RS-485 Data Link Tester

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Sponsor: LED Effects

Purpose

- Design a roving data tester and a data source.
- Test for correct wiring during the installation of LCD panels
- Check for wiring errors such as shorts, opens, as well as AC crosses
- Verify correct DC Voltages are being supplied to the panels
- Check data transmissions by sending test patterns and verifying accuracy

Osaka Chanel Building

Project that our design will be aimed at testing the cabling for initially

Other Buildings

Hong Kong Chanel Building

Macy's Holiday Display
San Francisco

The cable tester needs to be universal enough to be configurable for testing cabling on other projects

RS-485

- RS-485 is a multidrop **L**ow **V**oltage **D**ifferential Signaling (LVDS) standard regulating the electrical characteristics and not the protocol required.

- By using LVDS, long cable runs with high throughput. This is achieved by sending the signal level as a difference in DC voltages.

- There are a maximum of 128 devices on a RS-485 cable depending on the load per transceiver used.
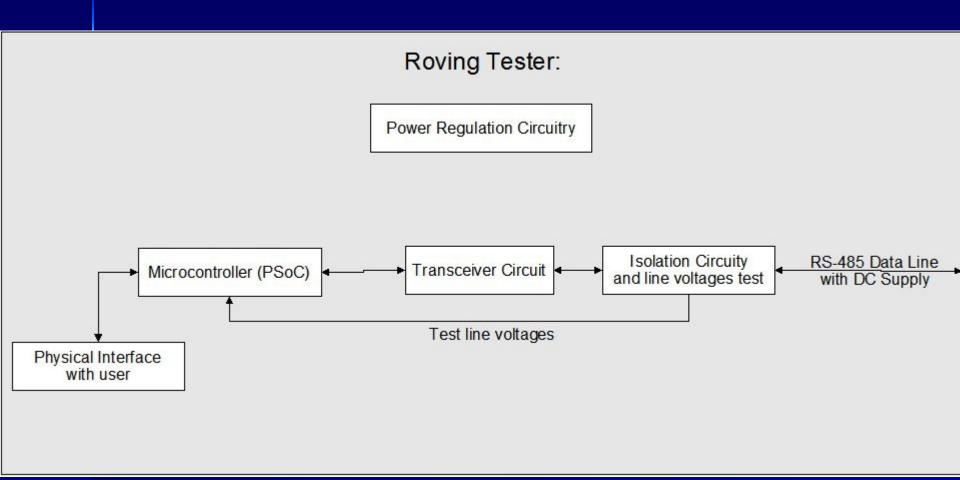
Project Requirements

- Roving Tester Requirements
  - Check Physical line characteristics
    - Polarity, AC wire crosses, missing connections, DC supply voltages
  - Communicate with Data Source
    - Initiate data verification test sequence
  - Collect, analyze, and display test results
  - Battery Operated
  - Universal Connector so it can be used in many projects with adaptors
- Data Source Requirements
  - Check for AC voltage
  - Wall Powered
  - Autonomous, and will send known signal when communicating with roving tester
  - Universal Connector

Project Deliverables

- Working Prototype
- Source Code
- Documentation
  - Project Documentation
  - Schematics
  - Operator Manual

Potential Solution

Roving Tester:

Power Regulation Circuitry

Microcontroller (PSoC) ← Transceiver Circuit ← Isolation Circuity and line voltages test ← RS-485 Data Line with DC Supply

Test line voltages

Physical Interface with user

Similar design for the Data Source but with reduced user interface

Macy's Holiday Display
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