

# SLATE™ Software Bootloader

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SLATE™ modules firmware are updated through a software bootload process. The following modules can be updated in this manner:

- Base module Function Block Engine (FBE) (R8001A1001)
- Burner Control (BC) module (R8001B2001)
- Analog I/O (IOA1) module (R8001U3001)
- Digital I/O (IOD1) module (R8001D4001)
- Fuel Air Ratio Control (FA) module (R8001C6001)
- Limit (LM) module (R8001L8001)
- Annunciator (ANN) module (R8001N7001)

SLATE Amplifier modules are not updated using the bootloader. They are not field updateable.

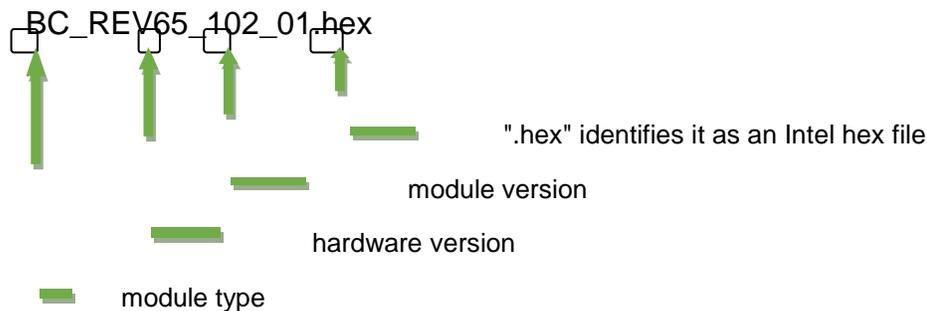
Software is updated in a module by transferring a firmware file from the Base module to the target module. The bootloader in the target module receives the new bootload file and updates its flash with it. The new software is executed when the bootload process is ended and the SLATE system proceeds through a reboot.

**WARNING:** Any SLATE module that is updated with new firmware will lose its configuration. Make sure to run a configuration backup or insure the current kit is saved to the Base micro SD card before updating SLATE modules.

Save module configurations by clicking the Menu button on the Base module, then highlighting Installation using the arrow buttons. Scroll down to “Save configuration set” and proceed. Log into the Base module (default base passcode: “1111”).

**WARNING:** Fuel/Air curves will be lost during a firmware update. Make curve backups for the combustion curves using the “Save Curve” option in the “System Tools” web page before updating modules with software revision 2.20 or newer or note the location of points for all actuators for all curves to manually re-enter them after the software updates for modules with software revision 2.08 or older.

SLATE modules are updated individually with the software bootload process. Only when the software is compatible with the target module will the bootload be permitted. A module must have the same module type and version as the bootload file indicates, and the module hardware expected by the software must also match. The file name of the software bootload file indicates the criteria it expects for the target module, and therefore, should NOT be renamed by the user. Honeywell names the hex files intentionally to target the correct module. An example of a software bootload file for a Burner Control module is:



**NOTE:** Hardware version will likely be version 65 or 102 for modules in the field. In some cases the hardware version may be version 0 for older modules. If the file provided by Honeywell is named with “65”, it is also compatible with hardware version “0”. The file name must be renamed to identify hardware version “0” in this case, e.g., “BC\_REV65\_102\_01.hex” to “BC\_REV0\_102\_01.hex”.

SLATE module software should only be updated when recommended by Honeywell. It is recommended to update all modules (including Base FBE) in a system at once to avoid possible compatibility issues. To fully take advantage of new features a software update includes, you may also need to update your kit to the new module version.

**WARNING:** Software must only be updated when the customer's system can stop its service and shut down. During a firmware update, SLATE enters a bootloading mode during which none of its sequencing will be operational.

Updates from versions 0 or 65:

Software bootload files are brought to a Base module using a USB storage device. The firmware files are placed in a folder named "updates" in the USB stick in the root. The Base module only looks for bootload files in this subfolder.

Updates from version 102:

Software bootload files are brought to a Base module using a Service Pack upload. The USB with the “updates” folder in the root is no longer required.

All bootloading is conducted from the local display on the Base module. User presence during firmware updates is required.

## Required Tools

Items necessary for a software bootload are the following:

- Base module
- Target modules to be updated
- USB stick containing software bootload files (located in "updates" folder for version 0 or 65)

Hardware version of the modules can be found at the Base module local display. Using the buttons on the Base module, click the Menu/Device Information (using either the “OK” button or the right arrow), then scroll to the module of interest using the up and down arrows until the module is highlighted. Once the module is highlighted, click the “OK” or right arrow button to select and use the up and down arrow buttons to maneuver to the “HW version”. This same procedure is used to see the module “Description” indicating the firmware (See Figure 1).

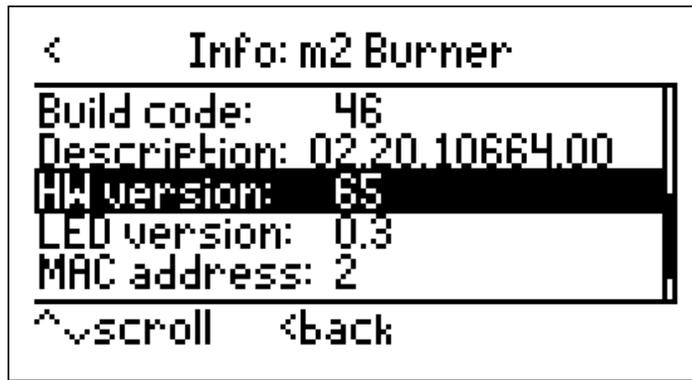


Figure 1 Module hardware version

A SLATE module hardware version can also be found using the Chrome browser at several possible pages like the "Simple Register View" page shown in the next figure.

