APPLICATION NOTE

TITLE:	**How to Backup and Restore Digispense® 4000 Settings**	**AN-109**
		REV A
CATEGORY:	**Controller Interface**	

1. DESCRIPTION

This application note describes how to backup and restore the internal settings of an IVEK Digispense 4000 controller (DS4000) equipped with a network interface such as EtherNet/IP™, PROFINET, or EtherCAT®.

NOTE: There is no backup procedure for DS4000 controllers with the USB or RS-232 interfaces.

A web browser can extract and save the DS4000's settings to a backup file. A backup file can be used to restore saved settings to any DS4000 controller, even if the save and restore operations are performed with different network interfaces.

Common scenarios for using backup and restore include:

- **Facilitate Firmware Upgrade** – Prior to upgrading a DS4000's firmware, create a backup of its settings. Then, after the firmware upgrade, the previous settings can be easily restored.

- **Propagate one Controller's Settings to other Controllers** – When many DS4000 controllers are being used for identical applications, backing up one controller and then restoring that configuration to other controllers is an efficient way to keep their settings in sync.

- **Protection from Equipment Failure** – If a controller experiences a hard failure, a backup file can be used to quickly restore the replacement controller to the correct settings. This assumes that a backup was created prior to the failure.

The remainder of this application note will provide steps for backing up and restoring DS4000 settings.

2. CONNECTING A WEB BROWSER TO THE DS4000

To connect a web browser to a DS4000, the controller's IP address must be known. There are two ways to determine the IP address of a DS4000:

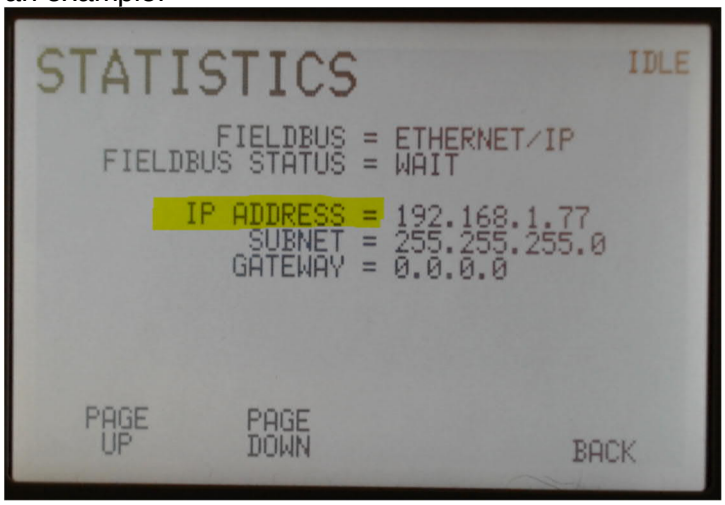
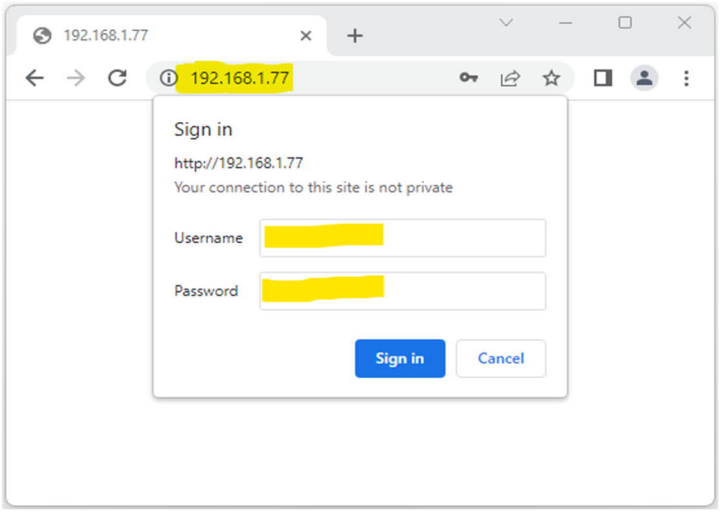
- A software application, HMS IPconfig by HMS Networks, can discover controllers and display their IP addresses.
    - HMS IPconfig can be downloaded from IVEK's website on the Product Manuals page.
- The DS4000BT has an LCD display that can be used to display the controller's IP address. Instructions for this are provided in the backup/restore steps in later sections.

