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APPLICATION NOTE 802

PACIFIC SCIENTIFIC, 110 FORDHAM ROAD, WILMINGTON, MA 01887

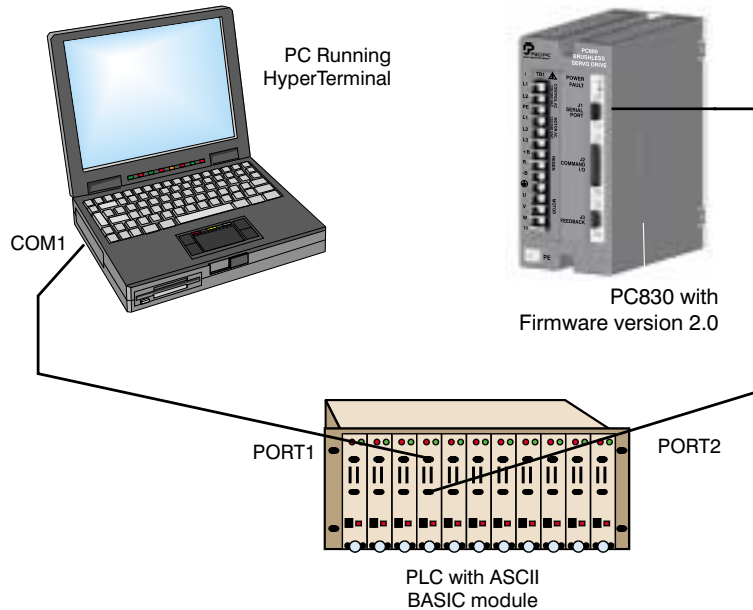# PC830 Simple ASCII Protocol and PLCs

Description   The purpose of this application note is to demonstrate how to communicate between PLC ASCII BASIC modules and the PC830 using the PC830 Simple ASCII Protocol. This application note includes BASIC programs for Allen Bradley, PLC Direct, Omron and GE PLCs. The programs demonstrate how to read and write all of the parameters in the PC830. The programs differ slightly due to the manufacturer's differences in the BASIC programming language.

Required Equipment

PC830
- PC830 with Firmware Version 2.0 or higher
- 830Tools Version 2.0 or higher
- MA830 Rev 5
- RS-232 Serial interface cable

PLC Direct
- PLC Direct D2-240, CPU or equivalent
- PLC Direct D2-06B, 6 slot back plane or equivalent
- PLC Direct F2-CP128, ASCII BASIC module or equivalent
- PLC Direct F2-CP-M, ASCII BASIC module manual
- (2) D2-DSCBL RS-232 Cables

Allen Bradley
- SLC500 series CPU or equivalent
- SLC500 series backplane or equivalent
- 1746-BAS ASCII BASIC module or equivalent
- 1746-6.3 BASIC reference manual
- (2) RS-232 Cables

GE
- IC693CPU313 5 slot chassis with embedded CPU or equivalent
- HE693ASC900 ASCII BASIC card or equivalent
- (2) RS-232 Cables

Omron
- C200HE-CPU42-E CPU or equivalent
- C200HW-BC051 5 slot back plane or equivalent
- C200H-ASCII ASCII BASIC module or equivalent
- (1) RS-232 Cables, (1) C-100-6 Omron serial cable

Development Considerations

Although the PLC manufacturers offer BASIC development software for the ASCII BASIC modules, each of the attached programs were developed using NotePad. HyperTerminal was used for communications and downloads. The attached HyperTerminal programs assume that COM port 1 of the PC is connected to PORT1 of the PLC BASIC module and the BASIC programs assume that PORT2 of the PLC BASIC module is used to communicate to the PC830. Please see the diagram below.

PC Running HyperTerminal

COM1

PC830 with Firmware version 2.0

PORT1

PORT2

PLC with ASCII BASIC module

Note: *Refer to the PLC and PC830 documentation for RS-232 pinouts and connections.*

Theory of operation

Each of the PLC BASIC programs allow the user to read, write or send commands to the PC830. Predefined subroutines are included in each of the programs for building the communication packet and calculating the checksum. There are also subroutines for reading the response from the drive and checking the integrity of the data. In most cases the main body of the program will need to be changed to suit the specific application. For most applications, the predefined subroutines for calculating the checksum and reading the PC830's response should be used. This will simplify and reduce development time.