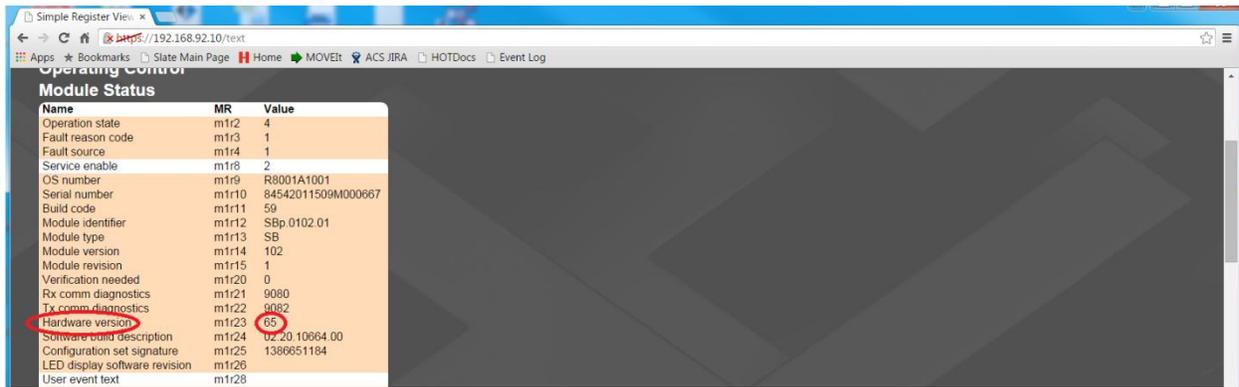


Figure 2 Hardware version in Chrome browser

## Start Bootload Procedure

Bootloading module software is performed at the Base module using it's local display. Procedure:

1. Insert USB stick with bootload files into the Base module. Insure the files are placed inside the "updates" folder in the root of the USB for versions 0 or 65.
2. For version 102 and newer, load appropriate service packs (Application MCU upgrade XX.XX followed by the Modules upgrade XX.XX). See Service Pack Installation Instructions.
3. Click the "Menu" button on Base module (see Figure 3).



Figure 3 Menu button on Base module

4. Scroll down using the up and down arrows and select "Maintenance" (see Figure 4).

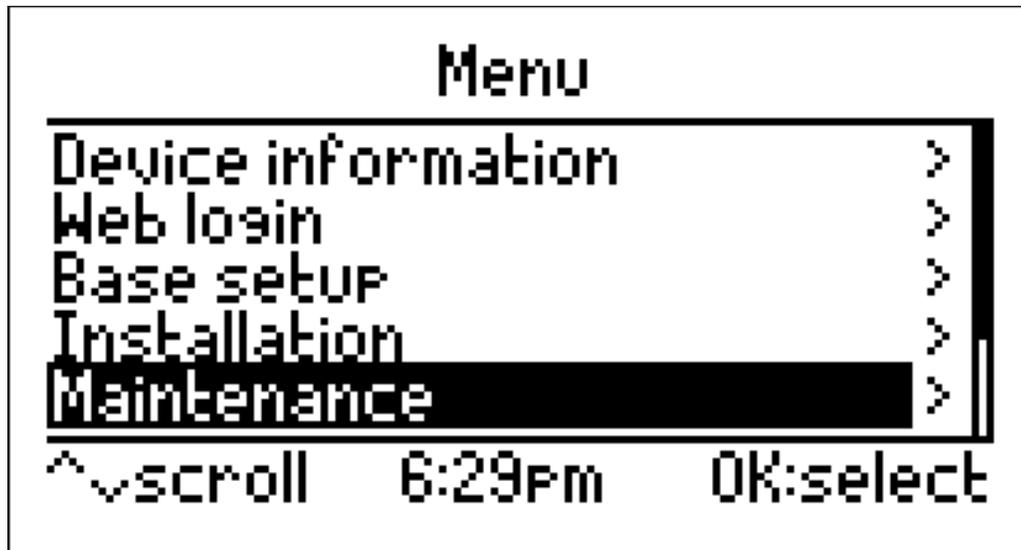


Figure 4 Select Maintenance

5. Scroll down and select "Update firmware" on Base module.

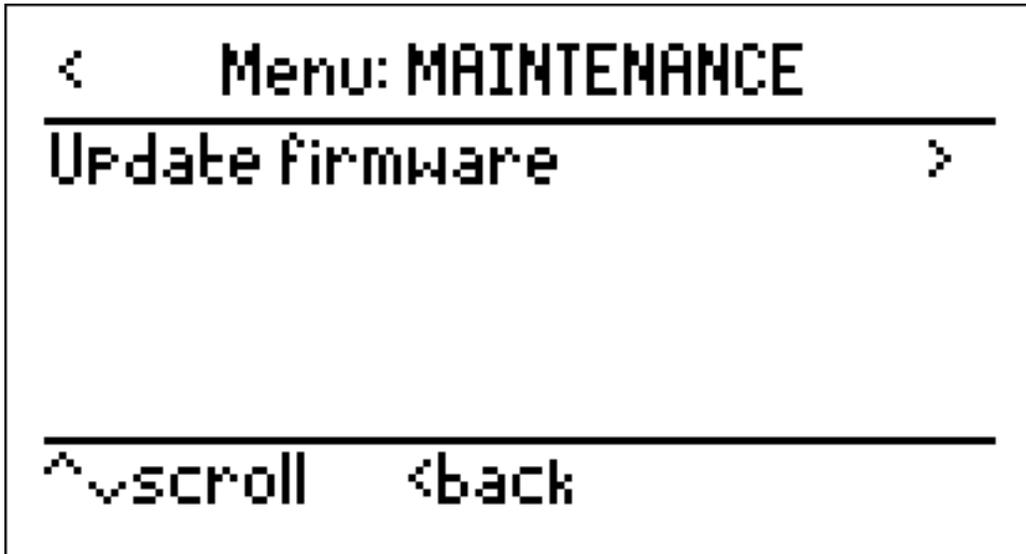


Figure 5 Select "Update firmware"

If the selection doesn't have an arrow in the right column, it indicates that this selection is not available. The USB stick may not be fully inserted or it may be missing the bootload files or the "updates" folder in the root, or the appropriate service packs were not loaded properly for versions 102 and newer. The issue must be resolved in order to proceed.

6. Login to the SLATE Base for permission to continue with bootloading (see Figure 6). The default Base passcode is "1111".