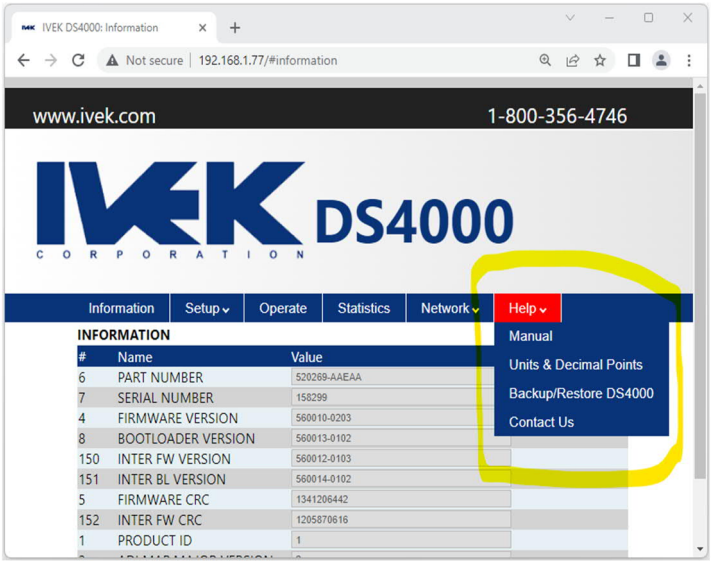
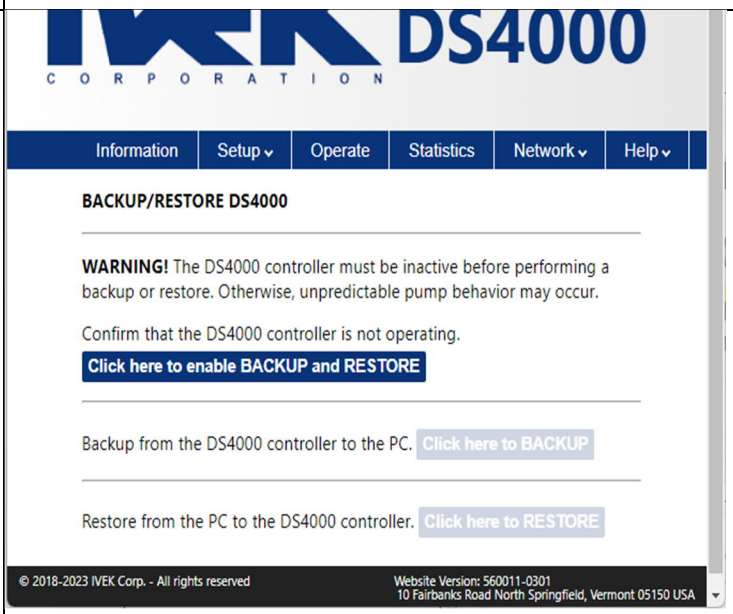
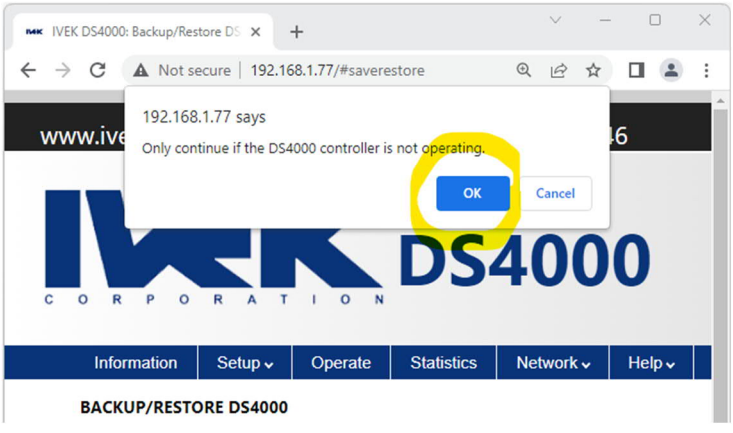
If the DS4000 is on a network that uses DHCP, then the controller will automatically be assigned an IP address when it is powered on. (A typical IP address looks something like 192.168.1.93.)

