Preliminary Description of Xentroler board REV01

Contents:

Background:

Nucon ballast offers switching control, light feedback as well as dimming control by control line. Usage of the control line offers easy design of portable battery powered light solutions, reduced run up control for not fast startable bulbs like DUV 35W, timing operations, battery voltage monitoring.

Ballast is designed to be powered out of battery stabilized 12/24V systems. Using switching mode power supplies regulation speed of voltage control is without energy buffering sometimes not sufficient depending on manufactures of such supplies. Therefore the bigger controlboard version Xentroler SMPS has an additionally buffer capacitor C8 and decoupling inductance L1 on board to enable starting of ballast powered out of SMPS like Traco TOL75 24V / 4,5 A

Xentroler Battery in combination with linear power supplies or more powerful SMPS is normally sufficiently working well.

http://www.nuconverter.de manufacturing & marketing: http://www.xenlight.com
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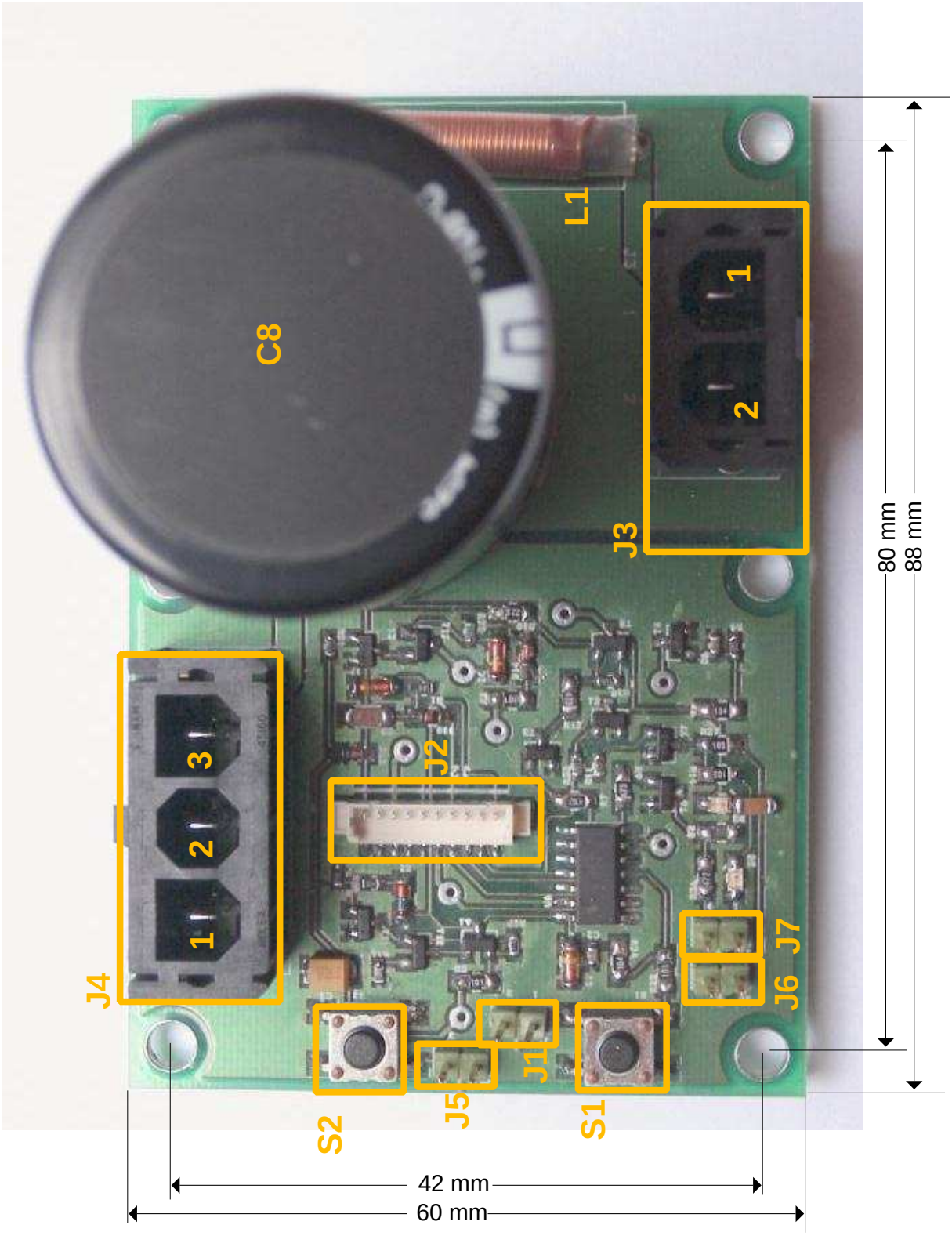
Xentroler SMPS as shown in picture 1:
max. input voltage 30V, nominal operating voltage 24V, current 2,5 mA- 30mA
2 SMD LEDs, 2 SMD push buttons, + external mounting holes or placed jumpers for off board switches LEDs; battery voltage measurement, board mounting holes M4, ∅ 4.2 mm

