

SYSTEMS ENGINEERING

HMI BACKUP AND RESTORE REFERENCE

WISVCUP APPLICATION

25. June 2024

With the Maple Systems HMI, the M4510 and S4520 PLC programs, setup parameters (including the timing channel setpoints) can be uploaded and **saved TO** the HMI. Once the upload is complete, this information can be **exported TO** an "expanded memory" file (.emi) on a USB thumb drive.

The PLC programs, setup parameters (including the timing channel setpoints) can also be downloaded and **restored FROM** the HMI or from an "expanded memory" file (.emi) on a USB thumb drive. This will essentially put the controller back to the previous state in a short amount of time (generally within a couple of minutes).

The PLC programs, setup parameters (including the timing channel setpoints) can also be **imported FROM** an "expanded memory" file (.emi) on a USB thumb drive. This allows the data to be updated in the HMI without having to upload it from the controller.

There are NO restrictions on UPLOADING FROM the M4510 or S4520 controllers. This function can be performed at any time. The **ONLY restriction for DOWNLOADING** is the **completion of an UPLOAD to 100%, otherwise the DOWNLOAD function will NOT be executed.**

UPLOADING is the process of **READING DATA FROM** the controller. This is a two step process which involves first uploading the PLC program and then the setup (and timing channel setpoint) data.

When TO perform a PROGRAM and/or DATA UPLOAD FROM the controller to HMI:

1. HMI initial installation or replacement of HMI (PROGRAM and DATA upload)
2. After a program update has been performed on the controller, external to the HMI (PROGRAM upload only)
3. As advised by Systems Engineering Technical Support

When NOT TO perform a PROGRAM and/or DATA UPLOAD FROM the controller to HMI:

1. M4510 PLC/PLS Rack or Replacement.
2. S4520 CO-CPU Replacement.
3. Module FAULTED (program corrupt)

When the HMI is initially installed or replaced it is important to normalize the data between the controller and the HMI. This is the process of **UPLOADING** the PLC program and setup **DATA FROM the M4510 and S4520**. The **UPLOAD** process can be done at anytime, including while the machine is in production. **Uploading the PROGRAM can take up to about 20 minutes to complete (each). This process should NOT be interrupted once started.** Uploading the **DATA** is completed in about 90 seconds or less, depending on the number of setup parameters and timing channel setpoints needed to upload. This process should NOT be interrupted once started.

NOTE: Anytime a setup parameter is changed through the HMI, the data is written to the M4510 or S4520, as well as saved to non volatile memory in the HMI. Therefore it is only necessary to perform a DATA UPLOAD at the initial installation or replacement of the HMI.

DOWNLOADING is the process of **WRITING DATA TO** the controller. This is a two step process which involves **FIRST** downloading or restoring the **PROGRAM** and then, **IF NECESSARY**, downloading and restoring the setup data (including the timing channel setpoints) .

WARNING: DOWNLOADING or restoring the PLC program or setup data to the controller should **ONLY** be done with the **MACHINE STOPPED!** This is especially true if the PLC program were to be restored as program execution is halted and **ALL OUTPUTS are turned Off.**

NOTE: If an S4516 or S4516-DF1 communications board is installed in the rack, a power cycle to the rack is required to properly reinitialize the board after downloading is complete.

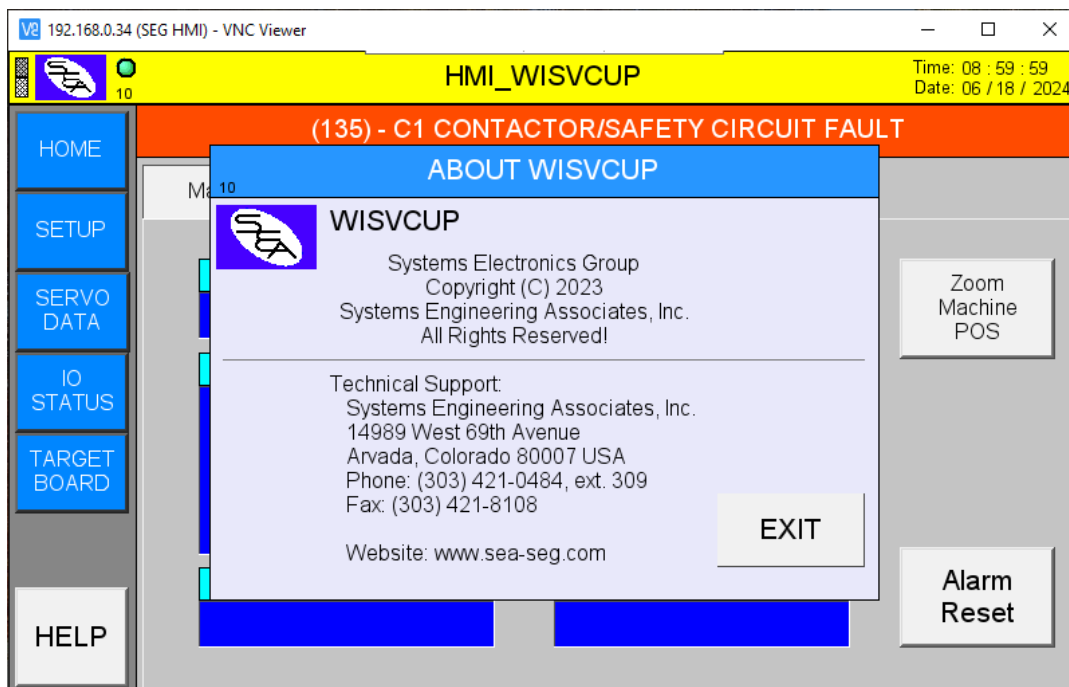
When TO perform a PROGRAM and/or DATA DOWNLOAD TO the controller:

1. M4510 PLC/PLS Rack Replacement (PROGRAM AND DATA download)
2. S4520 CO-CPU Replacement (PROGRAM AND DATA download)
3. Unrecoverable module Fault - program corrupt (PROGRAM download and possibly DATA download)
4. As advised by Systems Engineering Technical Support

When NOT TO perform a PROGRAM and/or DATA DOWNLOAD TO the M4500 controller:

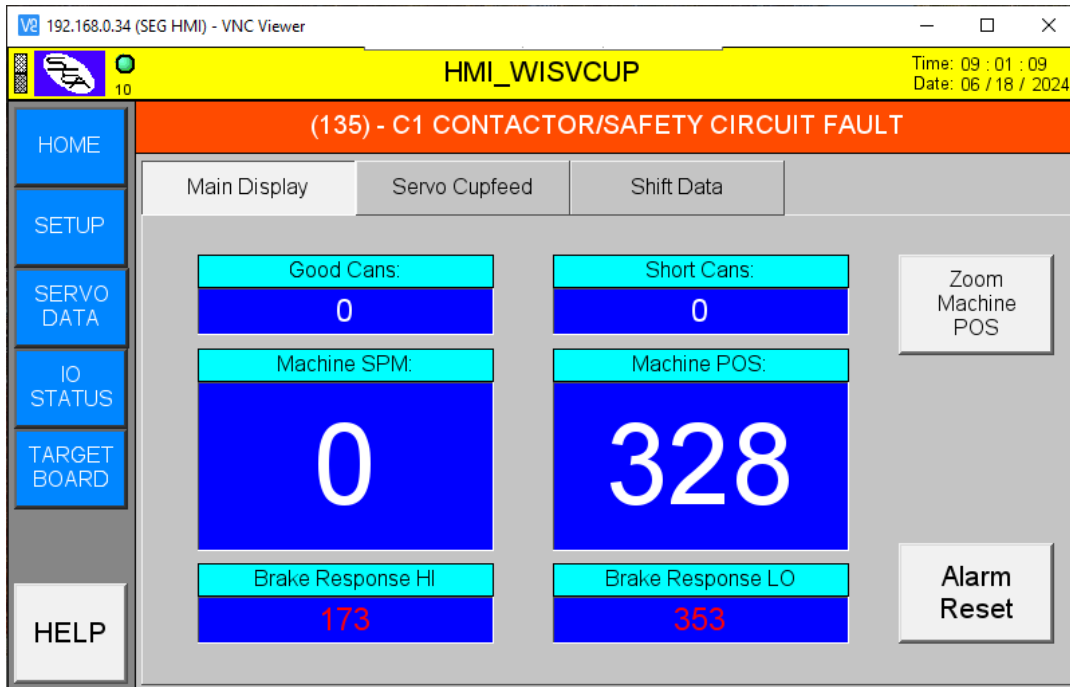
1. While machine is in production or running. Machine must be stopped for any type of download.
2. A **DATA DOWNLOAD** is **NOT** necessary if restoring a corrupted PLC program unless these values have also been corrupted.

NOTE: Selecting the "SEA" icon in the upper left corner of any screen will display information about how to reach Systems Engineering Technical Support.

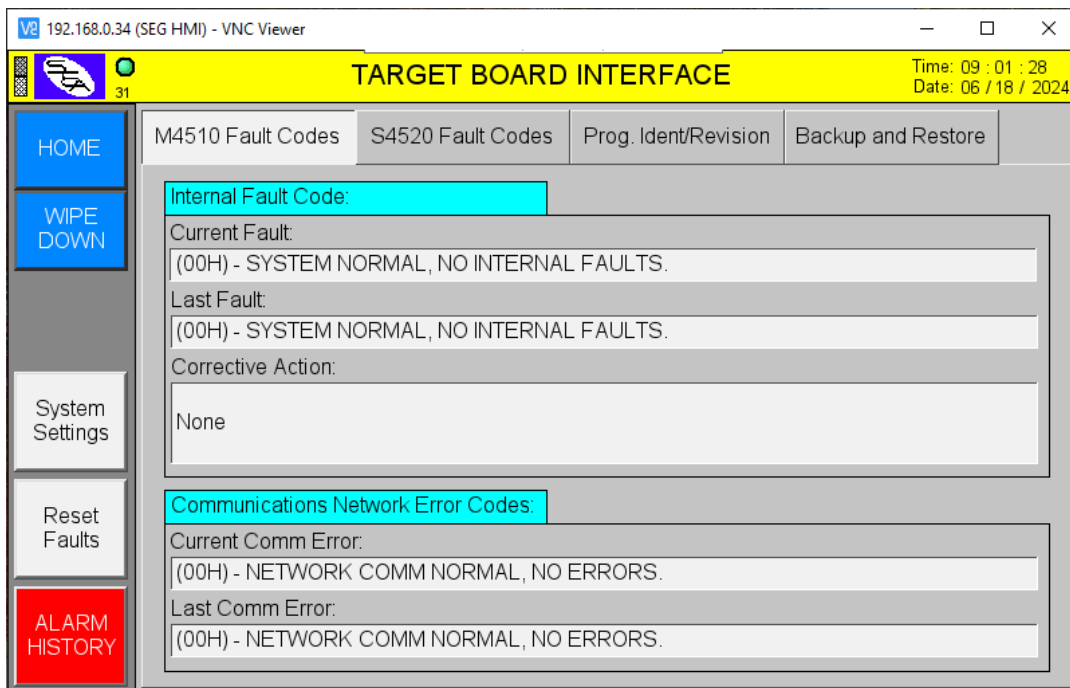


Perform the following to **UPLOAD FROM** the M4510/S4520 using the Maple Systems HMI display:

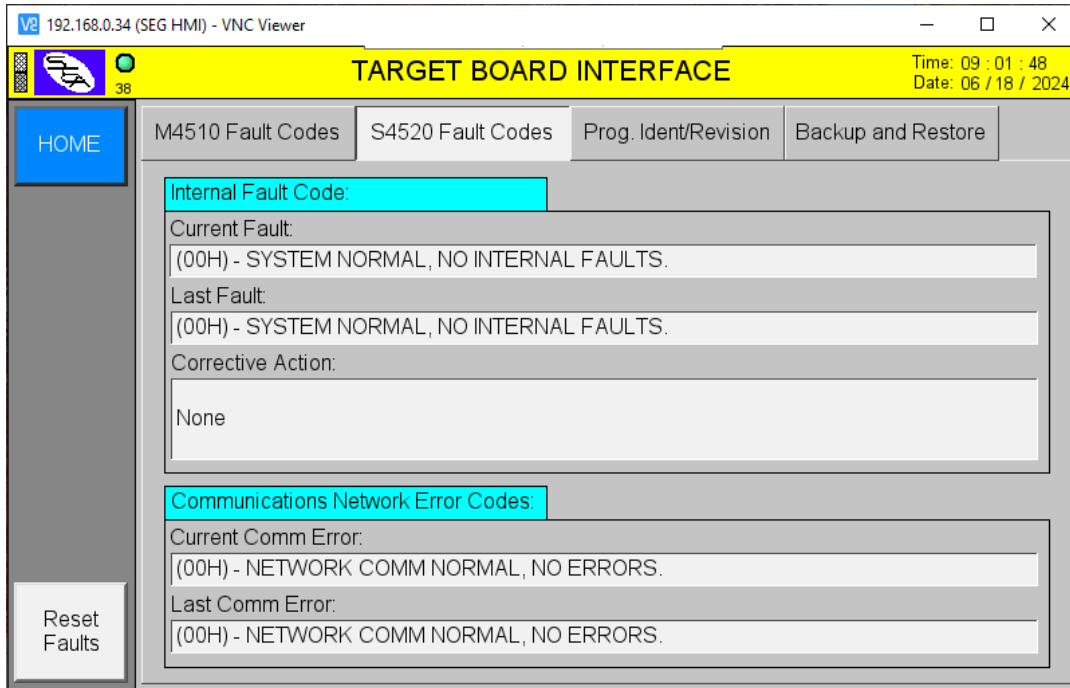
From the **HOME** screen, select **TARGET BOARD**:



