IMPROVING PERFORMANCE OVER RS-485 INTERFACES

Abstract

Trystar Power Studio™ GUI is a complimentary tool that can be used to directly control Trystar products, modify and apply their configuration, view and download datalogs, and apply firmware updates. Many Trystar products utilize the Modbus RTU protocol over RS-485 to communicate with Power Studio™. This application note provides instructions for improving the communication performance when using Power Studio™ with an industry standard USB to RS-485 adapter.

Introduction

The Trystar Power Studio™ GUI is a PC application that can be used to interface with Trystar products, such as the PCS-RS40 and IP-R. Power Studio™ allows users to directly control products, modify and apply configurations, view datalogs, and apply firmware updates.

Power Studio™ communicates with the target using the Modbus protocol over a serial RS-485 hardware interface. To facilitate communication between the PC running Power Studio™ and the target, an RS-485 adapter is typically required. The most common PC to RS-485 adapters are USB modules that utilize an FTDI interface chip. This application note provides instructions on how to improve the communication performance of Power Studio™ when using an FTDI-based RS-485 adapter.

Background

The configuration setup, datalog downloading, and firmware update features in Power Studio create a significant load on the RS-485 bus. With the default configuration settings, the FTDI drivers will buffer a message received on the RS-485 bus for 16ms before transferring it to the host computer over USB. During this time, Power Studio™ must wait for the response message to arrive before sending the next Modbus message to the PCS. Reducing the buffering time in the FTDI drivers allows Power Studio™ to better utilize the full bandwidth of the RS-485 bus. For example, with the buffering time reduced to 1ms the PCS-RS40 product configuration can be read 3 times faster than with the default settings.

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Procedure

Open the Windows Device Manager and select your RS-485 adapter.

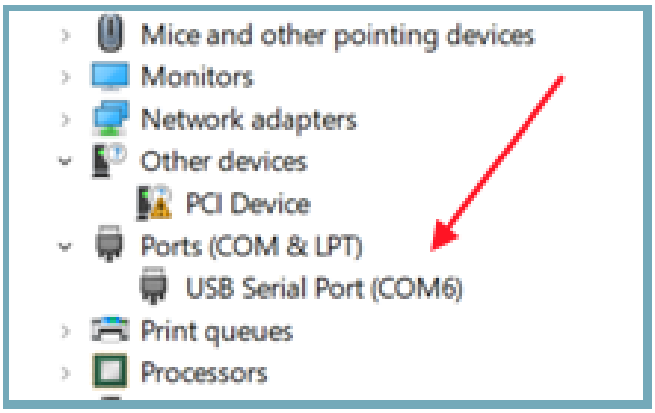


Figure 1 – Device Manager

Select “Change Settings”, then under the “Port Settings” tab select “Advanced”.

