



## Serial Write and Read Example VI

### Introduction

This virtual instrument (VI) provides a mechanism for serial communication between Mark-10 instruments and National Instruments LabVIEW software. It is compatible with any Mark-10 gauge, tester, or test stand with RS-232 or USB output. An understanding of LabVIEW is required to effectively utilize this tool.

### Download Instructions

Extract the file “Serial Write and Read Mark-10 Example.vi”. This example is based on the National Instruments’ “Basic Serial Write and Read.vi” example VI. After extracting the VI it may be opened by browsing to it in LabVIEW or double-clicking it in Windows Explorer / File Explorer.

### Detailed Description

The VI configures the serial port on the first iteration of the overall ‘while’ loop or when the “Apply” button is clicked. The VISA Configure Serial Port VI is set to the selected COM port with the default settings of the Front Panel controls. It is also set to Enable Termination Character, which is set to 0x0D (represented by “\n”), and then open the port. The ‘while’ loop continuously writes the string command, wired to the VISA Write VI, out the serial port, pauses (if configured), then reads the serial port.

The read terminates when the number of bytes at the serial port input buffer have been read (if the “Max Speed Test” is unchecked), or 1,000 bytes (if the “Max Speed Test” is checked), or the termination character is received. Mark-10 instruments respond in a continuous stream of less than approximately 15 bytes, so the read effectively terminates on the reception of a ‘\n’ character. The load string read by the ‘?’ command is appended to the “Read String” String control and the numeric value is input to the “Load” XY Graph control. The string is an array, bundled along with elapsed time, for plotting load vs. time. When the VI terminates, the serial port closes.

Refer to applicable Mark-10 user’s guides for a listing of serial port commands. For example, the “String to Write” control’s default string in this example VI is “?\r”, which is a ‘?’ character followed by a carriage return character (‘0x0A’ = ‘\r’). This queries Mark-10 instruments for the current load reading. Mark-10 motorized test stands equipped with travel measurement hardware respond to ‘n’ (no termination character required) with the load followed by the position. Both packets are terminated / separated with a CR-LF (\r\n) pair terminating string. If an ‘n’ is written to a supported motorized test stand, two reads are required for each ‘n’ written.

### Further Assistance

The LabVIEW Example Finder is helpful in locating the Basic Serial Write and Read VI as well as several other examples. Additional assistance may be found on the LabVIEW Discussion Forum by clicking on the “Community” button on [www.ni.com](http://www.ni.com). Click “Visit the Discussion Forums”, then click “LabVIEW”.