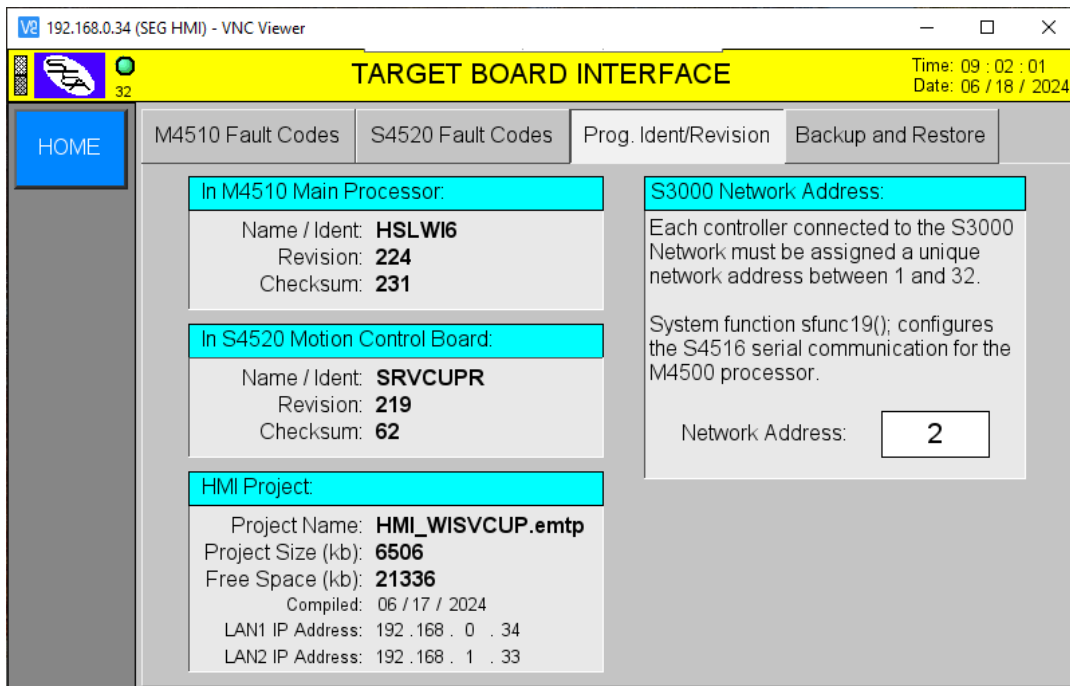
This will initialize to the "M4510 Fault Codes" TAB of the TARGET BOARD INTERFACE display. This will display information about the current fault status of the M4510 controller.



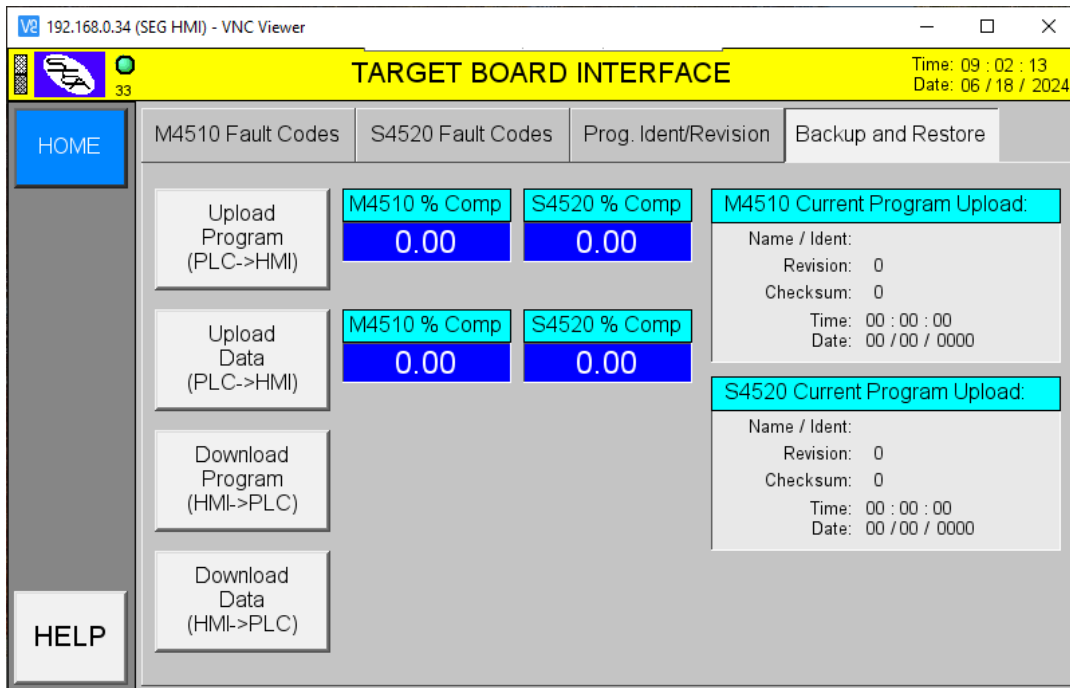
The "S4520 Fault Codes" TAB will display information about the current fault status of the S4520 motion control board.



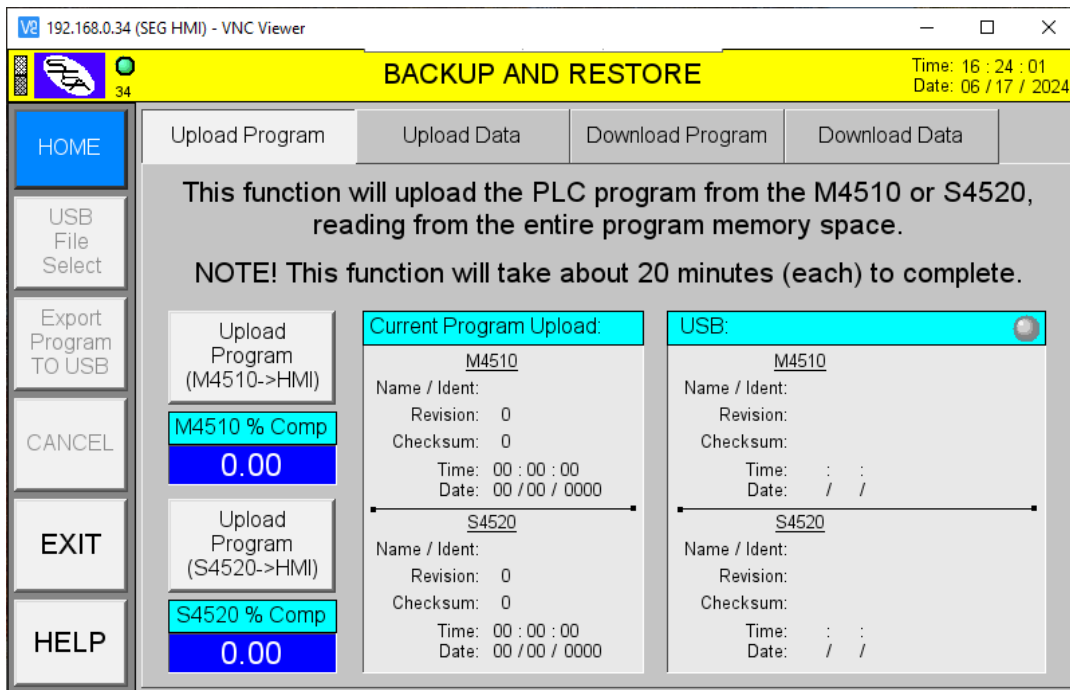
The "Prog Ident/Revision" TAB will show information about the current program loaded in the M4510/S4520 as well as the HMI project:



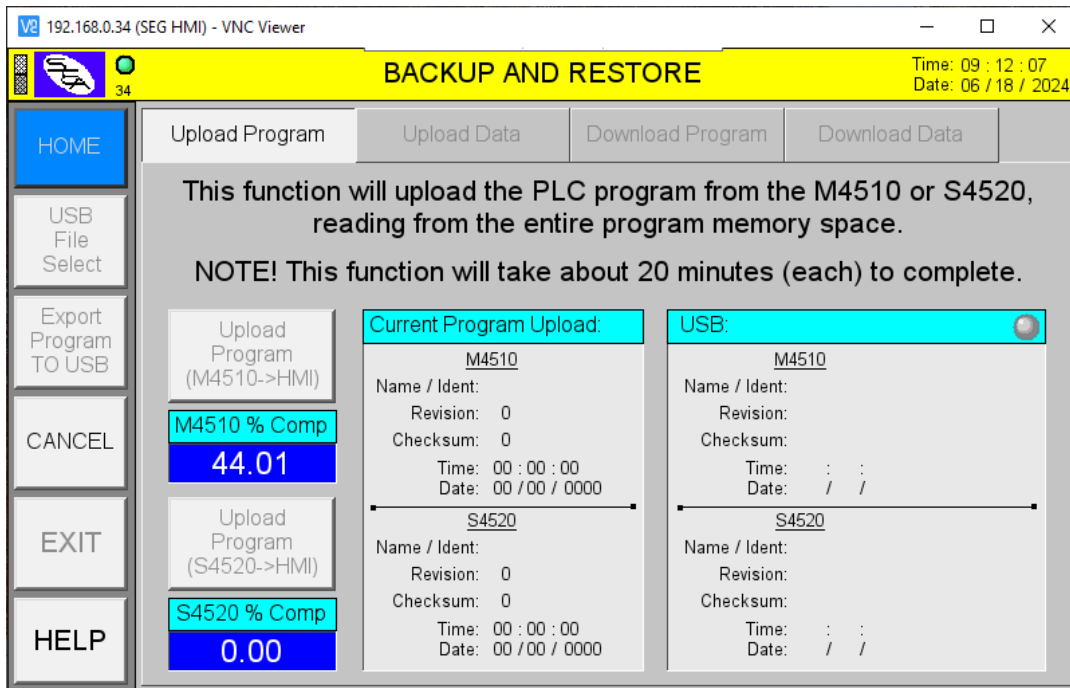
Select the **“Backup and Restore”** TAB. Then select the **“Upload Program (PLC->HMI)”** button:



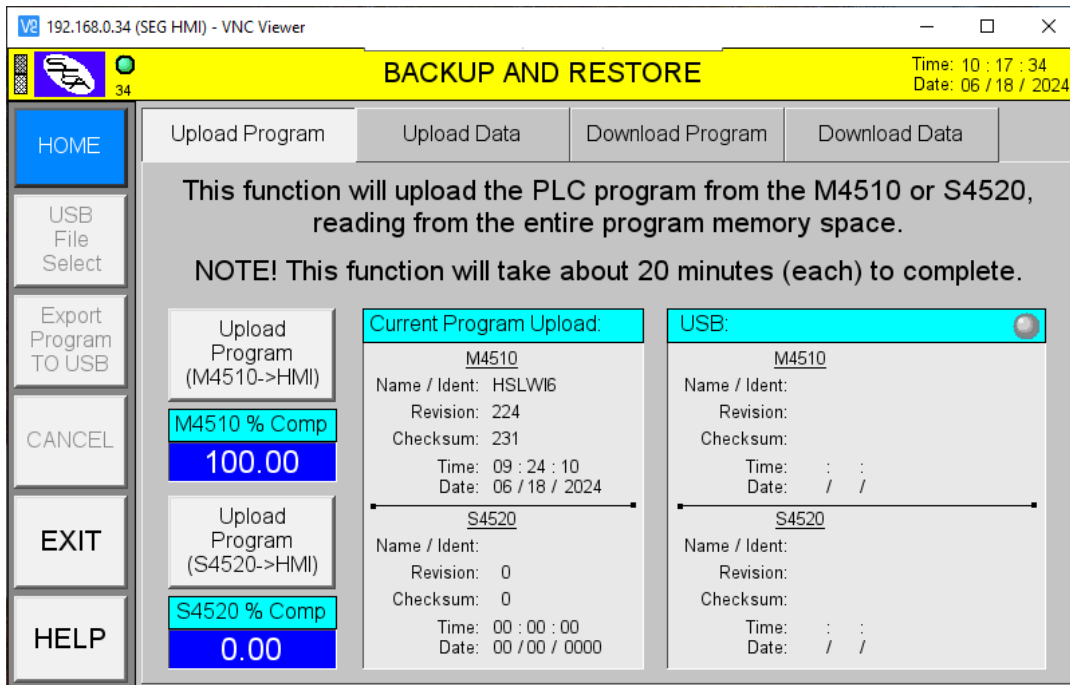
This will initialize to the **“Upload Program”** TAB. Select the **“Upload Program (M4510->HMI)”** button to initiate the UPLOAD process of reading the PLC program memory space from the M4510.



Note: The "CANCEL" button is used to **TERMINATE** the UPLOAD process at anytime.

