

Manual Firmware Upgrade Procedure for IO Expansion Serial Base and Expansion Module

Applies To

FreeWave Technologies:

- IOE-X-4422PC
- IOE-X-4422P

Background

This application note describes the procedure to manually upgrade the firmware for IO Expansion products.

Firmware Versions

The Serial Base and Expansion Module devices are generally available starting with firmware version 1.0. Earlier firmware versions indicate a pre-production unit meant for demonstration purposes only and will not provide the same functionality as specified in documentation.

It is important to note that a Serial Base may not communicate with stacked Expansion Modules if the firmware versions of either are before 1.0 (i.e. versions 0.10, 0.9, 0.8, etc. are not all compatible). An entire stack of IO Expansion modules must be upgraded from 0.8 to 0.9 at the same time. To upgrade firmware on an Expansion Module from 0.8 to 0.9 it is necessary for the Serial Base to begin with firmware version 0.8 as well.

Checking Firmware Versions

The firmware version on IO Expansion hardware is accessible in the Modbus registers. The firmware version is located in input read-only registers 157 and 158. Register 157 contains the major firmware revision (e.g. '1' of "1.0") and register 158 contains the minor firmware version (e.g. '0' of "1.0"). Poll the registers with any Modbus host and treat the result as an unsigned integer.

Manual Firmware Upgrade Procedure

Follow these steps to manually upgrade IO Expansion firmware:

1. Stack up to 15 Expansion Modules on one Serial Base to upgrade firmware.
2. Connect the 10-pin data cable to the top module in the stack.
3. Apply power to the stack either through the barrel connector on the data cable or through the power connector on the end of any device in the stack.
4. Connect the serial connector to a serial port on your computer.
5. Save the firmware loader executable and desired firmware version in the same directory on your computer.
 - a. Firmware loader executable is called "IO-XP_S19Loader.exe"
 - b. Firmware version 1.0 is called "io-xp_Rev1_0.abs.phy"
 - c. Firmware version 0.10 is called "io-xp_Rev0_10.abs.phy"
 - d. Firmware version 0.9 is called "io-xp_Rev0_9.abs.phy"
 - e. Firmware version 0.8 is called "io-xp_Rev0_8.abs.phy"
6. Open a command prompt.
 - a. To access the command prompt on Windows operating systems, click the "Start" button, then select "Run."
 - b. In the "Run" dialog box, type "cmd" in the "Open:" text box and click "OK."

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- c. A command prompt will open in a default location.
 7. Navigate through the computer's file system to get to the directory where the loader and firmware are saved.
 - a. To move up one directory, type "cd .."
 - b. To move into a directory, type "cd directoryname"
 8. To program the radios:
 - a. Type "IO-XP_S19Loader.exe COM1 19200 io-xp_Rev1_0.abs.phy 1 100"
 - b. Hit enter
 - c. Press enter when it the loader asks for a selection between "S" and "<ent>"
 - d. Hit any letter on the keyboard the loader asks "Enter a character for FW Rev:"
- 9. CRITICAL DETAILS:**
 - a. Wait until all red lights stop flashing before removing device power and the green power LED turns on (in regular power mode) or starts blinking (in low power mode).**
 - b. The IO Expansion module is organizing its memory while the red lights are shown.
 - c. Removing power before the programming procedure is finished may cause the IO Expansion module to be permanently unrecoverable except by FreeWave's engineering staff.