Tech Tip 19: Firmware Loading Tool Best Practices and Troubleshooting

Product Class: Firmware Loading Tool

Creation Date: 6/3/2015 2:28:39 PM
Last Modified Date: 7/16/2015 2:39:24 PM

R E F E R E N C E

Firmware Loading Tool - Best Practices

by Seth Swaney and Brian Cruz, Technical Support

The purpose of this article will be to go over the best practices for using and upgrading a field panels firmware. All information in this article is based off of using FLT version 3.13 with patch 3 or later installed. It will also cover information in case a firmware flash fails to load as well as known causes for the failed firmware flash.

This article will consist of the following topics:

- Prerequisite information needed to perform a Firmware Flash
- Procedure for Flashing a Field Panel with New Firmware
- How to recover a failed firmware flash
- Common Errors and Issues when using FLT

Prerequisites

The first item needed prior to flashing as field panel with new firmware is a PC loaded with the latest version of FLT. FLT is included with Commissioning Tool however can also be installed as a standalone tool. This software can be acquired on the Std Apps drive.
Once you have FLT loaded you must also have a communication cable part number 540-143. For PC's that do not have a COM port installed you must also use a USB to Serial converter. While 3rd party USB to Serial converters has been known to work with FLT the only one recommended and supported by Technical Support is PXA-USBADAPTER.

Next you will have to determine whether or not you will need firmware credits to flash the panel with the new firmware. As a rule of thumb if upgrading a 2.x or 3.x panel to a different revision if the number after the 1st dot changes then it will require a firmware credits (ex 2.7 up to 2.8 will require FW credits). See table below for examples of when a FW credit is required:

From Firmware Revision:	To Firmware Revision	Method of Flash Supported	Firmware Credits Needed:	Firmware Upgrade P/N if Applicable
Pre-2.8	2.8	Serial	Yes	545-486
2.8	Up to 2.8.10	Serial / Ethernet	No	N/A
Any Apogee Firmware	Any Bacnet Firmware	Serial	Yes	545-486
Pre-3.2	3.2	Serial	Yes	545-486
3.2	3.3.	Serial	Yes	545-486
3.3	3.3.X	Serial / Ethernet	No	N/A

If Firmware credits are needed to perform the upgrade you will need to order and retrieve firmware flashes from sitekeys. To order a firmware upgrade you must purchase through customer service part number 545-486. To receive firmware flashes from the Sitekey group, you must provide a site code which consists of 18 alphanumeric characters. The site code can be obtained either through stand-alone FLT by clicking on Start, Programs, and FLT or through Commissioning Tool (CT) by clicking the FLT icon from the Main Menu.

Keep in mind that these two site codes are different. When flashing field panels, you must make sure you start FLT from the same location from where you registered the firmware flashes.

Example
If you provided/registered the site code from stand-alone FLT, you must ensure the firmware is flashed from stand-alone FLT. If you start FLT from CT, the flashes that were previously obtained are not available.

It is recommended to have only one copy of FLT installed. For more information, see the June 2007 Field Support News article below titled FLT Has Two Installation Options that Contain Separate Flash Credits.

FLT Has Two Installation Options that Contain Separate Flash Credits
by Bryan Spegel, Field Support

With all revisions of the Firmware Loading Tool (FLT), the tools installation has offered two installation options:

Install FLT as part of Commissioning Tool (CT)

Install FLT as a stand-alone program

This is important to note since both versions can be installed, and at a later date, you may mistakenly think credits for flashes are missing. This may occur since credits are only applied to the specific FLT that is run when a site key is applied. Also, users run into problems with older versions of FLT on their system that were not updated, which may not allow certain flashes to be performed.

The following are facts and guidelines for keeping these two installations straight:

Both the CT and stand-alone versions of FLT are the same exact program.

If the CT version of FLT is installed, the stand-alone version of FLT in the C:\FLT folder is not updated unless that option is specifically selected when installing a new version of tools.

The stand-alone version of FLT is installed to the C\FLT folder. The CT version of FLT is placed in the C:\COMMTOOL folder with CT.

When installing CT, do not select the stand-alone version of FLT. This is not necessary and only causes confusion.

If CT is installed, there is no reason to install the stand-alone version of FLT. If the stand-alone version of FLT is already installed, it should be uninstalled. However, open the stand-alone version of FLT first to verify if it has any credits remaining. If so, use those credits before uninstalling. Credits cannot be transferred from one FLT program to another.

The FLT that comes with CT can be run outside of a job. This means that FLT does not have to be accessed from the toolbar of a job. To do this, create a shortcut on the desktop to C:\COMMTOOL\FLT.EXE.