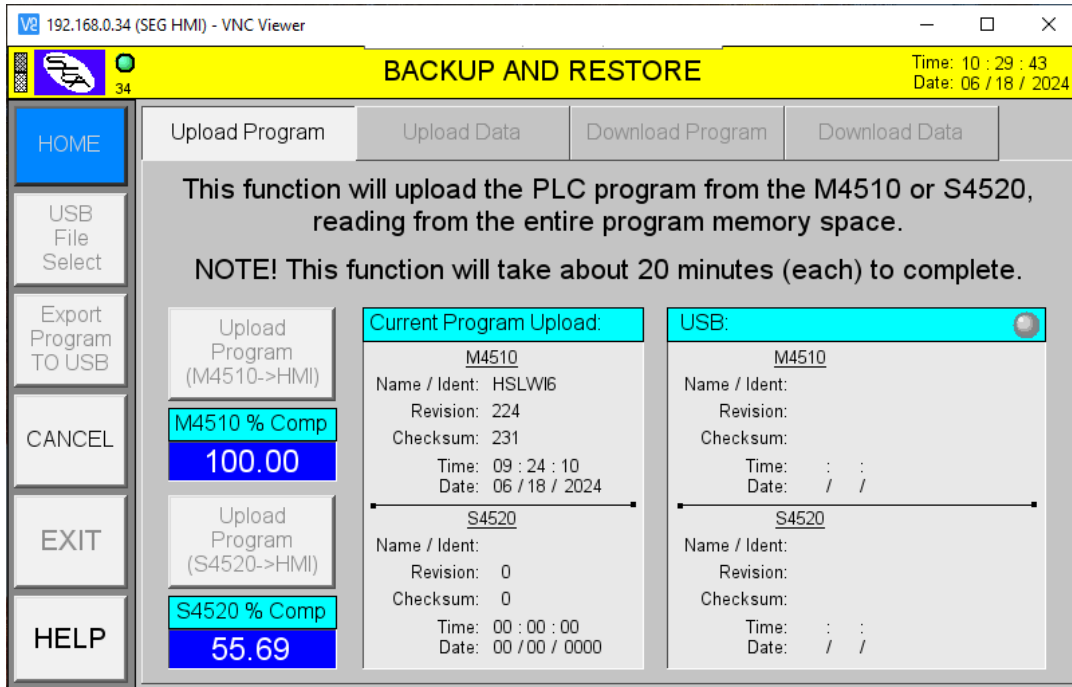


Once the upload for the M4510 is at 100% Complete, the **Current Program Upload** will show the Name, Revision and Checksum of the current program uploaded, as well as a time and date stamp of when it was completed.

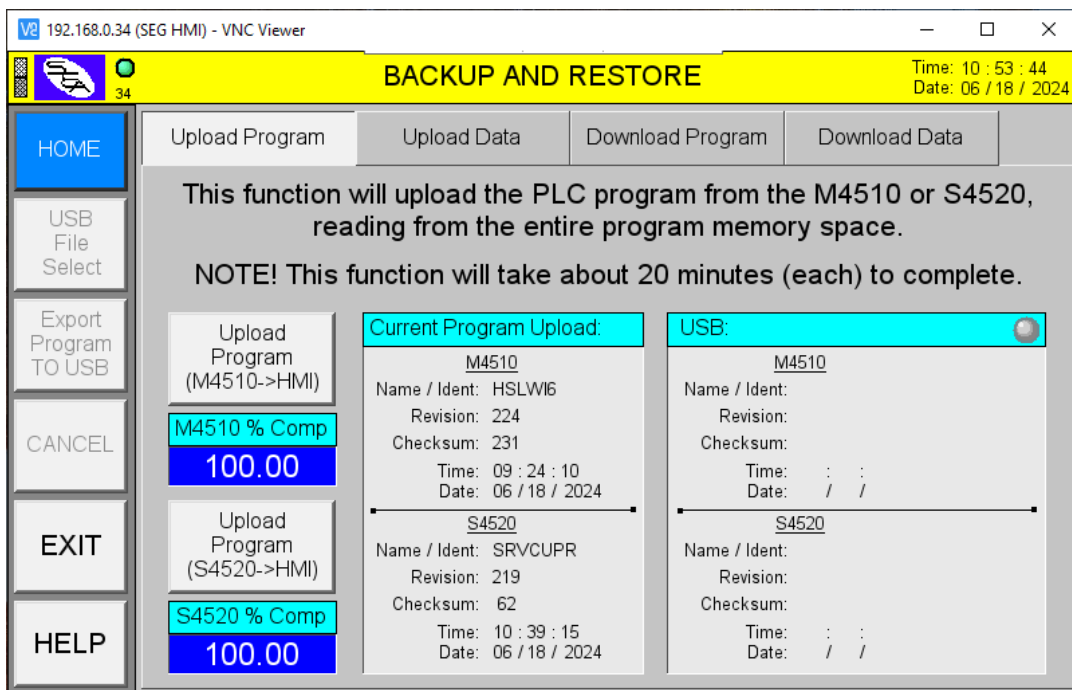


Next, select the **“Upload Program (S4520->HMI)”** button to initiate the UPLOAD process of reading the PLC program memory space from the S4520 Motion Control board.

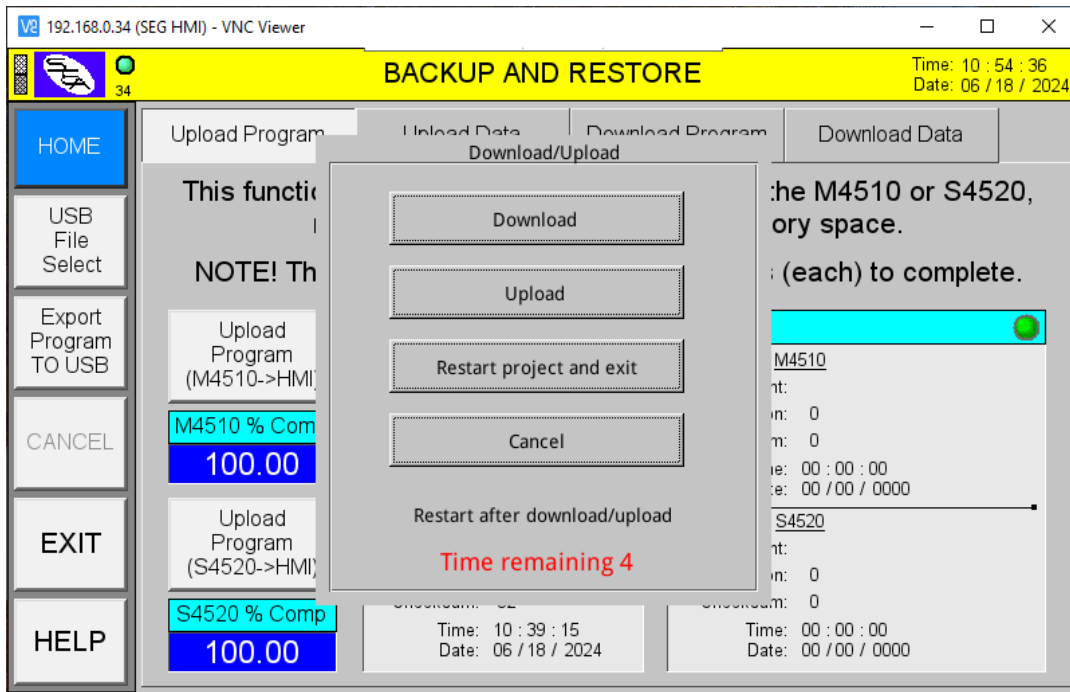
Note: The **“CANCEL”** button is used to **TERMINATE** the UPLOAD process at anytime.



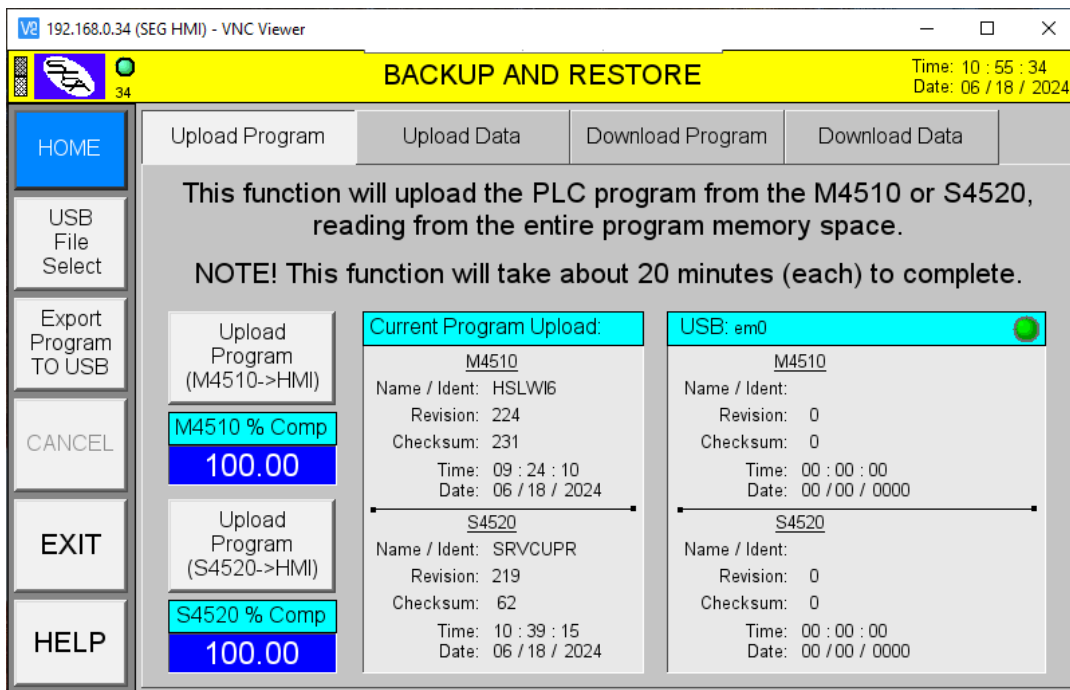
Once the upload is 100% Complete, the **Current Program Upload** will show the Name, Revision and Checksum of the current program uploaded, as well as a time and date stamp of when it was completed.



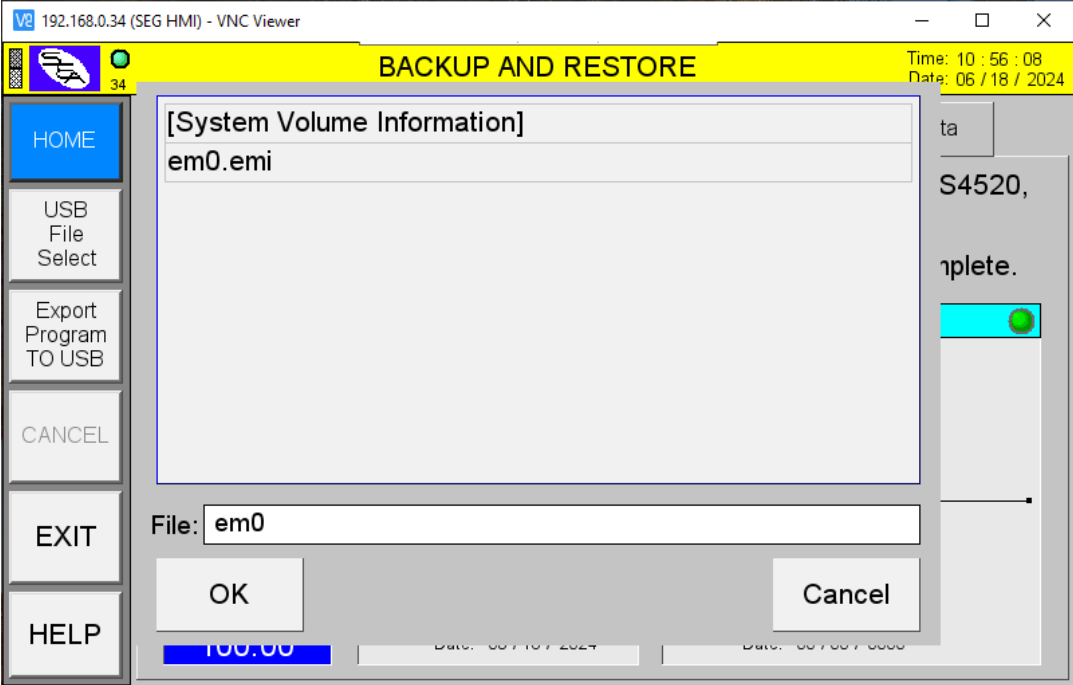
OPTIONALLY, the uploaded PLC program information can be exported to an “expanded memory” file on a USB thumb drive. To perform this function, insert a USB thumb drive into the USB port (located next to the RS-232 serial communications port) on the back of the HMI. Once inserted, a Pop-Up will be displayed to “Download/Upload” to/from the HMI. Select the “Cancel” button to exit or let the inactivity timer expire.



