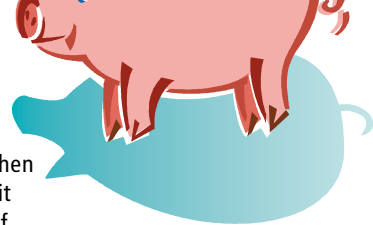


Battery saver circuit

i-TRIXX presents a small electronic switch that connects a battery to the equipment for a certain amount of time when a push-button is momentarily pressed. And we have also taken the ambient light level into account; when it is dark you won't be able to read the display so it is only logical to turn the switch off, even if the time delay hasn't passed yet.

The circuit is quite straightforward. For the actual switch we're using a well-known mosfet, the BS170. A mosfet (T2 in the circuit) used in this configuration doesn't need a current to make it conduct (just a

voltage), which makes the circuit very efficient. When the battery is connected to the battery saver circuit for the first time, capacitor C2 provides the gate of the mosfet with a positive voltage, which causes T2 to conduct and hence connect the load (on the 9 V output) to the battery (BT1). C2 is slowly charged up via R3 (i.e. the voltage across C2 increases). This causes the voltage at the gate to drop and eventually it becomes so low that T2 can no longer conduct, removing the supply voltage to the load. In this state the battery saver circuit draws a very small current of about 1 μA . If you now press S1, C2 will discharge



and the circuit returns to its initial state, with a new turn-off delay. Resistor R5 is used to limit the discharge current through the switch to an acceptable level. You only need to hold down the switch for a few hundredths of a second to fully discharge C2. In our prototype, connected between a 9 V battery and a load that drew about 5 mA, the output voltage started to drop after about 26 minutes. After 30 minutes the voltage had dropped to 2.4 V. You should use a good quality capacitor for C2 (one that has a very low leakage current), otherwise you could have to wait a very long time before the switch turns off!

The ambient light level is detected using an LDR (R1). An LDR is a type of light sensor that reduces in resistance when the light level increases. We recommend that you use an FW150, obtainable from