If CT is not installed, use the stand-alone version.

The FLT shortcut under Start and Programs is pointing to the stand-alone version located in the C:\FLT folder.

Procedure for Flashing a Field Panel With New Fimware

Starting with Commissioning Tool Revision 3.13 there are two ways a field panel can be flashed:

1. Using a Serial Connection
2. Using an Ethernet Connection

The information listed below will cover how to flash a panel with new firmware using both ways. Keep in mind prior to flashing a panel with any new firmware it is strongly recommended to backup the panel 1st.

Procedure for Flashing a Panel with New Firmware using Serial Connection

1. Backup the field panel database
2. Disconnect the panel from the ALN or FLN (if upgrading BACnet UEC panels)
3. Verify that you are connected to the correct port of the field panel being flashed and that the port speed is correct. The following table lists the ports and speeds that must be set:

Field Panel Hardware Type	MMI/Modem Port	MMI Port	HMI Port	Maximum Download Rate
Power Open Processor (RS-485 or Ethernet) and All MEC's		X		115200
Controller Module, Open Processor, SCU V5, and FLNC	X			38400
PXC Modular*			X	115200
PXC Compact*			X	115200

NOTE: For the PXC Modular and Compact field panels, the HMI port and Download baud rates in FLT must be set to the same speed or the flash will fail. It is recommended to flash at 115200.

4. Open FLT either thru Commissioning Tool or using Stand Alone FLT.
5. Click on the **Settings** tab, set the correct Port and set the Communication and Download Baud Rate to the same speed. If the Communication and Download Baud Rates are not the same speed for the PXC Modular and Compact field panels, the firmware flash will fail.
6. Once the speeds and ports have been configured, click the Firmware tab and select Identify.
7. After successfully identifying the Field Panel, click the **Browse** button and navigate to the path where the files that you will be using to flash the panel. When browsing, you will be searching for an appropriate EBN file.
8. Once you have successfully selected the correct .EBN file, click the upper **Load** button within the Firmware section.

CAUTION: Do not select the lower Load button within the Language section. Selecting this button may erase the firmware in the field panel and may not be recoverable.

9. After pressing the Load button, the loading process begins a five-step process:
a.Verifying the Controller
b.Erasing Flash

c.Loading Firmware
d.Starting the Firmware
e.Operation Complete (press OK)

10. After the panel has been successfully flashed, click Identify and make sure it reflects the new firmware revision.
11. Plug the panel back into the ALN and let the Insight workstation download the database.

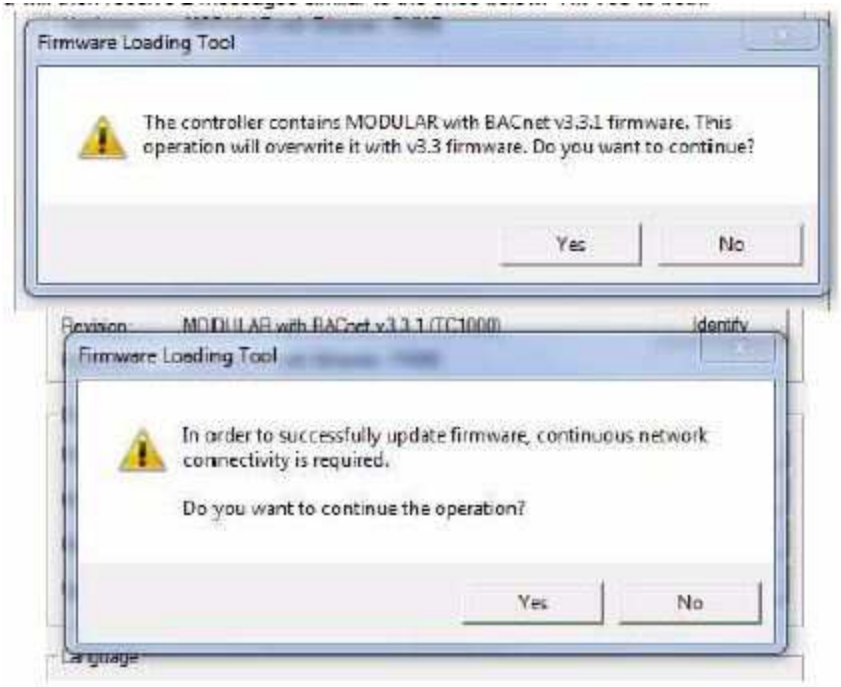
Procedure for Flashing a Panel with New Firmware using Ethernet Connection
This option can be done both on BACnet and Ethernet panels. In order to flash a panel over an Ethernet connection Telnet must be enabled on the field panel.

