



DC electric: Connect battery plus to U+ and battery minus to U-  
 10-16V  
 AC electric: Connect chassis to U+ and power supply cable to U-  
 In an AC system the negative half wave is usually limited by the regulator. Make sure this is true for your motorbike.  
 Note that in case of an AC system with the described connection the circuit ground is \*not\* chassis ground.  
 10-25V Extended ranges require other components/additional heatsink!  
 If the input voltage is lower than the battery voltage Short if not used, the battery takes over the supply current.

Layout note: S11 must be slightly bent due to its height. Reserve 10mm space on one side.

Option: Common mode choke may be bridged if not necessary

C\_AC is needed only for AC systems. Use a large capacitor (depends on the motorbike). Minimum 40u. Due to its size it will be mounted off PCB. GND

The interface is not fully RS232 compliant. It may not work with some PCs.

Second connectors are for alternative placement on left PCB wing.

GPIO0 to 3 may be used as digital IO (interrupt capable) or as analog input if resistors are exchanged (1K $\rightarrow$ 10K and 10K $\rightarrow$ 5K). See details of UOLT\_U and ALTW\_U for use as analog input. The same specifications apply.

Mount U1 on heatsink for extended input voltage ranges:  
 10-25V: 25 K/W  
 10-35V: 15 K/W  
 Use an 7805 with automotive temperature range.

An optional switch can be inserted here. omit D21 for AC systems. Short if not used.

Layout note: Q10 requires 1cm<sup>2</sup> copper at tab

if the input voltage is higher than 25V the battery charging circuit is short circuit resistant only up to 55°C

BATT\_AC There is no protection against reverse battery connection! Be sure to connect the battery correct. connect - to PAD4

GPI: recommended: Vin=0 to 16V absolute maximum: Vin=-13.8 to 17.5V low<0.34V, high>4.7V

Remember that in most 12V-systems the voltage can be much higher than 12V.

Lower values for R and C allow for a higher input frequency but this causes also a smaller voltage range and a higher sensitivity to ESD/EMI.

Layout note: place in parallel and adjacent with SU2

Header for extensions

Program Run

IC11B 74HC(T)4538D wheel input: recommended: Vin=0 to 16V absolute maximum: Vin=-13.8 to 17.5V low<0.74V, high>3V

RPM input: typical ignition signal shape from primary coil absolute maximum: 500V peak, 69V average recommended: 400V peak, 62V average low<31.5V, high (peak) > 101V

Series Resistance 60K Load Capacitance 12.5pF (integrated in the IC)

tolerances of temp and luminance measurement are compensated by user settings for contrast and brightness

Layout note: place LDR like LED behind transparent case lid

Assemble only one LDR. Second LDR is for alternative position on left PCB wing.

Alternator warning light. Connect ALTW to alternator side.

To achieve accurate voltage measurements the component tolerances have to be compensated. This has to be done by calibration in software for each individual device.

Voltages > 16V are not measured correctly. Especially in AC systems the input voltage may be much higher than 16V.

Recommended: Vin=0 to 16V Absolute maximum: Vin=-2.1 to 45.8V

Use VDD temperature sensors with characteristic curve number 2. -20°C to 150°C +3°C achievable by proper calibration.

Transistor off: Recommended: 16V Absolute maximum: 45V

Transistor on: Max. 50mA. Saturation with Uce<0.3V up to 45mA.

Diode: Absolute maximum: 200mA average forward current

First approach is to bridge the solder points (better EMC). It may be necessary to rise the impedance or leave them open (better ESD).

Layout note: Route analog return to AUSS of the processor. Route RPM return to USS of IC11. Do not connect anywhere else to GND.

All R0805 resistors are rated +-5%, 100mW@70°C if not specified otherwise.  
 Max. temperature range of the PCB is -20°C to 70°C (The range of the complete device may be lower, especially the LCD may narrow the resulting temperature range).

**SIx02** multi-function instrument panel for motorbike cockpits

Arnold Neugebauer

Date: 10.12.2003 Document Version: 1.1

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