Description of Xentroler SMPS board components:

C8: buffer elco 35V / 22000 uF
L1: inductance 20 uH/ 3A
J1: connector for external switch in parallel to S1
J2: on board programming connector (MOLEX plug:
J3: Xentroler SMPS input connector (MOLEX SABRE):
Pin 1 24V plus
Pin 2 24V minus
plug MOLEX SABRE catalogue number: 44441-2002
MOLEX SABRE crimp contact catalogue number: 43375
J4: Xentroler SMPS output connector (MOLEX SABRE) to ballast:
Pin 1 ballast ctrl line (pink)
Pin 2 ballast minus
Pin 3 ballast plus
plug MOLEX SABRE catalogue number: 44441-2003
MOLEX SABRE crimp contact catalogue number: 43375

J5: connector for external switch in parallel to S2
J6: connector for external red LED
J7: connector for external green LED
S1: push button
S2: push button



picture 1: Xentroler SMPS

Xentroler Battery as shown in picture 2:
max. input voltage 30V, nominal operating voltage 7V - 27V, current 2,5 mA- 30mA
false polarity input protection; 2 SMD LEDs, 2 SMD push buttons, + external mounting holes or placed jumpers for off board switches LEDs; battery voltage measurement, board mounting holes M4, ∅ 4.2 mm

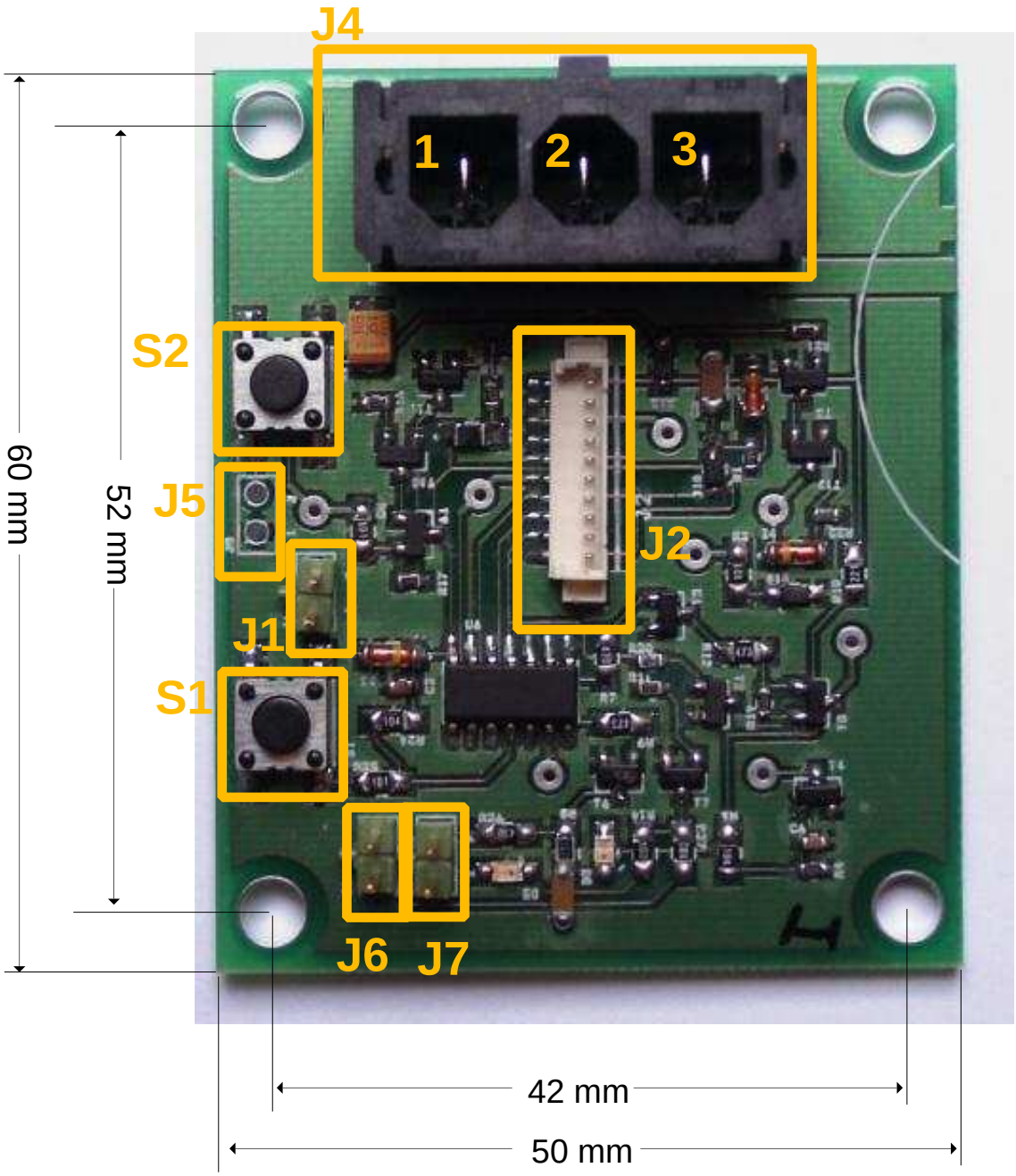
Description of Xentroler battery board components:

J1: connector for external switch in parallel to S1
J2: on board programming connector
J4: Xentroler battery connector (MOLEX SABRE) to ballast:
Pin 1 ballast ctrl line (pink)
Pin 2 ballast minus
Pin 3 ballast plus
plug MOLEX SABRE catalogue number: 44441-2003
MOLEX SABRE crimp contact catalogue number: 43375

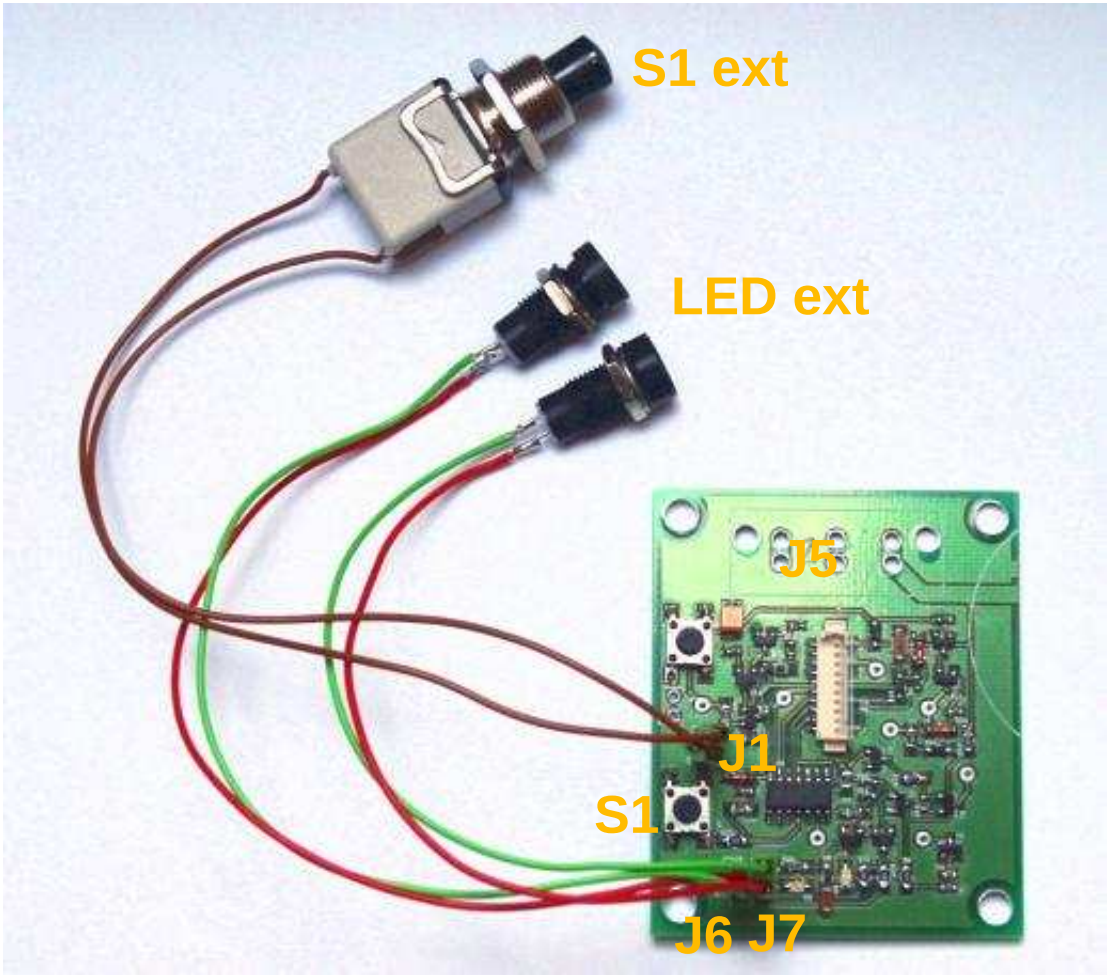
If J4 is not placed on PCB 3x2 pin mounting holes can be used for easier connections