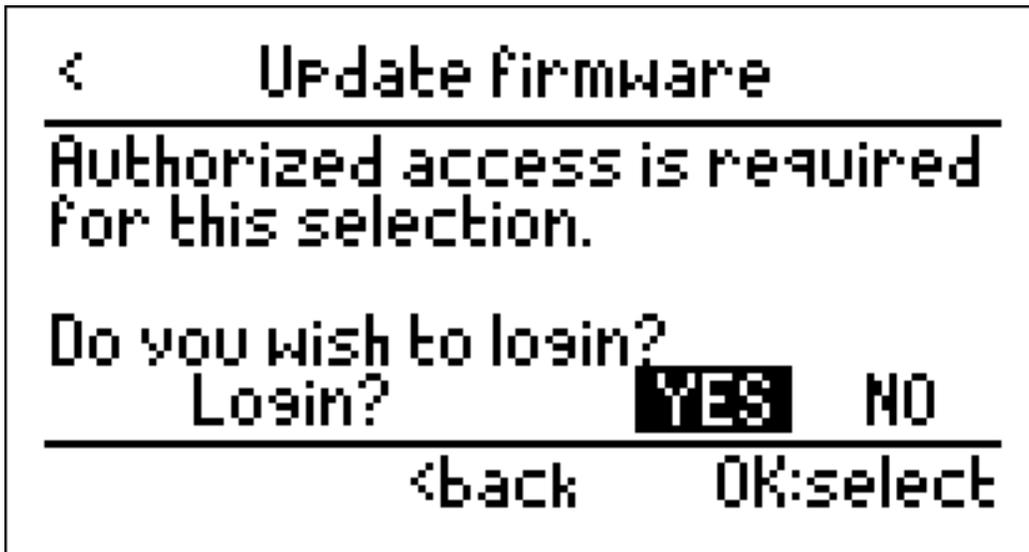


Figure 6 Login with Base passcode

7. Select "YES" to continue with firmware update (see Figure 7).



Figure 7 Select "Yes" to continue with bootloader

At this point, the Base module stops all SLATE™ applications and loads the Base module bootloader application (see Figure 8). The bootloader application causes all modules on the DIN rail (except for flame amplifiers) to enter bootloading mode and the system will shut down. Bootloading mode is evident on each module when the letters "BL.I." appear on their LED displays.

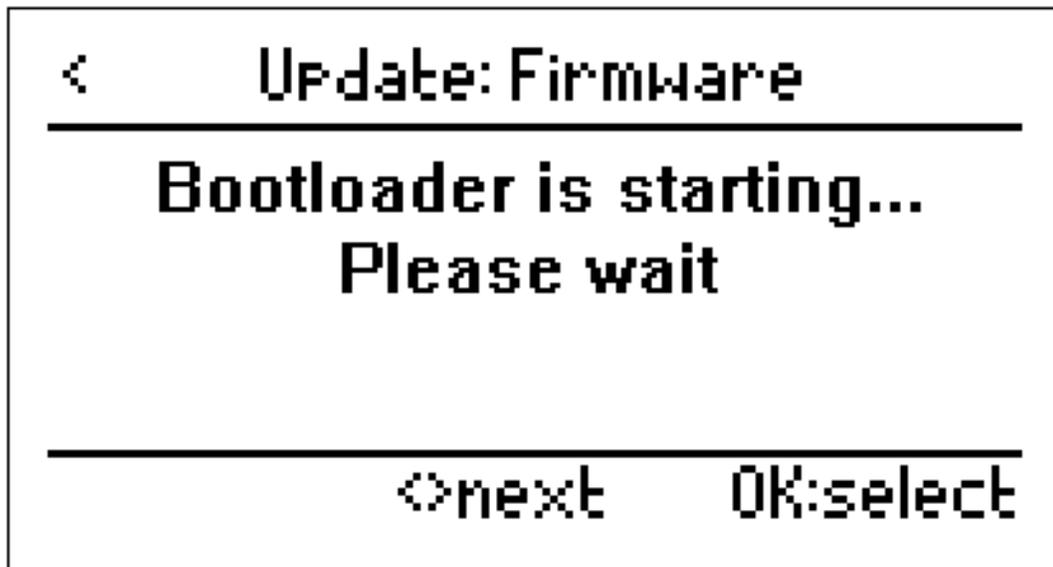


Figure 8 Bootloader starting

When the bootloader application is started a menu is displayed (see Figure 9) permitting modules to be updated.

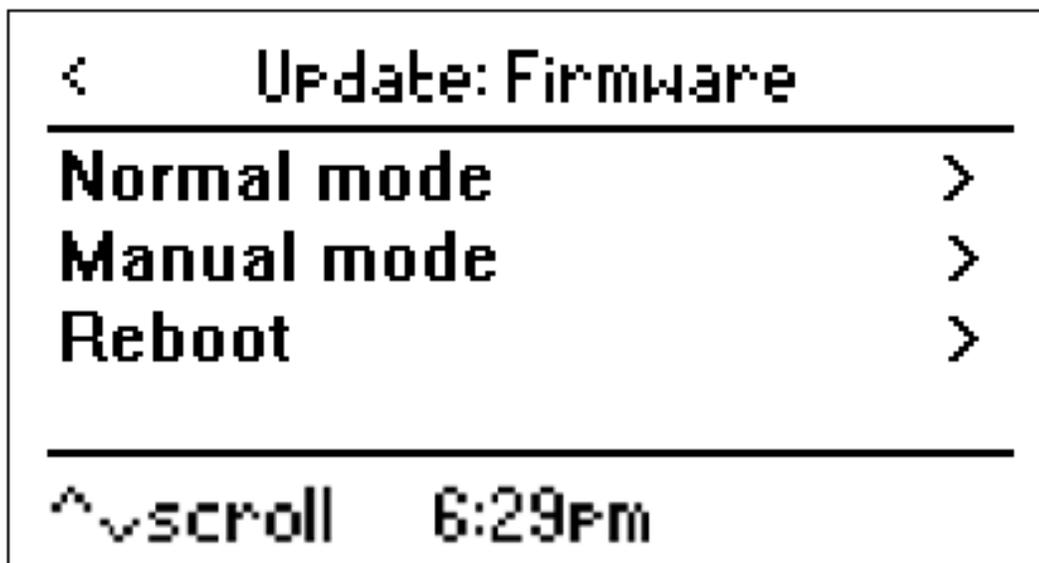


Figure 9 Bootloader main menu

8. Scroll down and select "Normal mode" if you want to let the bootloader determine which modules can be updated (see Figure 10) or

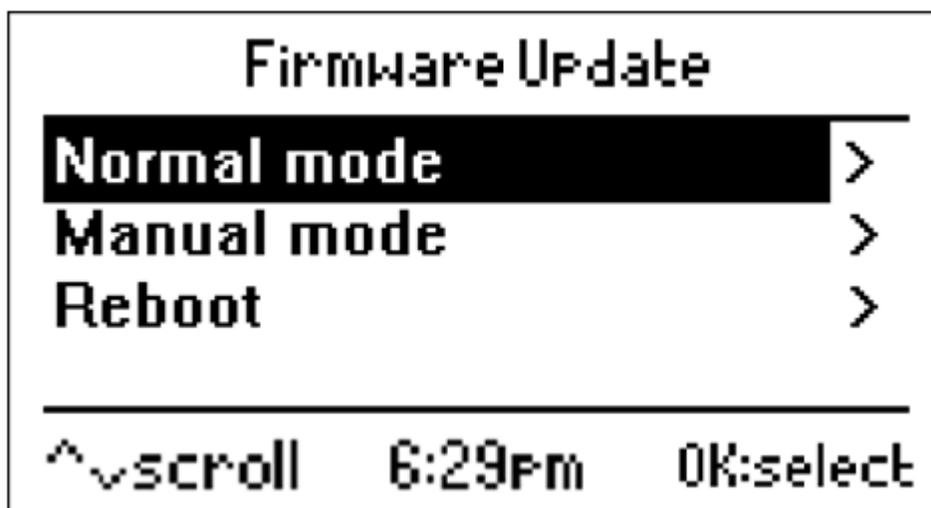


Figure 10 Select "Normal mode"

select "Manual mode" if you want to individually pick which target modules to update (see Figure 11).

