

1696955

EMCenter Firmware Update Manual



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Revision Record

MANUAL, EMCenter_Firmware_Update | Part # 1696955, Rev. T

| Revision | Description | Date |
|----------|---|--------------|
| A | Initial Release. | DEC 6, 2018 |
| B | Updated software link and added appendix of current firmware versions. | SEP 4, 2019 |
| C | Updated software link and current version appendix. | MAR 6, 2020 |
| D | Update for EMSense 10. | APR 15, 2020 |
| E | Update for EMGen. | JUL 15, 2020 |
| F | Update for EMSense 10 and EMGen. | MAY 10, 2021 |
| G | Update for EMGen. | JUN 10, 2021 |
| H | Update for EMSense. | AUG 16, 2021 |
| J | Update for EMSense 10. | SEP 15, 2021 |
| K | Update for EMControl and EMSense. | NOV 12, 2021 |
| L | Update for EMSense 10 and EMSwitch. | MAY 19, 2022 |
| M | Add EMSense 40, Update for EMSense 10. New ARM System Gold update 4.1.6 (X86 deprecated). | JAN 18, 2023 |
| N | Move all X86 instructions into the end section appendix. New Incremental needed for Gold 4.1.6 update. | MAR 23, 2023 |

| | | |
|---|--|--------------|
| O | Fixed link for 4.1.6 Gold update download. New EMCenter System updates, Gold 4.3.2 and INC 4.3.4. | DEC 5, 2023 |
| P | Update for EMGen and EMPower. | JUL 15, 2024 |
| R | Update for EMSense10/40 plug-in card and probes. | AUG 15, 2024 |
| S | Update for EMControl and EMSense. | SEP 10, 2024 |
| T | Update for EMCenter System with INC 4.4.4. | SEP 30, 2024 |



NOTE: Indicates helpful information intended to provide tips and extended knowledge for better use of the product.



CAUTION: Denotes a risk. Failure to follow instructions could result in needing to start the procedure over from the beginning, or minor computer memory loss.



WARNING: Denotes a danger. Failure to follow instructions could result in SEVERE damage to the computer's memory or loss of files.

Table of Contents

| | |
|--|-----------|
| Copyright, Revision Record, and Symbols | 2 |
| Table of Contents..... | 4 |
| 1. Introduction | 6 |
| 1.1. Identify CPU Card | 6 |
| 1.1.1. Software identification..... | 6 |
| 1.1.2. Hardware identification | 7 |
| 1.2. Version Info Page..... | 8 |
| 1.3. Most Current Version Numbers List | 8 |
| 2. Incremental update process..... | 11 |
| 2.1. Create Latest Incremental USB | 11 |
| 2.1.1. Download Incremental Firmware | 11 |
| 2.1.2. Change the Extension | 11 |
| 2.1.3. Copy onto USB | 12 |
| 2.2. Install Latest Incremental Update..... | 12 |
| 3. Latest Gold v4.3.2 ARM update process | 17 |
| 3.1. Create Gold v4.3.2 Version USB | 17 |
| 3.1.1. Download the Firmware | 17 |
| 3.1.2. Change the Extension to 7-zip | 18 |
| 3.1.3. Download and Install 7-Zip File Manager | 18 |
| 3.1.4. Extract the image from 7z file | 19 |
| 3.1.5. Download and Install Win32 Disk Imager | 20 |
| 3.1.6. Burn onto the USB | 20 |
| 3.2. Install Gold v4.3.2 Version Update..... | 23 |
| 4. Gold v4.1.6 ARM update process | 28 |
| 4.1. Create Gold v4.1.6 USB..... | 28 |
| 4.1.1. Download the Firmware | 28 |
| 4.1.2. Change the Extension to 7-zip | 29 |
| 4.1.3. Download and Install 7-Zip File Manager | 29 |
| 4.1.4. Extract the image from 7z file | 30 |
| 4.1.5. Download and Install Win32 Disk Imager | 31 |
| 4.1.6. Burn onto the USB | 31 |
| 4.2. Install Gold v4.1.6 Update | 33 |
| 5. Restore Previous Version and Reset Config Settings | 40 |

| | | |
|-----------|---|-----------|
| 5.1. | Restore Card | 40 |
| 5.2. | Restore System | 40 |
| 5.3. | Reset Network Settings | 41 |
| 5.4. | Reset Touchscreen Calibration | 41 |
| 6. | *DEPRECATED* X86 Gold v3.3.X | 42 |
| 6.1. | *DEPRECATED* Create Gold v3.3.X USB | 43 |
| 6.1.1. | Download the Firmware | 43 |
| 6.1.2. | Change the Extension to 7-zip | 44 |
| 6.1.3. | Download and Install 7-Zip File Manager | 44 |
| 6.1.4. | Extract the image from 7z file | 45 |
| 6.1.5. | Download and Install Win32 Disk Imager | 46 |
| 6.1.6. | Burn onto the USB | 46 |
| 6.2. | *DEPRECATED* Install X86 Gold v3.3.X Update | 48 |
| 6.3. | *DEPRECATED* Create Incremental USB | 54 |
| 6.3.1. | Download Incremental Firmware | 54 |
| 6.3.2. | Change the Extension | 54 |
| 6.3.3. | Copy onto USB | 55 |
| 6.4. | *DEPRECATED* Install Incremental Update | 55 |
| 6.5. | *DEPRECATED* List of Version Numbers for X86 Final Update | 56 |

1. Introduction

The following EMCenter document describes how to create the latest various version update keys for ARM, how to use the key to update the firmware, and how to restore a previous version of firmware. Use the EMCenter info page to find the version numbers.

As of 2023, the X86 EMCenter processor has been deprecated and will no longer receive any firmware updates. Information of the old X86 update process has been moved to the end of the document as an appendix section ****DEPRECATED* X86 Gold v3.3.X***.



CAUTION: If you are unsure of any step, please ask for help before you begin by emailing software.support@ets-lindgren.com or Michael.Christopher@ets-lindgren.com.



NOTE: The **ARM** EMCenter firmware updates **MUST** be updated in the following order to get the latest version:

1. Gold v.3.3.3 ([Section 6.1](#))
2. Gold v.4.1.6 ([Section 4.1](#))
3. Gold 4.3.2 ([Section 3.1](#))
4. Latest incremental ([Section 2.1](#))
5. Compare info page to current versions list ([Section 1.3](#))

1.1. Identify CPU Card

There are two types of CPU for the EMCenter: x86 or ARM. It is important to know which CPU card you are using because the instructions for the Gold update depend upon which chipset you have.

The X86 version is now fully deprecated and will remain at v3.3.16 since it will no longer receive any firmware updates. See the ***Most Current Version Numbers*** [section 1.3](#) to see which modules ARM are compatible.

1.1.1. Software identification

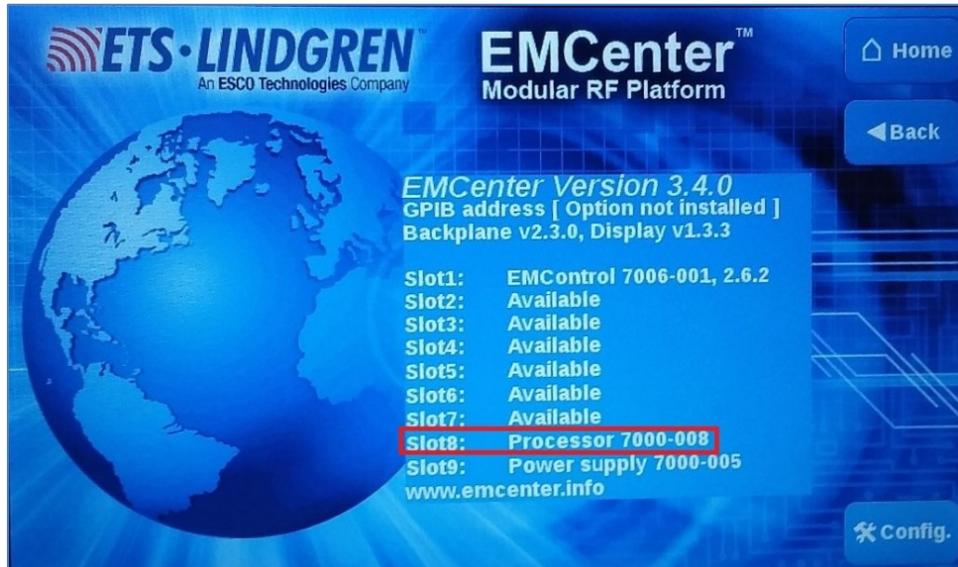
If the CPU is in an EMCenter, then you can look at the info page to identify the CPU. The processor number tells you the CPU type:

- EMCENTER PROCESSOR BOARD **STD (X86)** = 7000-006

- EMCENTER PROCESSOR BOARD + **GPIB (X86)** = 7000-007
- EMCENTER PROCESSOR BOARD **STD (ARM)** = 7000-008
- EMCENTER PROCESSOR BOARD + **GPIB (ARM)** = 7000-009



NOTE: As seen below, all versions 3.4.0 and above will be an ARM Processor. If the EMCenter version number is below 3.3.16 then it may be an x86.



NOTE: This image is only a representation of the EMCenter Info page and does not reflect the latest version number. See the [section 1.3](#) for the list of most current version numbers.

1.1.2. Hardware identification

If you are just looking at the card without it in an EMCenter, the CPU is easily identifiable by whether it has a 9-pin serial port. As shown in the figures below, the x86 has a 9-pin serial port and the ARM does NOT have a 9-pin serial port.



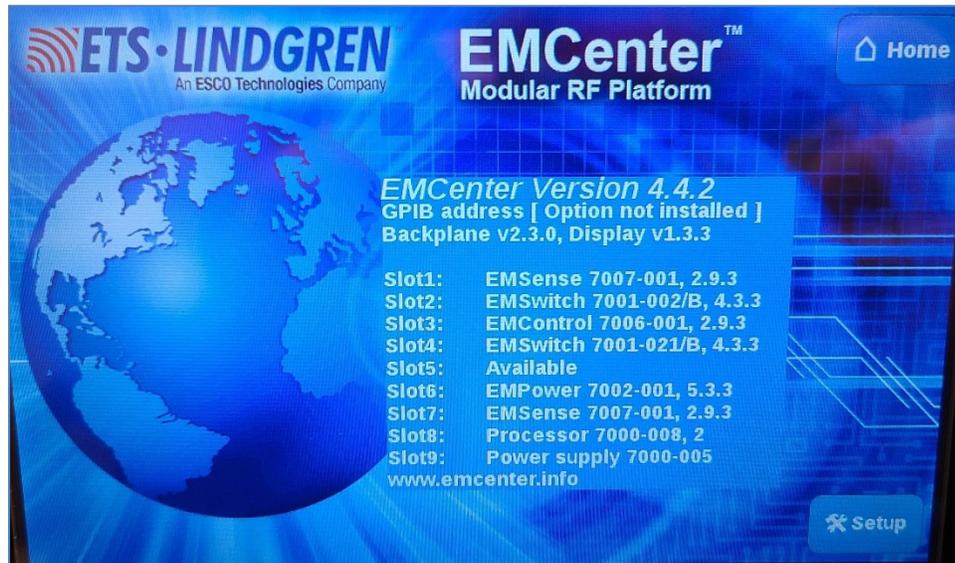
Figure 1: x86



Figure 2: ARM

1.2. Version Info Page

The Info page displays the version number of the EMCenter and the card versions.



NOTE: This image is only a representation of the EMCenter Info page and does not always reflect the latest version number. See the next [section 1.3](#) for the list of most current version numbers.

1.3. Most Current Version Numbers List

The table below shows the most current incremental version number for each EMCenter part as of *INC_2024_09_26*; see [section 2.1](#) for the incremental firmware download link.



CAUTION: As of 2023, there is a new Gold version for ARM only machines. The X86 EMCenter processor has been deprecated and will no longer receive any firmware updates.



NOTE: The ARM EMCenter firmware updates **MUST** be updated in the following order to get the latest version:

1. Gold v.3.3.3 ([Section 6.1](#))
2. Gold v.4.1.6 ([Section 4.1](#))
3. Gold 4.3.2 ([Section 3.1](#))
4. Latest incremental ([Section 2.1](#))
5. Compare info page to current versions list ([Section 1.3](#))



NOTE: Be aware that versions below will vary depending on the hardware version. It is highly recommended that you keep updating beyond the numbers listed below until there are no more updates available.

If any EMCenter part is not updating in the expected way, its hardware model may not be compatible with the latest updates. Please email software.support@ets-lindgren.com with an image of your EMCenter info page and the attempted incremental link for further instruction.

| Hardware Name | Part number(s) | Version # |
|------------------------------|--|-----------|
| EMCenter Processor CPU - ARM | 7000-008, -009 | 4.4.4 |
| EMCenter, Backplane | 7000-008, -009 | 2.3.0 |
| EMCenter, Display | 7000-008, -009 | 1.3.3 * |
| EMSwitch Card | 7001-001, -002,-003, -004*, -005, -011, -012, -013, -015, -021, -022 | 4.3.3 |
| EMSwitch Card (50 GHz) | 7001-023, -024, -025 **ARM only | 4.3.3 |
| EMSwitch Card (67 GHz) | 7001-026, -027 **ARM only | 4.3.3 |
| EMPower Card | 7002-001 | 5.3.3 |
| EMPower Probe | 7002-002, -004 | 2.6.1 |

| | | |
|--|---|--------|
| EMPower Probe | 7002-003, -005 | 2.60 |
| EMPower Sensor ETSI | 7002-006, -008 | 3.72 |
| EMGen Card | 7003-001 | 2.6.4 |
| EMGen Card | 7003-002 **ARM only | 1.2.0 |
| EMGen Card | 7003-003 **ARM only | 1.3.1 |
| EMControl Card | 7006-001 | 2.9.3 |
| EMSense Card, Battery | 7007-001 | 2.9.3 |
| EMSense Card, Laser | 7007-002 | 2.9.3 |
| EMSense 10 Card | 7007-200 **ARM only NOTE: EMSense 10 card will NOT update unless the probe is connected, and the LASER is ON. | 2.8.9 |
| EMSense 10 Probe (ISO & HS) | 7007-201, -202 **ARM only NOTE: EMSense 10 probe will NOT update unless the probe is connected, and the LASER is ON. | 2.10.1 |
| EMSense 40 Probe | 7007-203 **ARM only NOTE: EMSense 40 probe will NOT update unless the probe is connected, and the LASER is ON. | 2.10.1 |
| EMField, Supply card | 7008-100 | 1.2.4 |
| EMField, Amplifier board | 7008-001, -002, -003, -004, -005, -006, -007, -008 | 2.0.10 |
| EMField, Back panel | 7008-001, -002, -003, -004, -005, -006, -007, -008 | 2.4.1 |

2. Incremental update process

This section describes how to create an Incremental version *INC_2024_09_26* update USB and how to install the Incremental version into the ARM EMCenter.



NOTE: If your ARM CPU is less than system version **v4.3.2**, please go to **section 3** to install the latest Gold ARM update before you can use this latest incremental.