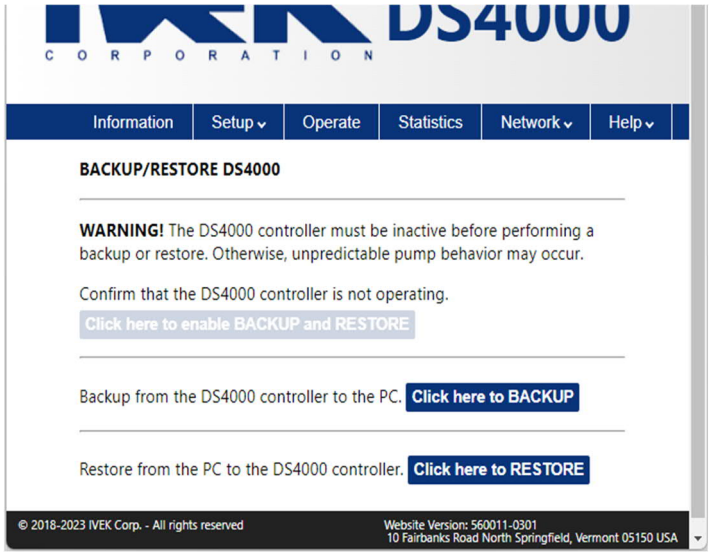
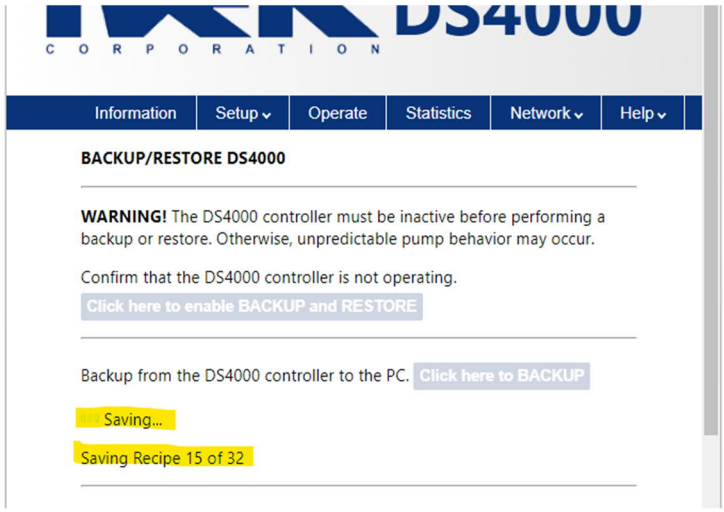
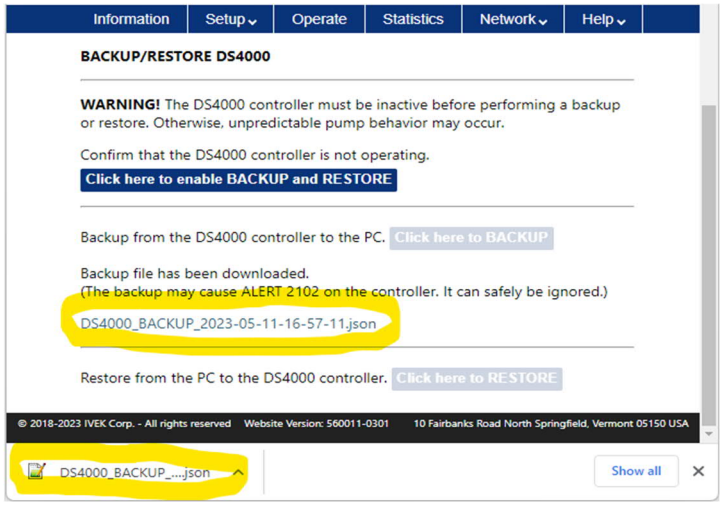
If the DS4000's IP address is 0.0.0.0, then a valid IP address must be assigned manually before the web browser can be connected to the DS4000. In this case, see AN-101 section 3 for instructions on using HMS IPconfig to assign an IP address to the DS4000 controller.