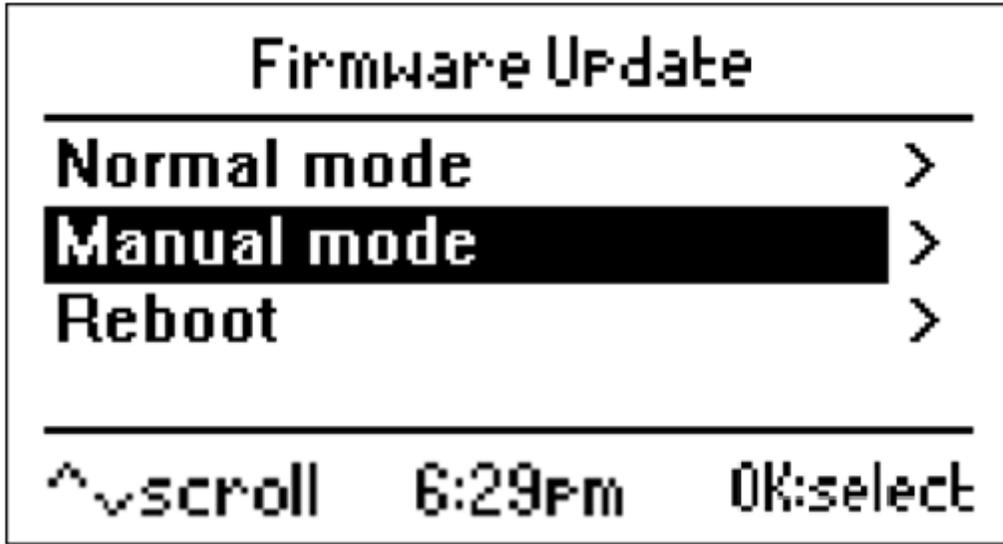


Figure 11 Select "Manual mode"

If you decide that you don't want to do any software bootloading at this point, scroll down to the "Reboot" line (see Figure 12).

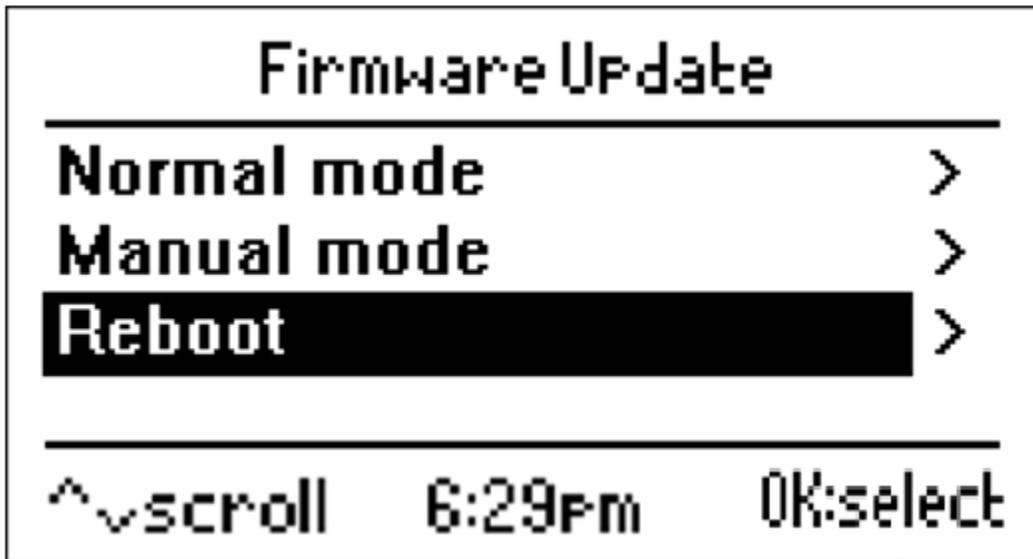


Figure 12 Select "Reboot" to end software bootload

Go to Normal Bootload section of this document if you selected "Normal mode", go to Manual Bootload section of this document if you selected "Manual mode", or go to the Reboot section of this document if you selected "Reboot".

## Normal Bootload

In "Normal mode" all the modules that can be updated are listed. (see Figure 13). If software bootload files for modules on the DIN rail don't exist in the USB stick (in "updates"), those modules will not be displayed in the list.

```
Modules found:
-----
FBE SW: 0.0, HW: 0, S/N:      >
Burner SW: 102.1, HW: 65, S/N>
Annun SW: 102.1, HW: 65, S/N>
Burner SW: 102.1, HW: 65, S/N>
-----
^vscroll  7:37pm
```