NOTE: The ARM EMCenter firmware updates **MUST** be updated in the following order to get the latest version:

1. Gold v.3.3.3 ([Section 6.1](#))
2. Gold v.4.1.6 ([Section 4.1](#))
3. Gold 4.3.2 ([Section 3.1](#))
4. Latest incremental ([Section 2.1](#))
5. Compare info page to current versions list ([Section 1.3](#))

2.1. Create Latest Incremental USB

2.1.1. Download Incremental Firmware

To get the latest version of the EMCenter incremental loader, copy the following link into your internet browser (works best with **Chrome**) and save the file to your computer in a known location:

http://www.ets-lindgren.com/WinCalFTP/vendorAndThirdparty/Incremental_202409260939_28c98353b17d6df7cb69bb7774839a09a3377a61.tar.gz.zip



NOTE: This is a large file, so try to use a fast internet connection and plan up to 30 minutes to get the file. Pay attention to what directory you save the download into because you will need that information in following steps.

2.1.2. Change the Extension

EXTRACT ALL from the .ZIP file to obtain an .ENC file.



CAUTION: The incremental file **MUST** be .ENC for the upload to work properly. Some browsers (such as Edge) download the wrong file type; we suggest using Chrome. If the file inside the .ZIP folder is **NOT** an .ENC file (such as a .GZ file), please try downloading with a different browser.

2.1.3. Copy onto USB

Insert the USB into your computer and pay attention to which driver letter it is using. Copy the .ENC incremental file onto the FAT32 USB using the Windows File Explorer.

Once the Windows File Explorer has finished copying the program onto the USB, you can close the program and eject the USB out of your laptop.

2.2. Install Latest Incremental Update

1. Take a picture of the CONFIG page that has the GPIB and Network settings:



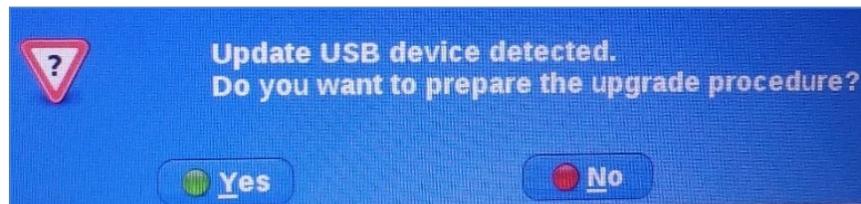
CAUTION: Updating the EMCenter replaces the entire contents of the “hard drive” of the EMCenter. Therefore, the TCP/IP network and/or GPIB address settings are completely reset to default.

2. Unplug unrelated USB, hard drives, or memory cards to prevent confusion and accidental deletion of data.
3. Turn ON the EMCenter and wait until it gets to the main screen.

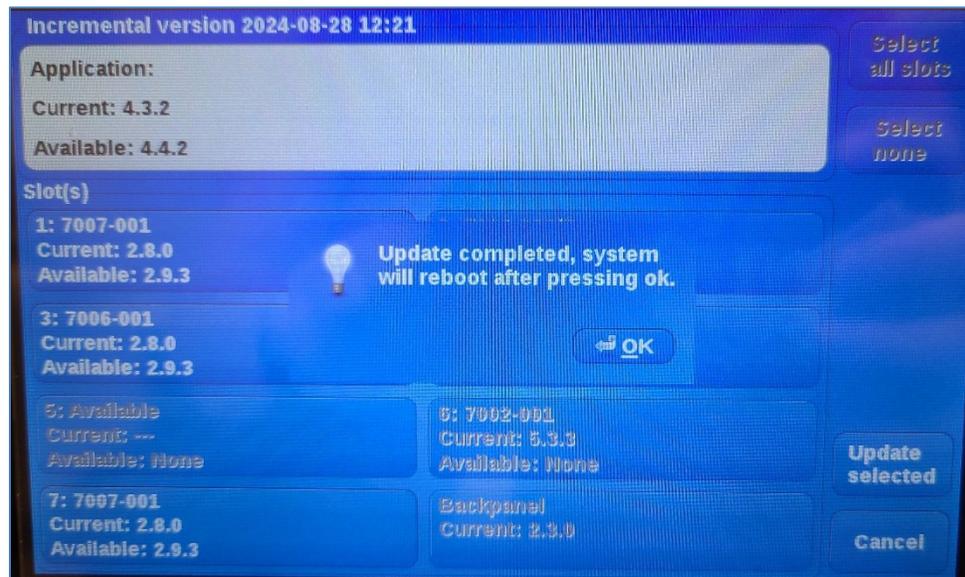


WARNING: During the following process, it is critical that you do NOT unplug, power down, or restart the EMCenter until specifically instructed to do so later in the instructions. Losing power during these steps can seriously damage the EMCenter.

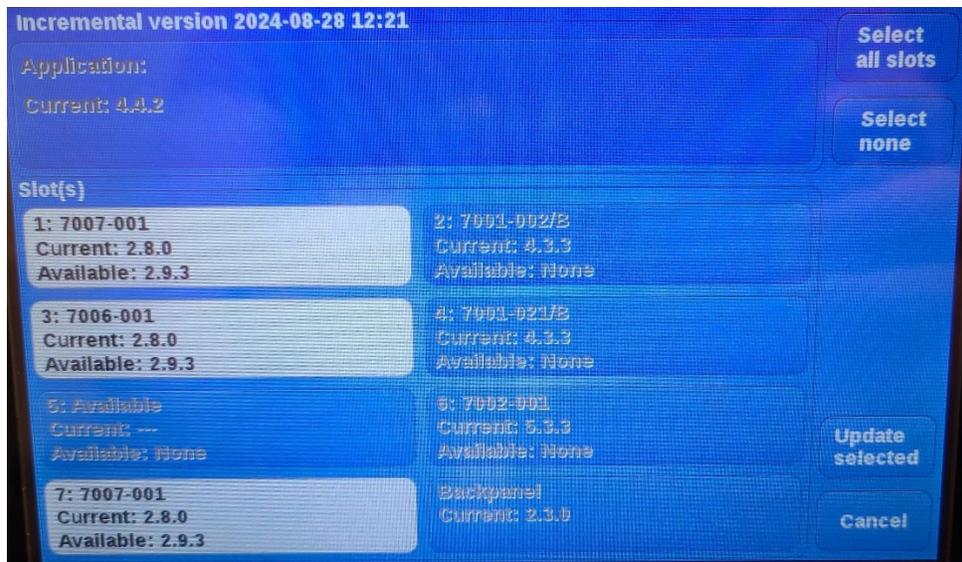
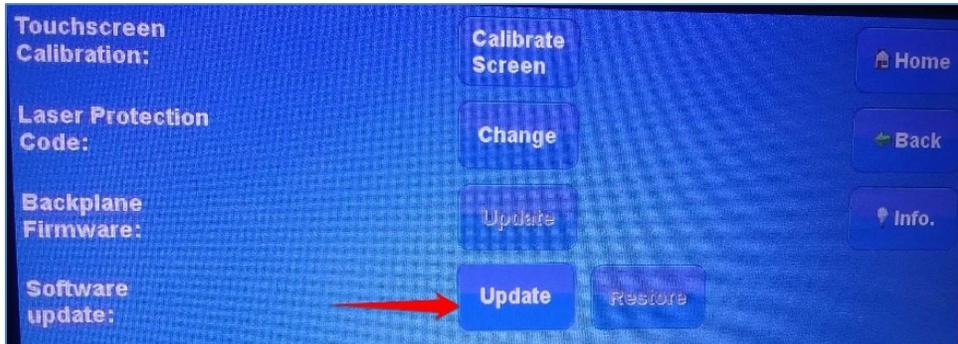
4. Plug in the USB stick with the incremental installer on it. The following box will appear when the USB is detected; click YES to prepare the download.



- a. Once you have downloaded the incremental update, you may remove the USB.
 - b. REBOOT, sometimes the new incremental update does not appear available until the power cycles completely.
5. Available updates to select are white and show the new update version. Any slot NOT selected (greyed out) will NOT be updated. **You must update the system and the card slots separately.**



- c. Once you have updated the system first, reboot. The slot updates will now be available by going to the second Config page. Selected slots will be highlighted white, and then press the **Update Selected** button.

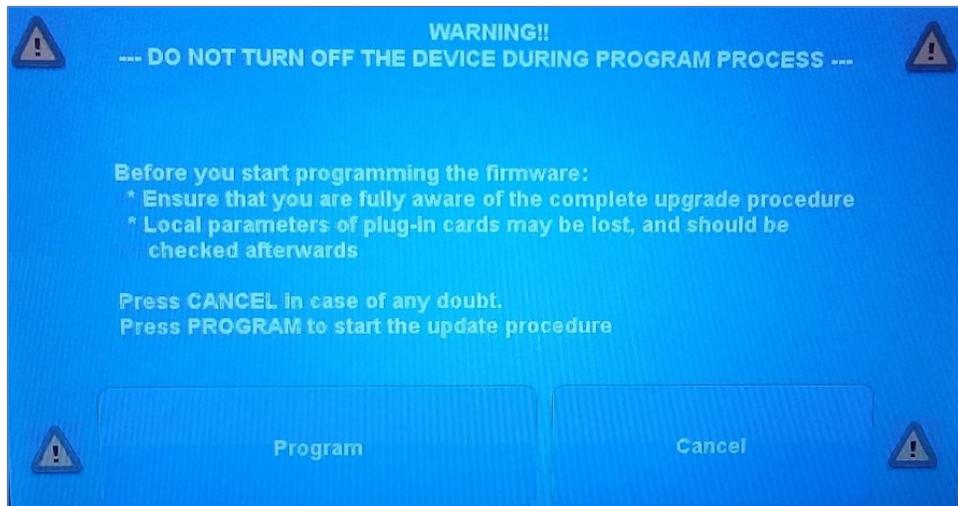




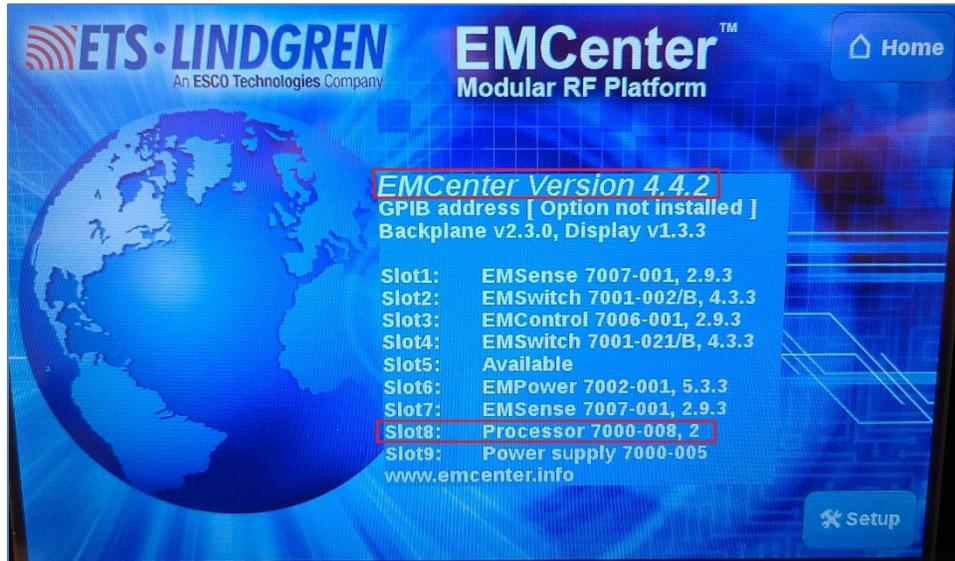
NOTE: Some updates will NOT show unless the Plug-in card is connected to the reciprocating instrument and that instrument is ON. For example, the EMSense 10 card will NOT update unless the probe is connected, and the LASER is ON.



- Once you select what to update, if applicable tap UPDATE SELECTED. The following screen is the final confirmation before the update happens. Select PROGRAM if you wish to proceed with the update.



7. The info screen should now have the newly installed EMCenter version and the processor in slot 8 will have a “, 1” or a “, 2” after the model number.



3. Latest Gold v4.3.2 ARM update process

This section describes how to create the latest **Gold update** USB for an ARM EMCenter.



NOTE: You must have at least the **Gold v4.1.6** version on your EMCenter or the **latest GOLD v4.3.2** version update will **not** work. **This update will only work with ARM processors as the X86 is now deprecated.**



NOTE: The ARM EMCenter firmware updates **MUST** be updated in the following order to get the latest version:

1. Gold v.3.3.3 ([Section 6.1](#))
2. Gold v.4.1.6 ([Section 4.1](#))
3. Gold 4.3.2 ([Section 3.1](#))
4. Latest incremental ([Section 2.1](#))
5. Compare info page to current versions list ([Section 1.3](#))



WARNING: It is imperative that you read this entire section **ALL** the way through before you begin. Mistakes could potentially crash your computer or the EMCenter.



CAUTION: This process has only been tested on Windows PCs. If you need a new Gold USB created and do NOT have Window PC to create it yourself, please contact ETS-Lindgren for further assistance.

3.1. Create Gold v4.3.2 Version USB

3.1.1. Download the Firmware

To get the latest version of the EMCenter firmware, copy the following link into your internet browser (works best with **Chrome**) and save the file to your computer:

http://www.ets-lindgren.com/WinCaFTP/vendorAndThirdparty/EMCenter_4.3.2.zip



NOTE: This is a large file, so try to use a fast internet connection and plan up to an hour to get the file.

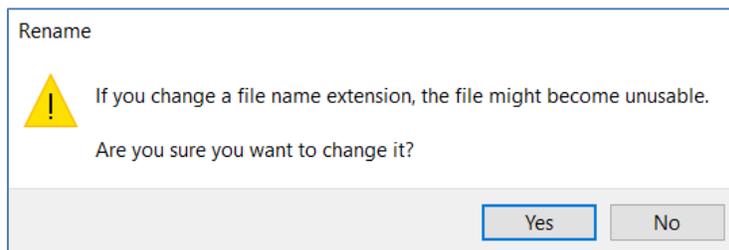


CAUTION: The download pop-up bar will ask you to open OR save; you must **SAVE** the .ZIP download to a known location. If you try to **OPEN** it, then you will get a compressed zip error message.

3.1.2. Change the Extension to 7-zip

Go to the location in you saved the file in and change the extension to be .7z.

A warning will appear asking for confirmation of the change in the file name extension; click YES.



Note: The file is downloaded as a .ZIP file, because .7z files will not download directly. Even though the extension says .ZIP, the file is really a 7-zip file and must be renamed with a .7z extension to be usable.

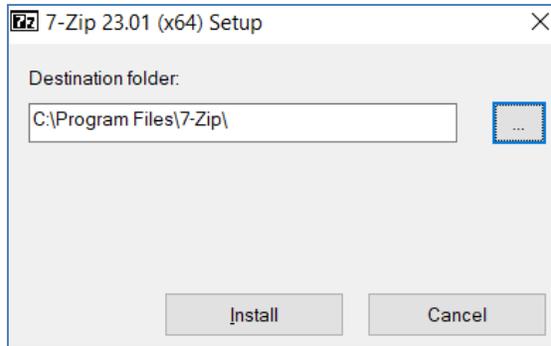
3.1.3. Download and Install 7-Zip File Manager

Once you fix the file extension, you will need to extract an image from the .7z file. To do this, you need to install a free program for your computer called 7-Zip.

