus minus connection

The HID light source has a plasma inside a gas tube, which can withstand for short times overtemperatures. The tube voltage is following the pressure and temperature of the bulb. The warming up time of the bulb can be monitored directly over the bulb voltage.

LED voltage is also changing as a function of current and temperature. But the voltage changes are much much smaller compared to HID and therefore the precise measurement of the LED is more difficult. LED must be measured in milivolts while HID is measured in volts!

When using a micro controler for controling the LED with a PWM modulated buck or DCDC converter just the output voltage = LED voltage must be measured.The current of the LED must not be measured so the shunt resistor can be saved.

Because of the micro controler calculation power we can determine and monitor the temperature of the LED and saving a temp sensor mounted on a cooling.

LED can be operated and temperature controled seperated by supply wires from control gear.

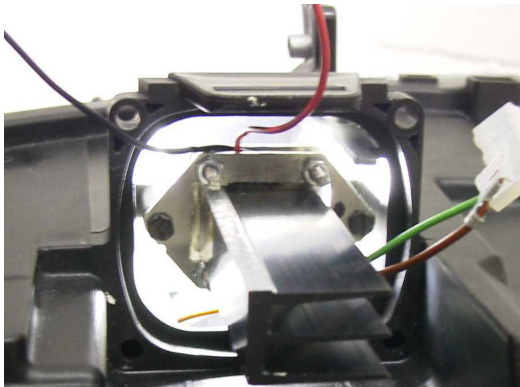NUC-LED software increases the reliability and reduces system cost.

Application example:

LEDs for daytime running lights are giving a white day light matching HID driving light.

The electrical power of the two XML LEDs in series is limited by the cooling behaviour of the LEDs itself. The shown example below at room temperature has 22° and a working temperature of the LEDs of 52°C when they are powered at 4.3 W only. The cable in between regulator PCB and LEDs is about 1m. Depending on the software settings a balance will take over and the electrical power will be reduced. Such regulation has a smooth gradient so your LEDs will not be simply switched ON OFF at the critical edge of operation instead the light output will change gently.