MAGNUM
E N E R G Y

Sensata Technologies
2211 West Casino Rd
Everett, WA, USA 98204
www.Magnum-Dimensions.com

Introduction

The PT-100 controller allows you to download and install updated firmware from the Magnum-Dimensions website—using a USB connection between your Windows-based computer and the PT controller. Firmware updates are routinely provided to improve performance, fix issues, and to add new features or change functionality.

Info: Installing new firmware resets your PT-100 controller to its factory default settings. However, if used in a standalone installation (i.e., not networked), the DIP switch settings will reload. If networked with a Magnum inverter and remote, your original settings are retained in the remote and will reload once the PT-100 is reconnected to the network.

Required Components

- a high-quality USB cable with a Micro-B connector (Figure 1)
- a Windows-based computer***** with an open USB connection (and Internet access)   ** – a ≥7.0 operating system*

Pre-Installation

Before you begin updating the PT-100's firmware, complete the following:

1. Check your PT controller's current version of firmware to confirm that you need to update your PT-100 (perform a Power-up test per the instructions in your PT-100 owner's manual).

2. IMPORTANT: Remove all power to the PT controller. Damage may occur to your computer if all power is not removed.

3. Detach the PT-100's access cover (four Phillips screws) from the body of the controller (per your PT-100 owner's manual).

4. Locate the USB Micro-B connector port inside the PT-100 (Figure 2).

5. From the Magnum product website (www.Magnum-Dimensions.com), download and save the DFUBootloader.zip file to a location on your computer (remember the location on your hard drive).

   The DFUBootloader.zip file contains a Driver folder, a Redist folder, the latest firmware version (PT100_Vx.x.dfu), and the bootloader application file (Sensata_USB_Bootloader.exe)****** with related .dll files.

   ** – This application erases the PT-100's old firmware, transfers the new firmware files from your computer to the PT controller, and then verifies that the firmware files have been successfully loaded.

Standard A connector

Micro-B connector

Figure 1, Required USB Cable

PT-100 Firmware Update Instruction Sheet

Installation

Follow these instructions in the order they are written. Failure to do so may result in an unsuccessful firmware update. Refer to the Troubleshooting section to address any issues or problems that may arise during the update.

⚠ **CAUTION:** Ensure there is no power connected to the PT controller.

I. Enabling the PT to communicate with the computer

1. Plug the standard A connector end (Figure 1) of the USB cable in to a USB port on your computer.

2. While holding down the PT controller's SELECT button, insert the Micro-B connector end of the USB cable into the Micro-B connector port inside the PT controller (Figure 2).

   The PT-100's BULK (blue) LED flashes and the LCD display shows "*USB*" (looks like "U58"); this indicates that the PT controller has successfully entered USB mode and is communicating with the computer.

3. Once "*USB*" appears on the PT's LCD display, release the SELECT button.

   Upon plugging the USB cable in to the PT-100 controller, your computer should locate and load a compatible USB driver (if not, see the Troubleshooting section). ***Note:*** *The PT-100 shows as an STM DFU Device in the Device Manager on your computer.*

II. Installing the latest firmware files to the PT controller

4. Locate the DFUBootloader.zip file you downloaded and extract all the files to a folder that you designate on your computer, and then launch the Sensata_USB_Bootloader.exe application.

   The PT-100 USB Bootloader application screen appears (as shown in Figure 3—ensure the highlighted fields are populated).

5. From the application screen, press the **Browse** button.

6. Locate and select the new firmware version file (i.e., PT100_Vx.x.dfu) that you downloaded earlier from the Magnum product website.

   Once the new firmware version file is successfully loaded, a "*File correctly loaded*" message appears at the bottom of the screen, and the **Program** button becomes active (as shown in Figure 4).

7. From the application screen, press the **Program** button.

   The following happens very quickly: the PT's LCD display briefly shows "*E*" and the FLOAT LED flashes (green), and then the PT's LCD display changes to "*P*" and the FLOAT LED continues flashing (green).

   Once the firmware files have been successfully loaded to the PT-100, an "*Upgrade successful!*" message appears (and FLOAT LED goes solid).