Go to the website <https://www.7-zip.org/download.html> and download the most current version of the .EXE for Windows.

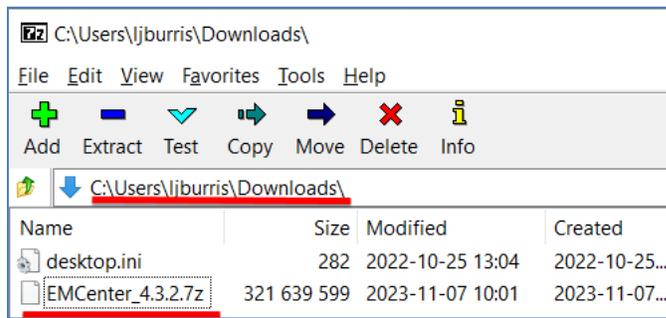
| Link | Type | System | Description |
|--------------------------|------|----------------------|-------------------|
| Download | .exe | 64-bit Windows x64 | 7-Zip for Windows |
| Download | .exe | 32-bit Windows x86 | |
| Download | .exe | 64-bit Windows arm64 | |

Run the 7zXXXX.exe file and select INSTALL.

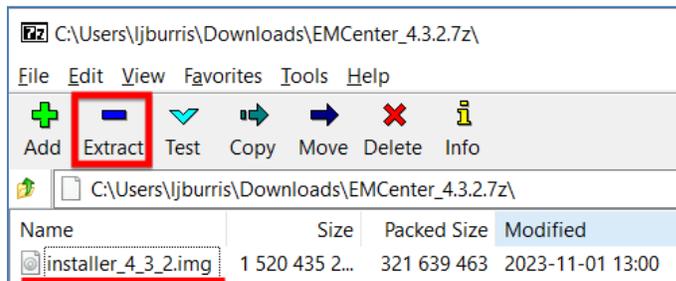


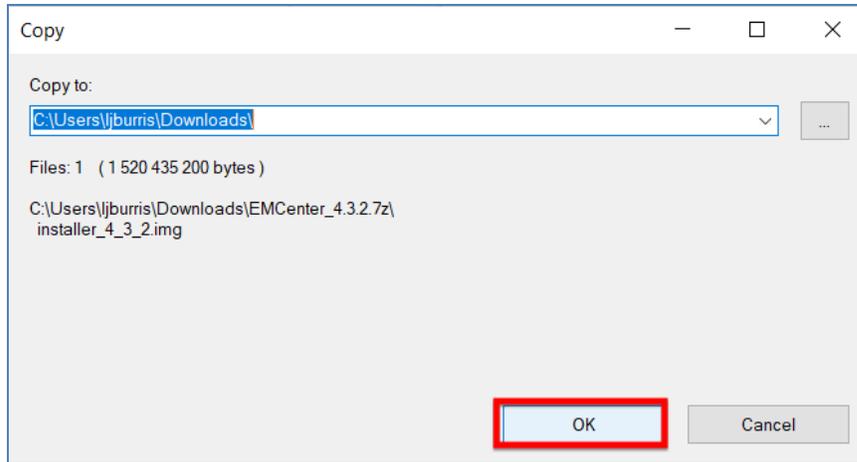
3.1.4. Extract the image from 7z file

Once 7-Zip is downloaded, search for and open the program called 7-Zip File Manager. Then navigate to the .7z file and double click the file to open it.



As shown below, the .7z file will contain one file with an installer .IMG; Extract that .IMG to a known location on your computer and select OK.





3.1.5. Download and Install Win32 Disk Imager

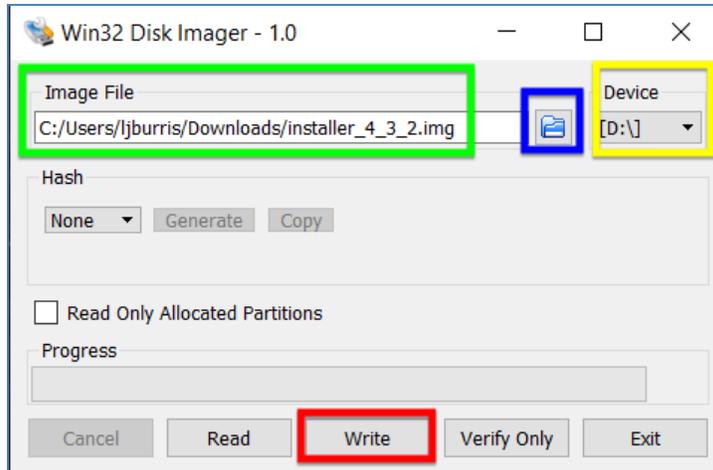
Please use the link below to download a program called Win32 Disk Imager using the default settings. This program writes the new firmware for the EMCenter onto the USB. This download can take a few minutes.

<http://sourceforge.net/projects/win32diskimager/files/latest/download>



3.1.6. Burn onto the USB

Insert the USB into your computer and pay attention to which driver letter it is using. If any files are still on the USB, they will be completely erased before the USB is turned into the update key.



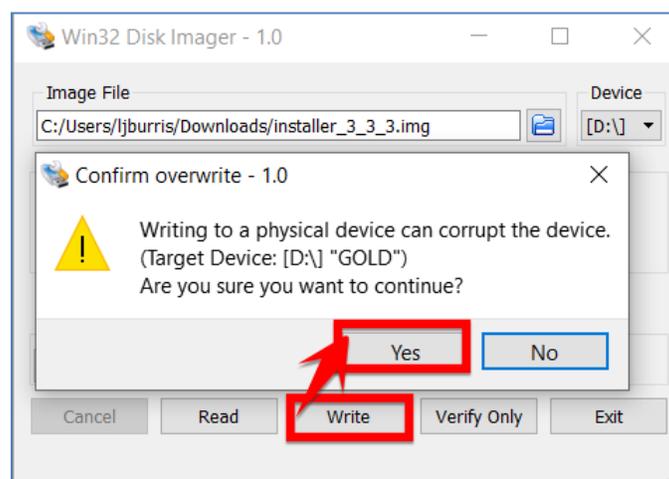
To start, run the program **Win32DiskImager.exe**. Use the image above for the following steps:

- a. Click the blue folder to select the image to be burned (BLUE box) and select the .IMG file that you extracted with the 7z program (GREEN box).
- b. Select the disk drive letter (YELLOW box) of the USB key that will be overwritten.



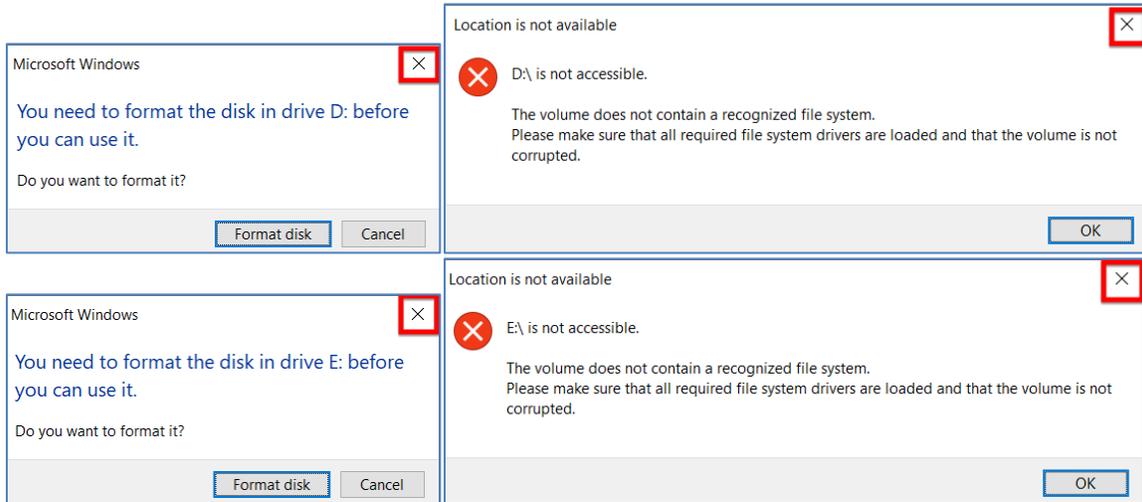
WARNING: This next step can COMPLETELY ERASE the drive you select. There is NO RECOVERY. If you are not sure what to do, please email software.support@ets-lindgren.com before proceeding.

- c. Click the Write button (RED box). You will get a last warning about the finality of this process, and then select YES to continue. This process will take a few minutes.

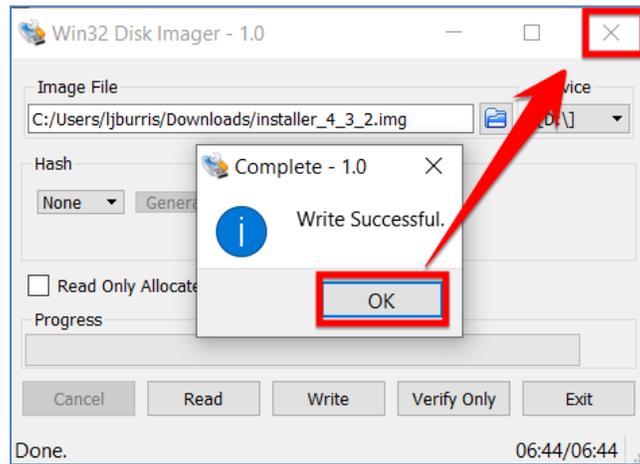




WARNING: If ANY popup asks you to “format the drive,” you MUST select CANCEL and X out of the box. Formatting the disk will corrupt the firmware and you will have to Burn the firmware again with a new USB. Repeat this if any of the following popups appear until you get to part D.



- d. Once the process is done, a popup will inform you that the “Write was successful.” Select OK, close all the windows using the X in the right-hand corner, and eject the USB out of your laptop.



Note: This USB is now only formatted to work on the EMCenter and will throw a format error any time you try to use it on a PC.

3.2. Install Gold v4.3.2 Version Update



WARNING: This update will completely overwrite the processor and you will not be able to go back to your previous version with Restore System mentioned in section 5.2.

8. Take a picture of the CONFIG page that has the GPIB and Network settings:



CAUTION: Updating the EMCenter replaces the entire contents of the “hard drive” of the EMCenter. Therefore, the TCP/IP network and/or GPIB address settings are completely reset to default.

9. Turn OFF the EMCenter and let it completely power down. Turn off the AC or unplug the mains power on the back to make sure it is powered down completely.
10. Unplug unrelated USB, hard drives, or memory cards to prevent confusion and accidental deletion of data.
11. Insert the USB installer key with the main firmware on it into one of the CPUs USB ports on the back of the EMCenter.

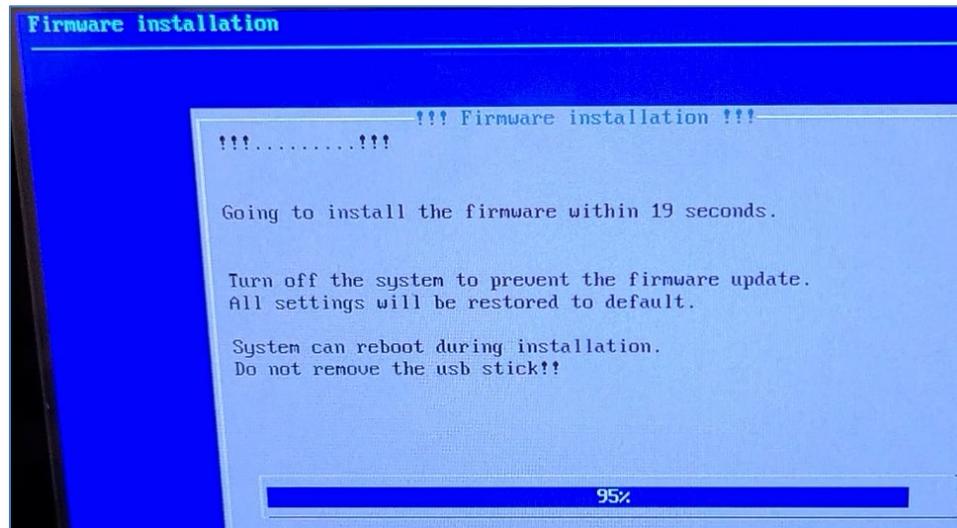


NOTE: A typical issue is that one USB port is functional, and the other is not; therefore, if the key does not register on the 1st port, then try the 2nd port.

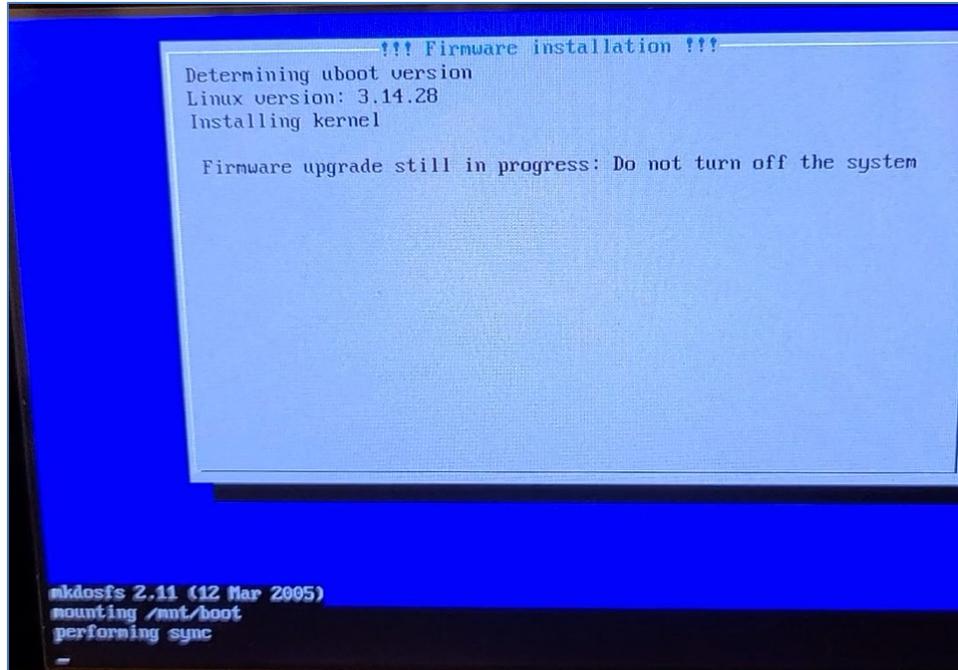
12. Turn ON the EMCenter to start the update. The system will automatically install the firmware from the USB disk on to the EMCenter.
 - a. There will be a few seconds delay where the screen is just black, and then the screen will look like below:



b. Next you should see the installation progress bar:

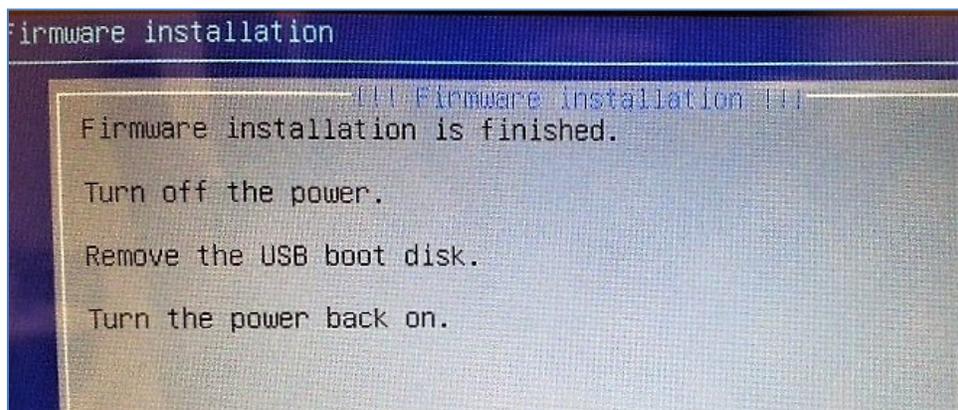


c. Then finally the kernel will start installing and the black text at the bottom will slowly move upward.

