

Standby Current for RS-422 Repeater is Less Than 3μA

Adding a low-power repeater circuit extends the range for reliable data transfer in an RS-422 communications system.

The RS-422 interface is an excellent choice for communicating in noisy environments and over a distance. But, when the distance exceeds the RS-422 capability for reliable data transfer, you must add a repeater. The repeater circuit of Figure 1, which must operate from batteries when no power supply is available, draws less than 3μA of current from a 3V supply.

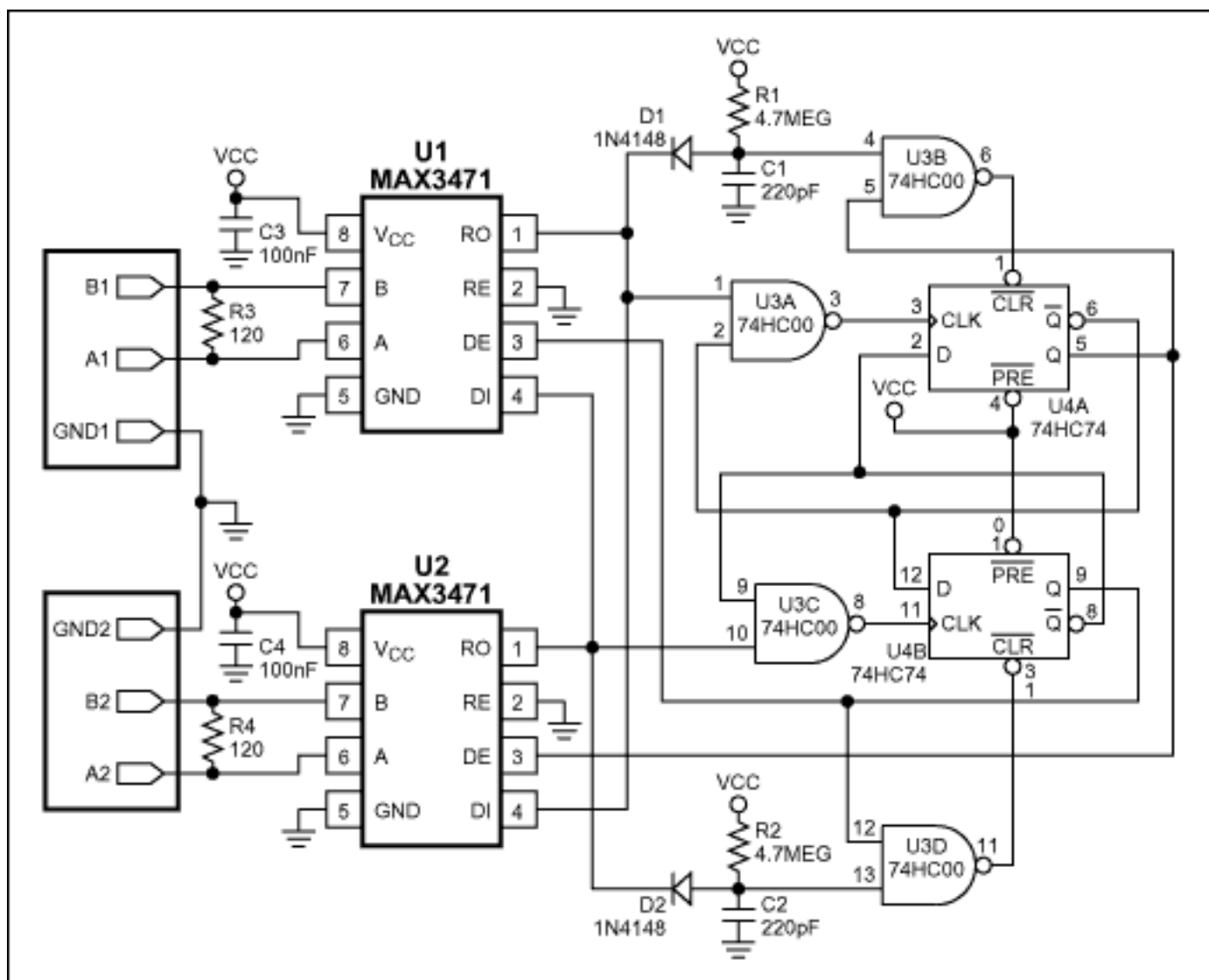


Figure 1. This RS-422 repeater draws only 3 μ A of standby current.

