# SBMS0 INTERFACE TO INVERTER WITH PUSH-BUTTON POWER SWITCH

A feature of the SBMS0 is the ability to interface with and turn off loads connected to the lithium battery should any of the battery cells reach a user-defined low voltage level. The interface is by opto-isolated “switches” at any of it’s EXE-IO port pairs.

Some inverters have an interface that can be directly connected to the SBMS0 port. Other inverters with “toggle-style” power switches may be modified by soldering wires in parallel with the toggle switch.

The SBMS0 by itself is not capable of turning off inverters with push-button power switches. This requires a momentary closing and then opening of the circuit controlled by the push-button switch… something the SBMS0 is not designed to do.

Most “push-button” inverters feature a port so that a remote switch may be plugged into the inverter and located in a more accessible location.

I designed this circuit to allow the SBMS0 to turn off my “push-button” style inverter (Micro Solar model INV-2000PS). No internal modifications were required to this inverter because the circuit is connected through the remote switch port.

The circuit contains a 555 pulse generator sending approximate 1 hz pulses to the collector of Q1. The oscillator LED toggles on and off continuously to indicate it is working.

When the inverter is powered on, pin 4 of the remote port changes from high impedance to ground, illuminating the POWER LED and providing a current path for the input side of the optoisolator.

The EXTIO port (in this case port3) is active (switched on) while the battery cell voltages are good. When any one of those cell voltages drop below the low voltage threshold, the port turns off, disconnecting the ground path and turning on Q1. Once turned on, Q1 provides a path for the oscillator pulses to turn the optoisolator on and off and, in turn, toggle the power switch circuit. (I should add… the power switch circuit on my inverter is activated on a positive edge trigger… the circuit must be closed, then opened again to turn the inverter power off.) When the inverter is turned off, pin 4 toggles from ground to high impedance and the optoisolator turns off.

The inverter will not be allowed to turn on again until all battery cell voltages are above the minimum voltage setting, turning port 3 back on, grounding the base of Q1 and turning it off. The inverter can then be turned on manually by the operator.

I added a power switch and LED to the circuit so it may be used stand-alone to turn the inverter power on and off. They are not necessary to the interface and if an RJ11 splitter is used, a standard remote power switch may be used in parallel.

This circuit will likely work with other push-button inverters and I am sharing this information for those that may want to play with this circuit in their own application. I am not affiliated with ELECTRODACUS and designed this to work with my installation only. Do not build this circuit and plug it in without inspection and measurement of your own inverter circuits to determine proper pin-outs and suitability. This schematic is intended as an example only. Please be careful and proceed at your own risk. Be safe!

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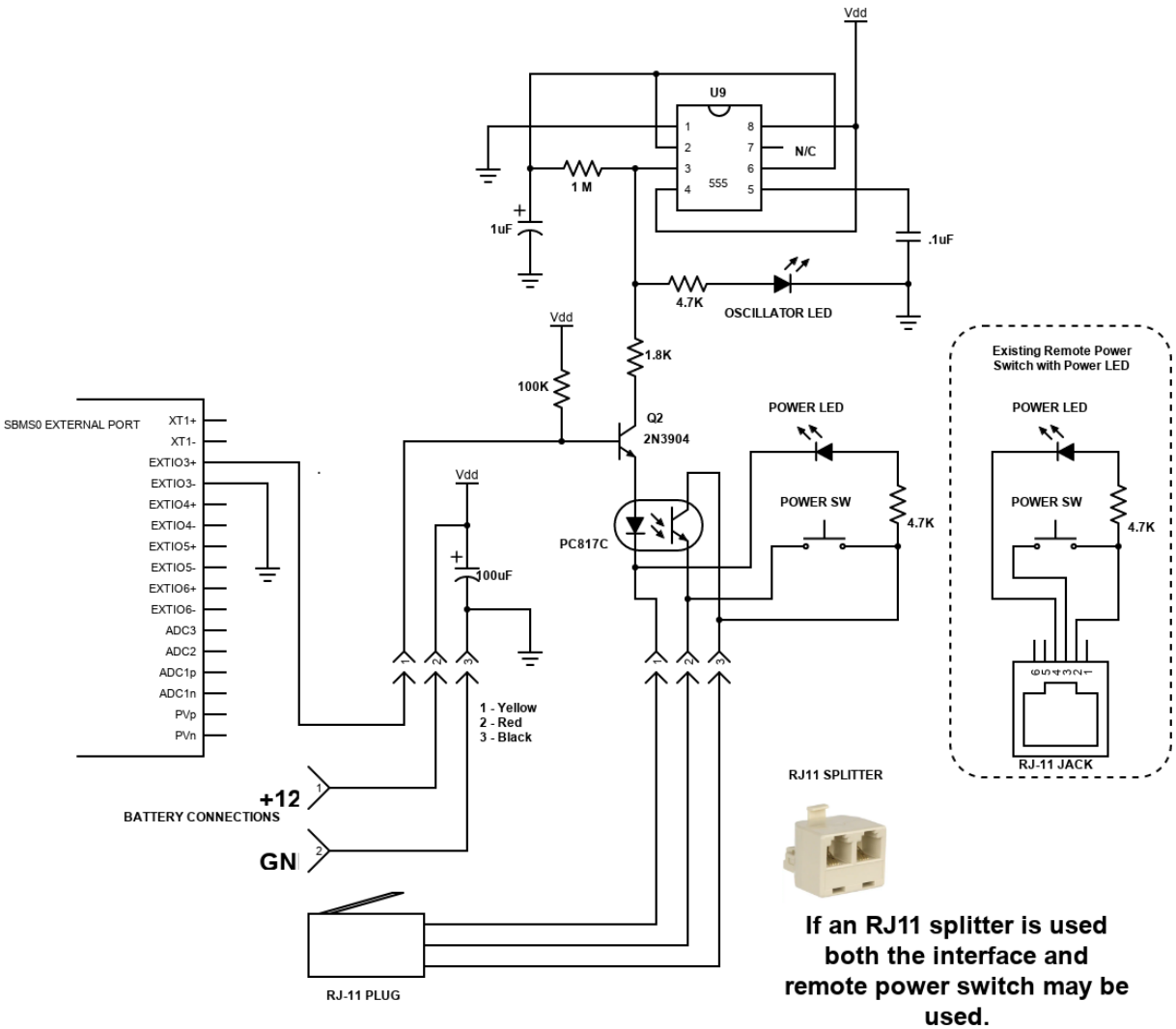
Vdd
U9
555
N/C
1 M
1uF
.1uF
4.7K
OSCILLATOR LED
1.8K
100K
Q2
2N3904
POWER LED
POWER SW
4.7K
PC817C
100uF
SBMS0 EXTERNAL PORT
XT1+
XT1-
EXTIO3+
EXTIO3-
EXTIO4+
EXTIO4-
EXTIO5+
EXTIO5-
EXTIO6+
EXTIO6-
ADC3
ADC2
ADC1p
ADC1n
PVp
PVn
1 - Yellow
2 - Red
3 - Black
+12
BATTERY CONNECTIONS
GN
RJ-11 PLUG
Existing Remote Power Switch with Power LED
RJ-11 JACK
RJ11 SPLITTER
If an RJ11 splitter is used both the interface and remote power switch may be used.