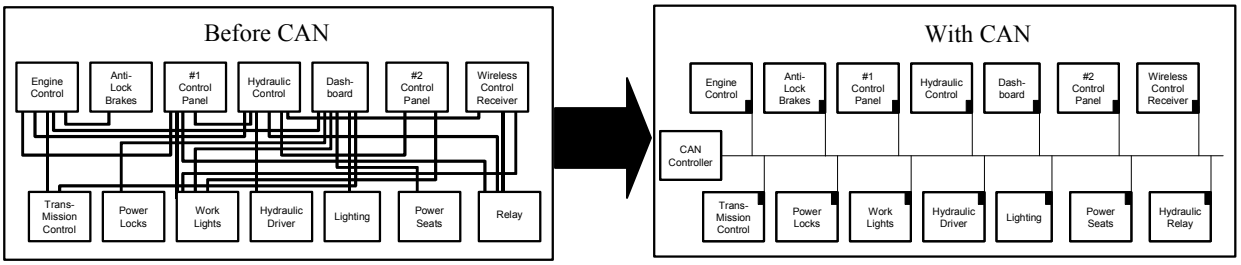
Remtron Technical Note
Controller Area Network (CAN)

The Controller Area Network (CAN) bus is designed for communication between microcontrollers. In an automotive environment, it is used to exchange information between on-board Electronic Control Units (ECUs) such as the Engine Management System, transmission, instrument packs, and body electronics. The German company Robert Bosch GmbH originally developed CAN for the automotive industry during the late 1980s. Its motivation for the development of CAN was to provide a solution to the problem of the enormous and constantly growing wiring harness required for inter-ECU communication in modern vehicles. The company's solution was to design a single network bus to which all the on-board peripherals could be attached. In 1993, CAN became ISO 11898 (the standard for high-speed applications) and ISO 11519 (the standard for lower-speed applications). It is a multi-master serial communications bus whose basic design specification called for high speed, high noise-immunity, and error-detection features.



The CAN communications protocol specifies the method by which data is passed between communicating devices on a CAN bus. It is the basic protocol (the first two layers of the seven-layer ISO Open System Interconnection model) that permits the orderly transfer of messages in the data bus. The transfer is managed by a CAN controller that makes sure all network members have a chance to participate and resolves any conflicts. To turn the messages into useful information, a higher-order protocol (the seventh, or Applications, layer) is also needed. The Application layer protocols can be proprietary schemes developed by individual CAN users or one of the emerging standards used within particular industries. Common application layer standards are DeviceNet, CANOpen, CAL, and SDS. DeviceNet is especially suited to the networking of Programmable Logic Controllers (PLCs) and intelligent sensors and actuators. The application layer protocols also can provide centralized diagnostics to permit quick isolation of problems occurring in any node of the network. That is a major advantage in the development and maintenance of complex automotive systems.

The Remtron CAN Receiver (RCAN) supports the basic CAN protocol as well as some of the application layer standard protocols. Each manufacturer usually implements these protocols in a slightly different manner in its equipment. RCAN can be programmed to meet the specific requirements of each. By interfacing through the CAN bus with existing relays and drivers, the cost of duplicating these devices in RCAN is avoided. This greatly reduces the cost and complexity of adding wireless remote control to an automotive-type system.