J5: connector for external switch in parallel to S2
J6: connector for external red LED
J7: connector for external green LED
S1: push button
S2: push button

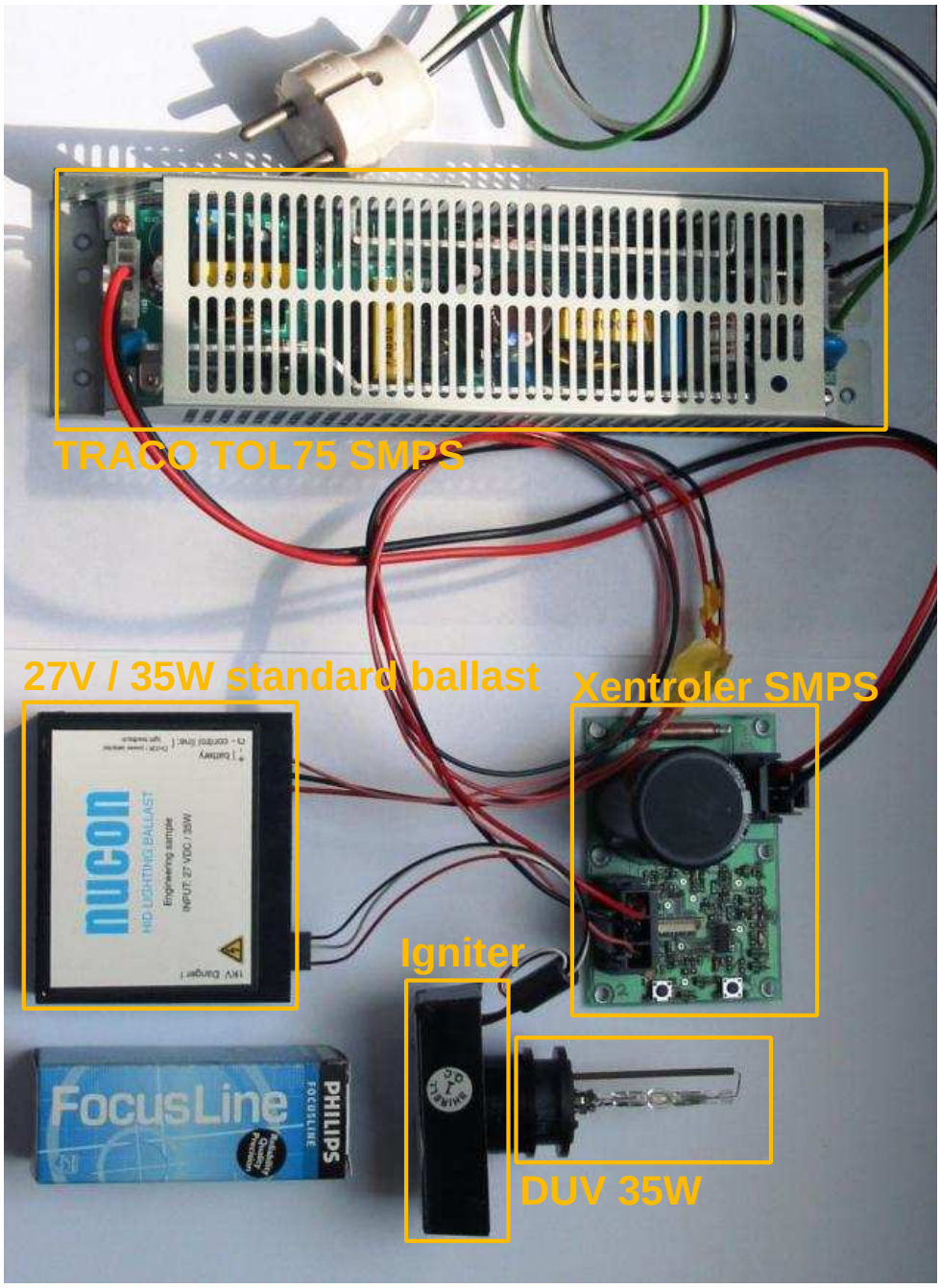
Connectors/plugs can be ordered at http://www.farnell.com