3. PERFORMING A BACKUP

The backup operation is initiated using a web browser and will produce a backup file on the PC.

Instruction	Image
Connect the PC to the network that contains the DS4000. Determine the controller's IP address using HMS IPconfig, or the HMI if available. For DS4000BT, the IP address can be found using the HMI as follows: Press SYSTEM SCREEN Press PAGE DOWN Press STATISTICS SCREEN Press PAGE DOWN **X 4**	Sample HMI screen. The IP address shown here is only an example. 
Open a web browser and type in the DS4000's IP address as shown in the image. Once connected, a sign-in screen will appear. Refer to TB-105 for a Username and Password. After entering the Username and Password, click 'Sign in'.	

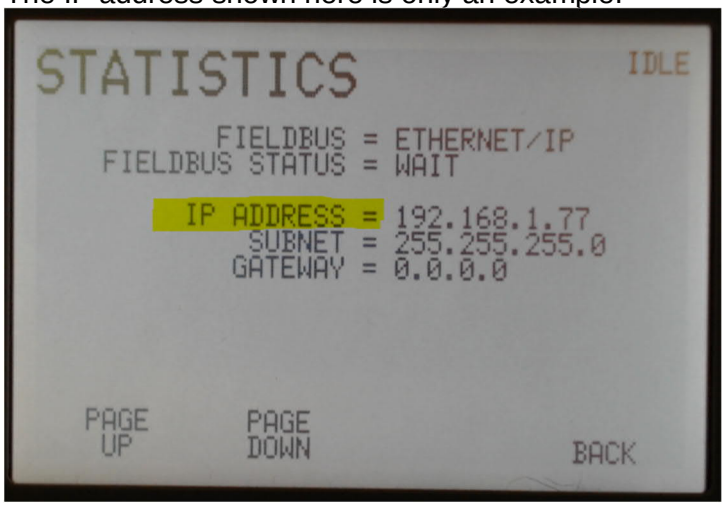
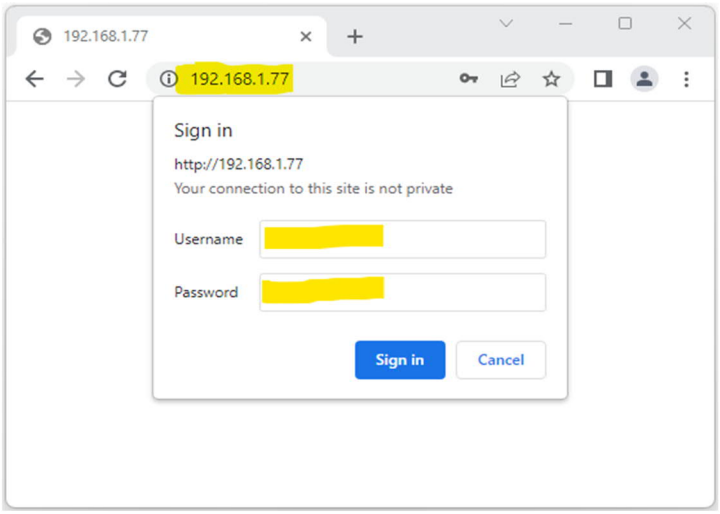
Once signed in, open the ‘Help’ menu on the far right and click ‘Backup/Restore DS4000’.	
CAUTION! DO NOT ATTEMPT TO BACKUP OR RESTORE WHILE THE DS4000 IS IN SERVICE. Click the button ‘Click here to enable BACKUP and RESTORE’.	
Acknowledge the popup window by pressing ‘OK’.	