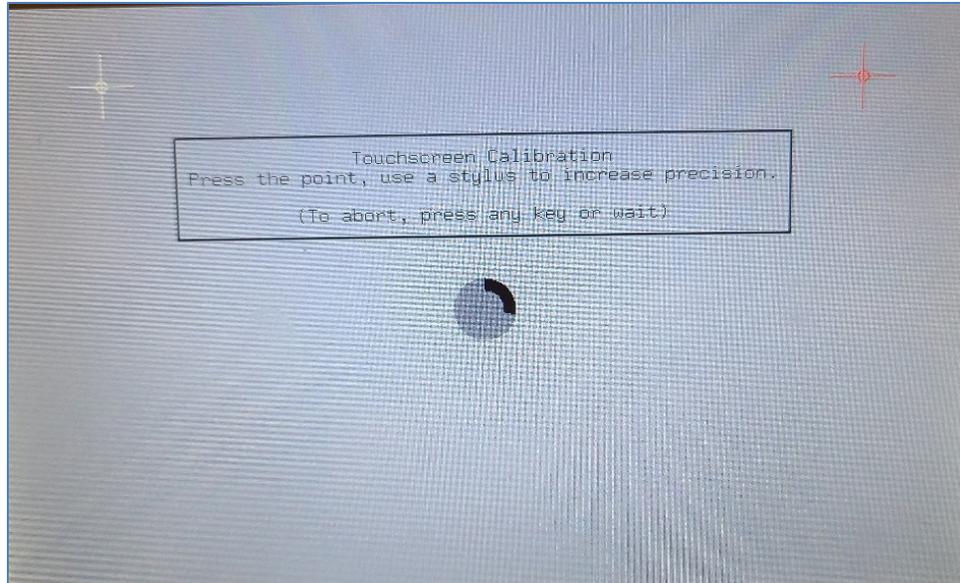


CAUTION: If the screen ever has the text fade and the screen stays frozen for longer than 7 minutes, turn off the EMCenter and restart it with the update USB still inserted. Let the update run again until the screen follows the same process as step 5 and ends with the step 6 screen.

13. **DO NOT turn off the EMCenter until you see the following screen.** Once you switch OFF the EMCenter, you can remove the USB installer.



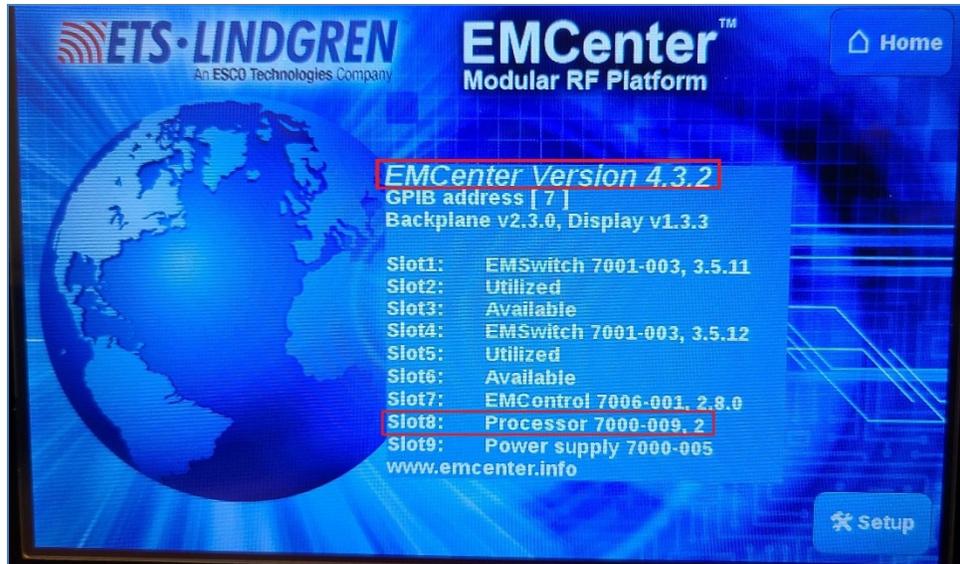
14. The first time you boot the EMCenter after updating, it will automatically run the touchscreen calibration sequence.



15. Go to the Config page and double check that the Network settings are still the same as your original picture before the update in step 1.



16. The info screen should now have the new GOLD EMCenter version as 4.3.2 and the processor in slot 8 will have a “ 1” or a “ 2” after the model number.



4. Gold v4.1.6 ARM update process

This section describes how to create a **Gold v4.1.6** version update USB for an ARM EMCenter.



NOTE: You must have at least the **Gold v3.3.X** version on your EMCenter or the **Gold v4.1.6** version update will **not** work. **This update will only work with ARM processors as the X86 is now deprecated.**



NOTE: The ARM EMCenter firmware updates **MUST** be updated in the following order to get the latest version:

1. Gold v.3.3.3 ([Section 6.1](#))
2. Gold v.4.1.6 ([Section 4.1](#))
3. Gold 4.3.2 ([Section 3.1](#))
4. Latest incremental ([Section 2.1](#))
5. Compare info page to current versions list ([Section 1.3](#))



WARNING: It is imperative that you read this entire section **ALL** the way through before you begin. Mistakes could potentially crash your computer or the EMCenter.



CAUTION: This process has only been tested on Windows PCs. If you need a Gold v4.1.6 USB created and do **NOT** have Window PC to create it yourself, please contact ETS-Lindgren for further assistance.

4.1. Create Gold v4.1.6 USB

4.1.1. Download the Firmware

To get the latest version of the EMCenter firmware, copy the following link into your internet browser (works best with **Chrome**) and save the file to your computer:

http://www.ets-lindgren.com/WinCalFTP/vendorAndThirdparty/emcenter_4.1.6.zip



NOTE: This is a large file, so try to use a fast internet connection and plan up to an hour to get the file.

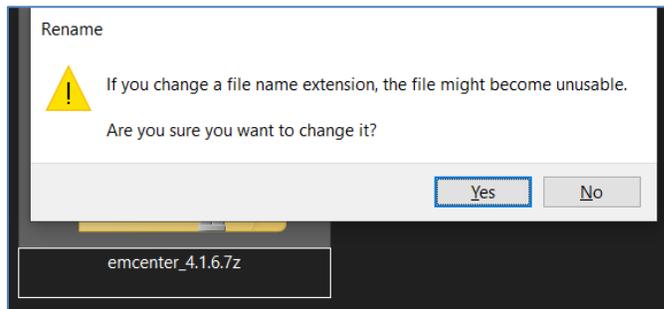


CAUTION: The download pop-up bar will ask you to open OR save; you must **SAVE** the .ZIP download to a known location. If you try to **OPEN** it, then you will get a compressed zip error message.

4.1.2. Change the Extension to 7-zip

Go to the location in you saved the file in and change the extension to be .7z.

A warning will appear asking for confirmation of the change in the file name extension; click YES.



Note: The file is downloaded as a .ZIP file, because .7z files will not download directly. Even though the extension says .ZIP, the file is really a 7-zip file and must be renamed with a .7z extension to be usable.

4.1.3. Download and Install 7-Zip File Manager

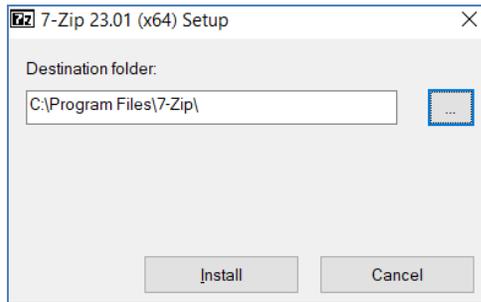
Once you fix the file extension, you will need to extract an image from the .7z file. To do this, you need to install a free program for your computer called 7-Zip.

Go to the website <https://www.7-zip.org/download.html> and download the most current version of the .EXE for Windows.

| Download | | | | |
|------------------------------------|------|----------------------|-------------------|--|
| Download 7-Zip 23.01 (2023-06-20): | | | | |
| Link | Type | System | Description | |
| Download | .exe | 64-bit Windows x64 | 7-Zip for Windows | |
| Download | .exe | 32-bit Windows x86 | | |
| Download | .exe | 64-bit Windows arm64 | | |

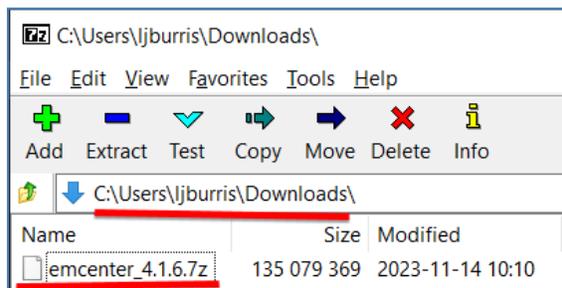
7ZIP
Home
7z Format
LZMA SDK
Download
FAQ

Run the 7zXXXX.exe file and select INSTALL.

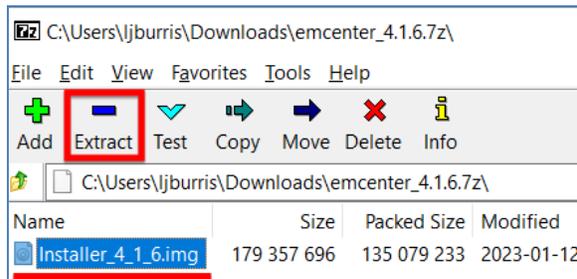


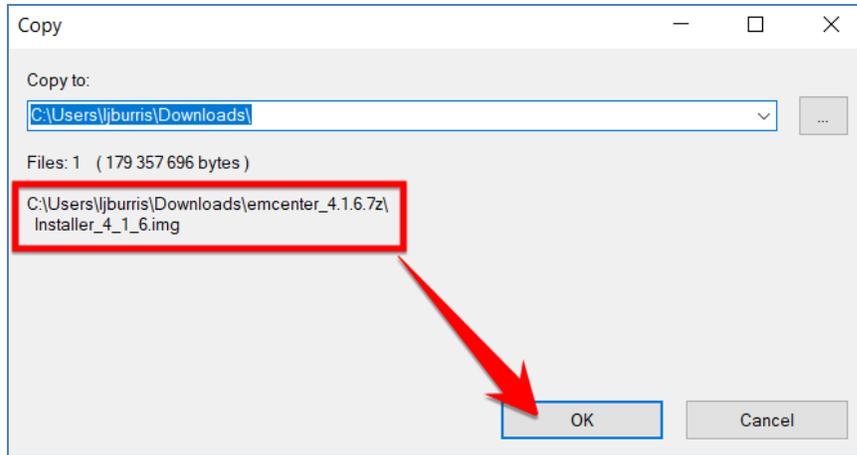
4.1.4. Extract the image from 7z file

Once 7-Zip is downloaded, search for and open the program called 7-Zip File Manager. Then navigate to the .7z file and double click the file to open it.



As shown below, the .7z file will contain one file with an installer .IMG; Extract that .IMG to a known location on your computer and select OK.

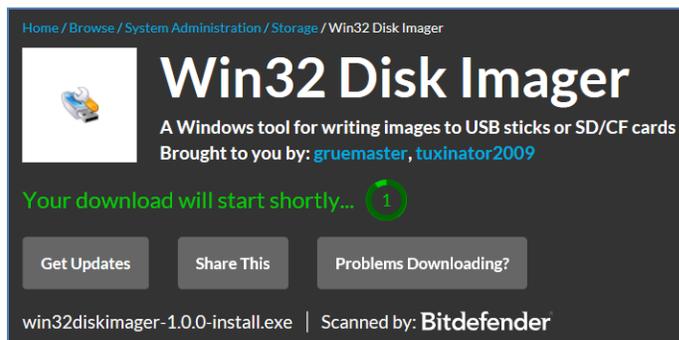




4.1.5. Download and Install Win32 Disk Imager

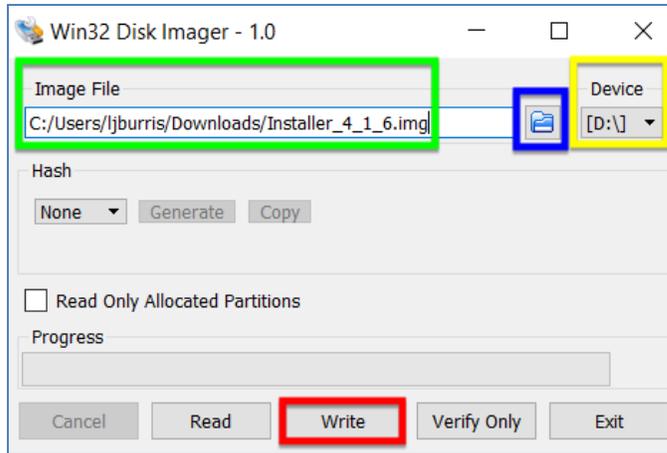
Please use the link below to download a program called Win32 Disk Imager using the default settings. This program writes the new firmware for the EMCenter onto the USB. This download can take a few minutes.

<http://sourceforge.net/projects/win32diskimager/files/latest/download>



4.1.6. Burn onto the USB

Insert the USB into your computer and pay attention to which driver letter it is using. If any files are still on the USB, they will be completely erased before the USB is turned into the update key.



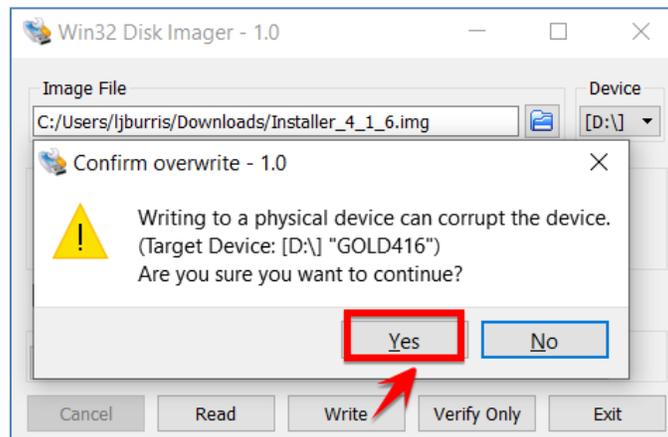
To start, run the program **Win32DiskImager.exe**. Use the image above for the following steps:

- Click the blue folder to select the image to be burned (BLUE box) and select the .IMG file that you extracted with the 7z program (GREEN box).
- Select the disk drive letter (YELLOW box) of the USB key that will be overwritten.