Low standby power and true fail-safe operation are the key features in this application. U1 and U2 drive their receiver outputs (RO) high when the RS-422 inputs are open circuited or terminated and undriven. An incoming data byte on the differential inputs A1-B1 forces a transition on RO of U1, and a state machine (right half of the schematic) is latched ON by the falling edge of RO. The state machine asserts a high level at U2's driver-enable pin, causing the incoming data byte to be re-transmitted from U2 at full RS-422 levels.

The state machine watches for transitions on RO. When a data-byte transfer is complete (as indicated by no falling edges within a time delay internal to the state machine) the state machine resets itself in anticipation of the next data byte from either side of the interface.

An incoming data burst (Figure 2, top) is retransmitted as outputs A2 (bottom trace) and B2 (middle trace). U2 de-asserts those outputs 700 μ s after the final transition. You can implement other delays by adjusting R1/C1 and R2/C2 in Figure 1.

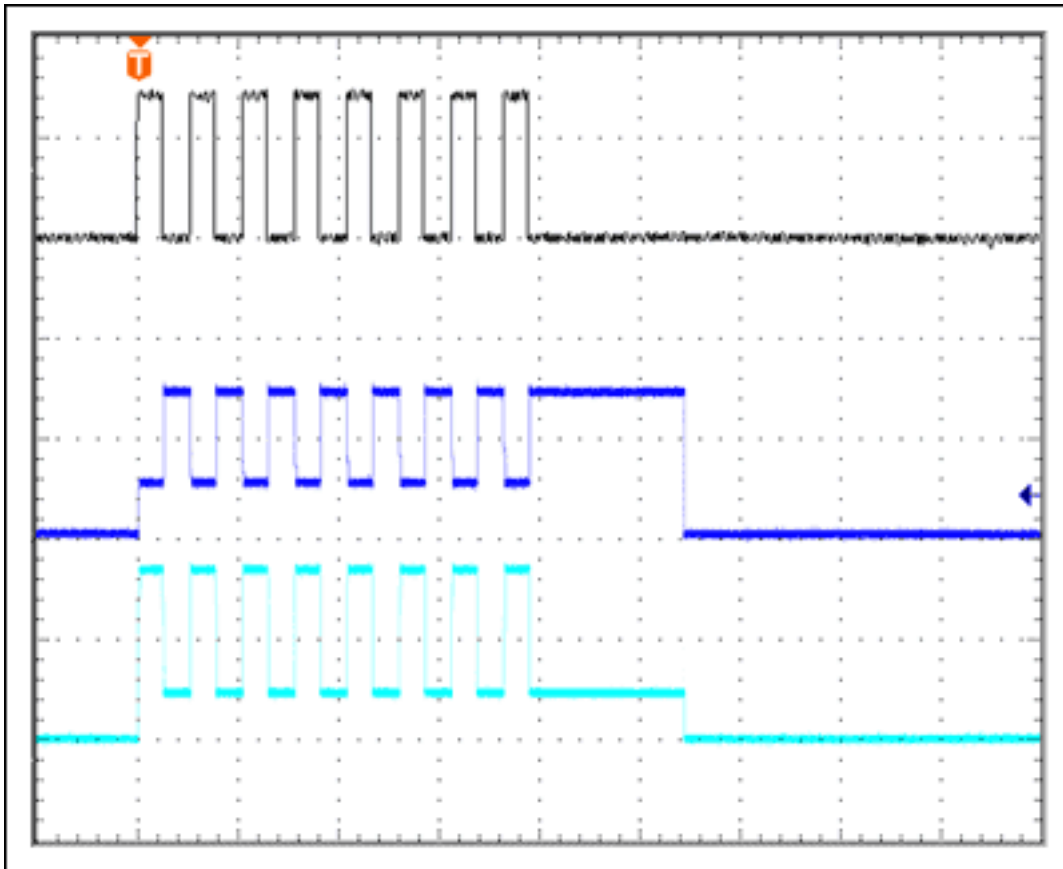


Figure 2. An input data byte causes the repeater to transmit the byte, then go to standby. Vertical scale is 1V per division; horizontal scale is 400 μ s per division.

More Information

MAX5160: [QuickView](#) -- [Full \(PDF\) Data Sheet](#) -- [Free Samples](#)