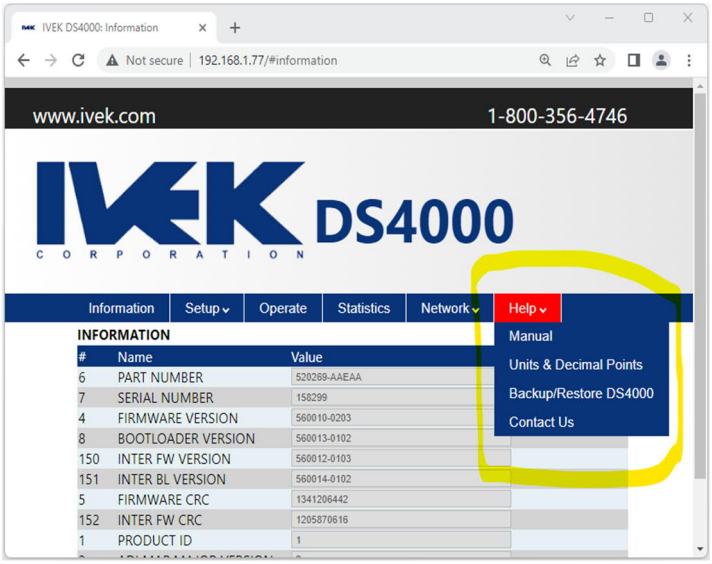
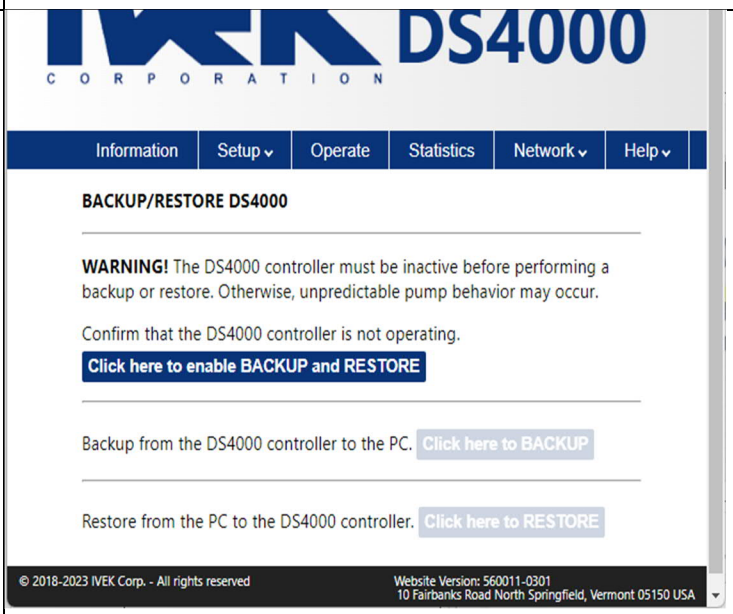
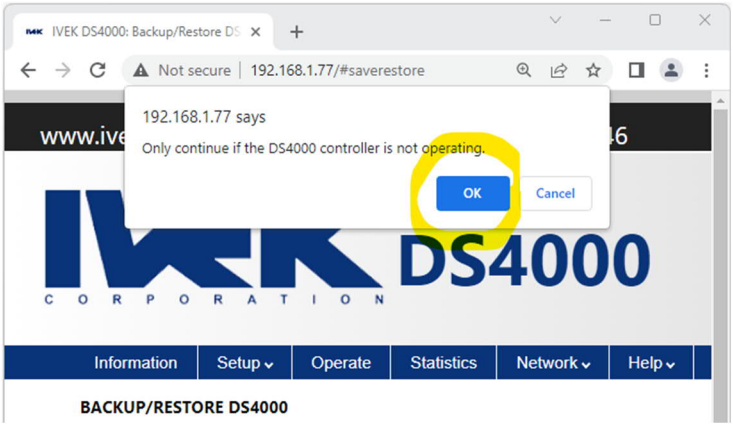
Now click 'Click here to BACKUP'. **NOTE: If a backup or restore operation is not initiated within five seconds, the buttons will become disabled. If that happens, repeat the last two steps.**	
Wait while the backup operation runs. The status is displayed on the web page.	
Once the backup is complete, the full filename of the backup file is displayed. Depending on the browser, the backup file may appear at the bottom of the window (e.g. Google Chrome™) or the upper right (e.g. Microsoft Edge™). The backup file typically can be found in the PC's 'Downloads' folder.	