Figure 13 "Normal mode" Module list

1. Scroll down using the arrow buttons and select the module that you want to update.

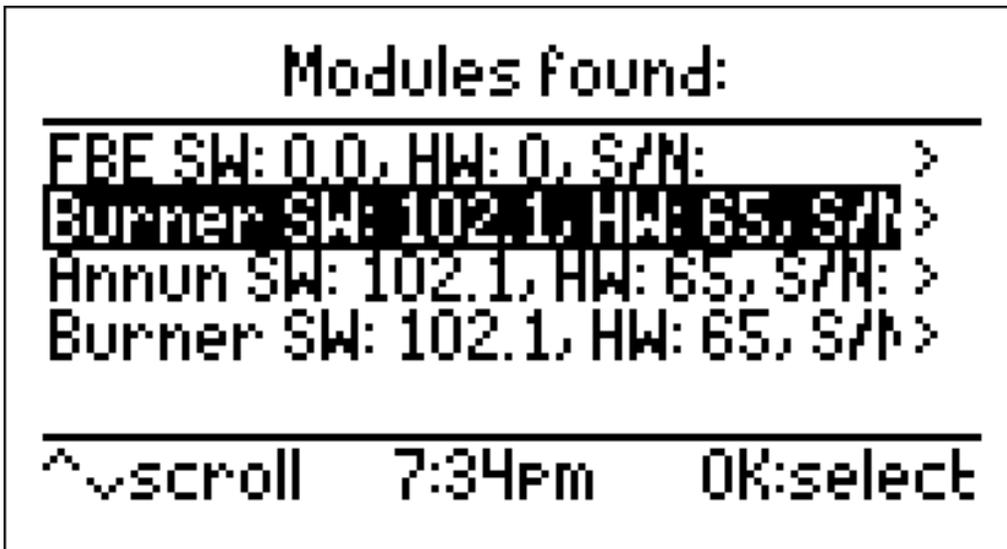


Figure 14 Select module for update

Click the “OK” button to choose your module. Before programming starts you will be asked to confirm your selection.

2. Confirm the software update when the following page is displayed by clicking the “OK” button.

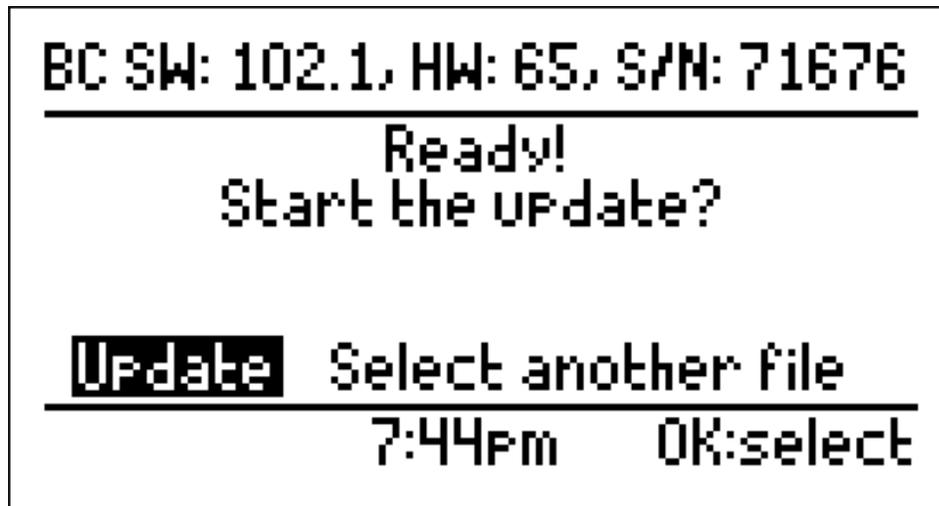


Figure 15 Confirm software update

If you change your mind and don't want to update this module at this point, select the left arrow, ◀, instead to return to a previous page (go to step 1).

3. Wait for the software to be updated into the module. Progress of the update is shown (see Figure 16) on the Base module display.

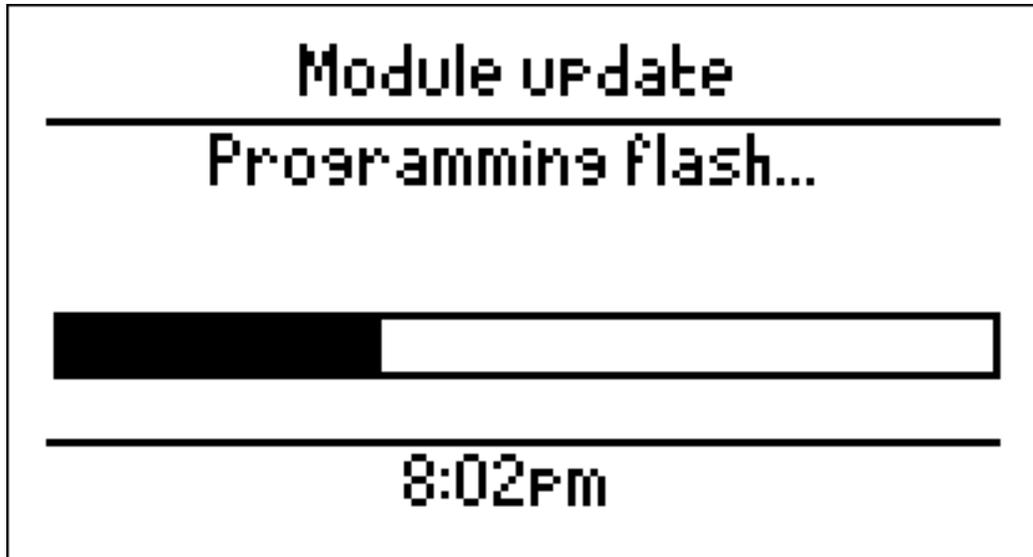


Figure 16 Programming module

4. When the update is finished, the module (unless the module updated is the FBE) displays a completed state on it's LCD display ( see Figure 17).



Figure 17 Bootload completed at module (LCD display)

A module update report is displayed on the Base module indicating that update is complete and another module can be selected to update (see Figure 18). Click the "OK" button to continue updating another module (go to step 1), or if no more modules need updating, select the "Reboot" option to end the bootloader procedure. Proceed to the Reboot section of this document.

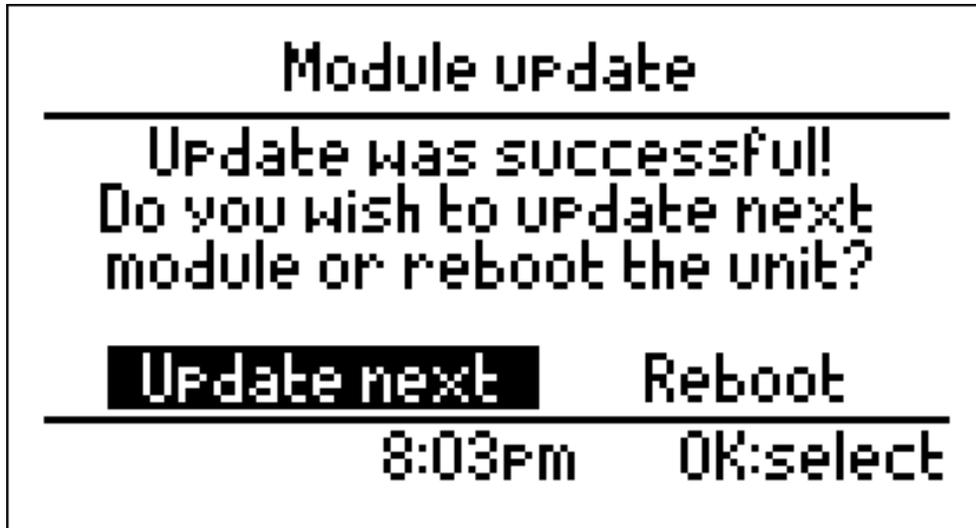


Figure 18 Software update has finished

If any errors occur during loading (for example, a timeout or failure to invalidate EEPROM), you may be asked to cycle power and try again. It is recommended to re-try without cycling power, but if the problem persists cycle power and try again.

