



Serial Status Input Circuit

When collecting status input data, a few points rapidly consume many connections requiring distribution panels, multiplex logic and expensive parallel IO devices. This simple serial circuit allows you to daisy chain status inputs up to 16 inputs using only four wires. I chose this circuit for a Subsea System due to the high cost of underwater cabling and connectors.

Status data is output via a FET switch at Q1 and Q2. In this example, I used Hall Effect sensors, detecting an adjacent magnet, however any status input will work. Input is presented to a CPU on the high and low portion of a serial clock.

The RC power on reset pulse clears the 4017 counters in all the daisy-chained devices. The serial clock is generated by a connected CPU control. Address select on each device sets the clock cycle at which it will respond. When the clock is high, data is input from the top sensor, when the clock is low, data is input from the bottom sensor.

The 4017 counter is an inexpensive CMOS part. In this circuit an address jumper is connected to the output of the 4017 which receives it clock from the CPU. Inverters U3A and U3C together with AND gates place the signal out on the serial bus on the clock pulse matching the address selector.

Clock rates vary depending on cable length and drive current. If speed is needed, you can drive it hard and clock it to 100KHz or more.

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