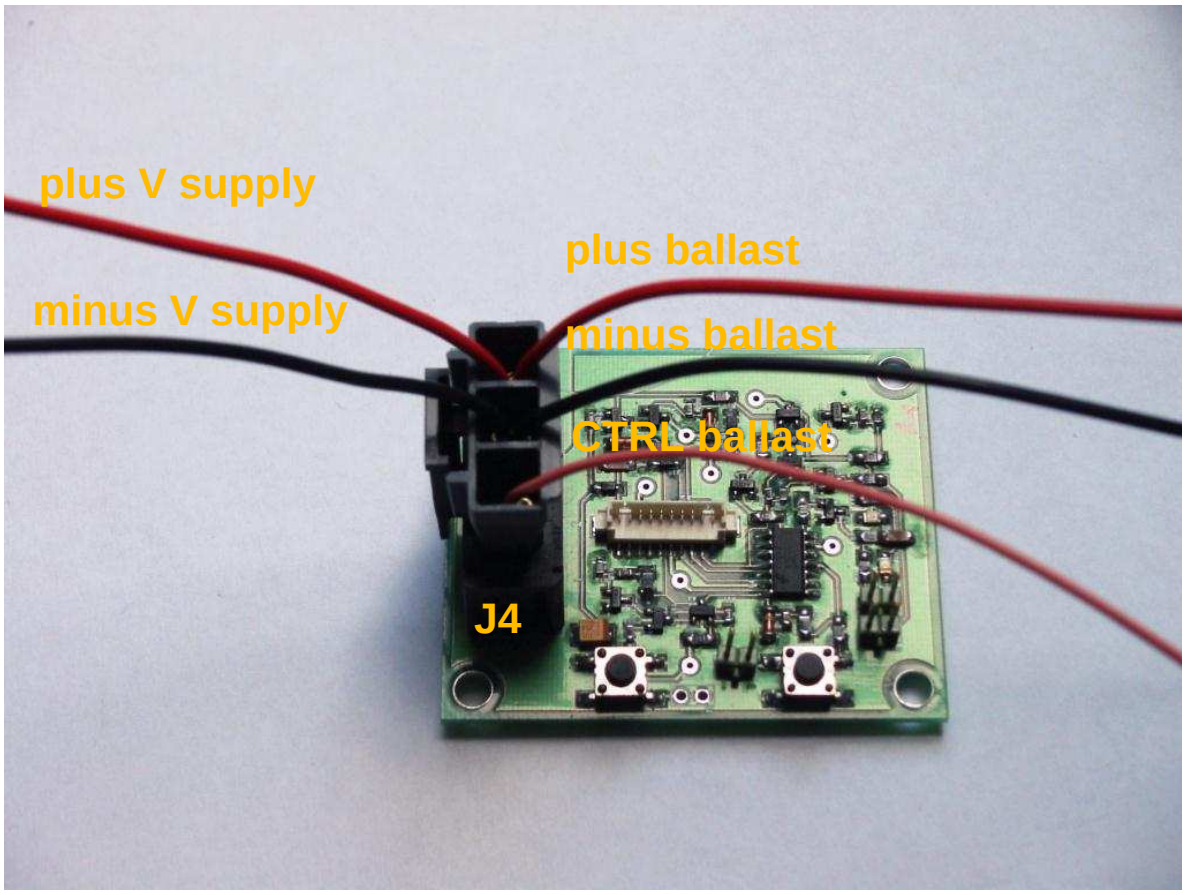
picture 2: Xentroler Battery



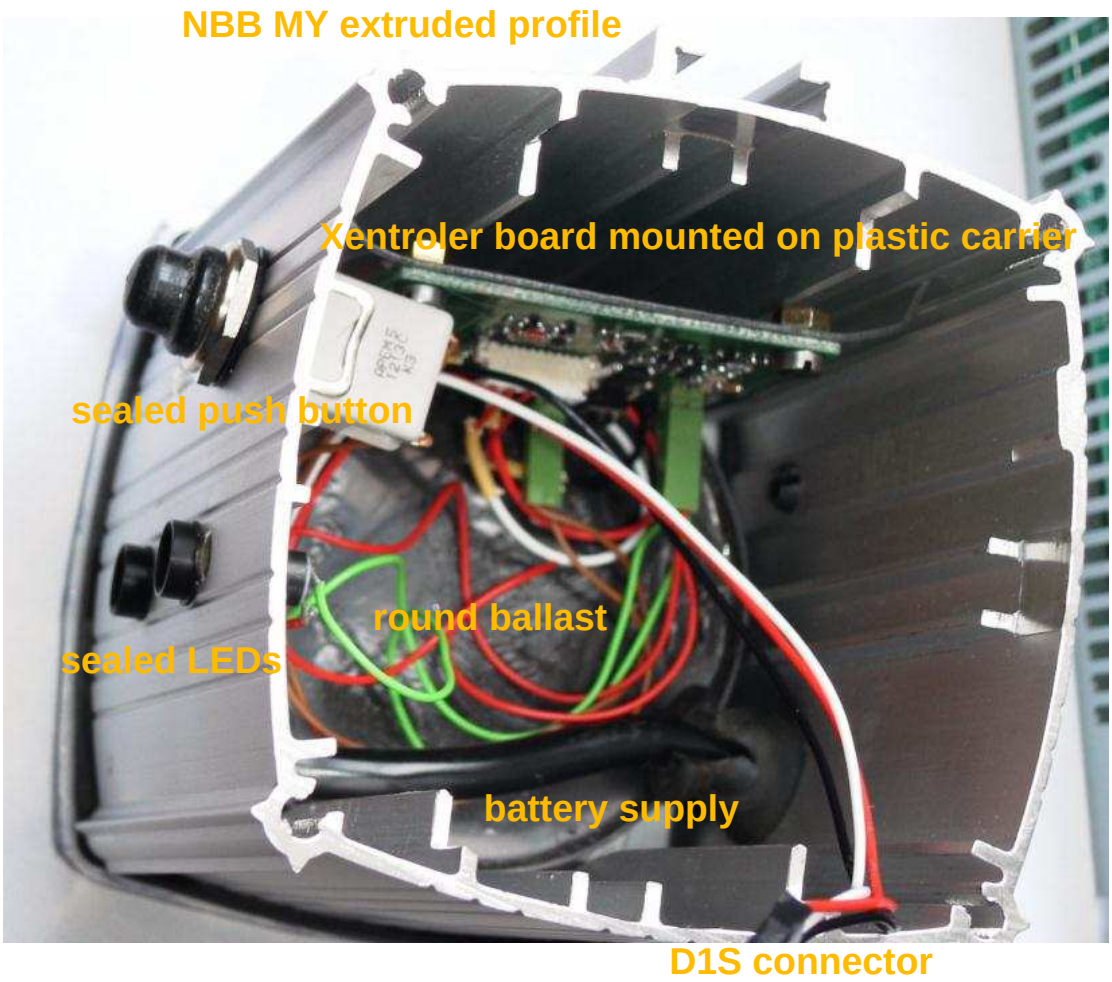
picture 3: Xentroler Battery with external LEDs connected at J6, J7 and one external push button hooked on J1. J5 is not placed for on board wire soldering of ballast and battery connections.



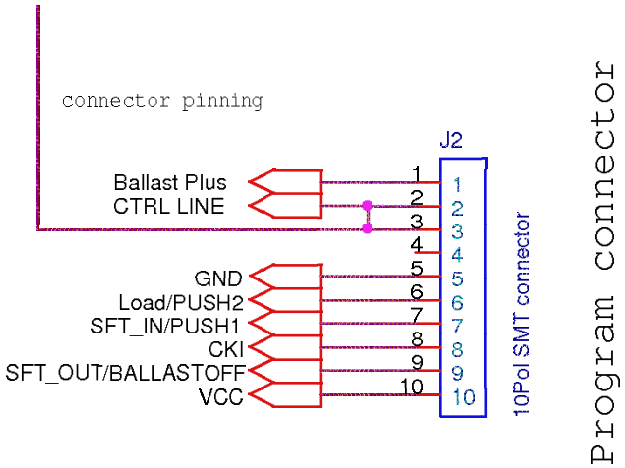
picture 4: Application example: Using special programmed Xentroler SMPS in combination with Traco TOL75 switching mode power supply to drive UV bulb of Philips MPXL Focusline with standard 27V/35W ballast and igniter system. The standard quick start is cut back by the Xentroler to avoid damage of electrodes during warm up phase. Application of Xentroler SMPS enables application of low cost standard components to obtain reasonable overall system cost for the special DUV 35W bulb.