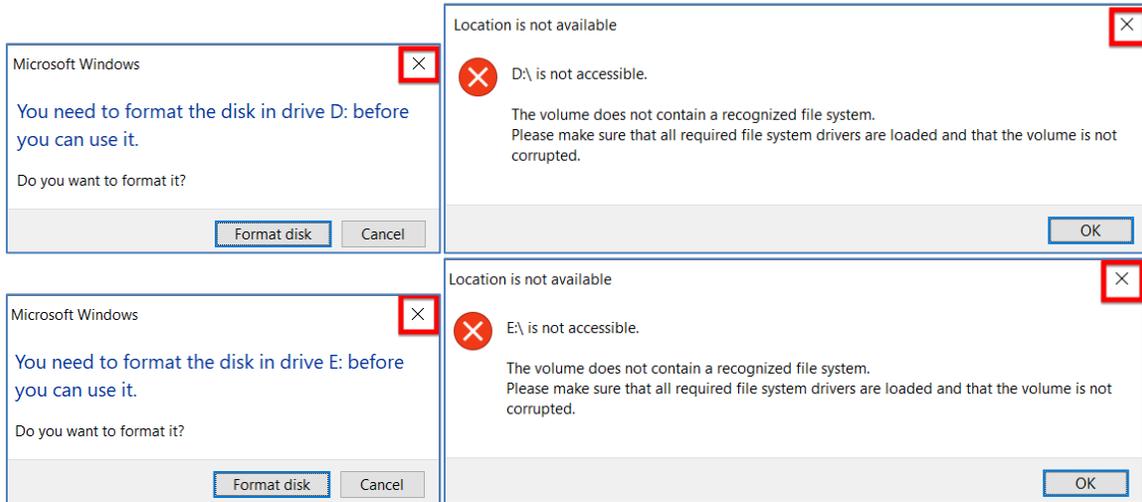
WARNING: This next step can COMPLETELY ERASE the drive you select. There is NO RECOVERY. If you are not sure what to do, please email software.support@ets-lindgren.com before proceeding.

- Click the Write button (RED box). You will get a last warning about the finality of this process, and then select YES to continue. This process will take a few minutes.

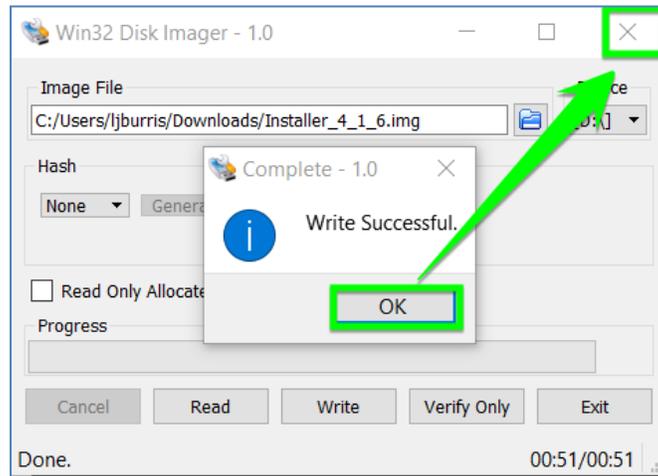




WARNING: If ANY popup asks you to “format the drive,” you MUST select CANCEL and X out of the box. Formatting the disk will corrupt the firmware and you will have to Burn the firmware again with a new USB. Repeat this if any of the following popups appear until you get to part D.



- d. Once the process is done, a popup will inform you that the “Write was successful.” Select OK, close all the windows using the X in the right-hand corner, and eject the USB out of your laptop.

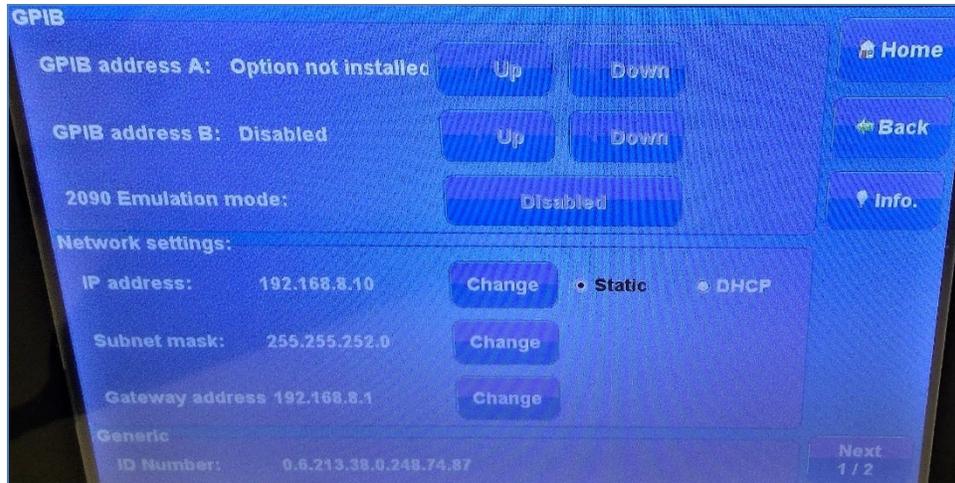


4.2. Install Gold v4.1.6 Update



WARNING: This update will completely overwrite the processor and you will not be able to go back to your previous version with Restore System mentioned in section 5.2.

1. Take a picture of the CONFIG page that has the GPIB and Network settings:



CAUTION: Updating the EMCenter replaces the entire contents of the “hard drive” of the EMCenter. Therefore, the TCP/IP network and/or GPIB address settings are completely reset to default.

2. Turn OFF the EMCenter and let it completely power down. Turn off the AC or unplug the mains power on the back to make sure it is powered down completely.
3. Unplug unrelated USB, hard drives, or memory cards to prevent confusion and accidental deletion of data.
4. Insert the USB installer key with the main firmware on it into one of the CPUs USB ports on the back of the EMCenter.

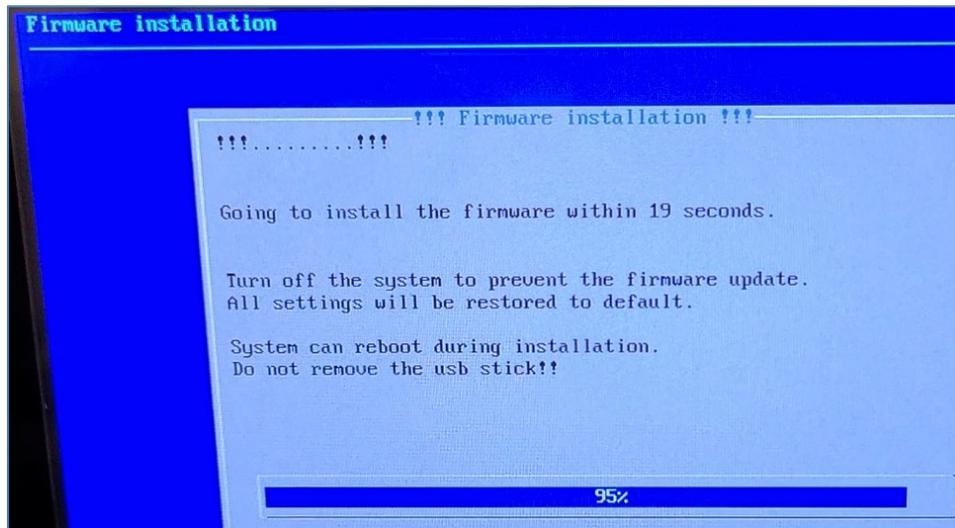


NOTE: A typical issue is that one USB port is functional, and the other is not; therefore, if the key does not register on the 1st port, then try the 2nd port.

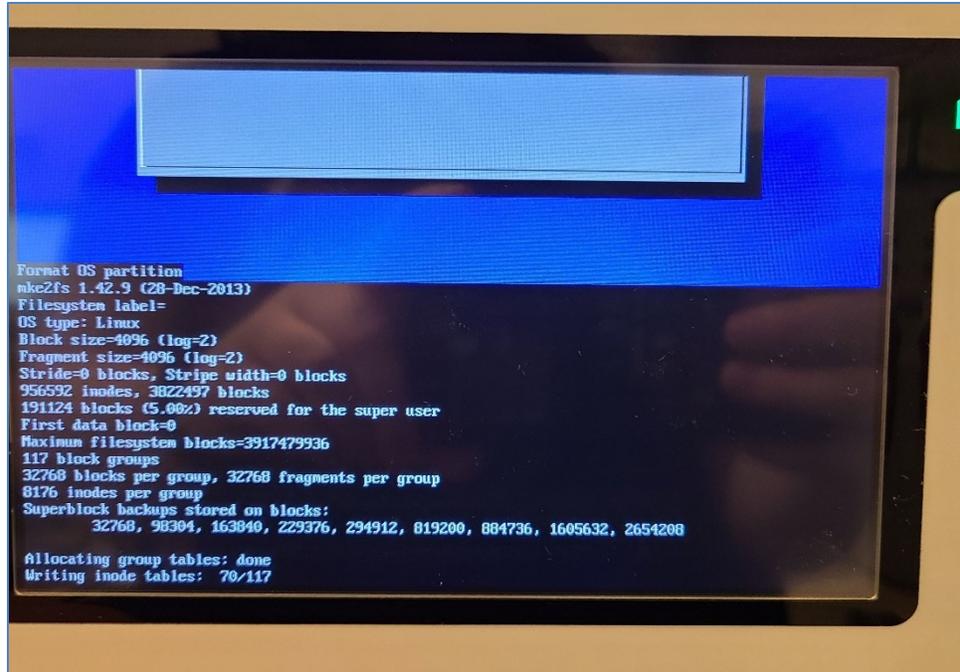
5. Turn ON the EMCenter to start the update. The system will automatically install the firmware from the USB disk on to the EMCenter.
 - a. There will be a few seconds delay where the screen is just black, and then the screen will look like below:

```
17.5439791 usb 1-1.1.5: new full-speed USB device number 8 using ci_hdrc
17.6667501 ftdi_sio 1-1.1.5:1.0: FTDI USB Serial Device converter detected
17.6705611 usb 1-1.1.5: Detected FT232RL
17.6740821 usb 1-1.1.5: Number of endpoints 2
17.6775281 usb 1-1.1.5: Endpoint 1 MaxPacketSize 64
17.6808681 usb 1-1.1.5: Endpoint 2 MaxPacketSize 64
17.6841221 usb 1-1.1.5: Setting MaxPacketSize 64
17.6879561 usb 1-1.1.5: FTDI USB Serial Device converter now attached to ttyUSB3
17.8058931 scsi 0:0:0:0: Direct-Access General UDisk 5.00 PQ: 0 ANSI: 2
17.8108531 sd 0:0:0:0: Isdnl 15769600 512-byte logical blocks: (8.07 GB/7.51 GiB)
17.8149481 sd 0:0:0:0: Isdnl Write Protect is off
17.8189321 sd 0:0:0:0: Isdnl No Caching mode page found
17.8224171 sd 0:0:0:0: Isdnl Assuming drive cache: write through
17.8287491 sd 0:0:0:0: Isdnl No Caching mode page found
17.8304981 sd 0:0:0:0: Isdnl Assuming drive cache: write through
17.8399421 sda: sda1 sda2
17.8876221 sd 0:0:0:0: Isdnl No Caching mode page found
17.8893321 sd 0:0:0:0: Isdnl Assuming drive cache: write through
17.8918511 sd 0:0:0:0: Isdnl Attached SCSI removable disk
17.9562231 kjournald starting, Commit interval 5 seconds
17.9629511 EXT3-fs (sda2): using internal journal
17.9688981 EXT3-fs (sda2): recovery complete
17.9724611 EXT3-fs (sda2): mounted filesystem with ordered data mode
17.9758911 UFS: Mounted root (ext3 filesystem) on device 0:2.
17.9823381 devtmpfs: mounted
17.9869241 Freeing unused kernel memory: 320K (80c1c000 - 80c9c000)
INIT: version 2.88 booting
Please wait: booting...
```

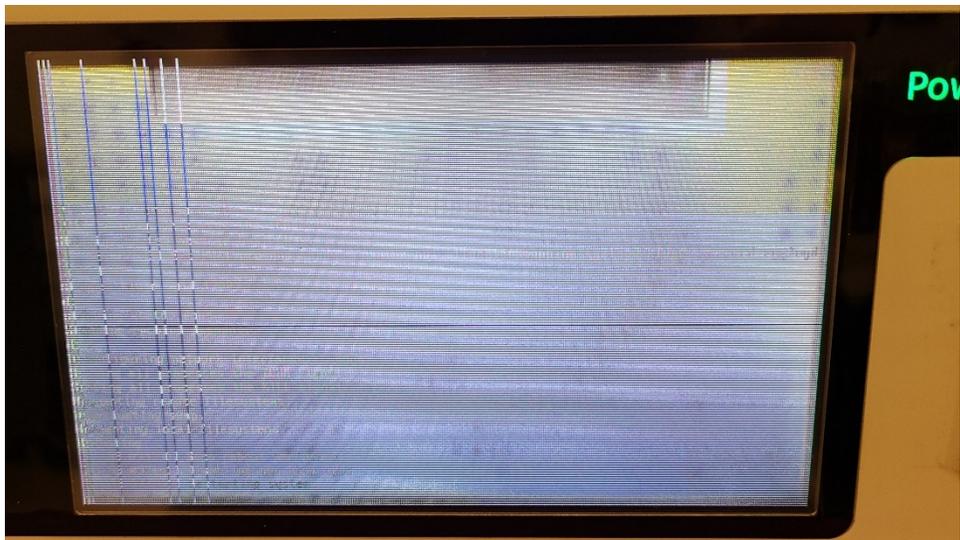
b. Next you should see the installation progress bar:



c. Then finally the kernel will start installing and the black text at the bottom will slowly move upward.



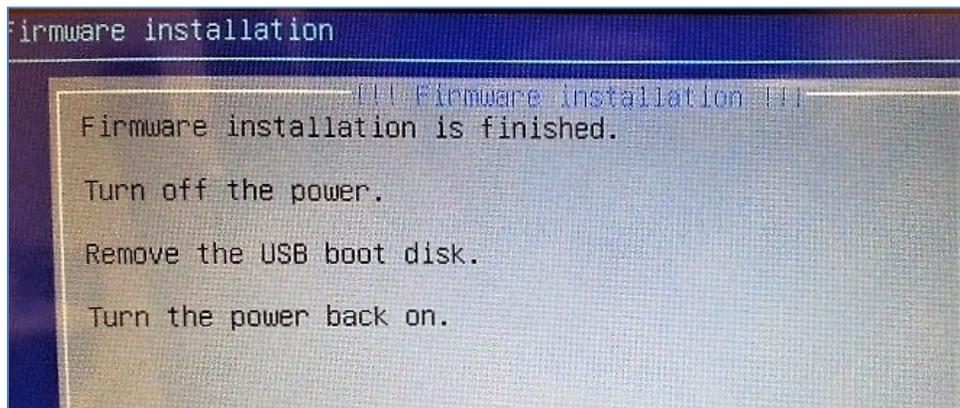
CAUTION: If the screen ever has the text fades from white to blank blue and the screen stays frozen for longer than 10 minutes, turn OFF the EMCcenter and restart it with the update USB still inserted.