NOTE: Flashing an ISB file Ethernet is not supported.

1. Make sure you have a current backup of the database. If not backup the database 1st.
2. Open FLT and select the **Settings** tab.
3. Under Connection Type select **IP Address**. Enter the IP address and field device password (for the HIGH user account) in the controller settings.
4. Click the **Identify** button.

NOTE: If the wrong IP address or field device password was used to identify the field panel, then <unknown> displays and an error message displays. Correct the IP address or field device password on the Settings tab, and click Identify again.

5. Once the Panel has been successfully identified select the **Firmware** tab.
6. The panel should still be identified however if not then Identify the panel and then click the **Browse** button and navigate to the path where the files that you will be using to flash the panel. When browsing, you will be searching for an appropriate EBN file.
7. Once you have successfully selected the correct .EBN file, click the upper **Load** button within the Firmware section.
8. You will then receive 2 messages similar to the ones below. Hit **Yes** to both.



9. After pressing the Load button, the loading process begins a five-step process:

a. Verifying the Controller
b. Erasing Flash
c. Loading Firmware
d. Starting the Firmware
e. Operation Complete (press OK)

10. After the panel has been successfully flashed, click Identify and make sure it reflects the new firmware revision.

NOTE: Firmware downgrades to revisions earlier than 2.5.3 are not supported using IP Address connection type. For these downgrades, you can use the COM Port Connection Type.
NOTE: When you upgrade to revision 3.3 firmware or higher, you may be prompted to update the password. If the HIGH user account password was never changed, then the new firmware will prompt for a new password when FLT tries to log on to identify the new revision string.

How to recover a failed firmware flash

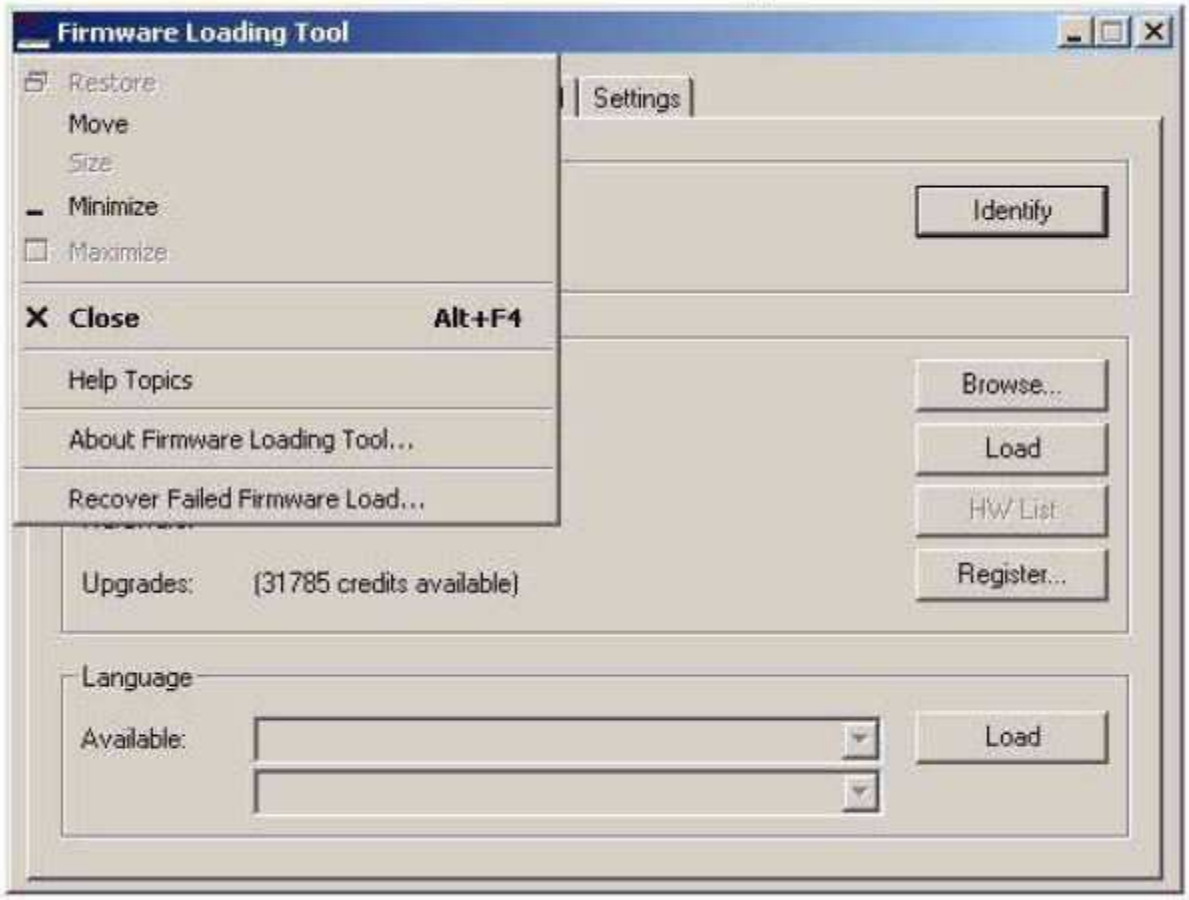
Recovering a Panel Using the Recovery Wizard