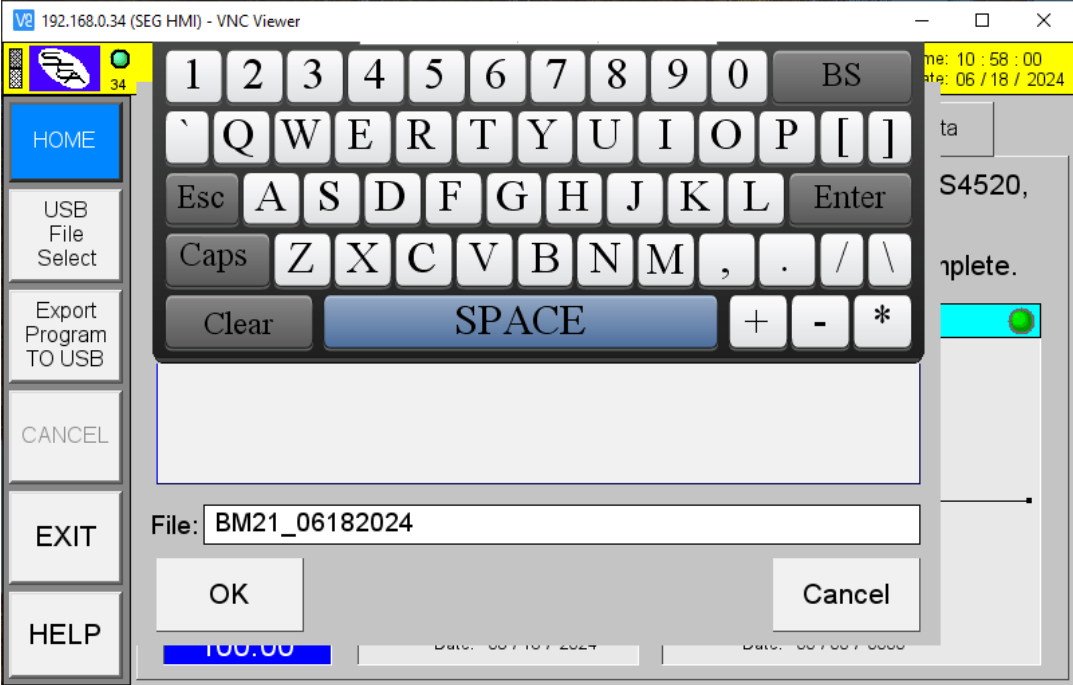
With the USB thumb drive inserted, the “USB File Select” and “Export Program TO USB” buttons become active (buttons are gray when NOT active).



The "USB File Select" button will allow the user to select an existing ".emi" file on the USB thumb drive. This feature does not export the data but can be used to view the details of the program information of the selected ".emi" file. Select the an existing file and the "OK" button or the "Cancel" button to exit the file selection window and return.

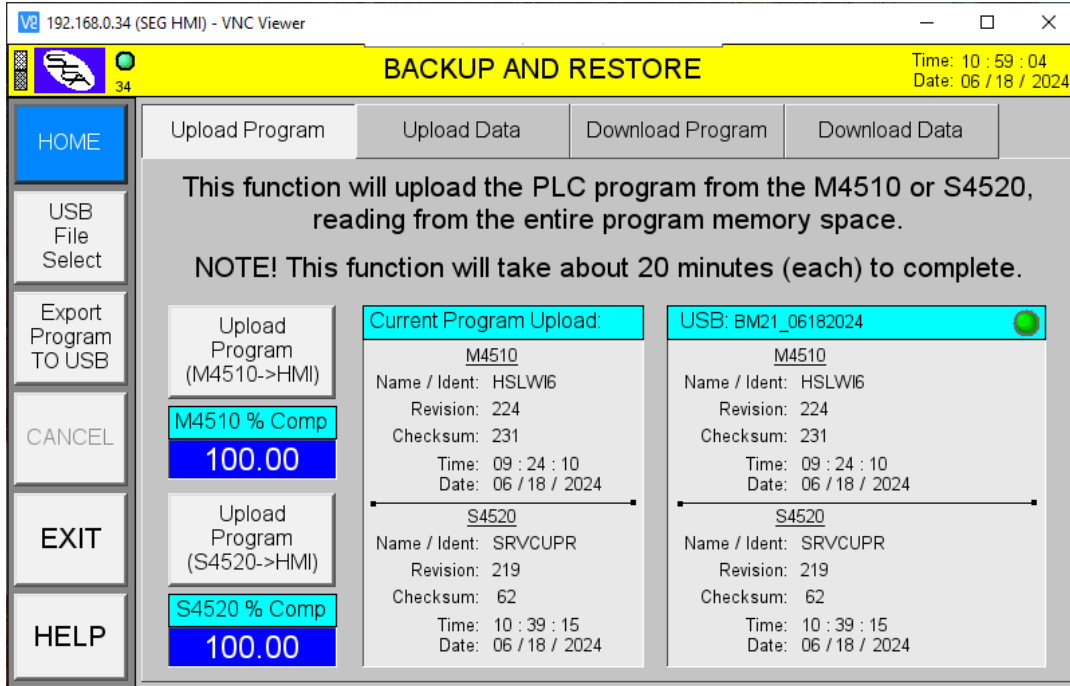


The "Export Program to USB" will allow the user to select an existing ".emi" file or enter in a new name to export the PLC program data. Use the keyboard to enter a new file name and press "Enter". Selecting the "OK" button to initiate the export process. Selecting the "Cancel" button will abort the export process.

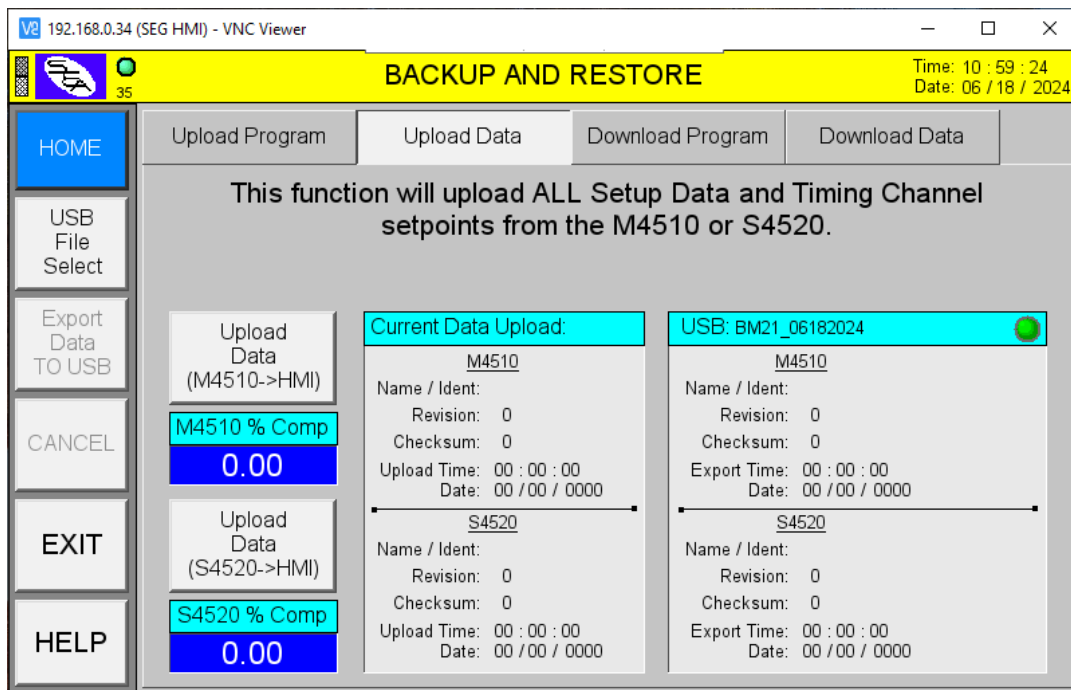


Once the export process is complete, the header for the "USB:" information will display the name of the ".emi" file selected as well as the information of the data area below will match that of the "Current Program Upload".

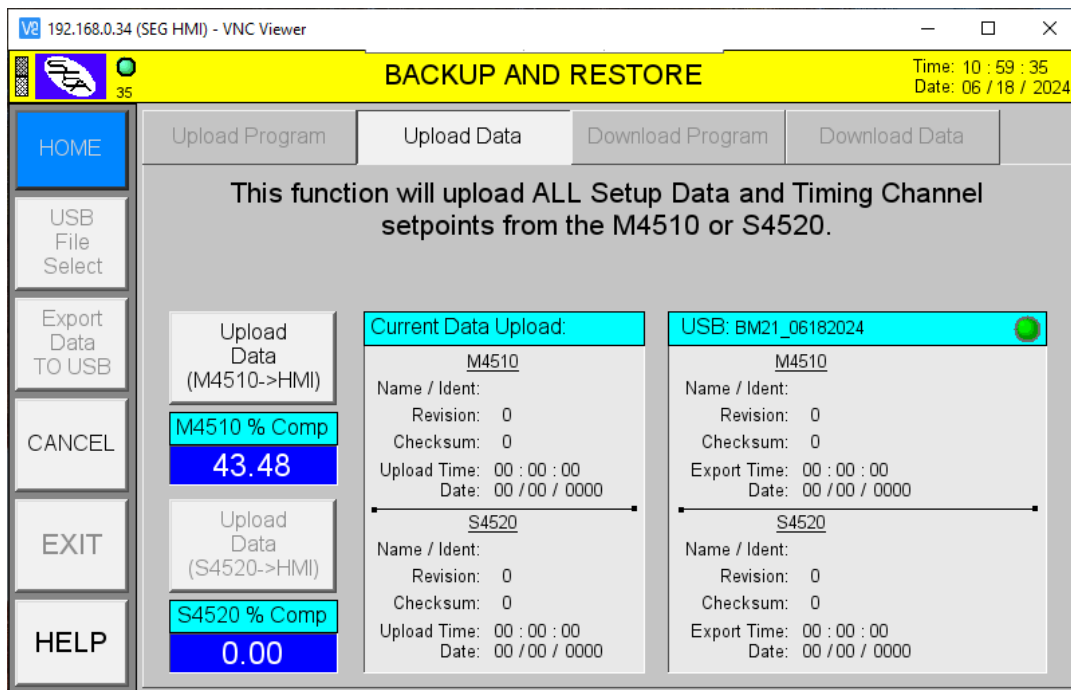
Note: Although the export process has been initiated, it will take a short time to completely write the data to the USB thumb drive. **Be sure to wait about 10 seconds before removing the thumb drive from the USB port to complete the write process.**



Next select the "Upload Data" TAB:



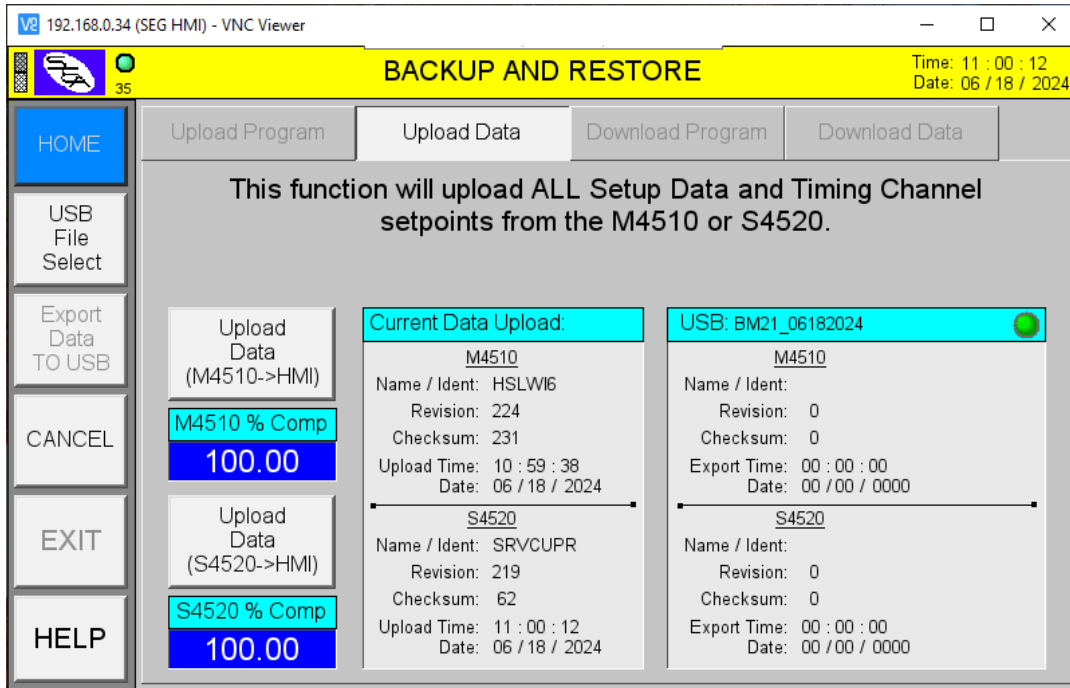
Selecting "Upload Data (M4510->HMI)" or "Upload Data (S4520->HMI)" will initiate the UPLOAD process of reading the setup parameters and timing channel setpoints from the M4510 and S4520 respectively.



