DIN-190 SERIES RS-232/RS-485 CONVERTERS and RS-485 REPEATERS

FEATURES

- Completely transparent to host software.
- No external flow control signals required.
- Optically-isolated bidirectional data flow.
- Standard baud rates: 300 to 115K baud.
- Automatic internal RS-485 bus supervision.
- Networking up to 4,000 feet.
- Transient suppression on RS-485 data lines.
- Internal jumper selectable termination resistors.
- Internal 1KΩ biasing resistors on RS-485 data lines.

APPLICATIONS

- Interface DGH RS-485 modules to any RS-232 port.
- Expand existing RS-485 networks.
- Portable data acquisition systems.

GENERAL DESCRIPTION

The DIN-190 series consists of the DIN-191 RS-232/RS-485 converter and the DIN-192 RS-485 repeater. The DIN-191 converters allow communications bus lengths up to 4,000 feet and baud rates up to 115K baud using one twisted pair of wires.

The RS-485 standard allows for bidirectional data on the same pair of wires. Therefore, some means of arbitrating the data direction is required. The DIN-191 automatically control the bus direction without external handshaking signals from the host. Therefore, host software written for half-duplex RS-232 may be used without modification. RS-485 bus control is completely transparent to the user.

The DIN-192 RS-485 repeater reamplifies, or boosts, existing RS-485 signals transmitted over long distances. Repeaters are required to extend communications bus lengths or to allow more than 32 RS-485 devices to be connected to a communications bus.

Both the DIN-191 and DIN-192 operate on +5Vdc power supply input voltage.

SPECIFICATIONS

Max common mode voltage: 500Vrms, 60s duration.
Baud rates: 300, 600, 1200, 2400, 4800, 9600, 19200,
38400, 57600, 115200 (Dip -switch selectable).
Temperature range (operating & storage): -25 to +70°C.
Relative humidity: 0 - 95% noncondensing.
Warranty: 12 months on workmanship and materials.

Power Specifications

Power requirements: Regulated +5Vdc.
Power consumption: 1.0W Max (RS-485 driver on).

MECHANICAL AND DIMENSIONS

Case: ABS case with screw terminal barrier plug (supplied.
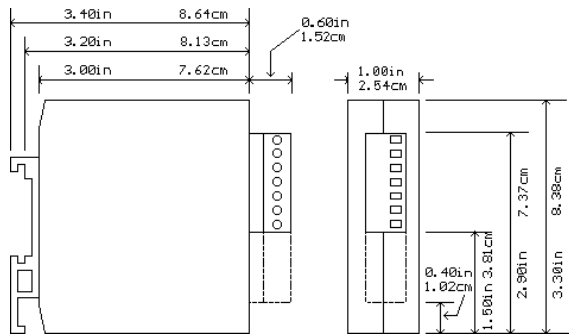
AUTOMATIC RS-485 BUS SUPERVISION

The DIN-191 and DIN-192 automatically control bus direction in hardware without the need of handshaking signals from the host computer. As shown in figure 1, the I/O control circuitry monitors the RS-232 receive (RX) input and both RS-485 drivers. The RS-485 drivers in the converters are always in the receive mode until either RS-485 driver, or RS-232 input, receives the start of a character to be retransmitted. When the start of a character is detected, the I/O circuitry enables the proper RS-

485 driver for one character time at the selected baud rate. When the character time expires the drivers return to receive mode. Since the converters are bidirectional it does not matter which driver receives the character.

ISOLATION

The DIN-191 and DIN-192 are designed to protect host computers from destructive fault conditions that may occur on the RS-485 data lines. The host input connections on each converter are optically-isolated to 500VAC from the RS-485 connections. The optical-isolation will prevent short circuits to hazardous AC voltages on the RS-485 data lines, or static discharges, from reaching a host computer. The RS-485 output is connected to earth ground to provide a safe path for static discharge. The power supply ground should reference earth ground to provide a safe path for static discharge.

SURGE PROTECTION

The DIN-191 and DIN-192 RS-485 drivers contain internal surge-protection on the data lines. Internal high speed transient suppressors on each RS-485 data line protect the driver from dangerous voltage levels, or spikes, that can occur on the data lines. Thermistors are installed in series with each RS-485 data line to protect the drivers against overcurrent and excessive voltage conditions. In a fault condition the normally low impedence thermistor reacts by rapidly increasing its impedance thus limiting excessive current flow. Once the fault condition is corrected the thermistor will return to its normally low impedance.

RS-485 TERMINATION

The RS-485 standard is highly immune to noise when each data line is properly biased and terminated. Each RS-485 driver is connected to pull-up and pull-down biasing resistors and termination resistors to insure the proper termination technique for any RS-485 system.
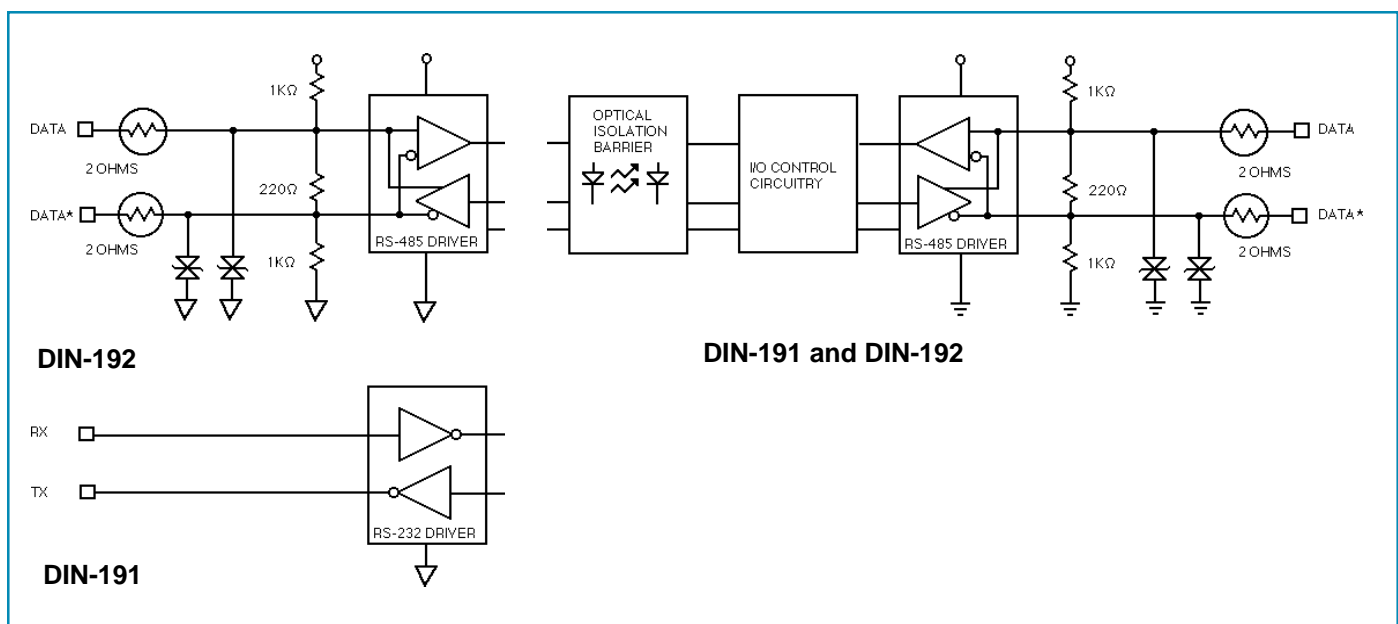

Figure 1 DIN-191 and DIN-192 Block Diagram.