The Recovery Wizard allows you to recover from a failed firmware or language load. The windows that display will vary, depending on the load that failed. For example, the Select the Language window will only display if you are recovering a failed language load for APOGEE firmware that contains a language file.

The **Recovery Wizard** is available only for the **COM Port** connection type.

1. Place panel in boot monitor by:
- Close FLT.
- Connect to the HMI of field panel with hyperterminal or some other terminal emulation program (Note: the panel will not respond to any requests to it at this point)
- Warm start the field panel (cycle power) while still connected to it
- Hit enter rapidly until you see the prompt: >>>
- You are now in boot monitor. Close the terminal program and open FLT

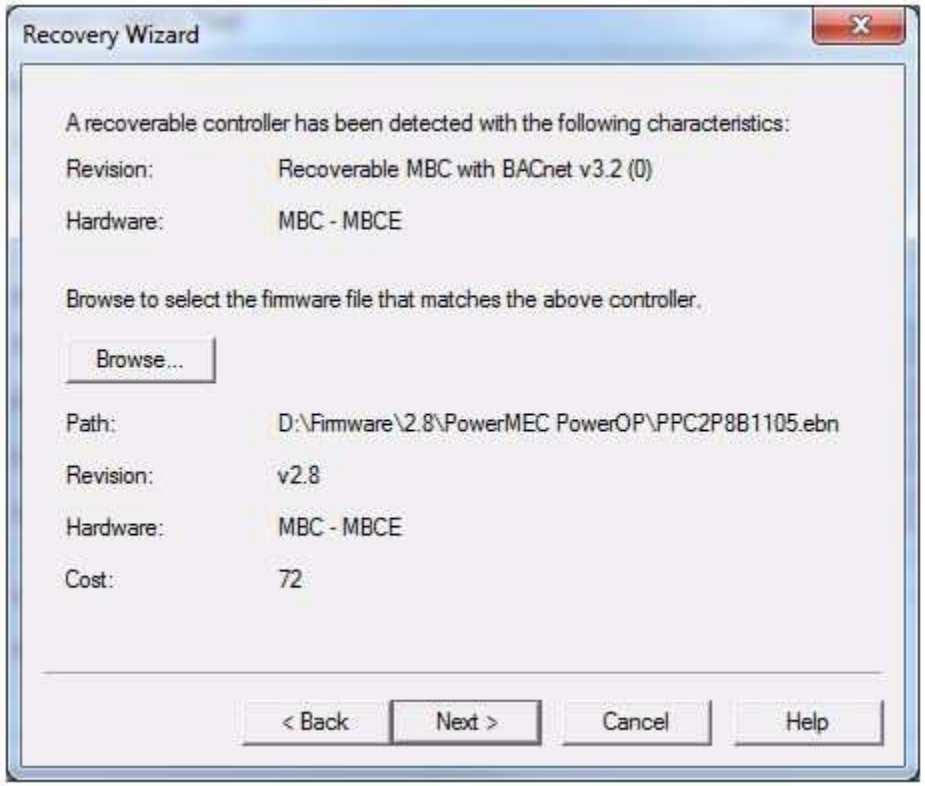
2. In FLT Access the Recover Failed Firmware Load from the upper left box of FLT.