## Manual Bootload

In "Manual mode" the modules are selected by individually picking the module on the DIN rail, one at a time, by pressing the "Reset" button on the module to be updated. The following page is displayed when "Manual mode" is selected (see Figure 19).

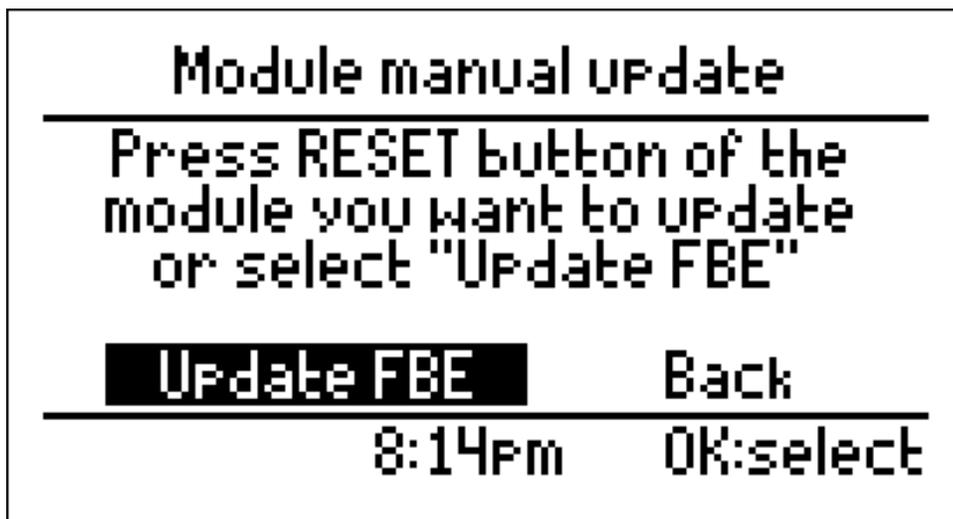


Figure 19 "Manual mode" update

1. Press the "Reset" button of the target module that needs software update or if the Base module FBE is to be updated select "Update FBE" and click the "OK" button on the Base module.

If the Base module FBE is selected, the following page is displayed on the Base module.

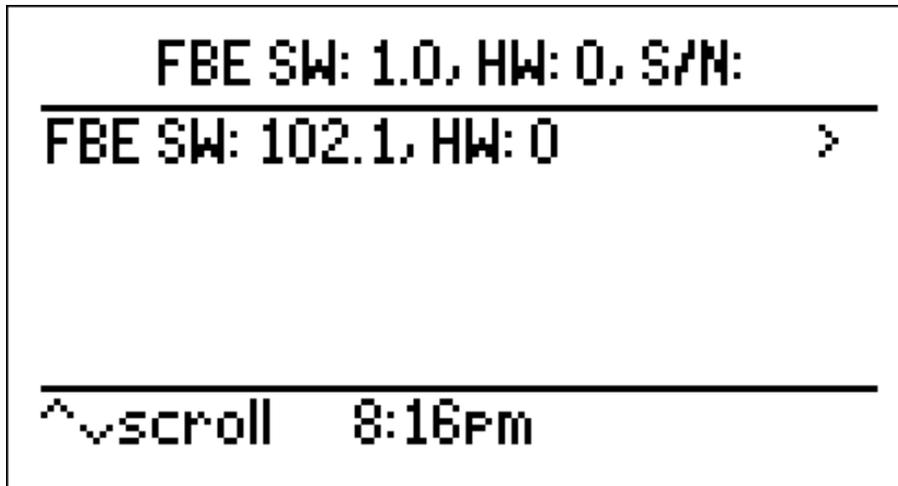


Figure 20 FBE selected in "Manual mode"

If the target module is not the Base FBE, the LCD display on the module changes to read "BL.A" when it is selected for updating (see Figure 21) and



Figure 21 Module displays "BL.A" when selected for bootloader

the Base module displays the following page identifying your selection (see Figure 22).

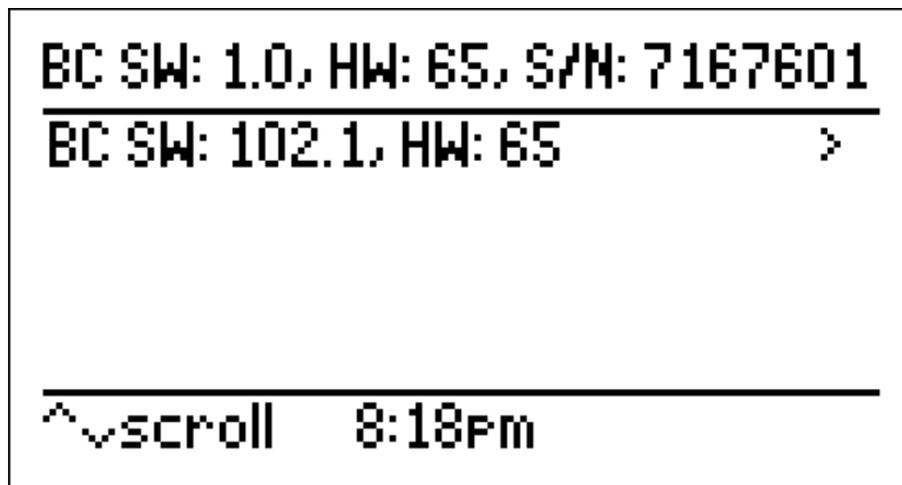


Figure 22 Module selected in "Manual mode"

