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Keywords: RS-485, rs485, EIA/TIA-485, RS-232, rs232, microcontroller, UART, address recognition, slave data transceiver

APPLICATION NOTE 1063

# Microcontroller Recognizes Addresses in RS-485 Systems

May 01, 2002

*Abstract: Note describes a simple circuit to create an RS-485 slave data transceiver capable of recognizing its assigned address. Only three ICs are required, a microcontroller, a physically tiny UART and an RS-485 transceiver. Enabling software is provided.*

One of many benefits of using the RS-485 data-interface standard, rather than RS-232, is its capability of implementing multi-drop networks. Such networks usually carry 9-bit data words, in which the ninth (parity) bit identifies each word as address or data.

One decision posed by small microcontrollers like IC1, which does not include a hardware universal asynchronous receiver-transmitter (UART), is whether to add an external-component UART or write your own UART in software. External UARTs once represented a large increase in board area, complexity, and price, and the ones available were usually an overkill for small  $\mu$ C applications. On the other hand, it may be difficult to spare the program memory and processor resources needed for a software UART. The program memory in IC1, for example, is only 1K  $\times$  14 bits of EEPROM. Available today is a third alternative—a low-cost external UART (IC2) that is also physically small. Use of this device liberates the program memory otherwise needed for a software UART.

An RS-485 bus can carry up to 256 transceiver modules of the type shown in **Figure 1**. IC3 is the RS-485 transceiver, and IC4 is a " $\mu$ C supervisor" that holds the  $\mu$ C in reset until a valid supply voltage is present. The  $\mu$ C's [assembly language program](#) can be downloaded from Maxim's website.



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