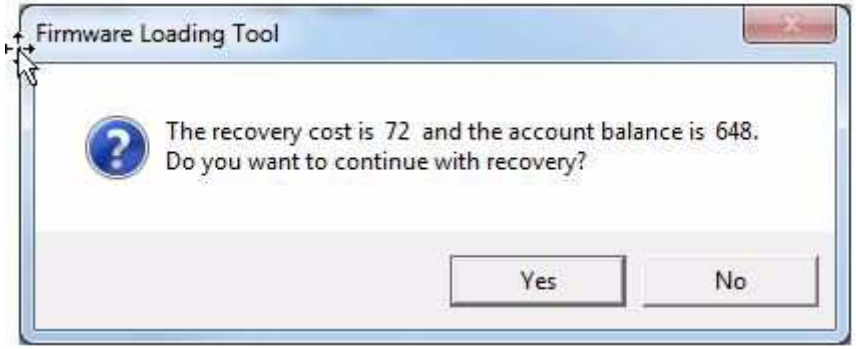
3. From the System menu, click Recover Failed Firmware Load. The Recovery Wizard displays.

4. Click **Next**. The current COM port and existing download baud rate display in the **COM Port** and **Baud Rate** fields, respectively. Change these fields as necessary

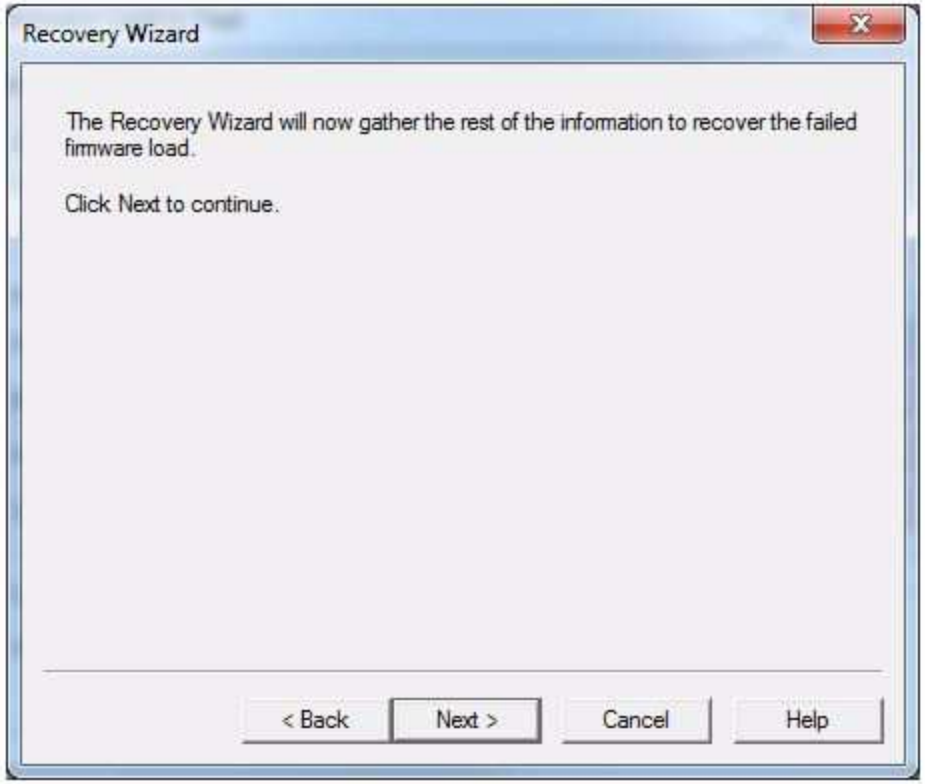
5. Click **Next.** If you are recovering firmware for an APOGEE controller, then the firmware revision and hardware type display. They will not display for a pre-APOGEE controller.
6. Click **Browse** to locate the firmware displayed in Recovery Wizard (for an APOGEE controller), or to locate the firmware that you were trying to load(for a pre-APOGEE controller). This is a required step.