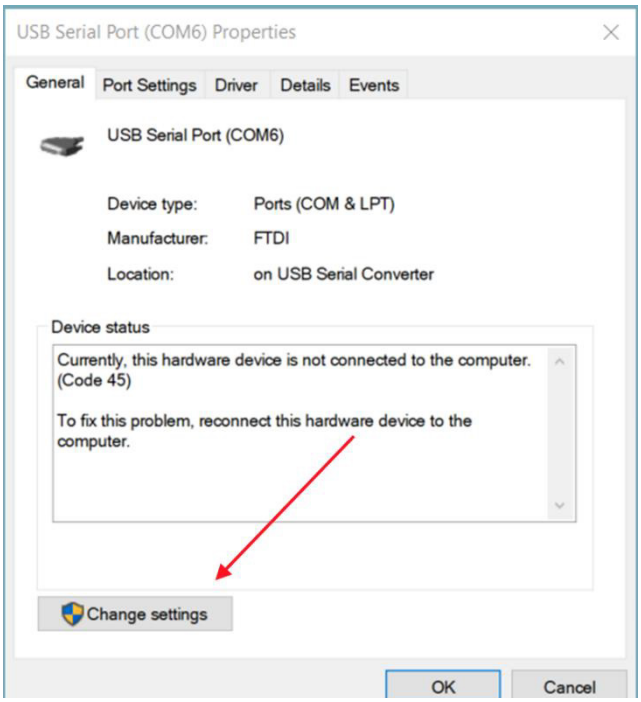


Figure 2 – COM Port Device

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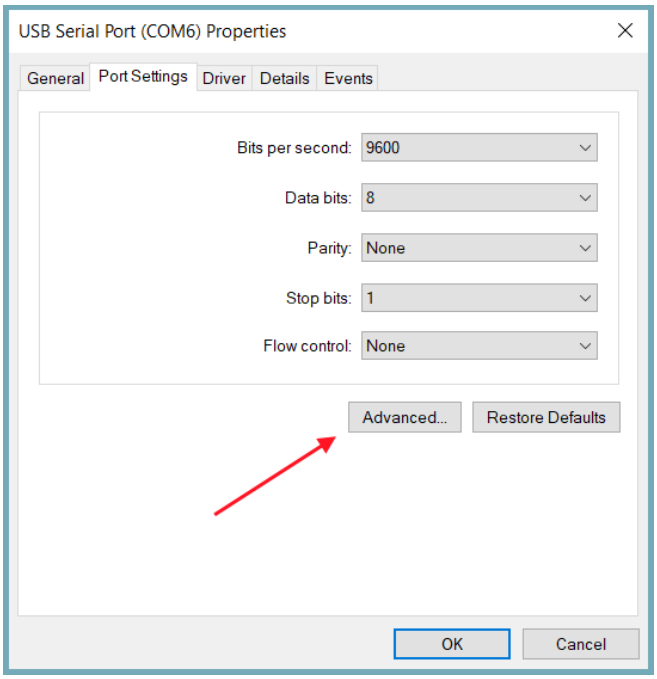


Figure 3 – Port Settings

The "Latency Timer" option defaults to 16ms. This value may be reduced to 1ms to maximize message throughput.

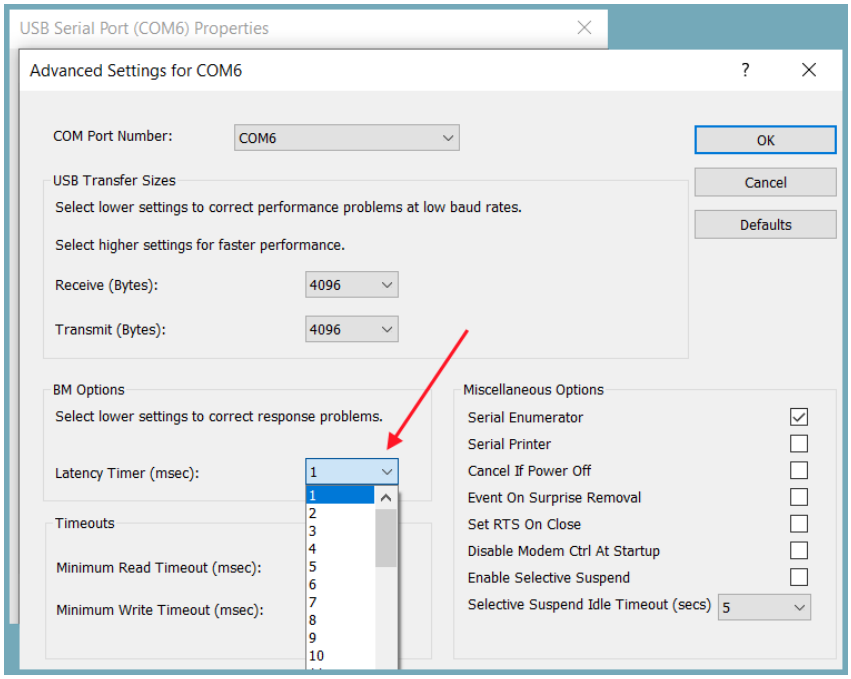


Figure 4 – Latency Timer

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