

Commissioning and Debugging Using a Siemens CP34 Series Communication Module

***** Technical content provided by Nick Clark, electrical engineer, Patti Engineering**

As a trusted [Siemens Solution Partner](#), Patti Engineering works with Siemens technology every single day. This month, we'd like to share a little behind the scenes insight into a recent project where our team of expert engineers worked on a leveling system to support robot machinery that builds airplanes. This article will give you a look into working with CP340 & CP341 communication cards for S7 300 PLCs, aiding as a reference on how to setup and debug one of these types of systems.



As background, the cards allow the PLC to communicate to a variety of serial devices. Each card has its own limitation and has to be chosen based on the requirements of the serial device – which speaks a certain language protocol (how the sent and received transmissions make it back and forth). These cards are often difficult to commission and start-up given the sheer amount of variation in serial devices, plus limited diagnostic feedback if it isn't functioning properly.

The project was put forth partly because of old serial devices that required integration into a PLC. The solution used by Patti Engineering's team was a proper CP34* card that matched the serial device and a RS485 to USB converter cable and software for testing. The serial data and devices can be very tricky to debug – considering the variation and settings, limited diagnostics, etc. – but using a few tools, tricks and knowledge of how different protocols work, our engineers were able to quickly get the job done and debug these devices over the course of a few weeks in development and only a couple of weeks onsite. Most new devices in plants use new communication protocols such as Profinet, Profibus, TCP and others. These protocols require very little debug and have come a long way since basic serial devices were standard. It is common to see basic serial devices in older machinery, but they have been fading out in modern applications. While the road to commissioning and debugging can be bumpy, Patti Engineering is here to help. Here's a little how to:

Types of serial communication: RS232, 20ma TTY, RS422, RS485 4-wire, RS485 2-wire.

	CP340	CP341
Serial Communication	20mA TTY, RS232C, RS422/RS485	20mA TTY, RS232C, RS422/RS485
Protocols	3964(R), ASCII, Printer	3964(R), ASCII, Printer, RK512
Baud Rate	2400, 4800, 9600, 19200	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200

Choosing a card: Choose a card that meets the specifics of the serial device. The table above shows a quick comparison of the limitations of two cards.

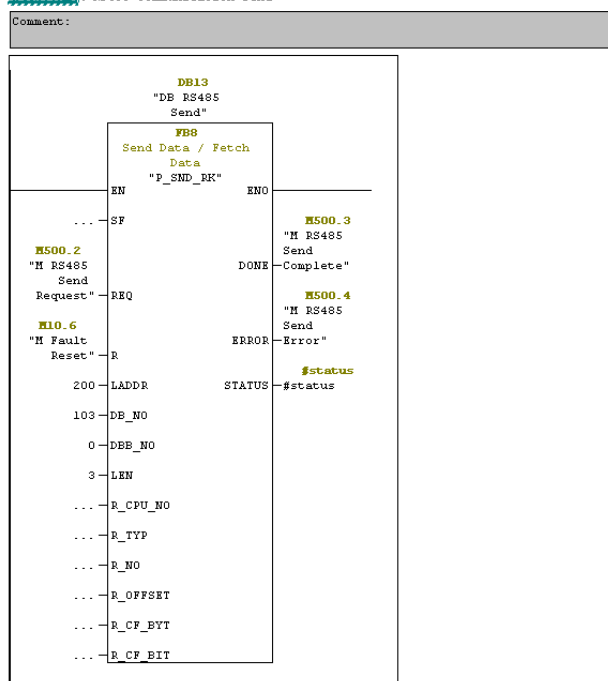
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Setting up hardware: From Siemens website, use the file "Setup_PtP_V5113.exe (V5.1 + SP13)". Run and install. The file will bring in the necessary blocks library and parameters to add the card in the hardware configuration.

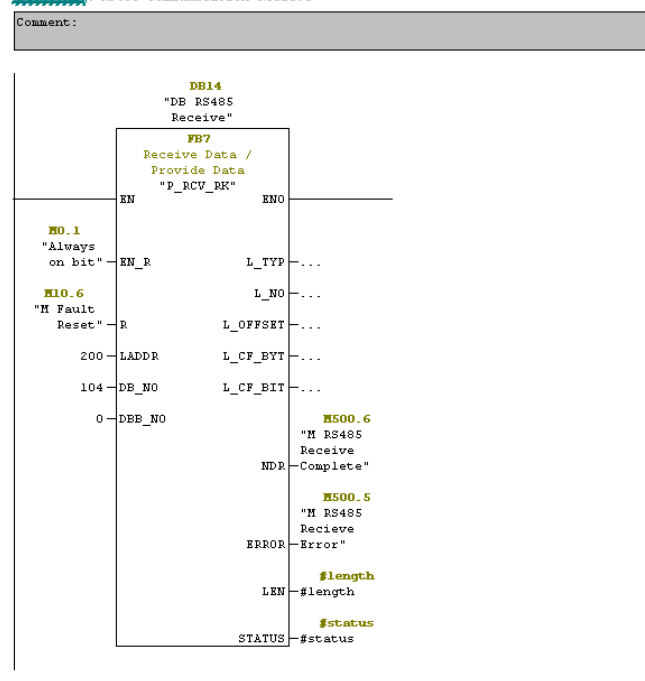
Setting up software: Below are Siemens function blocks for handling the type of communication that is needed. They are in the new CP PtP library for each application.

- FB7 P_RCV_RK CP341 – receive block for RS485 ASCII communication
- FB8 SND_RK CP341 – send block for RS485 ASCII communication

Network 3: RS485 Communication Send



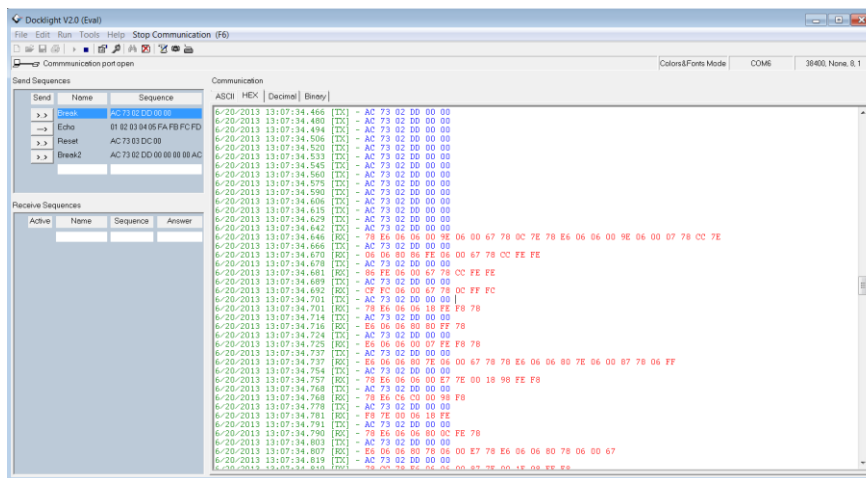
Network 5: RS485 Communication Recieve



External debug and testing: This is a serial to USB converter for watching the sent and received transmissions. This can be used in conjunction with the software to further debug and test communication. Many newer laptops are not providing serial ports on them any longer.



There are many free software tools to debug serial data transmission. Below is an example of one of them in operation. This can be useful by seeing the live transmission if device diagnostics are not sufficient for debug.



We hope this article shed a little light on:

- what these communication cards are used for
- the basics of each type of communication protocol supported
- how to choose them for a specific application
- how to set up the hardware and software
- how to test the serial data transmission with an external device
 - RS485 to USB converter and serial communication software

Please don't hesitate to contact us if you have any questions!