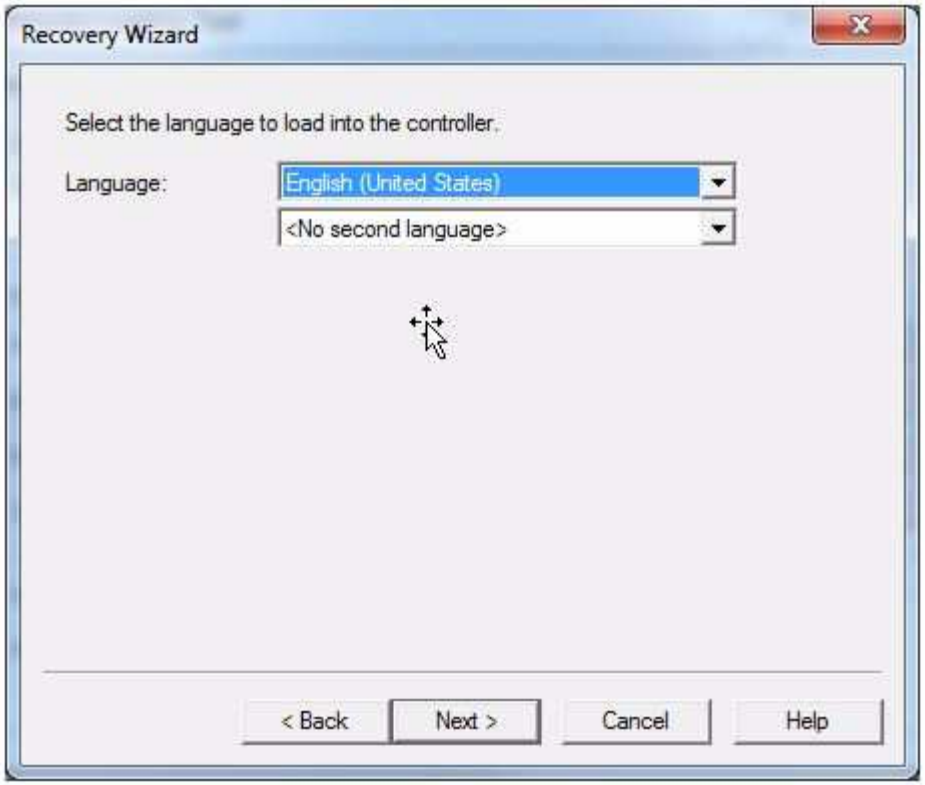
7. Click **Next.** If the FW revision you select is different then the current recoverable version loaded it will require FW credit and you will receive the following message:



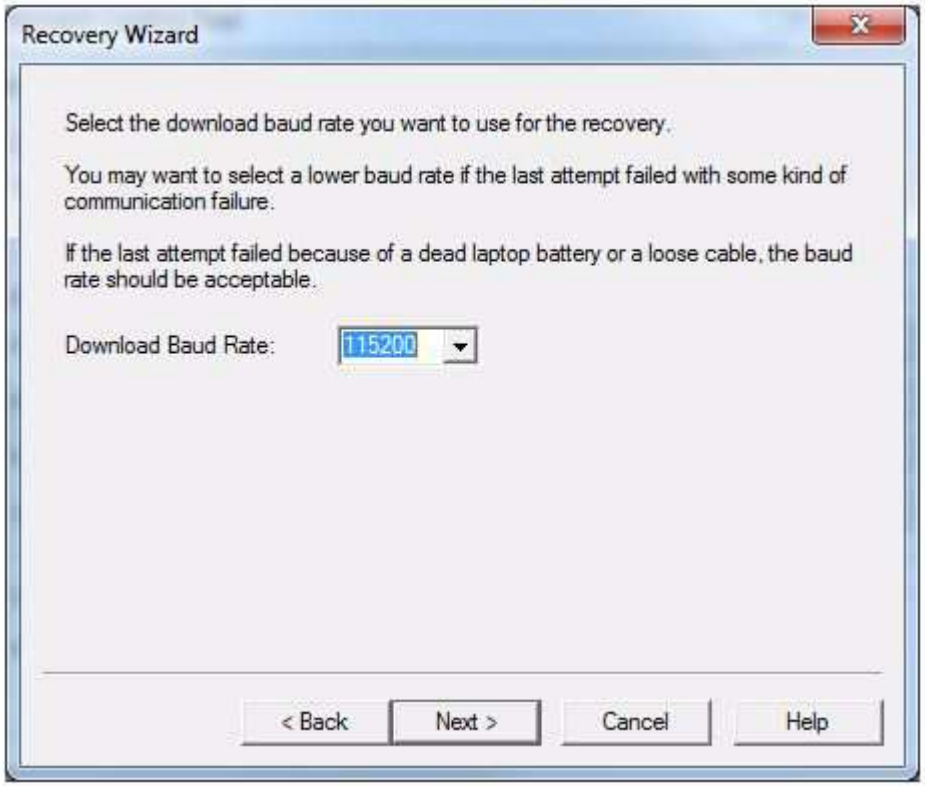
8. The Recovery Wizard now displays a message indicating that it is recovering a failed firmware or language load.