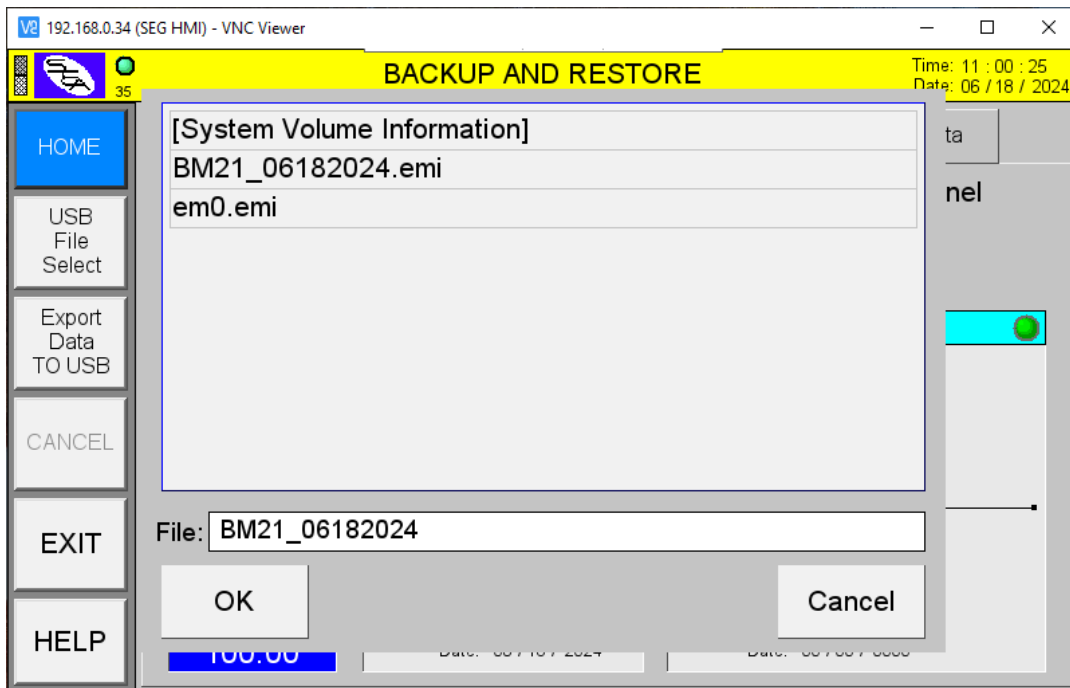
Note: The "CANCEL" button is used to **TERMINATE** the process at anytime.

Once upload is at "100% Complete", the user can:

- Use the "HOME" button to return to the HOME screen.
- Select the "EXIT" button to return to "Backup and Restore".
- "Export Data TO USB"

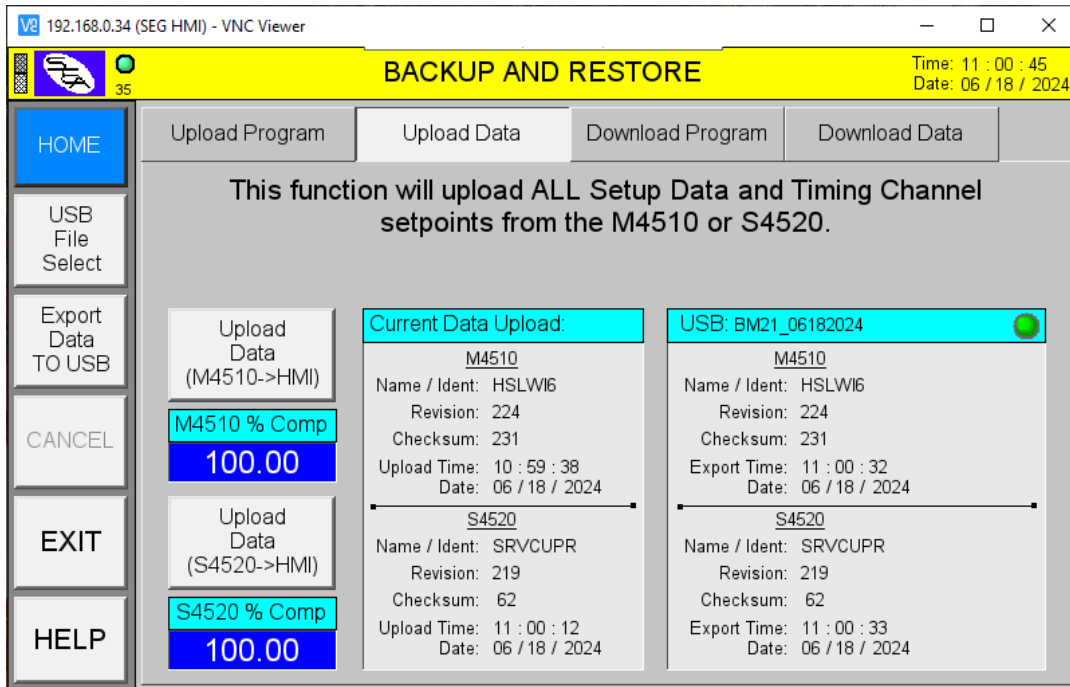


Exporting the "DATA" to the USB thumb drive will function the same as exporting the PLC program data. Ideally, exporting the "DATA" should be done **TO the same file** used for exporting the PLC program data.



Once the export process is complete, the header for the "USB:" information will display the name of the ".emi" file selected as well as the information of the data area below will match that of the "Current Data Upload".

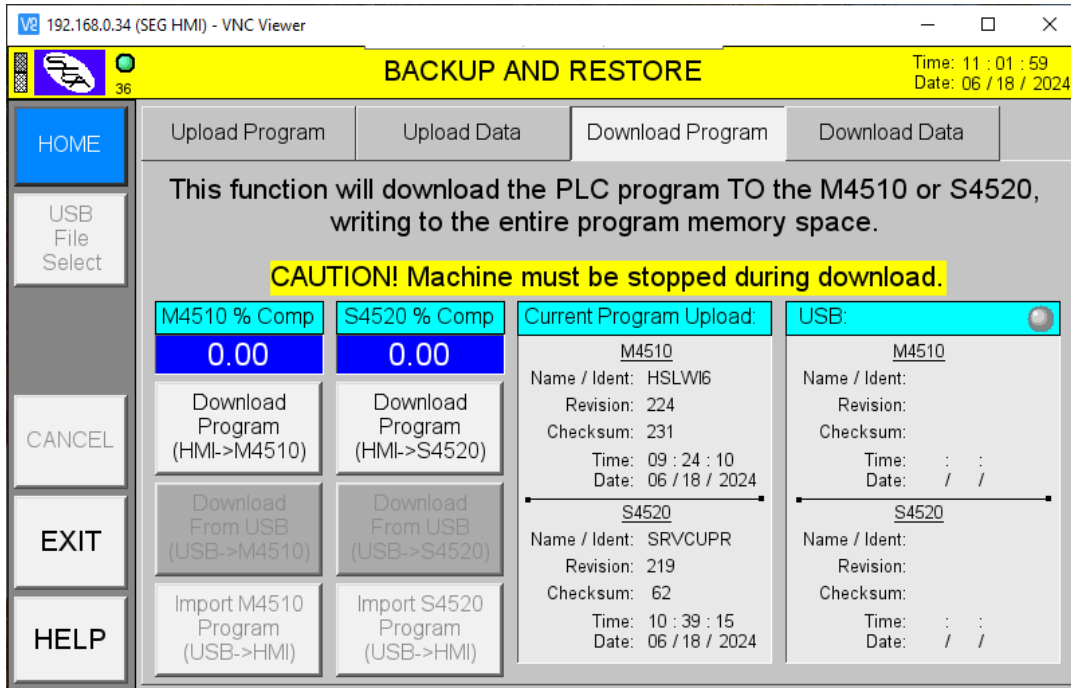
Note: Although the export process has been initiated, it will take a short time to completely write the data to the USB thumb drive. **Be sure to wait about 10 seconds before removing the thumb drive from the USB port to complete the write process.** The time and date stamp is when the export function was executed.



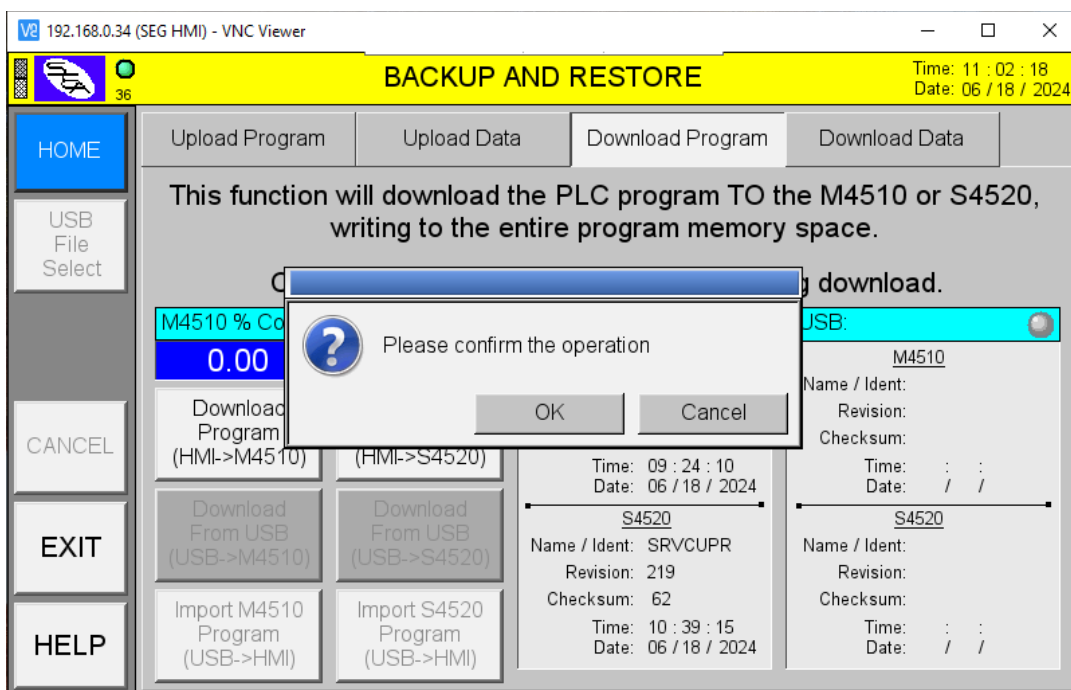
Perform the following to **DOWNLOAD TO** the M4510 / S4520 using the Maple Systems HMI display:

Select either the “**Download Program (HMI->M4510)**” or the “**Download Program (HMI->S4520)**” button.

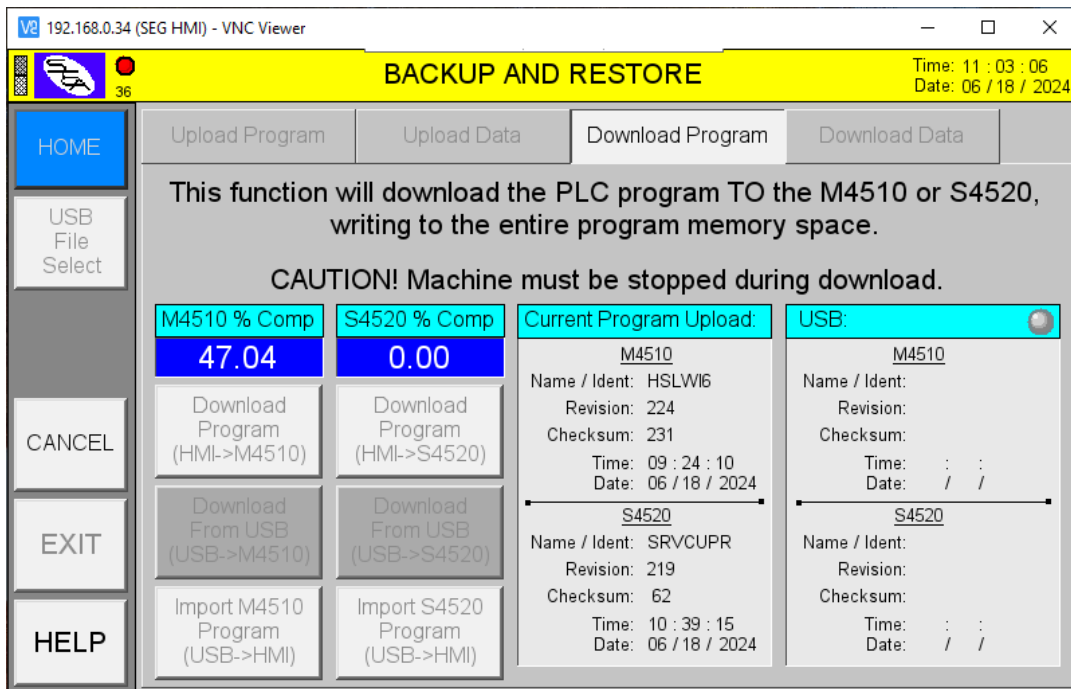
Note: The “**Download**” buttons are only enabled when a complete program upload exists.



Once selected, a popup will be displayed asking to confirm the selected operation. Select “Ok” to initiate the program download.

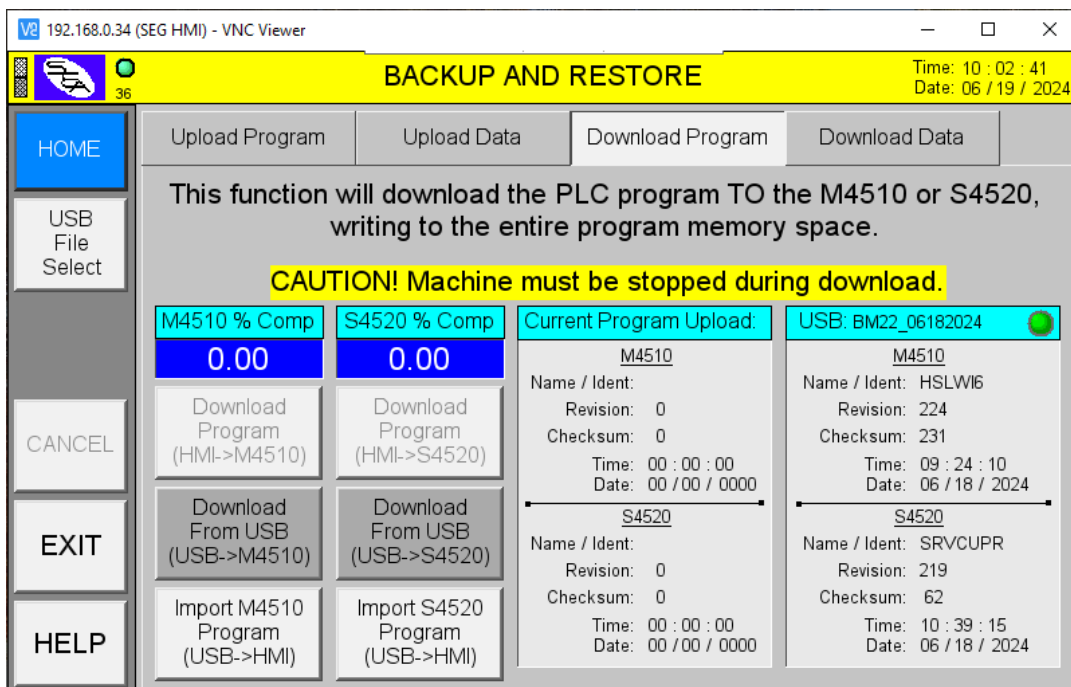


Initiating the DOWNLOAD process will restore (write) the PLC program (previously backed up to the HMI) to either the M4510 or the S4520, respectively. This process should complete in about 90 seconds (M4510 or S4520).