8. Press the **Quit** button to close the bootloader application screen.

9. Unplug the Micro-B connector from the PT-100's Micro-B connector port.

Micro-B connector port
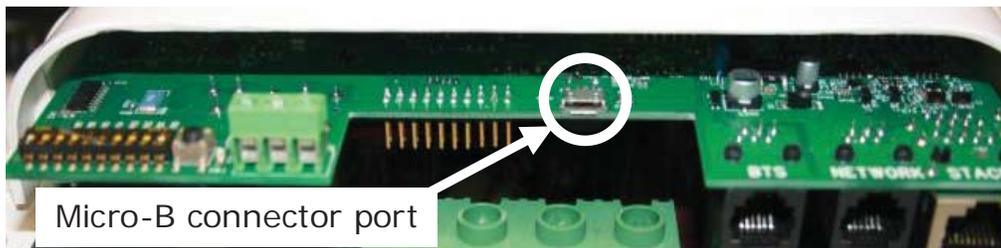
Figure 2, PT-100 Controller's USB Micro-B Connector Port

Note: Once the USB drivers are properly installed, these fields should automatically populate upon initially opening this screen. If not, refer to the Troubleshooting section.
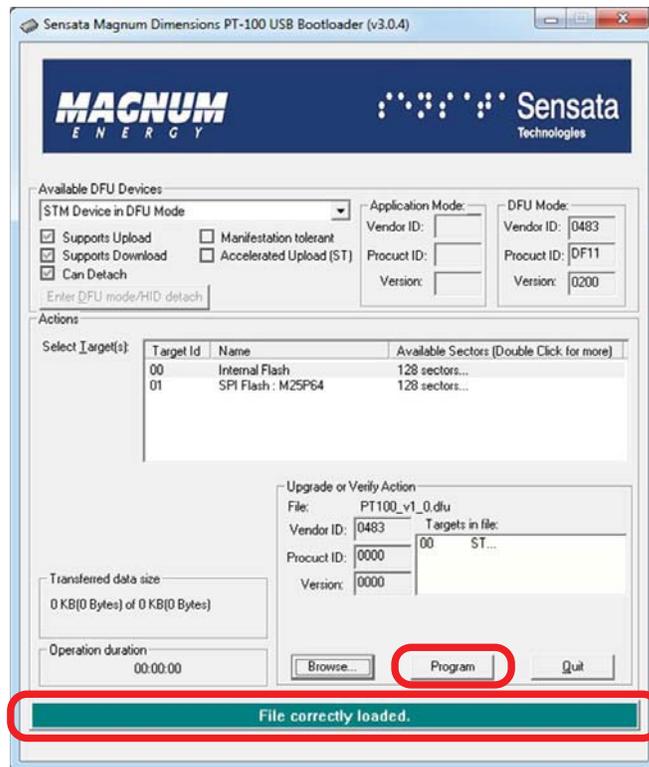
Note: This firmware update application screen requires no data input from the user.
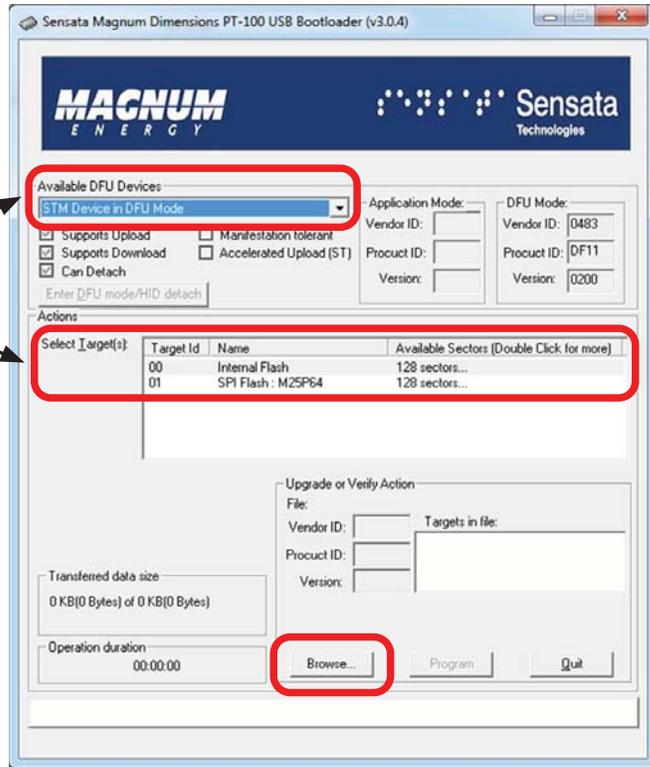
Figure 3, **Firmware Bootloader Application Screen (Initial View)**

Note: The Program button becomes available once the firmware file is successfully loaded.