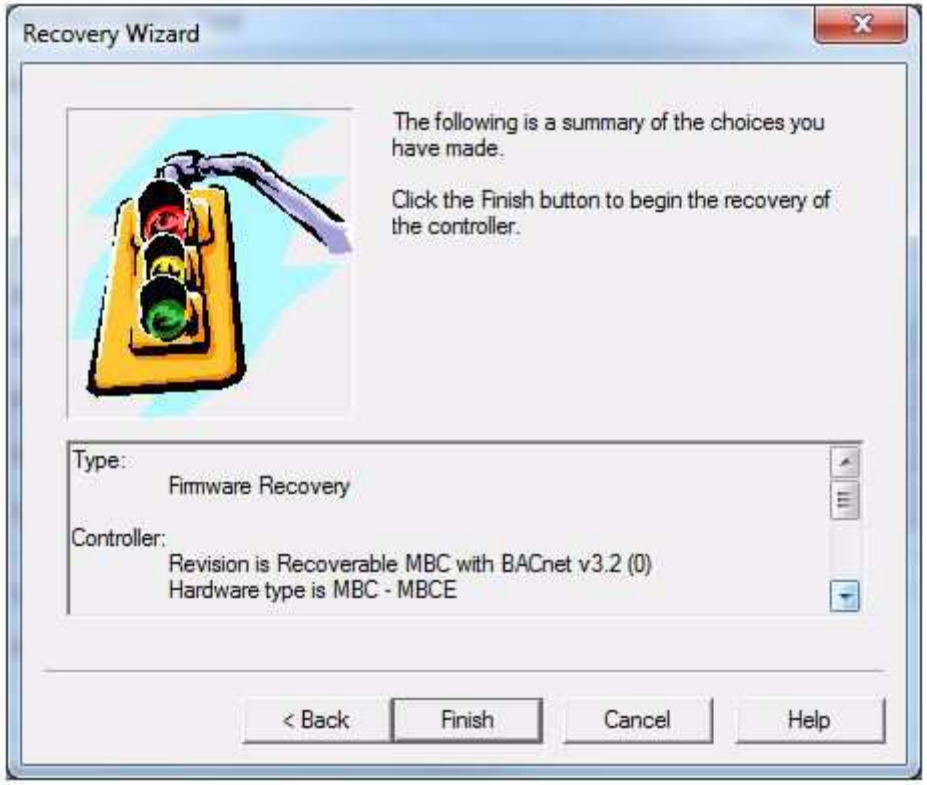
9. Click **Next**. The Recovery Wizard may display a window that allows you to select the language. This window displays only for APOGEE firmware that contains a language file. Click **Next** to continue



10. If the load failure was due to an incorrect baud rate or a power interruption, you can enter the correct baud rate at this time. Select the download baud rate and click **Next**.



11. Verify that the information displayed in the summary is correct, and click Finish. The Recovery Wizard loads the language or firmware that initially failed.



Common Errors and Issues when using FLT

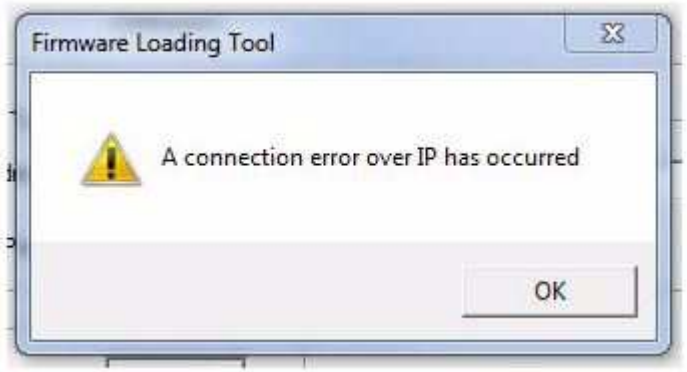
Load Button Does not Light when Trying to Flash Firmware

Reasons for the load light not be on or FLT load button does not activate :
1. With Apogee and BACnet FW the language file must reside in the same directory as the .EBN file
2. If you have selected an inappropriate FW file that does not match or compatible with the selected controller
3. HMI Cable is not connected to appropriate port on panel.

NOTE: This only applies to SCU, FLNC, MEC, and MBC panels

A Connection Error over IP has Occurred May Display when Identifying A Panel

When attempting to identify a panel after configuring the IP setting the following error may occur:



This error will occur if one of the two scenarios is true
1. Telnet is not enabled on the panel
2. Telnet is being blocked on the customer network

Access Violation Error when Launching FLT

When launching any version of FLT, you may get the error: Access Violation Program Terminated. This may occur on newer laptops that do not have a serial port. When FLT attempts to connect to and authenticate a serial port, and there is no serial port to authenticate with, the error displays.

As a workaround, connect and install a Serial Port to USB Adapter to your laptop before launching FLT.

Unable to enter the monitor. Verify you are connected to the correct MMI port.

