

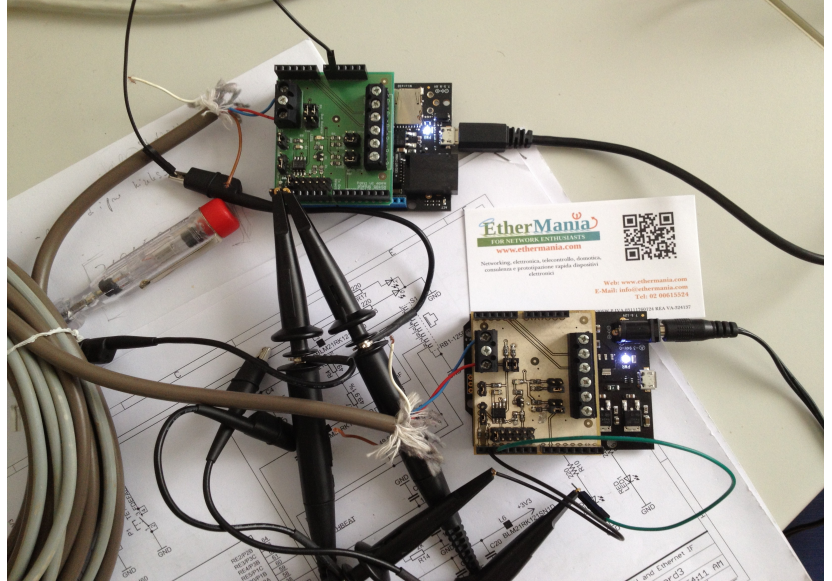
RS485 Shield and Netduino

Introduction

In this document is an explanation on how tests were performed when implementing the Netduino2RS485 test code and libraries for the RS485 Shield and Netduino, Netduino 2 Plus.

As shown on the right picture, we setup a bench test where two boards (in the example is one Netduino 1st generation and one Netduino 2 Plus) equipped with two RS485 Shields (the one you can see at the bottom of the picture is the prototype we have in our Lab) are connected together by means of a twisted pair cable (part of it is visible on the left side of the picture).

The two boards are connected to four scope probes used to measure and check waveforms at the Netduino expansion slots.



On the Netduino 2 Plus we installed the “Ping” program you can find our RS485Shield repository located at GitHub here: <https://github.com/ethermania>

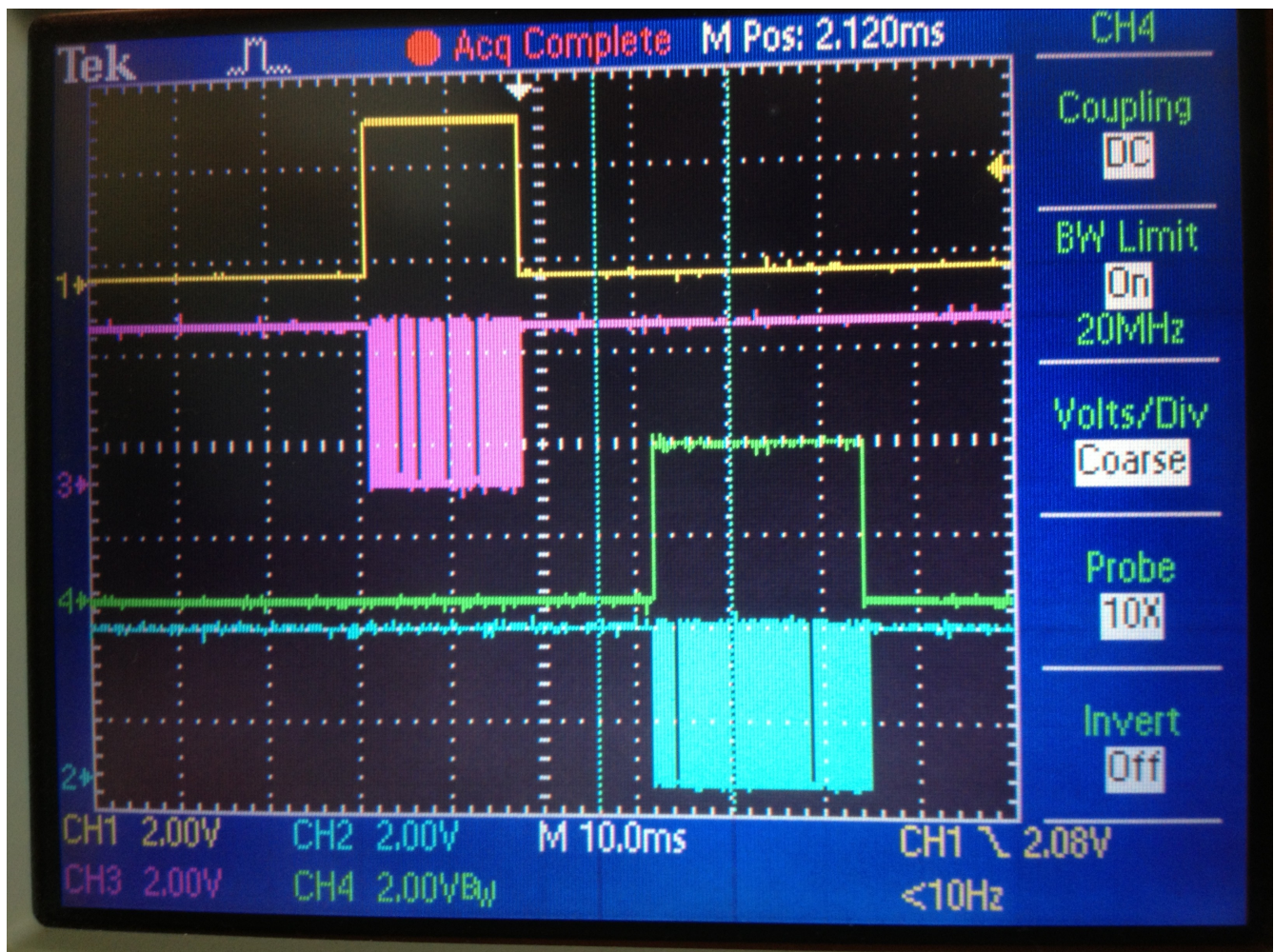
On the Netduino 1st generation board we installed the “Pong” program present on the same repository. Please note that the Netduino 1st gen was flashed with the latest 4.2.0.1 firmware available before proceeding to this test.

The two shields were configured with BUS termination ON (JP2 set) and with Tx Enable Selection pin located on D2 (the jumper is placed on the first position near the R7 resistor). We disabled bus balancing only on one shield, as required by the RS485 electrical specifications. To do that, we closed JP4 switches on one board and left open on the other.

Based on what's implemented on the Ping and Pong programs, we expect the Ping board starts to send a welcome message each second, then Pong board answers with a slightly long answer.

Running programs

As soon as the programs started, the two LEDs present on the shield started flashing, following the data flow on the BUS. The relevant waveforms are reported on next picture.



In the picture is reported:

- The Tx enable pin status for the Ping board on the yellow track
- Tx Tx data pin status for the Ping board on the magenta track
- The Tx enable pin status for the Pong board on the green track
- The Tx data pin status for the Pong board on the cyan track

Data flowing from Ping to Pong are answered back by Pong to Ping. As expected, the answer sent by Pong contains more data than what is present in the welcome string sent by Ping.

As shown, each Tx data is properly windowed by the Tx enable pin. This ensure the RS485 BUS proper contention.