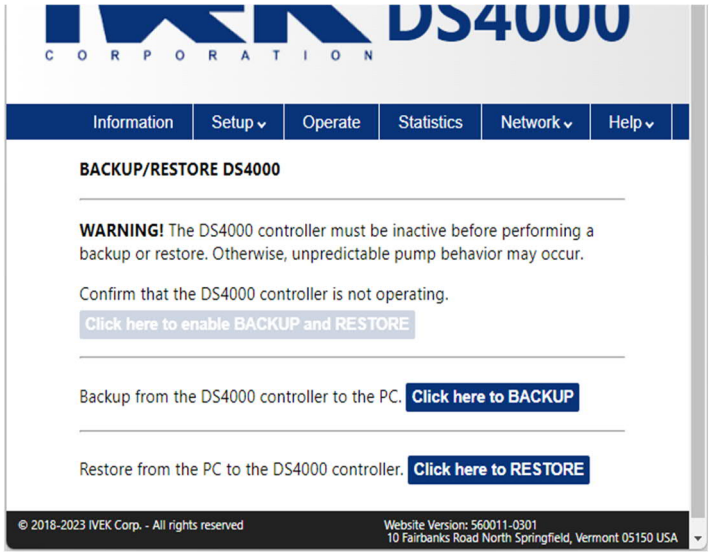
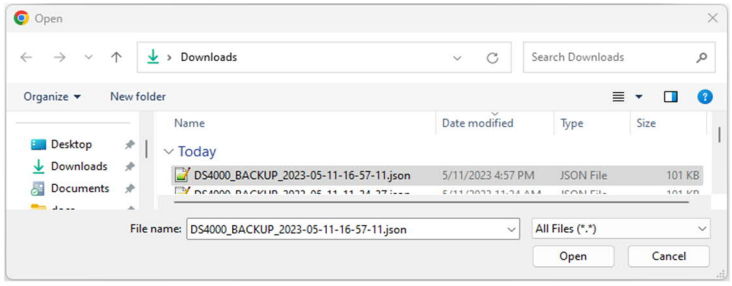
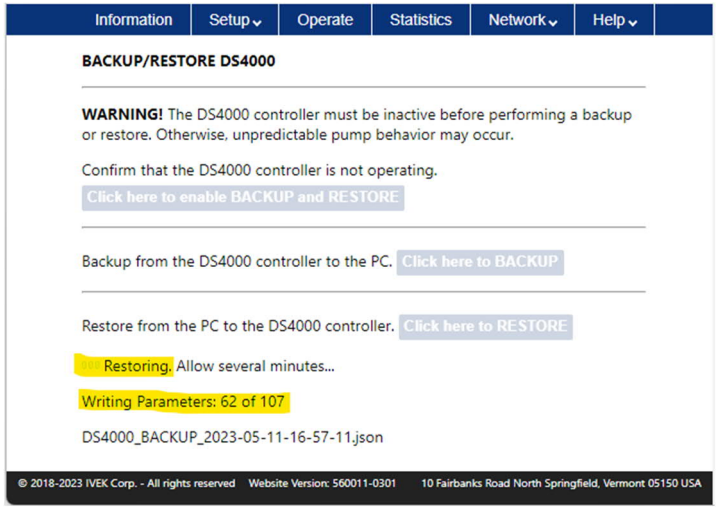
4. PERFORMING A RESTORE