Typically this error will occur because of one of the following two reasons:
1. Communication and Download baud rates do not match in the Settings tab of FLT
2. For older panels such as SCU, FLNC, MEC, or MBC's the HMI cable is plugged into the incorrect MMI / MMI Modem port. See TSN Procedure for Flashing a Field Panel With New Fimware

Once corrected the field panel must be warm started to clear this condition. Then proceed on with flashing the controller.

The Error The File's Revision Does Not Match the Controller's Revision Displays When Loading ISB File - Update 1
by Mazhar H. Paliwala, Field Support, Updated by Mazhar H. Paliwala, Technical Support

When using the Firmware Loading Tool to load an ISB file into an Integration Driver, the revstring of the ISB must match the revstring of the driver. Otherwise, the FLT does not allow the ISB to be loaded.

There are three common reasons this happens:

- The Integration Firmware has not been flashed into the PXC-M or PXC36.
- The ALN type is not correct.
- The driver type does not match. For example, you attempt to load a Modbus ISB file into a BACnet MS/TP Driver.

Incorrect ALN Type

Power Open Processor and PXC type Integration Drivers are available in the following two ALN protocols:

- P2 protocol on RS-485 or Ethernet ALN. These drivers have a revstring in the format of XXP (for Power Open Processors) and XXC (for PXC type panels). For example, a Johnson N2 Master Driver on P2 protocol has a revstring of J2P or J2C.
- BACnet/IP protocol. These drivers have a revstring in the format of XXB (for Power Open Processors) and XXD (for PXC type panels). For example, a Johnson N2 driver on BACnet/IP protocol has a revstring of J2B or J2D.

Incorrect ISB for Driver Type

When creating a new ISB file in the Application Builder tool, for certain drivers like Modbus, you have the option of selecting BACnet PPC, BACnet PXC-M, PPC or PXC-M (see Figure 1). If the driver for which the ISB file is being created is a Power Processor on a P2 protocol ALN, then select the PPC option from the list. If it is on a BACnet/IP protocol ALN, then select the BACnet PPC option.

Example:

An ISB file must be created for a Modbus Driver on PXC-M.

- If the driver is on a P2 protocol ALN, select Modbus for PXC-M from the Select Driver list.
- If the driver is on a BACnet/IP protocol ALN, select Modbus for BACnet PXC-M from the Select Driver list.

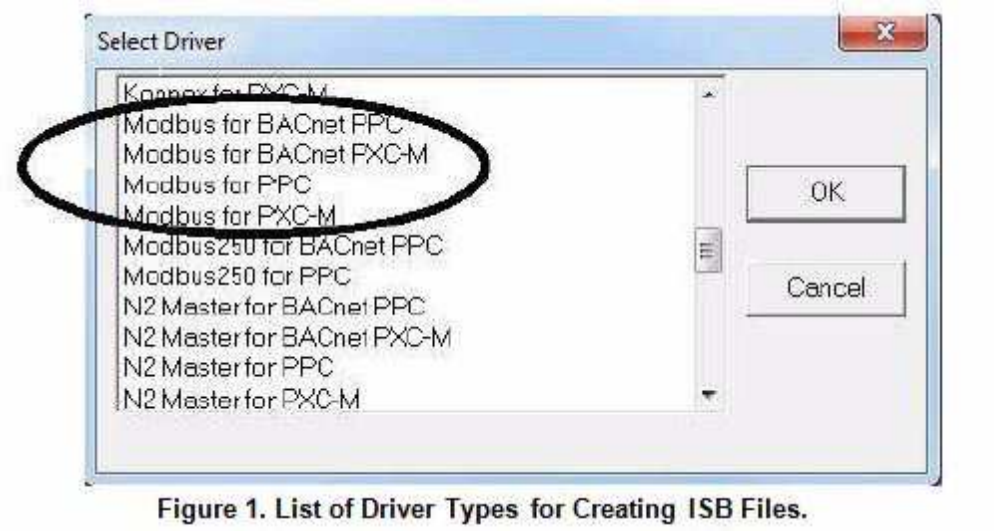


Figure 1. List of Driver Types for Creating ISB Files.

The revstring of the ISB file displays on the status bar on the top of the window in the Application Builder tool. If you attempt to flash an XXP or XXC ISB file to an XXB or XXD Revision Driver, or vice-versa, the following message displays:

```
The integrated system loading cannot be performed because the following condition(s) exist: The file's revision does not match the controller's revision.
```

Therefore, make sure that an ISB file with a matching revstring is flashed into the driver.

If you have any specific questions regarding this subject, please call Technical Support.

Author: swaneys
Document ID: ST1-01J-PJQJ