



Service Bulletin 00.033.542 SPCe Firmware Download Process Using Bootloader version 1.11.02 or lower versions.

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3.0

Purpose

To explain the process of downloading firmware image to Gamma Vacuum's SPCe controller.

Scope

Applies to SPCe controllers running Bootloader version 1.11.02 or lower versions. (Factory installed on SPCe controllers s/n 301602000 and lower serial numbers)

Warnings

Voltages as high as 8000V may be present in the power supply. These voltages can exist at peak currents of 40 mA. As a result, this power supply can be lethal if certain precautions are not taken. Never handle any of the external high voltage connections while high voltage is present. Always turn off the power supply and disconnect it from the power source before opening this power supply.

Required Tools and Materials

An SPCe unit.

Desired firmware image to be downloaded (firmware image file has extension *.bin; for example "version1_10.bin").

A computer equipped with a serial communication port.

A null-modem DB9 male to female cable or a standard DB9 male to female RS-232 serial communication cable with an external null-modem adapter.

Standard terminal emulation program (TEP) such as Windows HyperTerminal or similar. Any terminal emulation program may be used as long as it has file transfer capabilities using YModem (preferred) or XModem file transfer protocols.

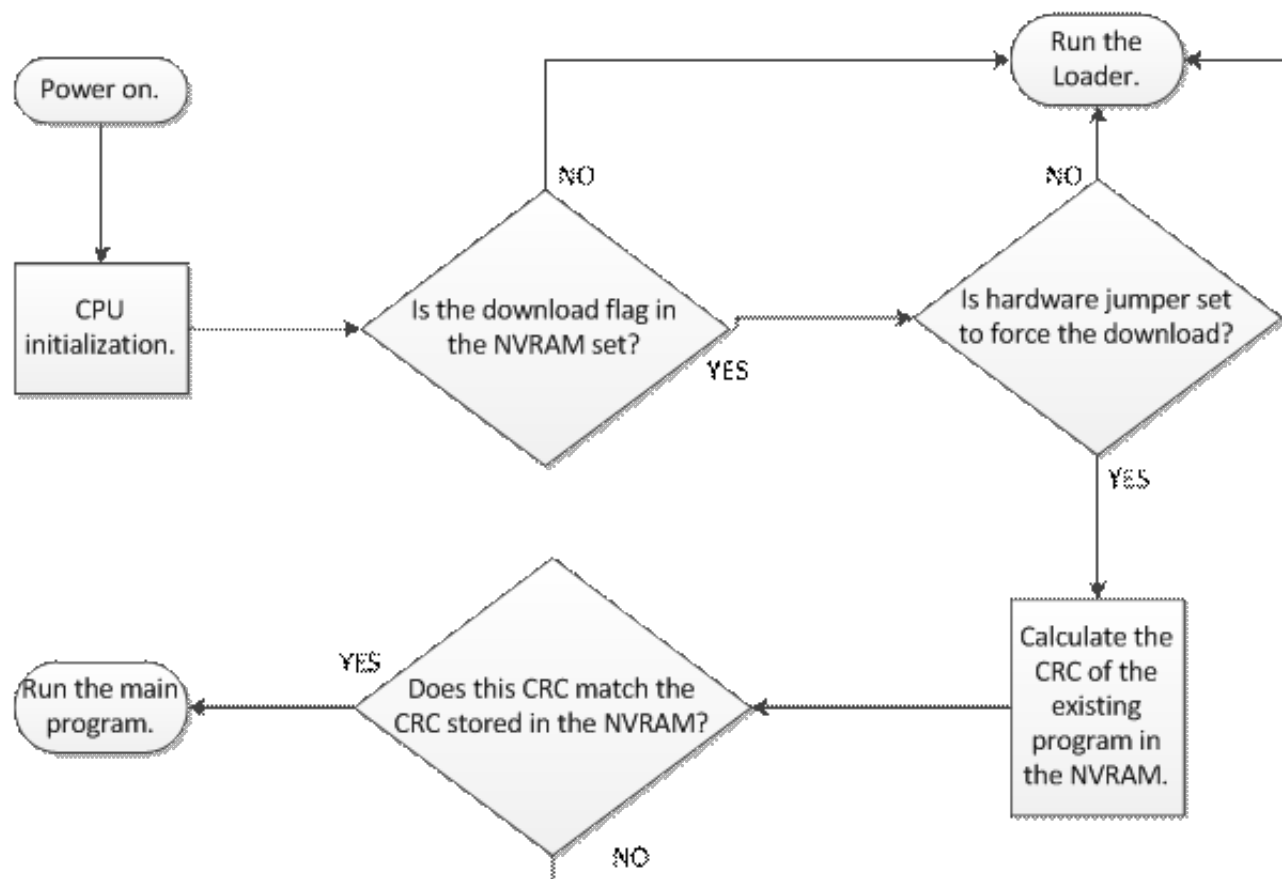
Procedure

The SPCe Controller Architecture

The SPCe controller has two separate programs:

1. A "Loader" program. This is the tool used for updating controller's firmware. Installed at the factory.
2. The SPCe firmware program. This is controller's operational run-time environment.

