RS232 CATX LINE DRIVER

February 2023

6100915 (local)
6100916 (remote)
6100917 (both unit

Federal Communications Commission (FCC) Statement

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Contents

1. Specifications

Power
Wall-mount type power supply
5 VDC Output, 100~240 VAC/47~63 Hz Input
Typical Load: 150 mA at 5 VDC each

Interface
DB9—EIA RS-232-F; ITU v.28
RJ45—RS-485

Flow Control
RTS/CTS

Size
0.8"H x 1.7"W x 3.2"L

Weight
2.0 lbs. includes local unit, remote unit, and power supplies

Data Format
Asynchronous, Full-Duplex

Maximum Distances / Data Rates
4000 feet for data rates = 100K bps
2000 feet for data rates = 200K bps
1500 feet for data rates = 250K bps

Note: the combined RS232 cable and device load should be
= 1000pf and = 3K ohm in order to operate at 250K bps.

Isolation
1000 VDC isolation between RS232 interface and RS485 interface

Interconnect
Four pair twisted-pair cable, low capacitance CAT5 or CAT6 recommended for best performance

Connectors
(1) - DB9 female (Local), DB9 male (Remote),
(1) - RJ45, (1) - DC power jack

Environmental:
Temperature: 0 to 40°C operating, -10 to 70°C storage
Humidity (non-condensing): 20% to 80% operating; 10% to 90% storage

2. Introduction

These CATX DB9 Line Drivers have the ability to remote your receiving device up to 4000 feet from the sending device. The LOCAL unit has a DB9 Female connector and is configured as a DCE device. The REMOTE unit has a DB9 Male connector and is configured as a DTE device. This allows the LOCAL/REMOTE pair to function as a long extension cable between two RS232 devices. There are no user configurable settings. The LOCAL and REMOTE units are connected with a CAT5 or CAT6 twisted pair cable. The LOCAL and REMOTE units swap the RJ45 pins so a straight pinned cable is required. The units are isolated, to provide protection from differences in ground potential between the units. The units pass TXD, RXD, RTS, and CTS signals to allow the application to use hardware handshake signals if required. The LOCAL unit provides an active high output on DSR and DCD, while the REMOTE unit provides an active high output on DTR.

3. Installation

Before you begin, make sure all equipment is off and the CATX DB9 Line Drivers are not powered on.

Connect the LOCAL (DB9 Female) device to a PC or Data Terminal Equipment (DTE) device. Connect the REMOTE (DB9 Male) device to a Data Communication Equipment (DCE) device. Connect the LOCAL and REMOTE units with a straight through CAT5 or CAT6 twisted pair cable. Once all connections are made, use the supplied 5 VDC power supplies to power up the Line Drivers. Now power can be applied to your equipment.

Table 3.1 - DB9 Pinout

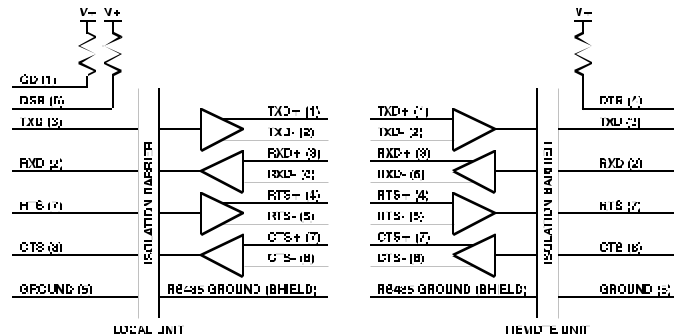| DB9 - Signal	Local DCE	Remote DTE
1 - Carrier Detect	Asserted High	No Connection
2 - Received Data	Output	Input
3 - Transmitted Data	Input	Output
4 - Data Terminal Ready	No Connection	Asserted High
5 - Signal Ground	RS232 Ground	RS232 Ground
6 - Data Set Ready	Asserted High	No Connection
7 - Request To Send	Input	Output
8 - Clear To Send	Output	Input
9 - Ring Indicator	No Connection	No Connection

DCE - Data Carrier Equipment (can connect to a PC)
DTE - Data Terminal Equipment (configured the same as a PC)

RJ45 - Signal	Local	Remote
1 - Pair 3+	TXD+ (output)	TXD+ (input)
2 - Pair 3-	TXD- (output)	TXD- (input)
3 - Pair 2+	RXD+ (input)	RXD+ (output)
4 - Pair 1+	RTS+ (output)	RTS+ (input)
5 - Pair 1-	RTS- (output)	RTS- (input)
6 - Pair 2-	RXD- (input)	RXD- (output)
7 - Pair 4+	CTS+ (input)	CTS+ (output)
8 - Pair 4-	CTS- (input)	CTS- (output)
9 - Shield	RS485 Ground	RS485 Ground

A shielded RJ45 cable may be used to connect the RS485 ground between the LOCAL and REMOTE units. A shielded cable can reduce noise which can improve the RS485 signals, but can also add capacitance, which can reduce the RS485 data rate.

Figure 3.1 - Block Diagram

4. Troubleshooting

If the units fail to operate check the following before calling for technical support.
1. Are units powered on? Check to see if the power supplies are plugged into a working AC outlet.
2. Check to see if the inter-connect wire is connected properly. A straight through CAT5 or CAT6 twisted pair cable should be used, because the Local and Remote units swap transmit and receive pins.
3. Try a lower baud rate if possible to make sure the baud rate is not too fast for the length of cable.
4. Check the DB9 cable connections. The Local unit has a DB9 female connector, and is intended for connection to a PC or data terminal equipment. The Remote unit has a DB9 male connector, and is intended for connection to a modem or data communication equipment.

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