Once the appropriate serial connections have been made and the BASIC program has been downloaded and executed in the PLC, the program will query the user to Read, Write or send a Command to the drive. After the data is entered, the program will build and send the string to the PC830 and check the response.
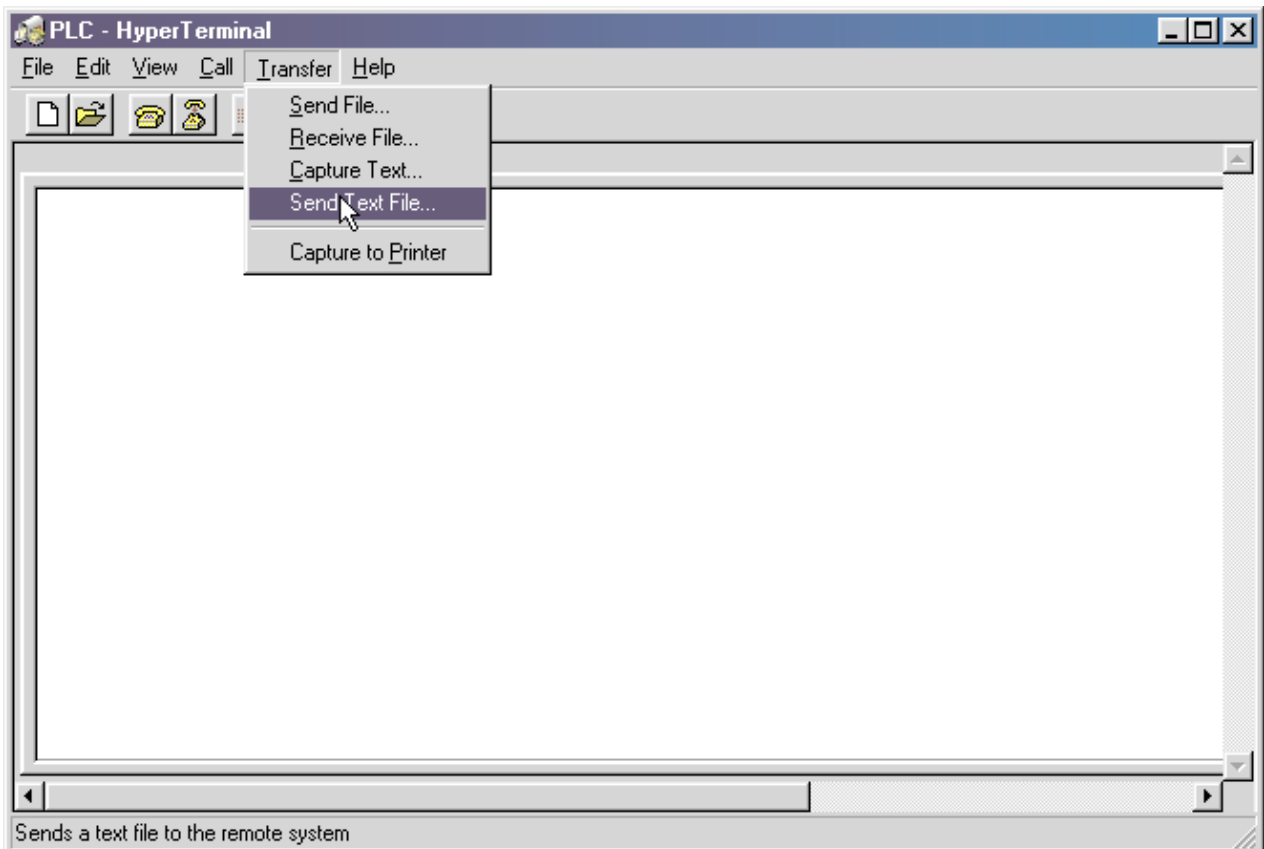
Procedure   Perform the following to use the PC830 with a PLC ASCII BASIC module:

1. Using 830Tools, configure the PC830 for the desired mode of operation.

2. Connect the serial ports as outlined in the diagram on the previous page.

3. Run HyperTerminal on the PC and open the HyperTerminal (*.ht) file provided for the PLC being used.

4. Apply AC power to the PLC and verify communications. A > prompt should be returned. If no > appears, check the cabling and the baud rate on the BASIC module.

PLC	Key to Establish Communication	Baud Rate
Allen Bradley	Enter	19200
PLC Direct	Enter	19200
Omron	Cntrl-X	9600
GE	Space Bar	19200*

***Note:** *Baud rate is negotiated upon power-up.*

5. Once communications are established, download the (*.txt) BASIC program associated with the PLC being used.

6. In the **Transfer** menu, select **Send Text File**. Wait for the download to be complete. (The > prompt will be displayed when complete.)

PLC - HyperTerminal

File Edit View Call Transfer Help

Send File...
Receive File...
Capture Text...
Send Text File...
Capture to Printer

Sends a text file to the remote system

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Procedure (cont'd)   7. Type **RUN** at the > prompt.

8. The program will query the user to select Read, Write or Command. Select **Read** and press **Enter**.

9. The program will then prompt the user to enter a Parameter ID. Enter **10033,** the ID for **ResPos** (refer to the Appendix G, "Serial ASCII Protocol" in the MA830 for additional IDs).

10. A value between 0 and 65535 should be returned.

Note: If *a time-out occurs or no response is received check the serial cable between the PLC Port2 and the PC830.*