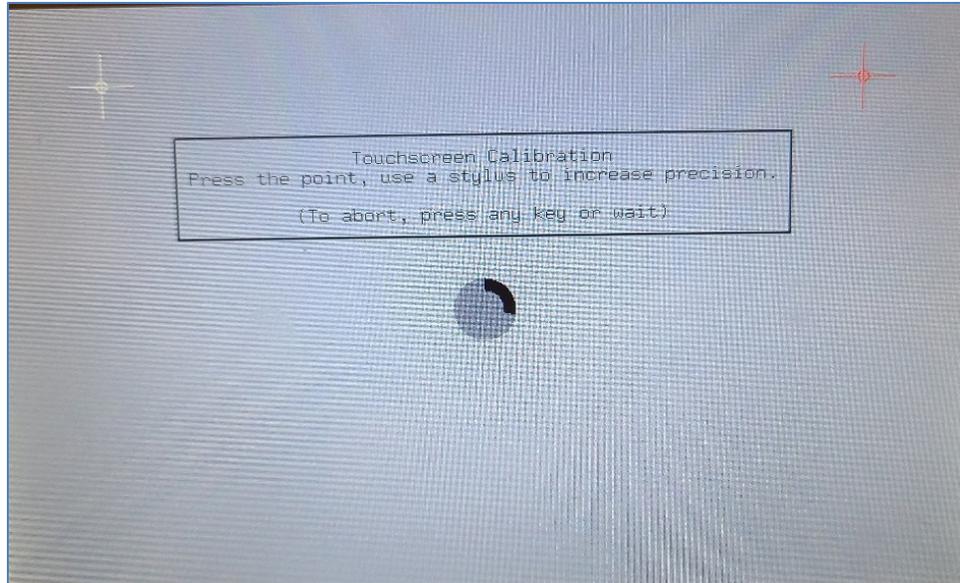


The v4.1.6 update may need to run until the screen freezes and reboot up to 3 times before the update shows the screen shown in step 6.

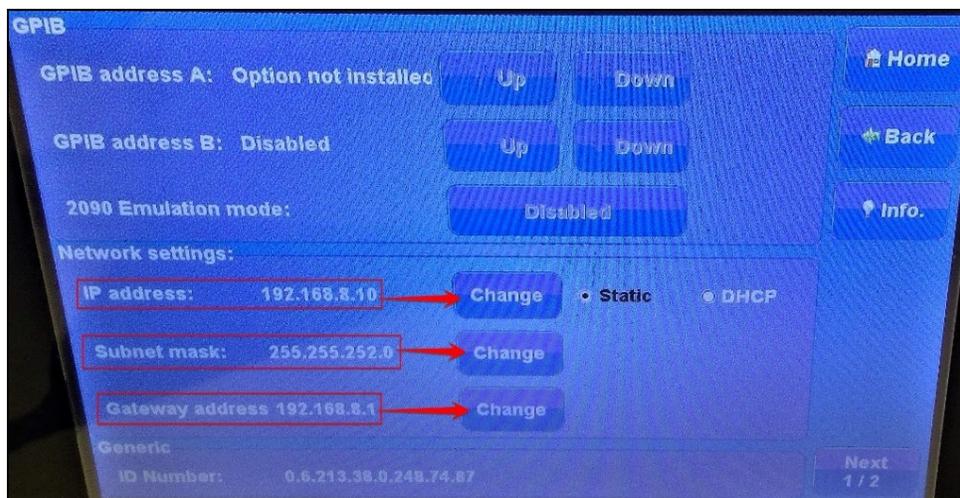
6. **DO NOT turn off the EMCenter until you see the following screen.** Once you switch OFF the EMCenter, you can remove the USB installer.



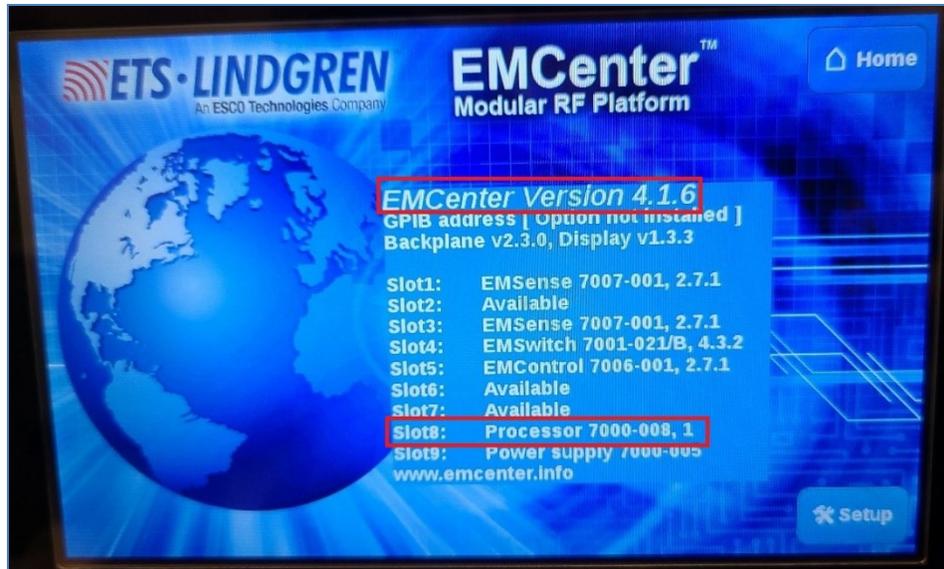
7. The first time you boot the EMCenter after updating, it will automatically run the touchscreen calibration sequence.



8. Go to the Config page and double check that the Network settings are still the same as your original picture before the update in step 1.



9. The info screen should now have the EMCenter version as 4.1.6 and the processor in slot 8 will have a “, 1” or a “, 2” after the model number.



5. Restore Previous Version and Reset Config Settings

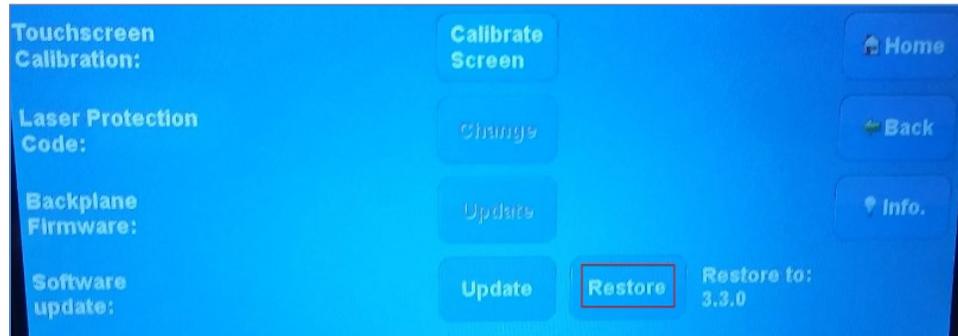
5.1. Restore Card

From the home page, select the slot number of the card you wish to restore. Next to software version, there is an option to Restore Embedded Software:



5.2. Restore System

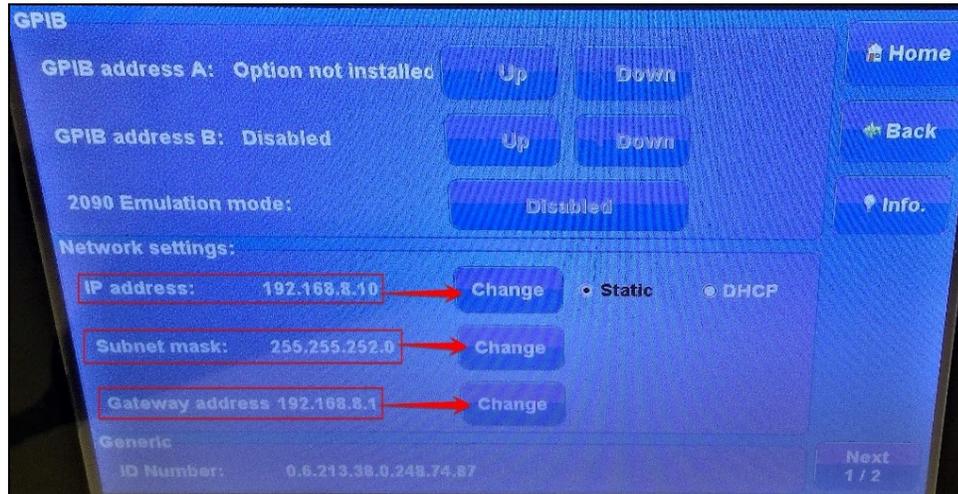
From the home page, go to the second Config Page. Next to the software update, there is an option to Restore with the previous version number installed:



5.3. Reset Network Settings

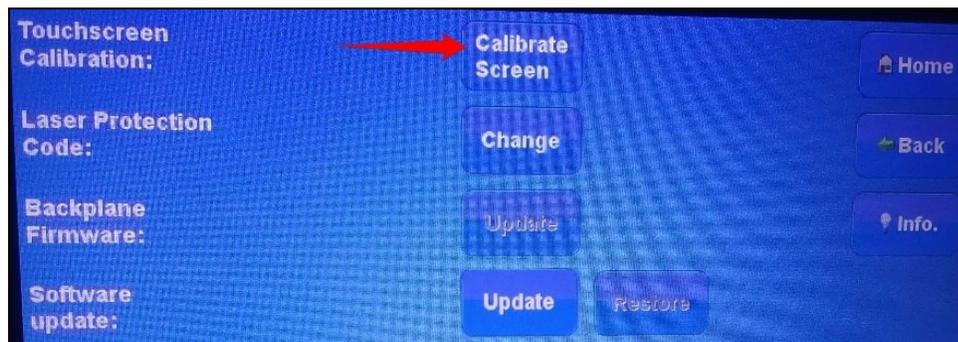
NOTE: The firmware updates have a known side effect of resetting the network settings and the touchscreen calibration.

Go to the Config page and double check that the Network settings are still the same as your original picture before the update.



5.4. Reset Touchscreen Calibration

Only reset the touchscreen calibration as needed. To recalibrate, go to the second Config page and select Calibrate Screen. You can also send the command CALIBRATE\n over the Ethernet, GPIB, or USB command channel using NI MAX to start a touchscreen calibration process.



6. *DEPRECATED* X86 Gold v3.3.X



CAUTION: The X86 EMCenter processor has been deprecated and will no longer receive any firmware updates beyond the *INC_2020_04_07* update.

This section describes how to create a **GOLD v3.3.X** version update USB and how to install the Gold v3.3.X version onto the EMCenter. The Gold v3.3.X version for **X86** will update to **3.3.0** and **ARM** will update to **3.3.3**.

This section also describes how to create an Incremental version update USB and how to install the Incremental version into the X86 EMCenter. At the end of the section will be the list that shows the final incremental version number for each EMCenter part as of *INC_2020_04_07*.



CAUTION: If any EMCenter part is not updated in the expected way, its hardware model may not be compatible with the latest updates. Please email software.support@ets-lindgren.com with an image of your EMCenter info page and the attempted incremental link for further instruction.

6.1. *DEPRECATED* Create Gold v3.3.X USB



NOTE: If your version number is greater than is v3.3.0 for X86 or v3.3.3 for ARM, then you do **NOT** need to create a Gold update USB.



NOTE: The ARM EMCenter firmware updates **MUST** be updated in the following order to get the latest version:

1. Gold v.3.3.3 ([Section 6.1](#))
2. Gold v.4.1.6 ([Section 4.1](#))
3. Gold 4.3.2 ([Section 3.1](#))
4. Latest incremental ([Section 2.1](#))
5. Compare info page to current versions list ([Section 1.3](#))



WARNING: It is imperative that you read this entire section **ALL** the way through before you begin. Mistakes could potentially crash your computer or the EMCenter.



CAUTION: This process has only been tested on Windows PCs. If you need a Gold v3.3.X USB created and do **NOT** have Window PC to create it yourself, please contact ETS-Lindgren for further assistance.

6.1.1. Download the Firmware

To get the latest version of the EMCenter firmware, copy the following link into your internet browser (works best with **Chrome**) and save the file to your computer:

http://www.ets-lindgren.com/WinCalFTP/vendorAndThirdparty/emcenter_3.3.3.zip



NOTE: This is a large file, so try to use a fast internet connection and plan up to an hour to get the file.

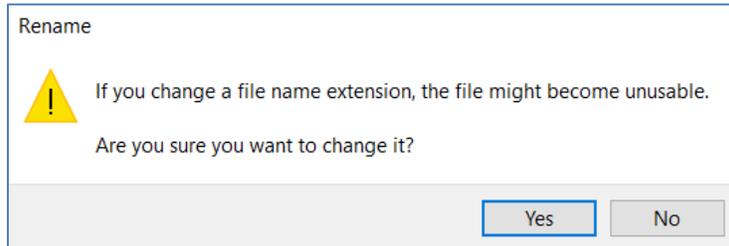


CAUTION: The download pop-up bar will ask you to open **OR** save; you must **SAVE** the .ZIP download to a known location. If you try to **OPEN** it, then you will get a compressed zip error message.

6.1.2. Change the Extension to 7-zip

Go to the location in you saved the file in and change the extension to be .7z.

A warning will appear asking for confirmation of the change in the file name extension; click YES.

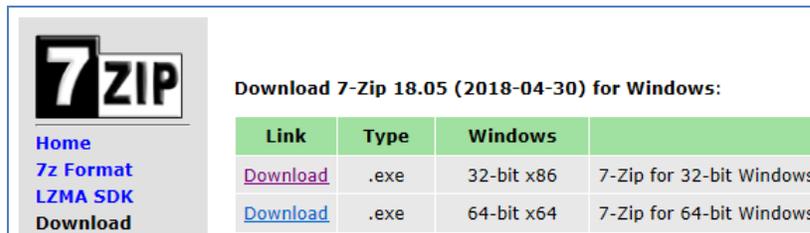


Note: The file is downloaded as a .ZIP file, because .7z files will not download directly. Even though the extension says .ZIP, the file is really a 7-zip file and must be renamed with a .7z extension to be usable.

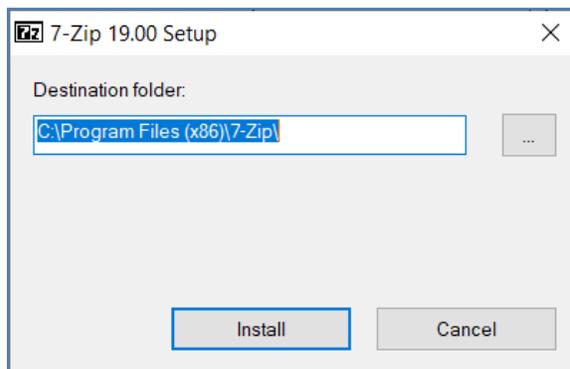
6.1.3. Download and Install 7-Zip File Manager

Once you fix the file extension, you will need to extract an image from the .7z file. To do this, you need to install a free program for your computer called 7-Zip.