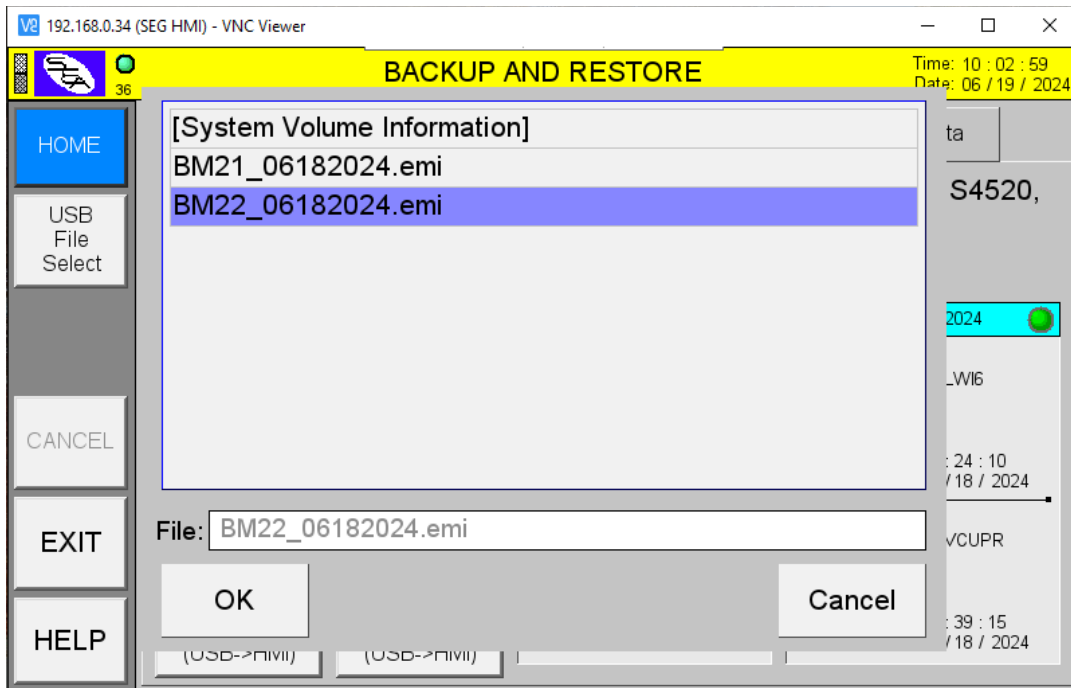


Note: The "CANCEL" button is used to **TERMINATE** the process at anytime.

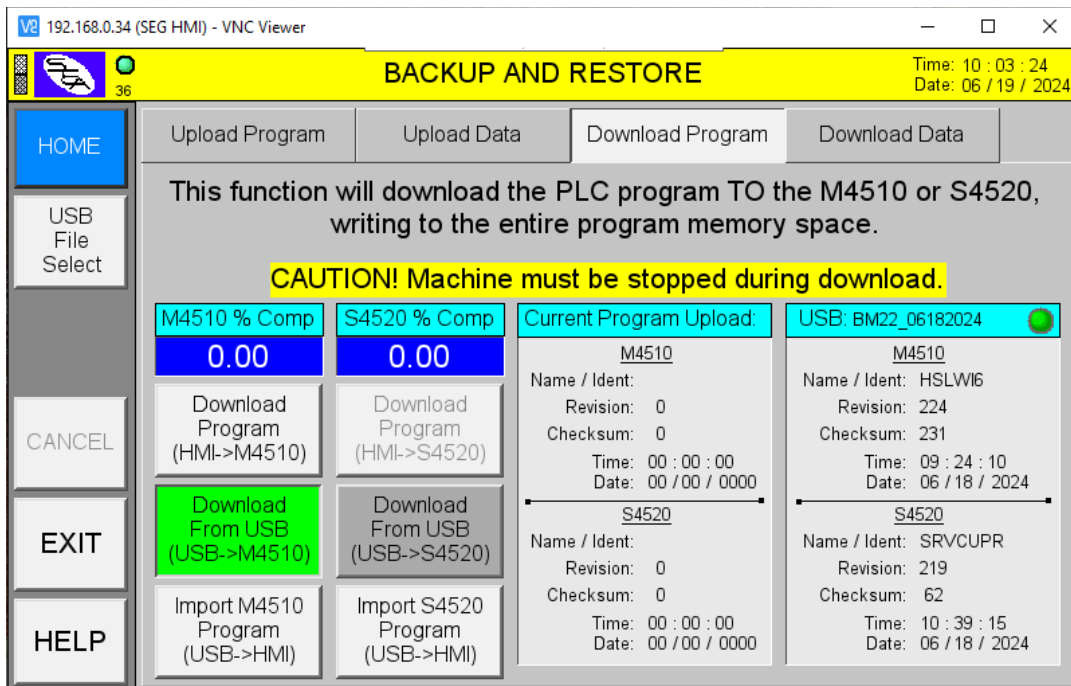
An alternate method would be to download the program from the USB thumb drive connected to the USB port of the HMI. The header of the USB field will display the currently selected file (if one had previously been selected).



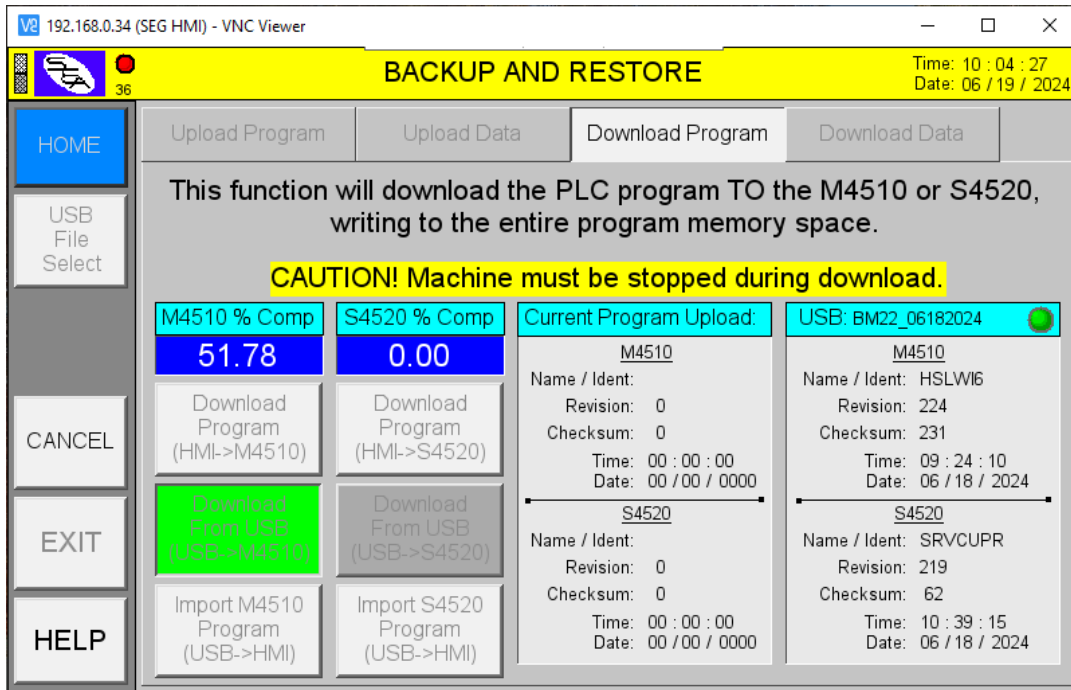
Use the file explorer window to select the desired file and then select "OK".



Select either "Download From USB (USB->M4510)" or "Download From USB (USB->S4520)", only one option can be selected. Then select the respective "Download Program" button to initiate the program download.

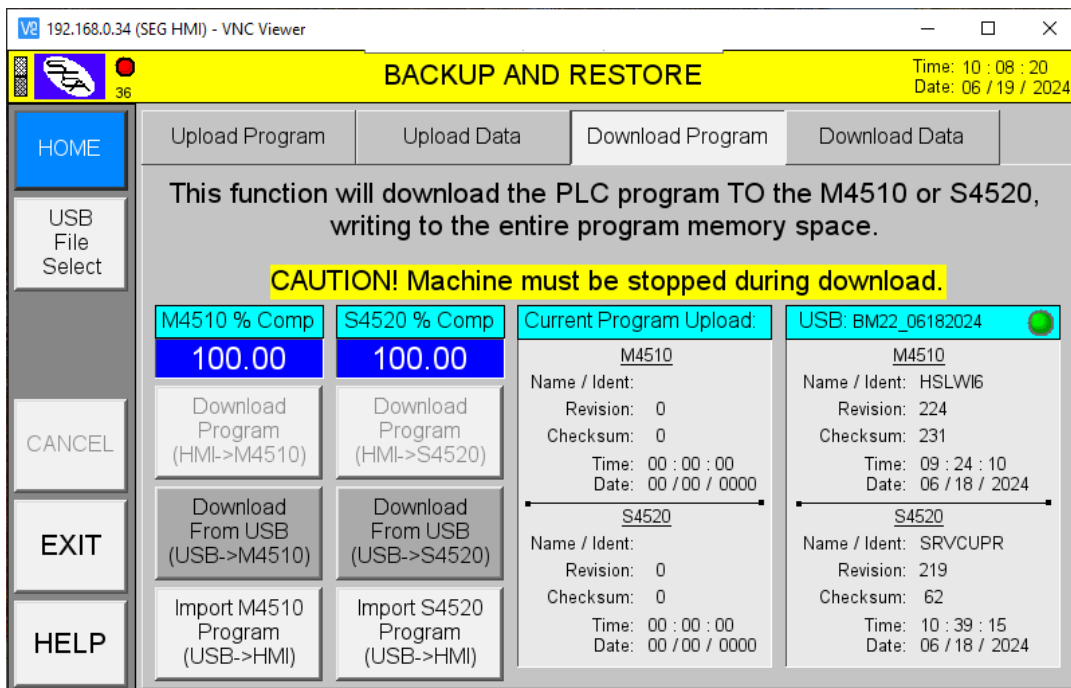


Program download will proceed as before when restoring directly from the HMI. In this case the PLC program data is being restored from the file that was selected from the USB thumb drive.

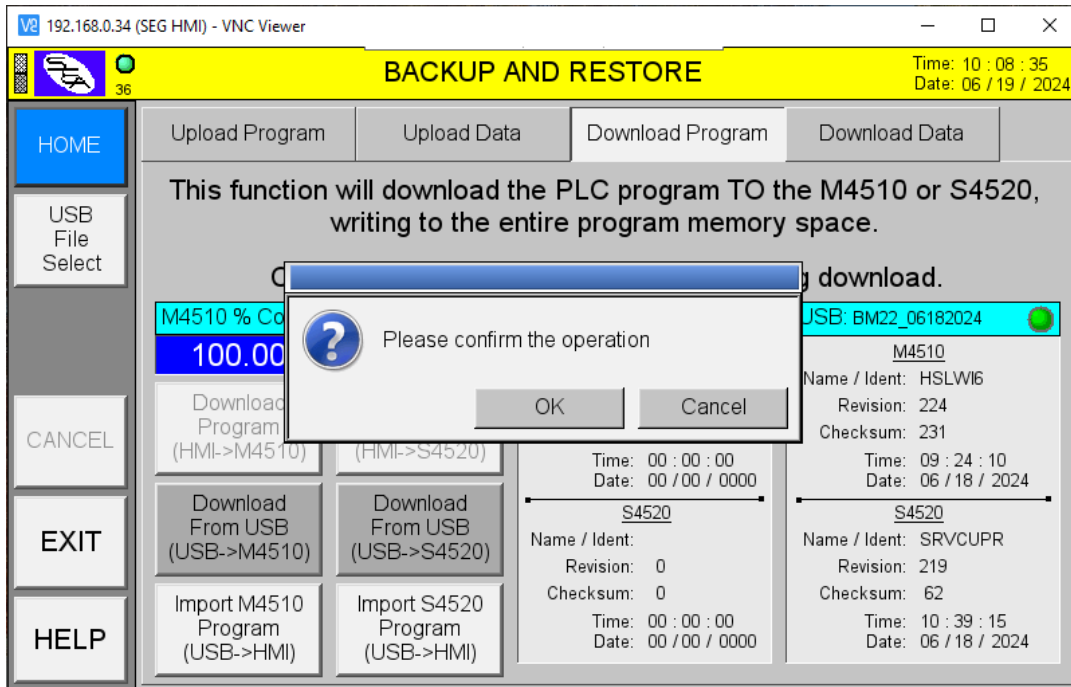


Once the download is 100% Complete, the user can:

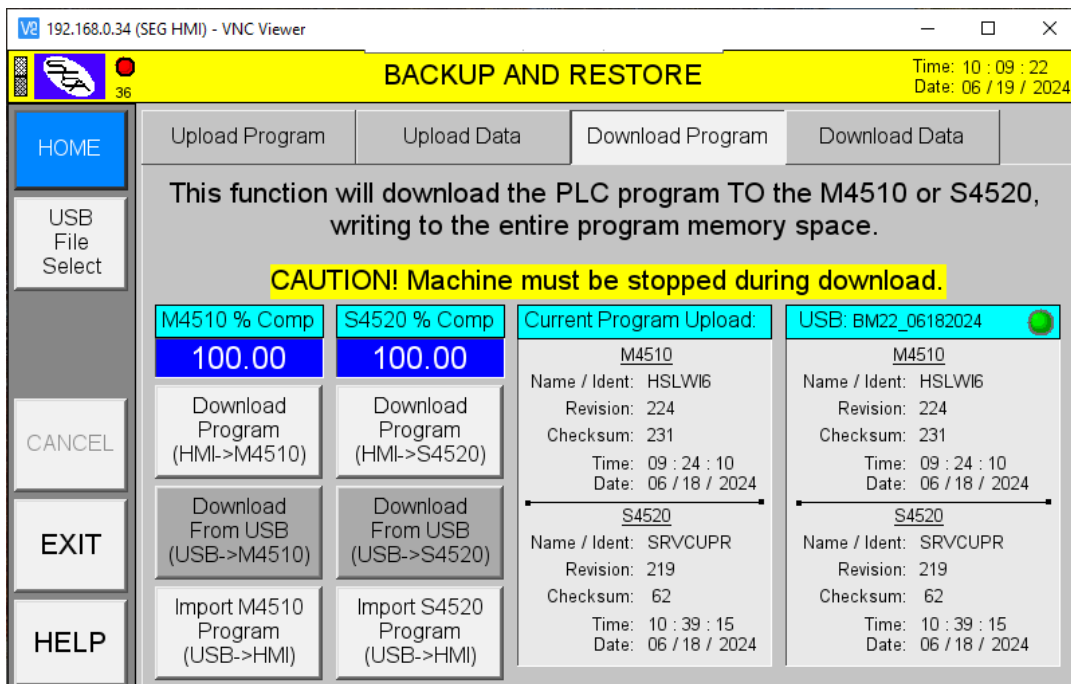
- Use the "HOME" button to return to the HOME screen.
- Select the "EXIT" button to return to "Backup and Restore".
- Select the "Download Data" TAB to restore the setup data.
- "IMPORT (USB->HMI)" the PLC program (M4510 or S4520).



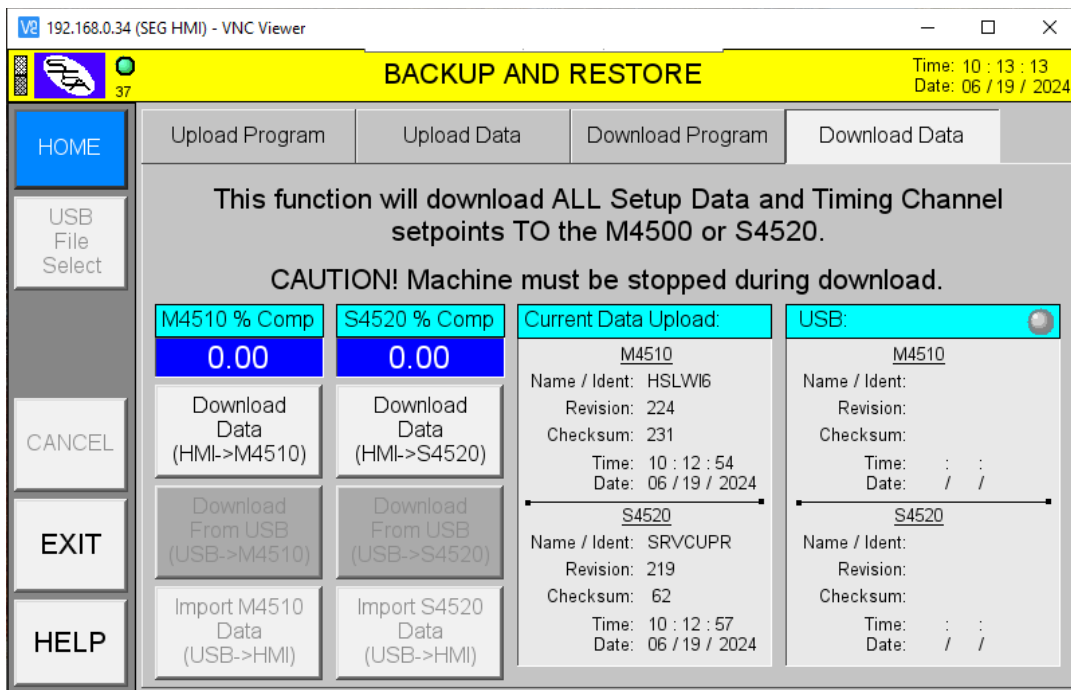
Either or both of the PLC programs for the M4510 or S4520 can be **“IMPORTED”** into the HMI from the selected USB expanded memory file (.emi). A popup will be displayed asking to confirm the operation. Select **“OK”** to import the PLC program data into the HMI. This is particularly useful if the program was downloaded from the USB “.emi” file as it would then be saved to the retentive backup memory of the HMI without having to upload from the respective CPU board.



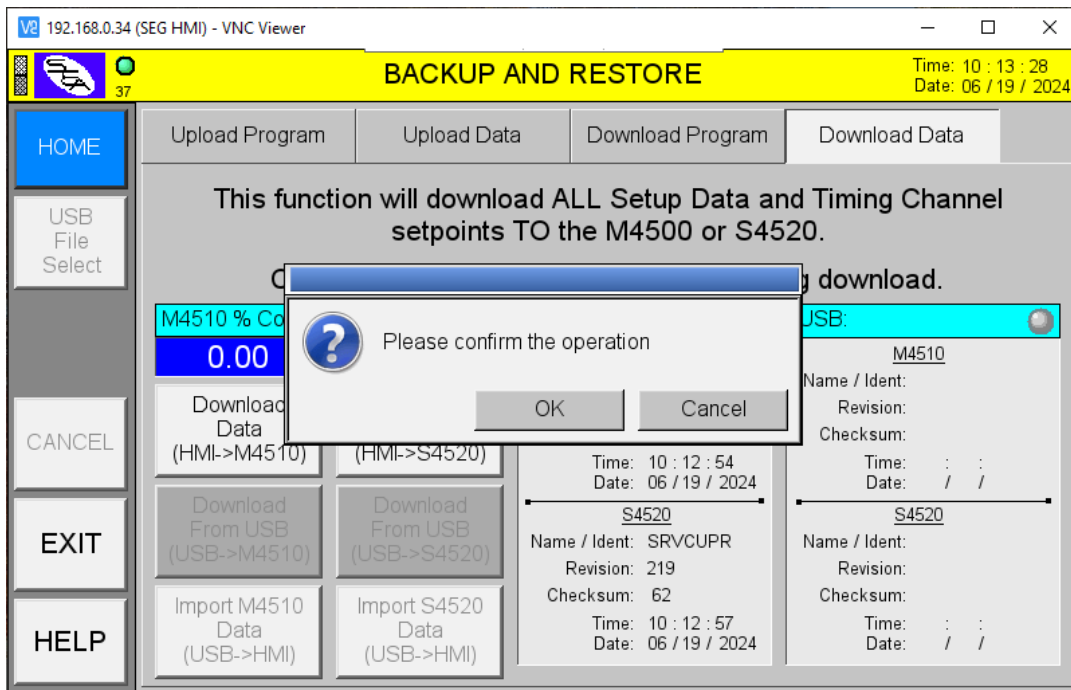
Once the import process is complete, the information regarding the **“Current Program Upload”** will match that of the USB selected/imported “.emi” file.



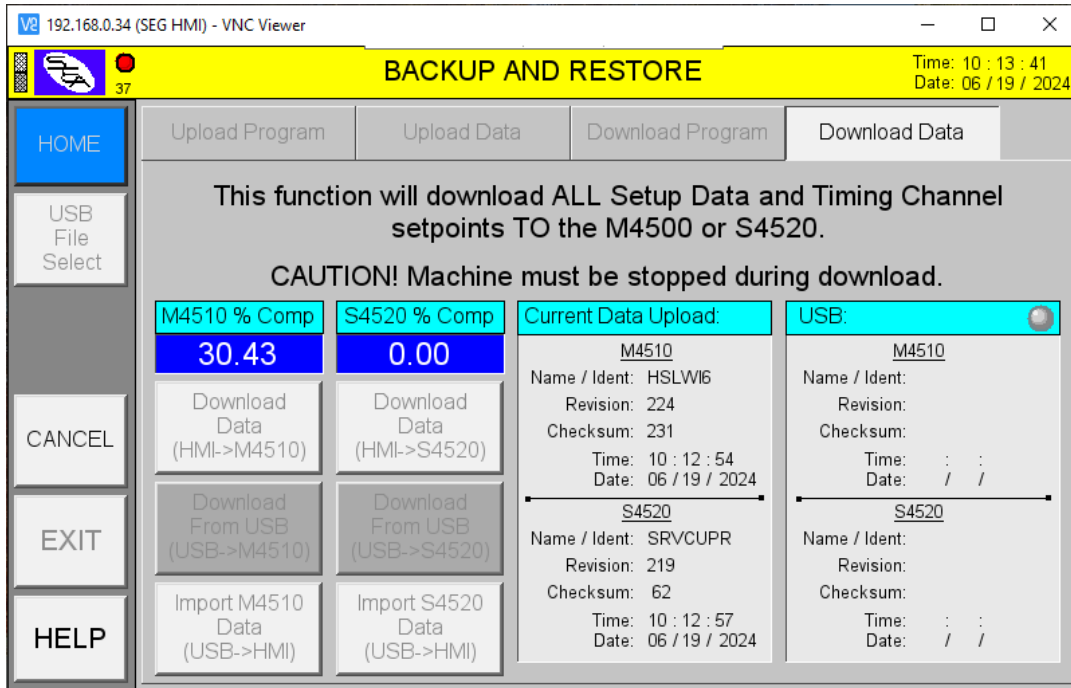
Select the **"Download Data"** TAB to restore the setup variables and timing channel setpoints:



Selecting **"Download Data (HMI->M4510)"** or **"Download Data (HMI->S4520)"** will display a popup to confirm the operation. Select the **"OK"** button to continue and initiate the download process.

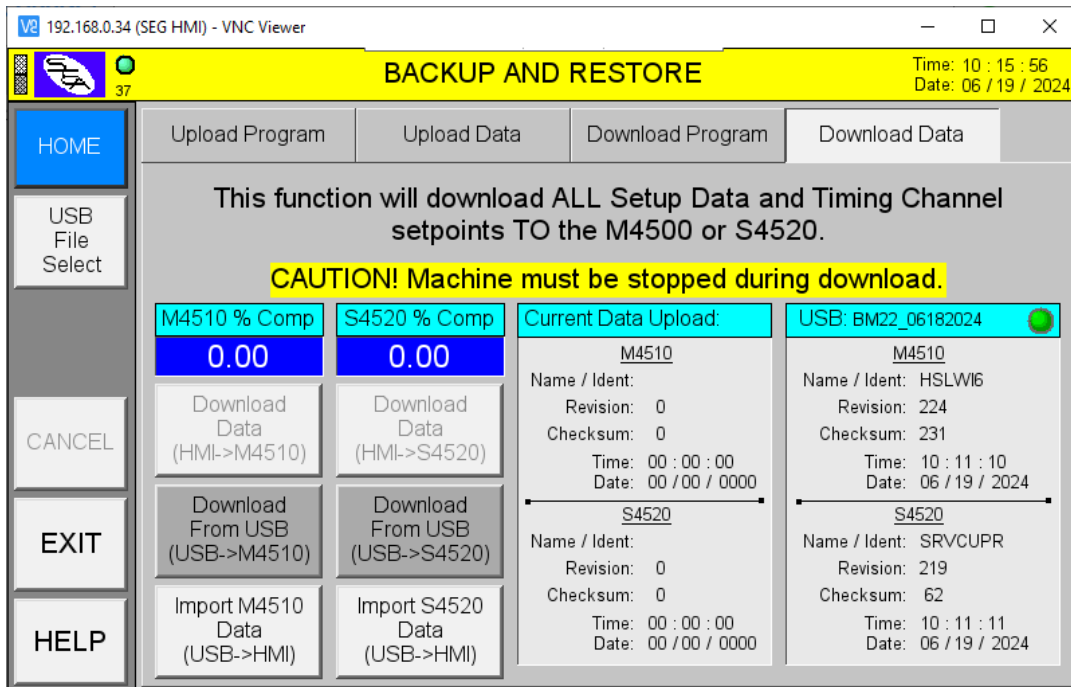


Selecting "OK" will initiate the DOWNLOAD process of writing the setup parameters and timing channel setpoints to the M4510 or S4520, respectively.

