Monitoring serial communications in microcontroller based embedded systems

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Abstract: More and more microcontrollers are embedded in a large area of products from industrial to domestic domains. A good example is the automobile, a modern one containing tens of microcontrollers. As their number increased the communication between them became necessary. The serial solution was preferred and a lot of serial buses and protocols were developed optimizing different parameters of the communication. Several examples are: RS232, LIN, SPI, CAN and so on. Monitoring serial communications is necessary in R&D phase, e.g. for creating virtual transfer partners, and in testing and debugging phases. The paper describes a message based monitoring tool for the RS232 bus and monitoring tools for the LIN and SPI buses. Many microcontrollers contain the LIN and SPI buses and almost all of them include the RS232 bus. The created tools work in passive mode, monitoring the transfers and sending the data to a PC or in active mode (only for the LIN bus), interfering in the communication and sending headers, responses or injecting typical errors.

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