Go to the website <https://www.7-zip.org/download.html> and download the most current version of the .EXE for Windows.

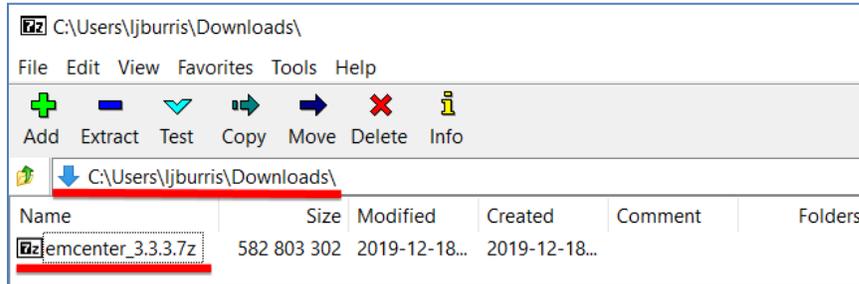


Run the 7zXXXX.exe file and select INSTALL.

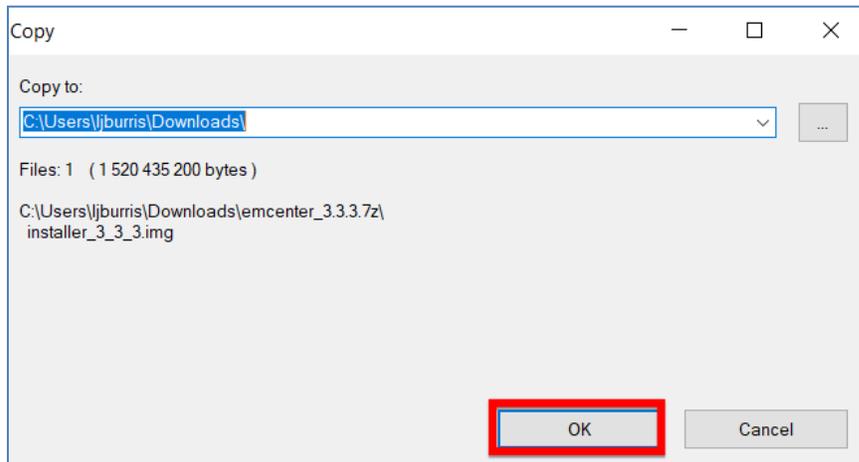
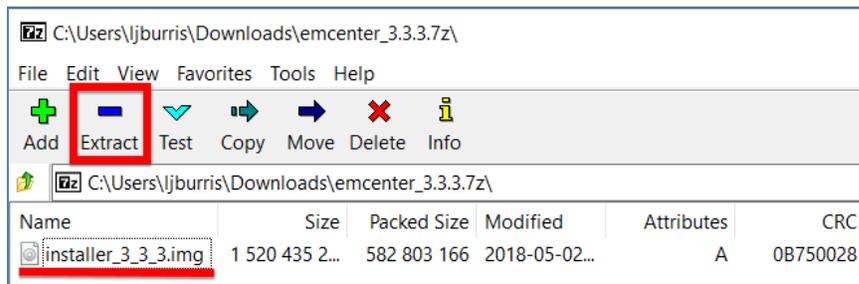


6.1.4. Extract the image from 7z file

Once 7-Zip is downloaded, search for and open the program called 7-Zip File Manager. Then navigate to the .7z file and double click the file to open it.



As shown below, the .7z file will contain one file with an installer .IMG; Extract that .IMG to a known location on your computer and select OK.



6.1.5. Download and Install Win32 Disk Imager

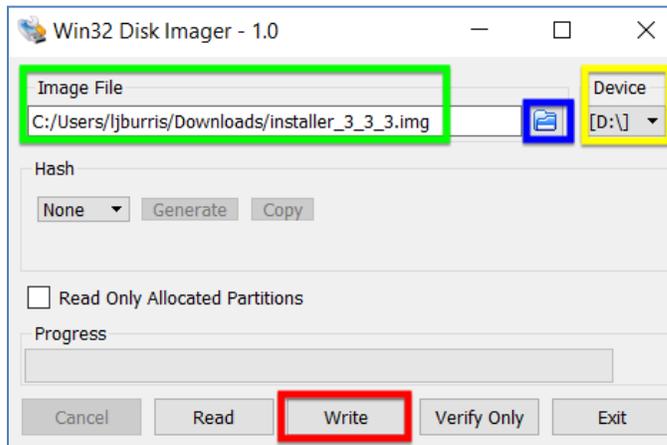
Please use the link below to download a program called Win32 Disk Imager using the default settings. This program writes the new firmware for the EMCenter onto the USB. This download can take a few minutes.

<http://sourceforge.net/projects/win32diskimager/files/latest/download>



6.1.6. Burn onto the USB

Insert the USB into your computer and pay attention to which driver letter it is using. If any files are still on the USB, they will be completely erased before the USB is turned into the update key.



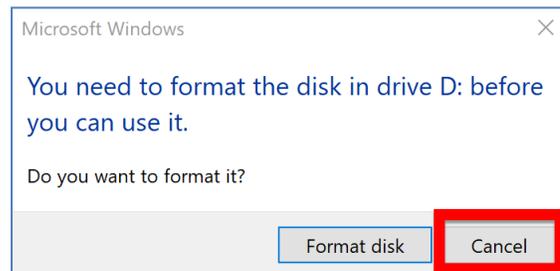
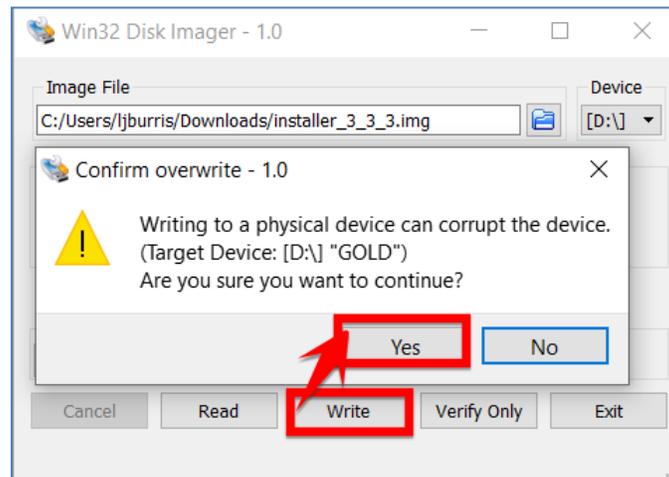
To start, run the program **Win32DiskImager.exe**. Use the image above for the following steps:

- a. Click the blue folder to select the image to be burned (BLUE box) and select the .IMG file that you extracted with the 7z program (GREEN box).
- b. Select the disk drive letter (YELLOW box) of the USB key that will be overwritten.



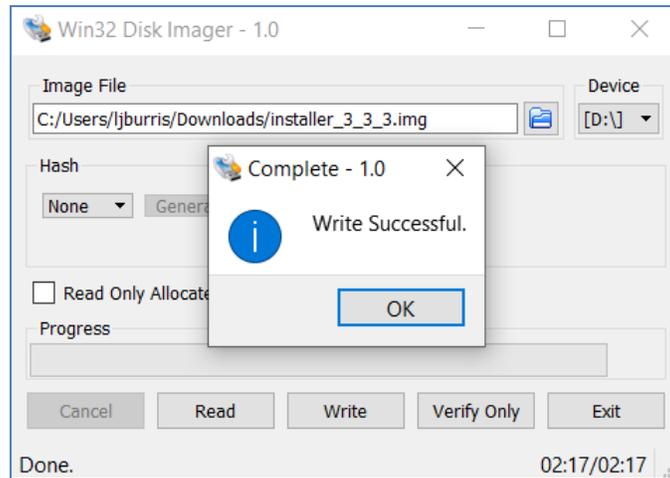
WARNING: This next step can COMPLETELY ERASE the drive you select. There is NO RECOVERY. If you are not sure what to do, please email software.support@ets-lindgren.com before proceeding.

- c. Click the Write button (RED box). You will get a last warning about the finality of this process, and then select YES to continue. This process will take a few minutes.



WARNING: If a popup asks you to “format the drive,” you MUST select CANCEL. Formatting the disk will corrupt the firmware and you will have to Burn the firmware again with a new USB.

- d. Once the process is done, a popup will inform you that the “Write was successful.” Select OK, close all the windows using the X in the right-hand corner, and eject the USB out of your laptop.

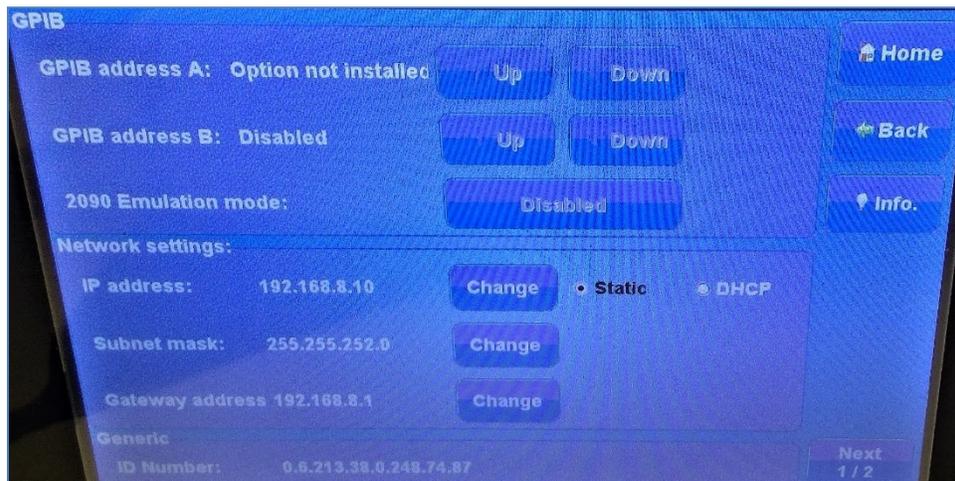


6.2. ***DEPRECATED* Install X86 Gold v3.3.X Update**



NOTE: You will need a USB keyboard to access the BIOS settings.

1. Take a picture of the CONFIG page that has the GPIB and Network settings:



CAUTION: Updating the EMCenter replaces the entire contents of the “hard drive” of the EMCenter. Therefore, the Config Page settings are completely reset to default.

2. Turn OFF the EMCenter and let it completely power down. Turn off the AC or unplug the mains power on the back to make sure it is powered down completely.
3. Unplug unrelated USB, hard drives, or memory cards to prevent confusion and accidental deletion of data.
4. Insert the USB installer key with the main firmware on it into one of the CPUs USB ports on the back of the EMCenter.

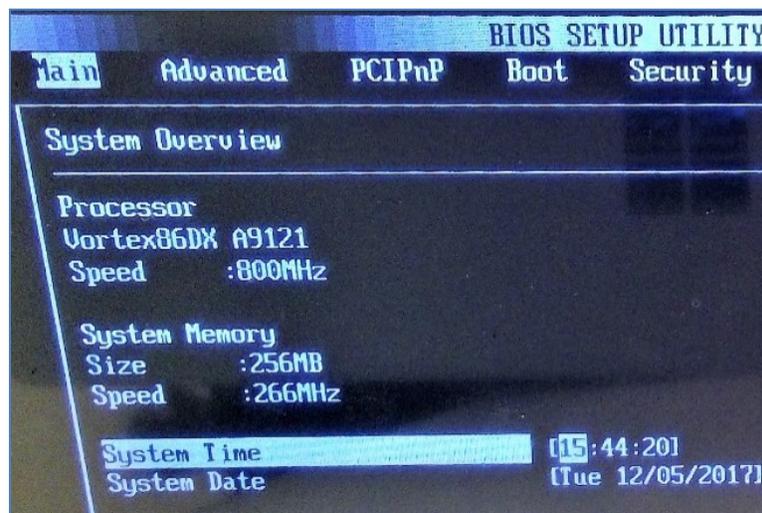


NOTE: A typical issue is that one USB port is functional, and the other is not; therefore, if the key does not register on the 1st port, then try the 2nd port.

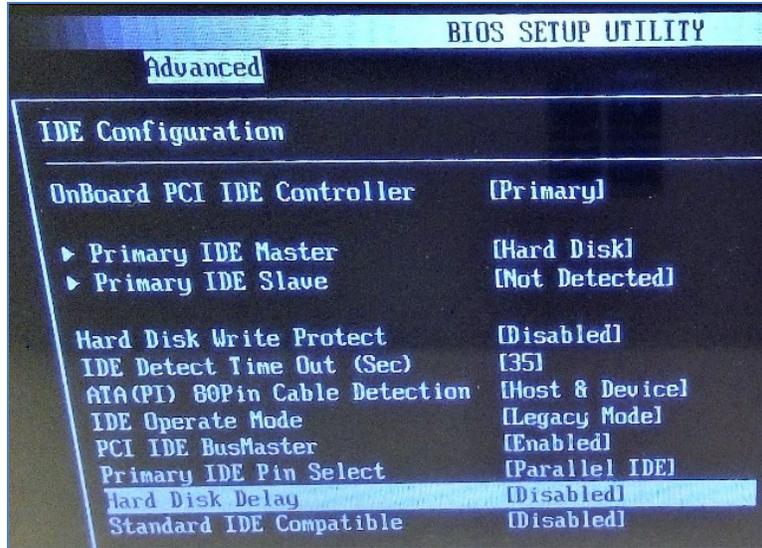
5. Plug in a USB keyboard. Turn ON the EMCenter while repeatedly pressing the DEL key to take you to the BIOS.
6. Navigating the BIOS: To go forward in the directory or select a choice, use the ENTER key. To go back up to the main menu of the directory, use the ESC key.
7. Go to the Main menu and make sure the System Time and System Date are set to the current time and date.



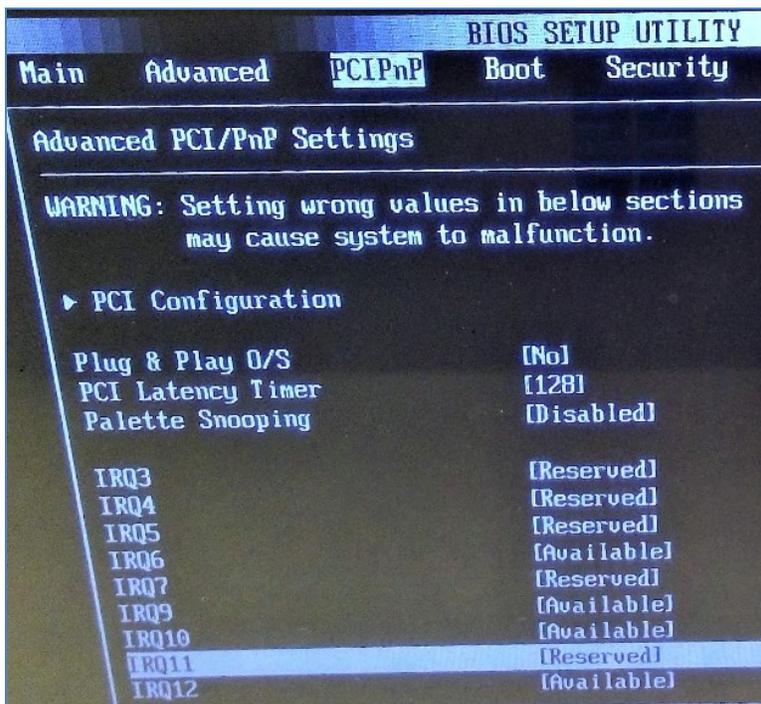
CAUTION: A typical error can occur if the EMCenter date/time does not match the connected computer's date/time.