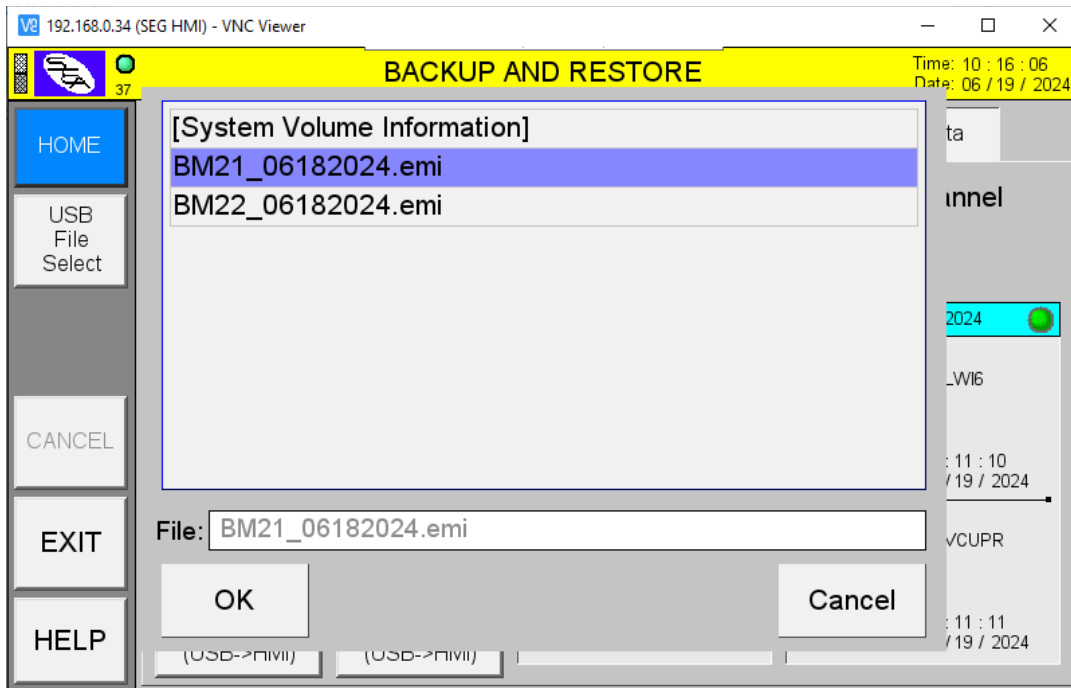


Note: The "CANCEL" button is used to **TERMINATE** the process at anytime.

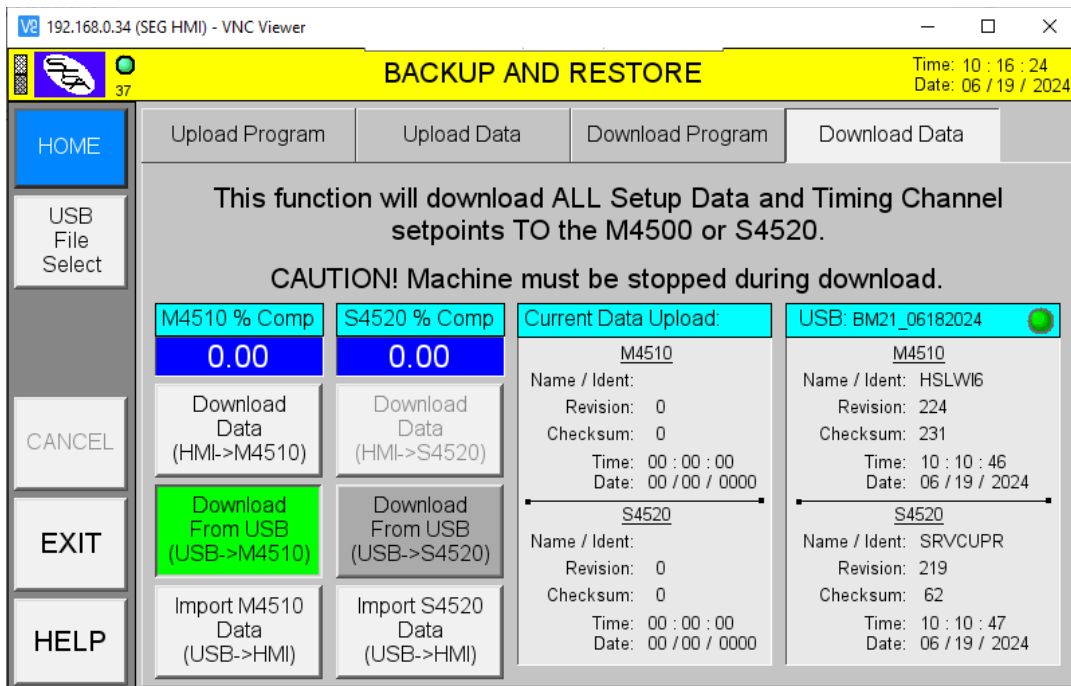
An alternate method would be to download the setup parameters from the USB thumb drive connected to the USB port of the HMI. The header of the USB field will display the currently selected file (if one had previously been selected).



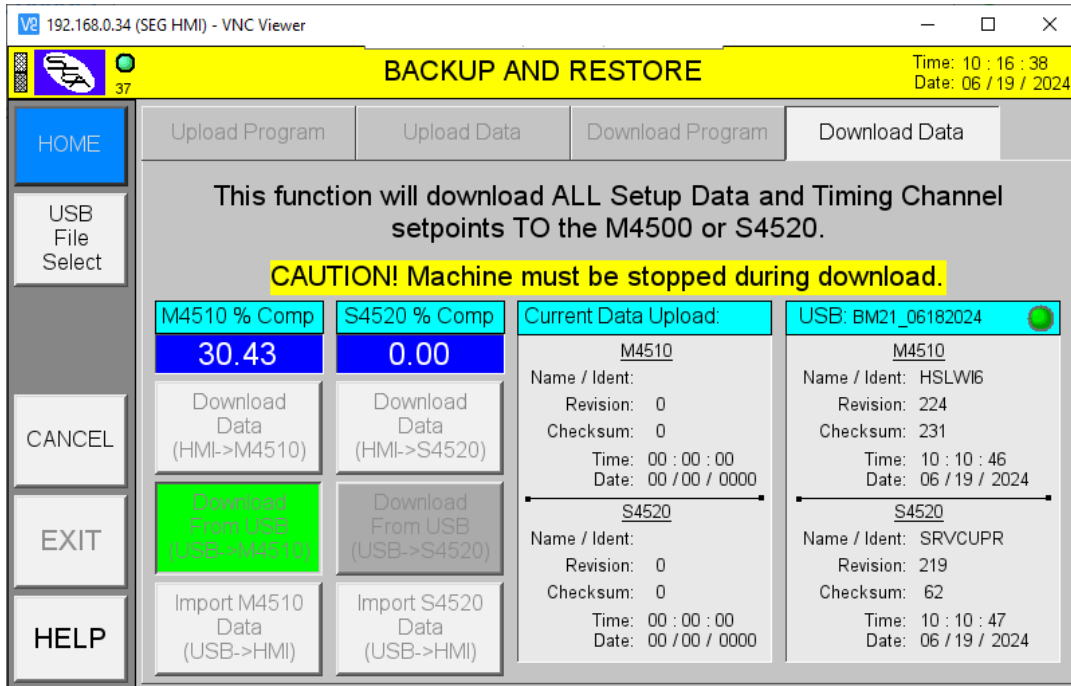
Use the file explorer window to select the desired file and then select "OK".



Select either "Download From USB (USB->M4510)" or "Download From USB (USB->S4520)", only one option can be selected. Then select the respective "Download Data" button to initiate the data download.

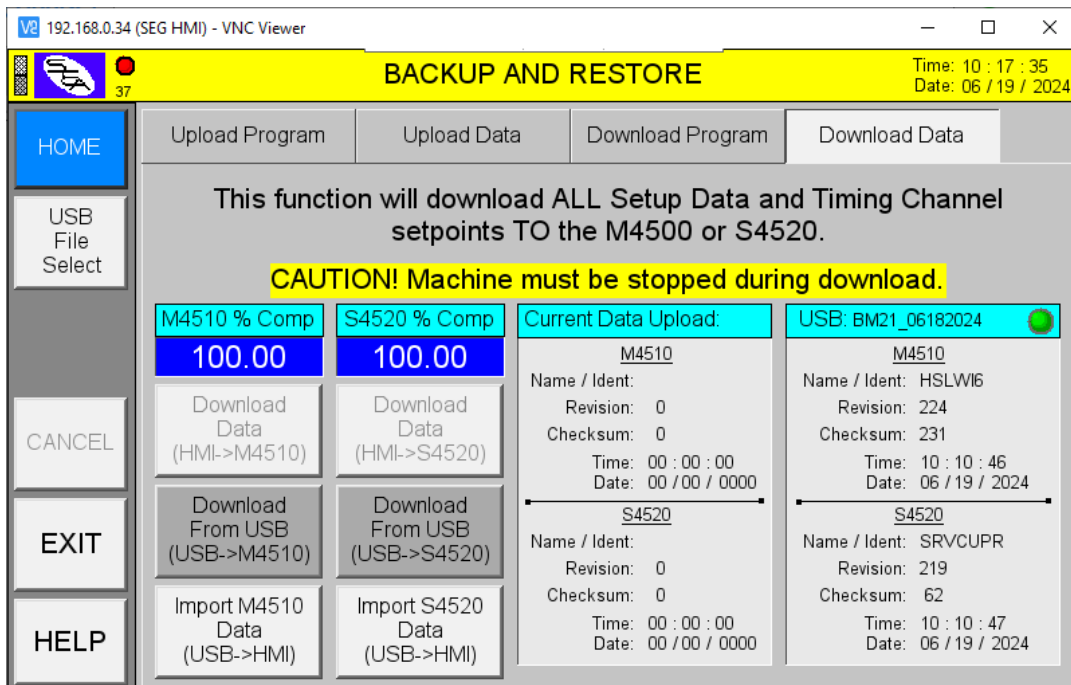


Data download will proceed as before when restoring directly from the HMI. In this case the setup data is being restored from the file that was selected from the USB thumb drive.

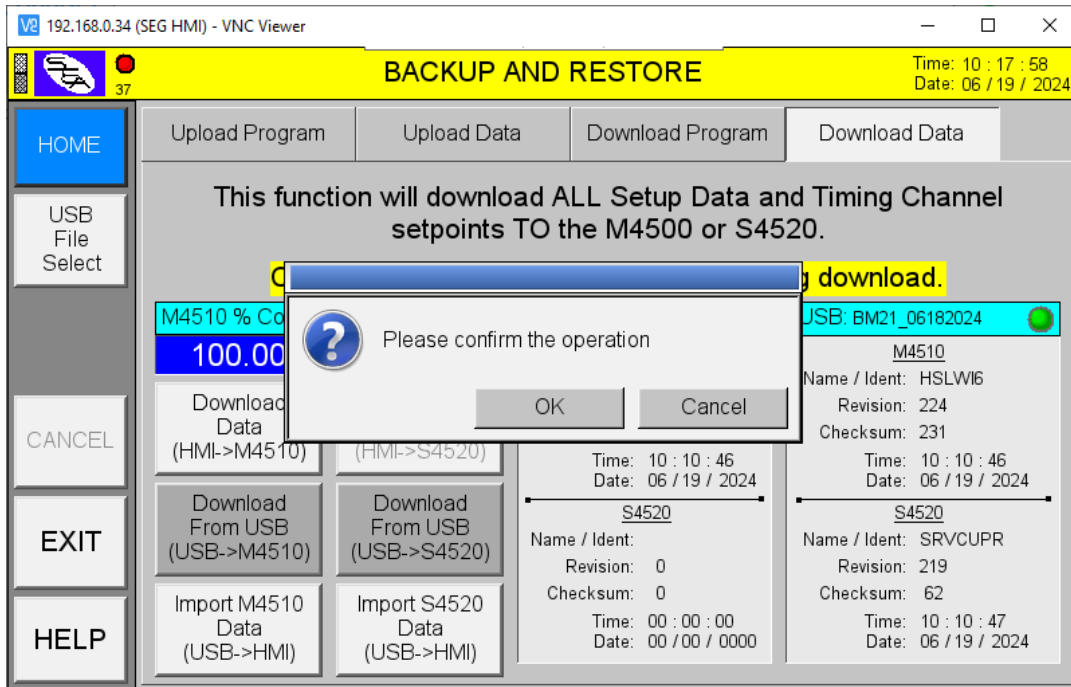


Once download is 100% Complete, the user can:

- Select the "HOME" button to return to the HOME screen
- Select the "EXIT" button to return to "Backup and Restore".
- "IMPORT (USB->HMI)" the setup data (M4510 or S4520).



Either or both sets of setup parameters for the M4510 or S4520 can be **“IMPORTED”** into the HMI from the selected USB expanded memory file (.emi). A popup will be displayed asking to confirm the operation. Select **“OK”** to import the PLC program data into the HMI. This is particularly useful if the setup data was downloaded from the USB “.emi” file as it would then be saved to the retentive backup memory of the HMI without having to upload from the respective CPU board.



Once the import process is complete, the information regarding the **“Current Program Upload”** will match that of the USB selected/imported “.emi” file.