picture 5: Xentroler battery is for many low voltage power supplies especially battery powered stabilized systems applicable. J4 offers space for quite big wire diameter sizes so it can be used for interfacing the Xentroler by a T-connection (Y-c.) of the ± supply harnesses.



picture 6: Xentroler mounted inside NBB MY D1S module. Because inside the housing is lack of space for mounting options J2 is used to supply Xentroler board and connects ballast control line to it.



picture 7: J2 connector pinning

Xentroler software options:

Software *option DUV35*:

The DUV bulb has lower burning voltage and less initial gas pressure at starting. The bulb can be not operated in low power mode with standard ballast systems. The bulb shall be cold started with moderate run up power only. Xentroler SMPS/battery for DUV35 therefore cuts back run up power for first seconds of starting. Therafter operation at standard 35W power is possible only.

Instruction to operate:

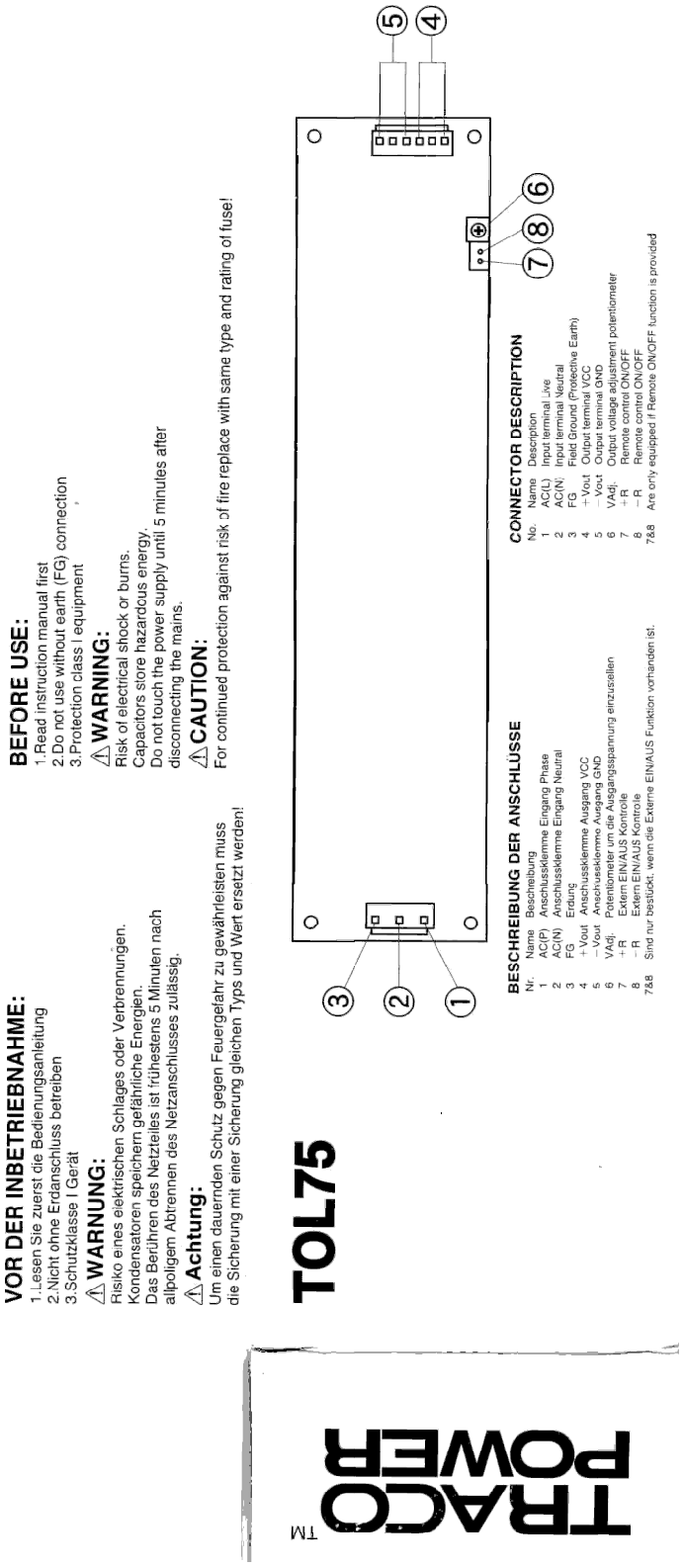
- First powering up requires error reset by very long push of S1 of approxemately 5 s.
- Push button S1 does switch on and off bulb by a short push of approxemately 0,3 s.
- Green LED shows low power mode
- Red LED shows error mode
- error while operation sets error mode