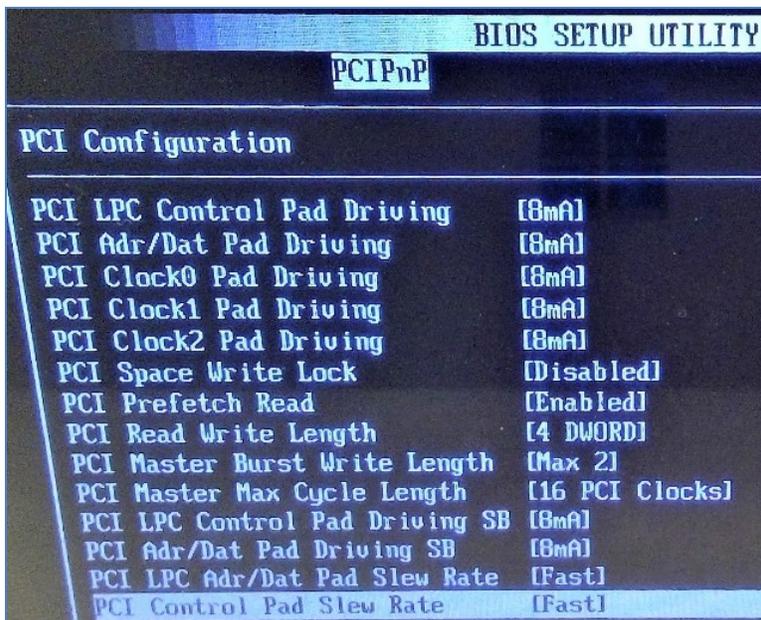
8. Go to the Advanced menu, then IDE Configuration, and set the Hard Disk Delay to Disabled.



9. Go to the PCIPnP menu and set IRQ11 to Reserved.

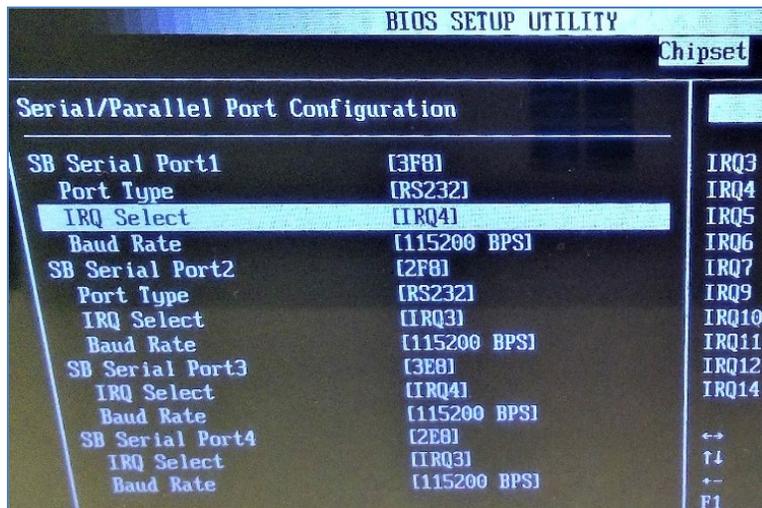


10. While still under the PCIPnP menu, go to PCI Configuration and change ALL the settings on that page to match the picture below:

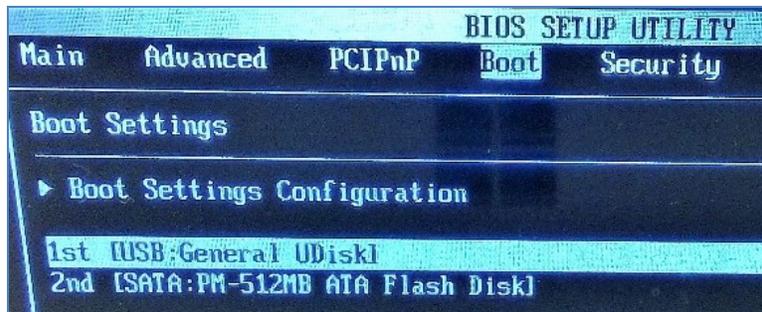


- Set Space Write Lock to Disabled.
- Set Prefetch Read to Enabled.
- Set Read Write Length to 4 DWORD.

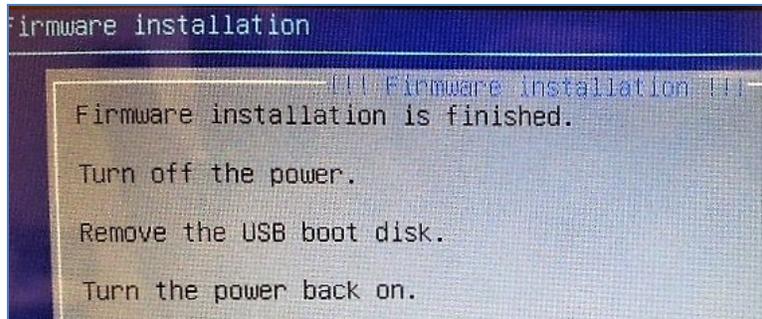
- d. Set Master Burst Write Length to Max 2.
 - e. Set Master Max Cycle Length to 16 PCI Clocks.
 - f. Set LPC Adr/Dat Pad Slew Rate and Control Pad Slew Rate to Fast.
 - g. Set the rest to 8mA: LPC Control Pad Driving, Adr/Dat Pad Driving, Clock0 Pad Driving, Clock1 Pad Driving, Clock2 Pad Driving, LPC Control Pad Driving SB, and Adr/Dat Pad Driving SB.
11. Go to the Chipset menu, then South Bridge, then Serial Port Configuration and change ALL the settings on that page to match the picture below:



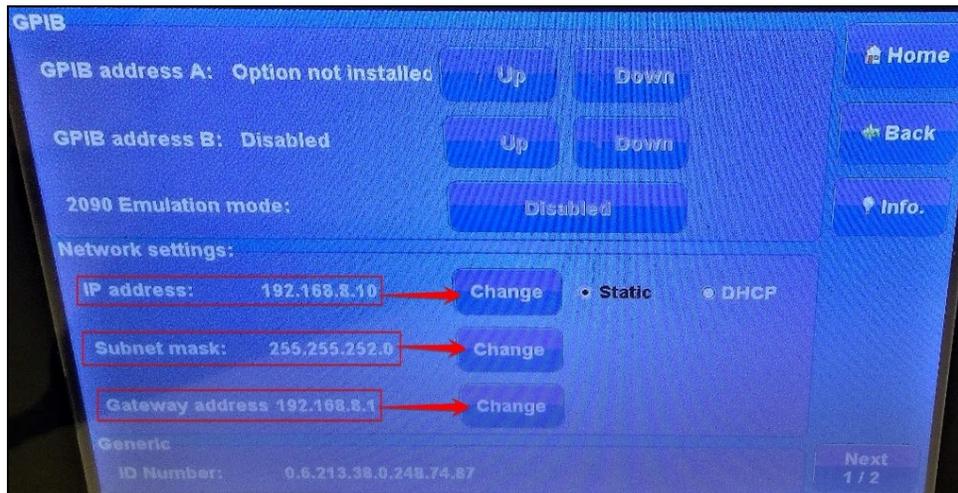
- a. Set the IRQ Select of Ports 1 and 3 to IRQ4.
 - b. Set the IRQ Select of Ports 2 and 4 to IRQ3.
 - c. Set all the Baud Rates to 115200 BPS.
12. Go to the Boot settings and make sure that the USB is set to be the first boot device. This step MUST be done, or the update will not work.



13. Hit F10 to save and continue booting the EMCenter. The system will automatically install the firmware from the USB disk on to the EMCenter.
 - a. The update is slow and may take a few minutes.
 - b. If the key was made correctly and the BIOS settings were set correctly, then the following screen is shown.
14. DO NOT turn off the EMCenter until you see the following screen. Once you switch OFF the EMCenter, you can remove the USB installer.



15. Go to the Config page and double check that the Network settings are still the same as your original picture before the update in step 1.



16. The info screen should now have the EMCenter version as 3.3.0.



6.3. *DEPRECATED* Create Incremental USB



CAUTION: This incremental is for the deprecated X86 final update. If you have an ARM EMCenter, please go to section 2.1 for the correct incremental download.

6.3.1. Download Incremental Firmware

To get the latest version of the EMCenter incremental loader, copy the following link into your internet browser (works best with **Chrome**) and save the file to your computer in a known location:

http://www.ets-lindgren.com/WinCalFTP/vendorAndThirdparty/Incremental_202004071424_0adb892b61e5daa8ef0a251b0fc34d29eb9f41cd.tar.gz.zip



NOTE: This is a large file, so try to use a fast internet connection and plan up to 30 minutes to get the file. Pay attention to what directory you save the download into because you will need that information in following steps.

6.3.2. Change the Extension

EXTRACT ALL from the .ZIP file to obtain an .ENC file.



CAUTION: The incremental file **MUST** be .ENC for the upload to work properly. Some browsers (such as Edge) download the wrong file type; we suggest using Chrome. If the file inside the .ZIP folder is **NOT** an .ENC file (such as a .GZ file), please try downloading with a different browser.

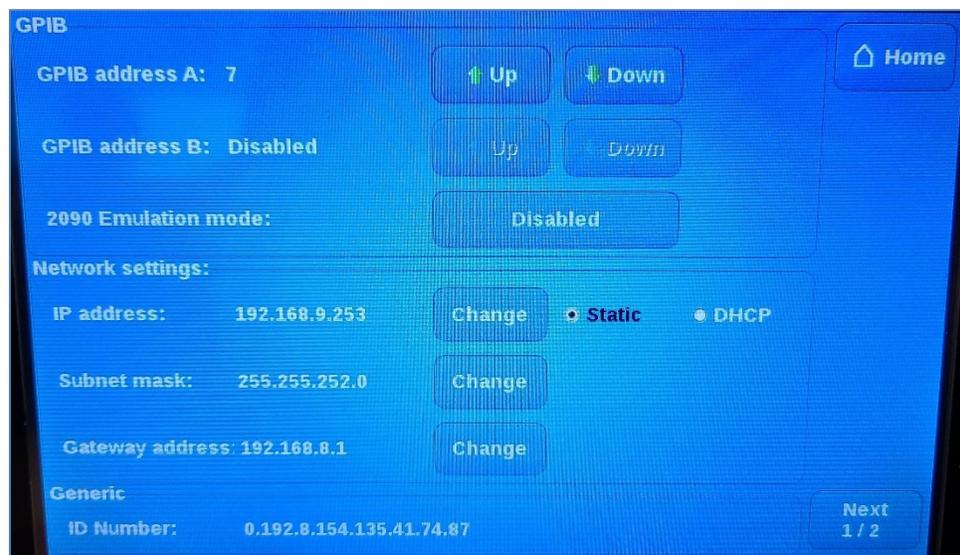
6.3.3. Copy onto USB

Insert the USB into your computer and pay attention to which driver letter it is using. Copy the .ENC incremental file onto the FAT32 USB using the Windows File Explorer.

Once the Windows File Explorer has finished copying the program onto the USB, you can close the program and eject the USB out of your laptop.

6.4. ***DEPRECATED*** Install Incremental Update

1. Take a picture of the CONFIG page that has the GPIB and Network settings:



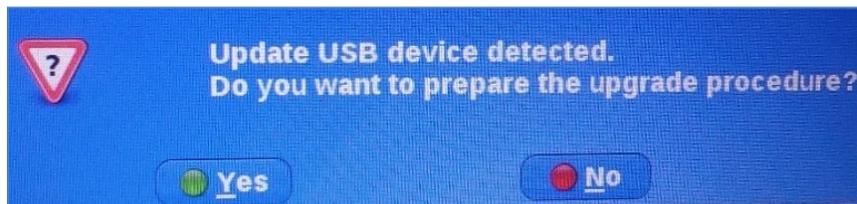
CAUTION: Updating the EMCenter replaces the entire contents of the “hard drive” of the EMCenter. Therefore, the TCP/IP network and/or GPIB address settings are completely reset to default.

2. Unplug unrelated USB, hard drives, or memory cards to prevent confusion and accidental deletion of data.
3. Turn ON the EMCenter and wait until it gets to the main screen.



WARNING: During the following process, it is critical that you do NOT unplug, power down, or restart the EMCenter until specifically instructed to do so later in the instructions. Losing power during these steps can seriously damage the EMCenter.

4. Plug in the USB stick with the incremental installer on it. The following box will appear when the USB is detected; click YES to prepare the download.



- d. Once you have downloaded the incremental update, you may remove the USB.
- e. REBOOT, sometimes the new incremental update does not appear available until the power cycles completely.

6.5. ***DEPRECATED* List of Version Numbers for X86 Final Update**

The table below shows the final incremental version numbers compatible as of *INC_2020_04_07*; see **section 6.3** for the final incremental firmware download link.



CAUTION: The X86 EMCenter processor has been deprecated and will no longer receive any firmware updates.



CAUTION: If any EMCenter part is not updated in the expected way, its hardware model may not be compatible with the latest updates. Please email software.support@ets-lindgren.com with an image of your EMCenter info page and the attempted incremental link for further instruction.

| Hardware Name | Part number(s) | Version # |
|-------------------------------------|---|-----------|
| EMCenter Processor CPU - X86 | 7000-006, -007 ** Deprecated, no longer receiving updates ** | 3.3.16 |
| EMCenter, Backplane | 7000-006, -007 | 2.3.0 |
| EMCenter, Display | 7000-006, -007 | 1.3.3 |
| EMSwitch Card | 7001-001, -002,-003, -004, -005, -011, -012, -013, -015, -021, -022 | 4.3.1 |
| EMPower Card | 7002-001 | 5.3.2 |
| EMPower Probe | 7002-002, -003, -004, -005 | 2.60 |
| EMPower Sensor ETSI | 7002-006 | 3.69 |
| EMGen Card | 7003-001 | 2.6.4 |
| EMControl Card | 7006-001 | 2.6.3 |
| EMSense Card, Battery | 7007-001 | 2.6.3 |
| EMSense Card, Laser | 7007-002 | 2.6.3 |
| EMField, Supply card | 7008-100 | 1.2.4 |
| EMField, Amplifier board | 7008-001, -002, -003, -004, -005, -006, -007, -008 | 2.0.10 |
| EMField, Back panel | 7008-001, -002, -003, -004, -005, -006, -007, -008 | 2.4.1 |