2. Scroll down to the module line (see Figure 23) and click the “OK” button to confirm the module selected.

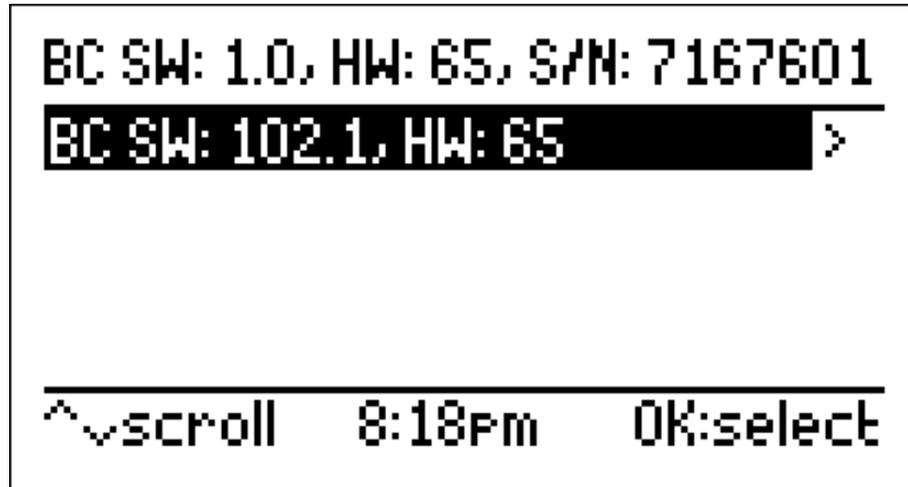


Figure 23 Confirm module selected

If the module selected is not the one desired, click the left arrow instead to go to the previous page and select a different module (go to step 1).

3. Confirm the software update when the following page is displayed by selecting the “OK” button.

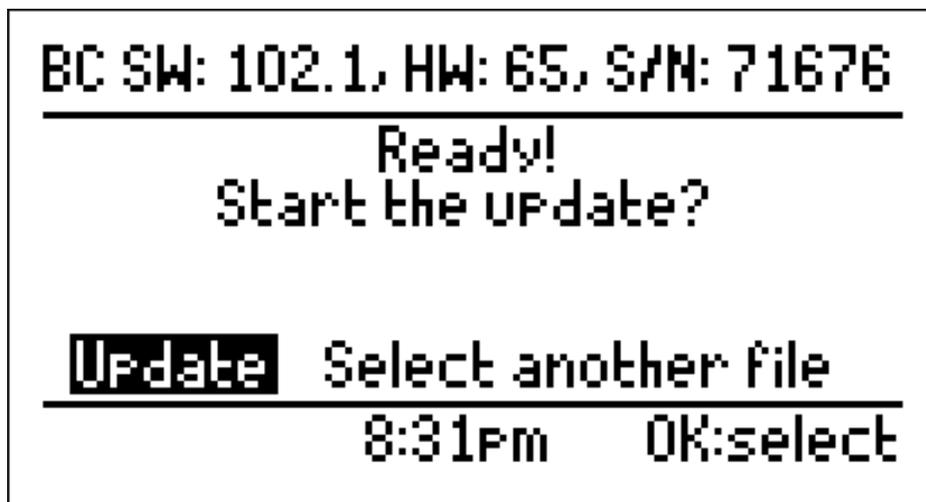


Figure 24 Confirm software update

If you change your mind and don't want to update this module, select the left arrow instead to return to a previous page (go to step 1).

4. Wait for the software to be updated into the module. The progress of the update is displayed (see Figure 25).

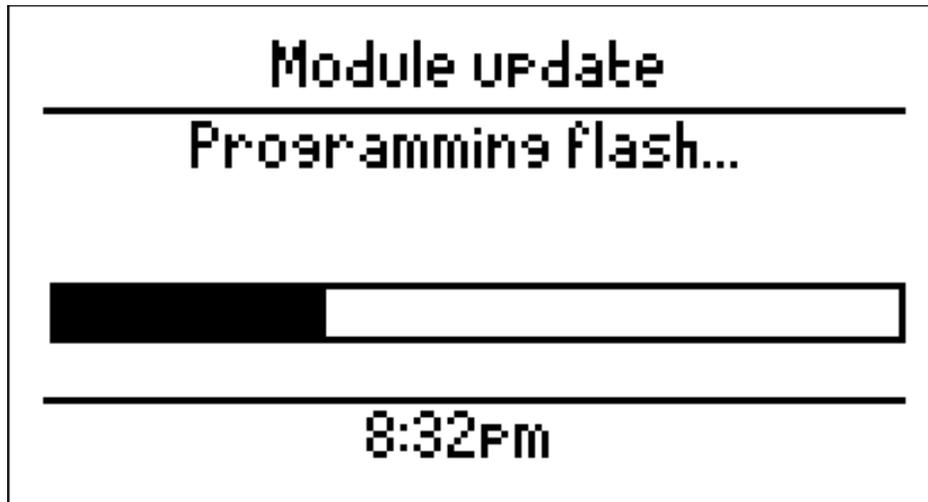


Figure 25 Programming module

5. When the update is finished, the module (unless the module updated is the FBE) displays a completed state on it's LCD display (see Figure 26) and



Figure 26 Bootload completed at module (LCD display)

a module update report is displayed on the Base module indicating that update is complete and another module can be selected to update (see Figure 27). Click the "OK" button to continue updating another module (go to step 1), or if no more modules need updating, select the "Reboot" option to end the bootloader procedure. Proceed to the Reboot section of this document.

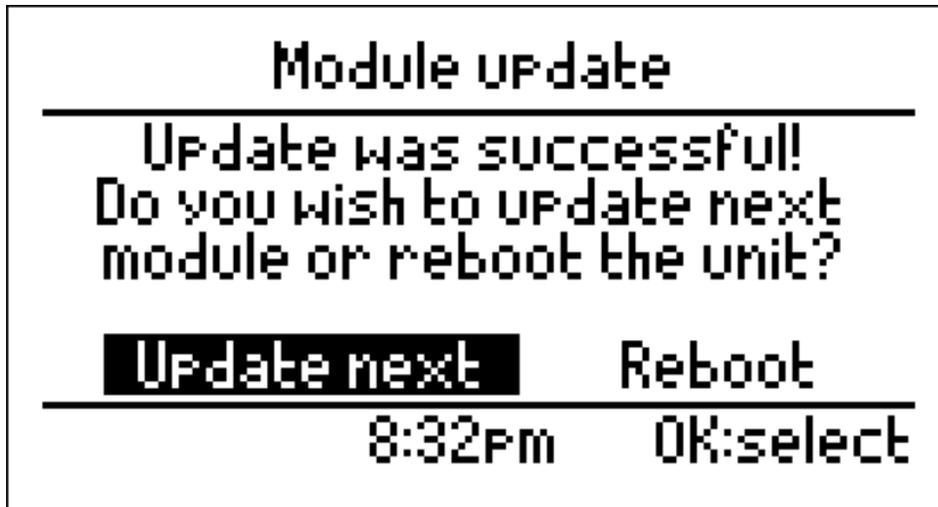


Figure 27 Software update has finished

## Reboot

The following screen is displayed when the "Reboot" option is selected to end the bootloader procedure. You can continue with the reboot by selecting "Reboot" and pressing the "OK" button or return to bootloading by staying on the "No" option and pressing the "OK" button (see Figure 28).