Software *option portable D1S/D2S/DL50*:

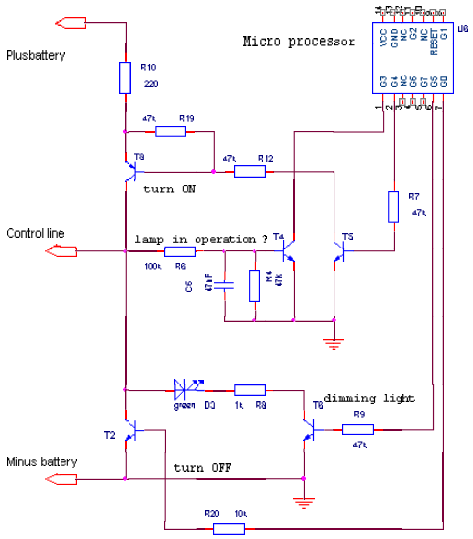
- one or two push button modes for ON/OFF dimming mode
- First powering up requires error reset by very long push of S1 5 s.
- Short push changes light intensity
- Green LED shows low power mode
- Red LED shows error mode
- keeps ballast OFF when connecting battery
- detects empty battery, does not allow start with empty battery
- timer options
- controls low power operation and performs auto restarts in low pow mode only if needed
- shows empty battery by changing light intensity from time to time

Software versions are depending on customers special application s, boards can be in circuit programed and updated.

Appendix A: Traco switch mode power supply TOL 75
for Xentroler SMPS version 24V 4,5 A max is suitable



Appendix B: Principle interfacing to microcontroler



Turn ON: transistor T8 pulls up Control line to Plus battery

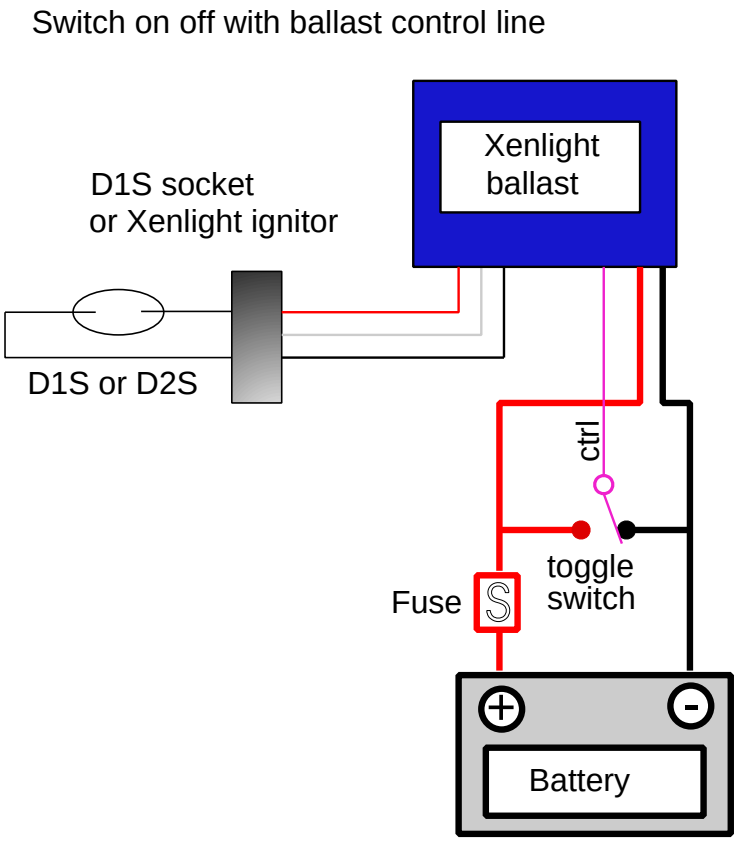
Turn OFF: transistor T2 pulls Control line to Minus battery

Dimming light: transistor T6 drains current from Control line over 1k resistor and LED to Minus battery

Lamp in operation?: transistor T4 amplifies voltage input of Control line without draining significant current from the Control line and forwards signal to logic input of micro processor

Transistors: can be substituted by switches like push buttons or reed relais for operation without a microprocessor.

Appendix C: ***Principle interfacing by manual On Off switch control***



Turn ON: toggle switch pulls up Control line to Plus battery
Turn OFF: toggle switch pulls Control line down to Minus battery, a turned OFF position keeps the ballast off while connecting to battery.