To understand the usage of the two programs please review SPCe startup state machine:



SPCe Startup State Machine

Download SPCe firmware using Xmodem or Ymodem file transfer protocol **(using serial interface)**

In order to download the new firmware image to your SPCe controller first you must start the SPCe Loader program.

There are two ways to do this. The end effect is the same no matter which case is used, but depending on the circumstances at hand, one of the ways will be more suitable.

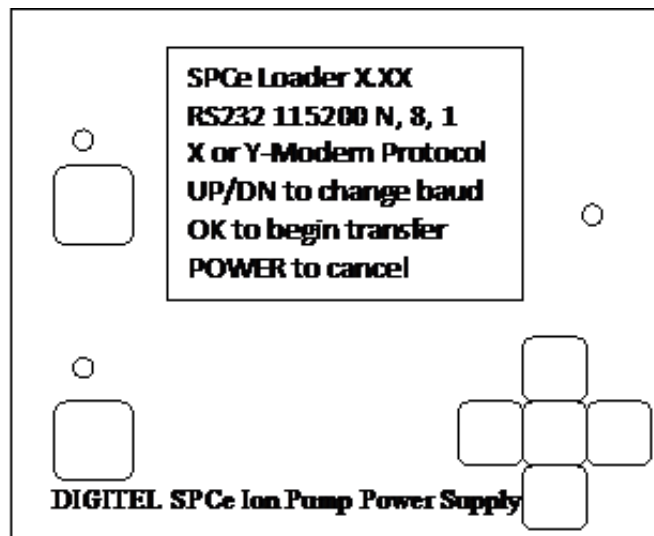
1. Via front panel:

- Power up the controller. Press the 'OK' button to open the controller's main menu, scroll left or right using arrow buttons to "Config" or "SPC" (firmware version dependent) menu item. At "Config" menu item, scroll down to "Update" menu sub-item and press 'OK' button to open "Update Firmware" screen. Select 'Yes' and press 'OK' button to have the SPCe boot up in the SPC Loader mode upon next controller power up. You will be asked to commit changes, select 'Yes' and press 'OK' button to confirm. Restart the controller using the power button. Controller will load up the SPCe Loader program upon power up.

2. Via hardware intervention:

- Remove controller's top cover. Jumper location J15 on the display board and cycle controller power. Controller will load up the SPCe Loader program upon power up.

Note: If after the update process, jumper on location J15 is not removed, the SPCe controller will again start the Loader program at the next power cycle.



SPCe Loader Screen

Perform the following steps to finish downloading the SPCe firmware.

1. The Loader program must be up and running.
2. Connect the null-modem serial cable between the computer and the SPCe controller.
3. On the computer, launch the terminal emulation program (TEP), i.e. in Windows: go to Start, Programs, Accessories, Communications, Hyper Terminal.
4. Make sure the configured terminal emulator program (TEP) port matches the serial comm. port on the computer to which the cable is connected.
5. Ensure that TEP communication parameters are 8-N-1-N (8 data bits, No parity, 1 stop bit, No flow control). Please make sure that any type of flow control such as XON/XOFF or similar is not used.
6. Ensure the transfer baud rate is set the same for TEP and SPCe. To change transfer baud rate on the SPCe use the up and down arrow key.
7. Press OK button on the SPCe to start download process.
8. The characters "D:C" should appear in the TEP window. If this is not the case, verify TEP configuration and the serial communication link.
9. The character "C" should appear in (approximate) 2-second intervals in the TEP window. This is an indication that the SPCe unit is ready to accept new firmware image. The transfer of the firmware image file has to be performed using either YModem or XModem file transfer protocols. YModem is preferred.
10. From the TEP, select file transfer option, select Ymodem for file transfer protocol, specify desired firmware image to be transferred and start the transfer process.
11. After download has completed, the SPCe screen will read 'Success. Press POWER to restart system.'
12. Cycle power to the unit using the POWER button and at power up the SPCe will run downloaded firmware image.

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