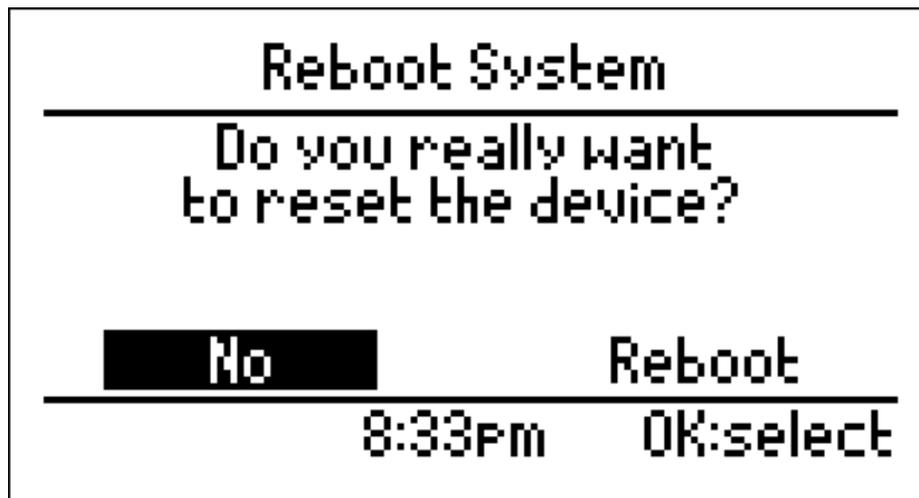


Figure 28 End software bootloader

Ending the software bootloading causes the primary applications in the Base module to be restarted. This reboot can take a few minutes to complete. The Restarting page is displayed while the reboot occurs (see Figure 29). The status page is displayed once more on the Base module when the reboot is finished.

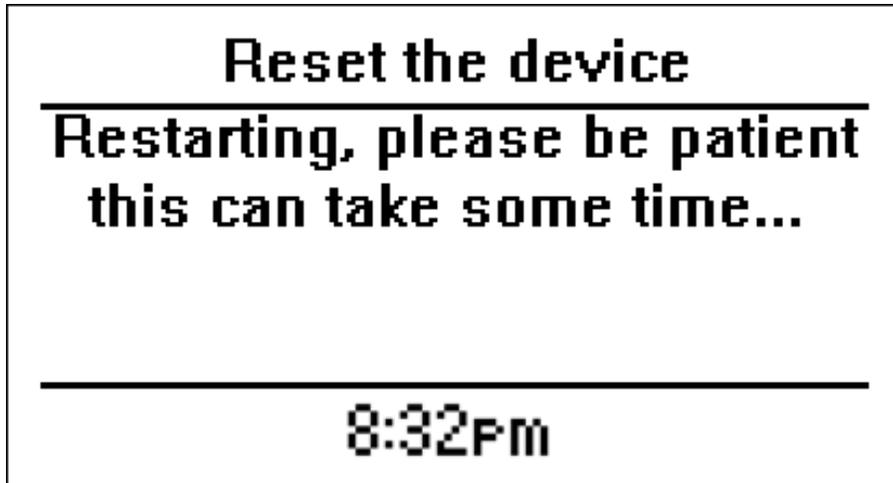


Figure 29 Resetting Base module after bootloads are complete

Bootloading software into modules causes them to lose their configurations since their flash is reinitialized. The module displays "m--" on its LCD display to indicate that the module is not configured (see Figure 30). The designer kit must be reloaded to reconfigure the modules.



Figure 30 Unconfigured module (LCD display)

## Bootload Confirmation

The software loaded into the modules can be confirmed by viewing the "Description" information for each module on the Device Information page in the Base module (see Figure 31).

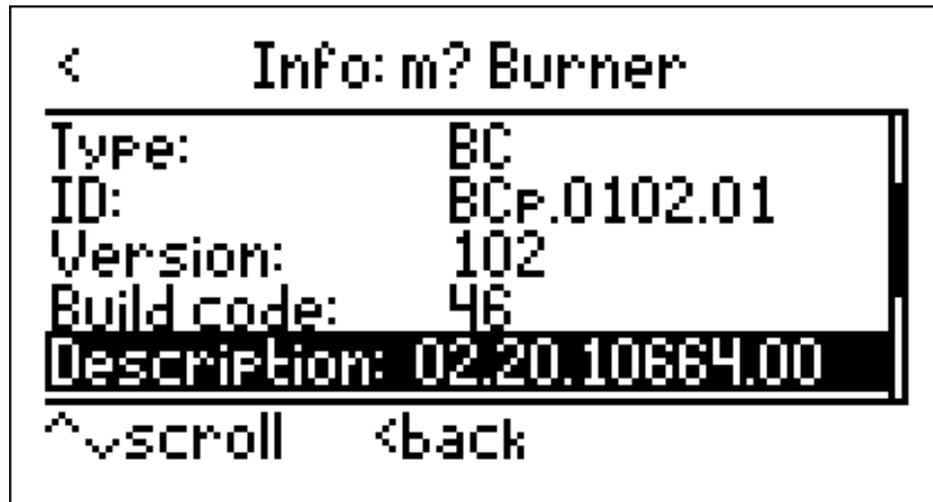


Figure 31 Module software build

The "Description" information identifies the software release running in the module. It should match the version of the software bootload file contained on the USB stick or the Service Packs. To get the SLATE system back up and running after an update, reload the module configurations or kit. Each module's configuration and the active kit should have been saved before running the bootload process. Reload the saved curves when updating modules with software revision 2.20 or newer or re-enter the curves point by point on modules with software revision 2.08 or older.

If the Base module FBE was updated, the kit must be reloaded. This can be done either from the Base module (Menu/Installation/Load original kit) or via the SLATE default pages accessible through the Chrome browser.

If only the following: Analog I/O, Burner, Digital I/O, Annunciator, Limit, and/or Fuel Air Ratio Modules were updated (excluding the Base module), then either reload the entire kit or configuration set. Either option will update the modules and get the SLATE system operational.