Note: Upon pressing the Program button, the PT-100's LCD display shows "E" (Erase mode - erasing old firmware files) and then quickly transitions to show "P" (Program mode - loading updated firmware files).

Figure 4, **Firmware Bootloader Application Screen (File Loaded)**

III. Verifying that the update was successful

Perform a Power-up test to confirm whether the updated firmware has been successfully loaded to the PT-100. You can initiate a Power-up test by either:

- Plugging the USB's Micro-B connector back in to the PT-100's Micro-B connector port—do not press the SELECT button. Or,
- Connecting appropriate battery voltage to the battery terminals of the PT controller (ensure correct polarity).

Once you connect power, monitor the front panel of the PT controller to verify that the latest firmware version appears on the LCD screen in sequence. See Figure 5 for an example of the PT controller going through the power-up sequence (only shows sequence up to firmware version display).
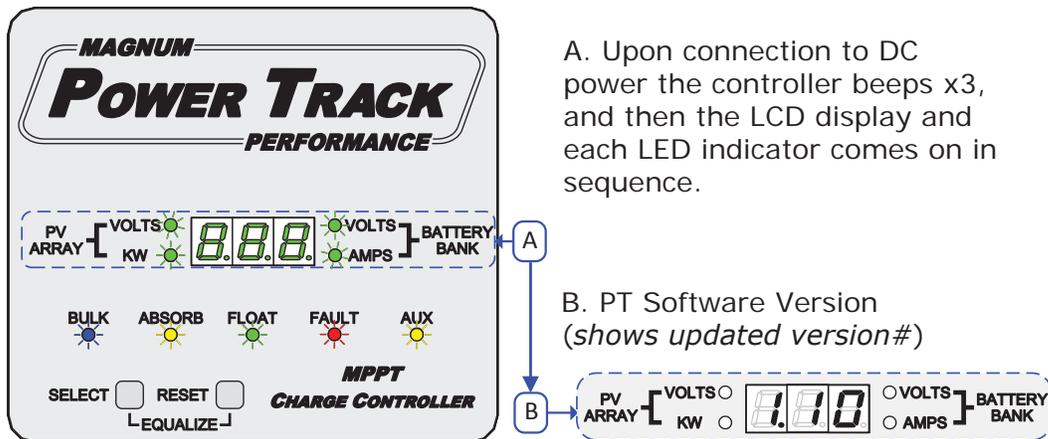

A. Upon connection to DC power the controller beeps x3, and then the LCD display and each LED indicator comes on in sequence.

B. PT Software Version (*shows updated version#*)

Figure 5, Power-up Test Firmware Version Display

Troubleshooting

Driver

- **Issue:** An 'unable to locate the necessary driver' or 'USB device not recognized' message appears.

    Remedy: Access and install one of the drivers (compatible with your operating system) from the Driver folder you previously downloaded.

Uploading

- **Issue:** The Available DFU Devices and Select Target(s) fields (see Figure 3) on the bootloader application screen do not populate when initially opened.

    Remedy: 1) If the USB cable is connected to a USB port on the front of your desktop computer, try plugging it in to a USB port on the back of the computer (the front USB port might be compromising signal integrity). 2) Try substituting a shorter (or higher quality) USB cable.

Redist Files

- **Issue:** The bootloader application failed to load.

    Remedy: The USB Bootloader application you will be using was written in Visual C++ and requires "standard libraries" (i.e. collections of pre-written software). If the application does not run, these libraries may not be on your computer. A Redist folder is provided that contains .exe files that "redistribute" the libraries (hence, the name); so that the bootloader application can run.