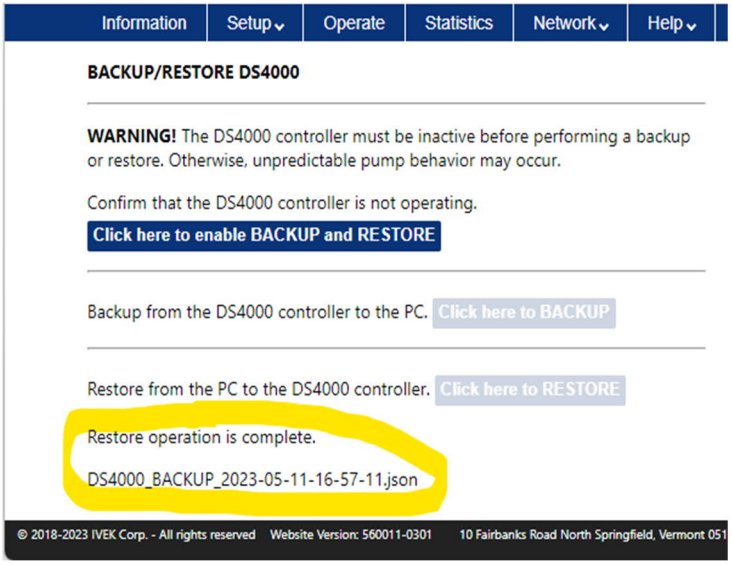
The restore operation is initiated using a web browser and requires the operator to select a backup file on the PC. Backup files are named with the following convention: the prefix is ‘DS4000_BACKUP_’ followed by a date/time stamp, and ending with ‘.json’.

NOTE: Incompatibilities can occur when an older backup file is restored to a DS4000 with newer firmware. Section 0 addresses mixed version restore operations.

Instruction	**Image**
Connect the PC to the network that contains the DS4000. Determine the controller’s IP address using HMS IPconfig, or the HMI if available. For DS4000BT, the IP address can be found using the HMI as follows: Press SYSTEM SCREEN Press PAGE DOWN Press STATISTICS SCREEN Press PAGE DOWN **X 4**	The IP address shown here is only an example. 
Open a web browser and type in the DS4000’s IP address as shown in the image. Once connected, a sign-in screen will appear. Refer to TB-105 for a Username and Password. After entering the Username and Password, click ‘Sign in’.	

Once signed in, open the ‘Help’ menu on the far right and click ‘Backup/Restore DS4000’.	
CAUTION! DO NOT ATTEMPT TO BACKUP OR RESTORE WHILE THE DS4000 IS IN SERVICE. Click the button ‘Click here to enable BACKUP and RESTORE’.	
Acknowledge the popup window by pressing ‘OK’.	

Now click 'Click here to RESTORE'. **NOTE: If a backup or restore operation is not initiated within five seconds, the buttons will become disabled. If that happens, repeat the last two steps.**	
Use the File Open dialog to select which backup file to restore to the DS4000. Click 'Open'.	
Wait while the restore operation runs. The status is displayed on the web page. The restore operation is slower than the backup. Allow several minutes. The number of parameters to restore will vary depending on how many recipes are in use on the DS4000.	

Once the restore is complete, the filename of the restored file is displayed. The DS4000 is ready for service.	

5. RESTORING TO A DS4000 WITH A DIFFERENT FIRMWARE VERSION

If a backup was performed by an older version of DS4000 firmware but will be restored to a newer version of firmware, then it is possible that some settings will no longer be compatible. If the restore operation detects any incompatibilities, helpful information will be displayed on the browser interface. Below are examples of these scenarios.

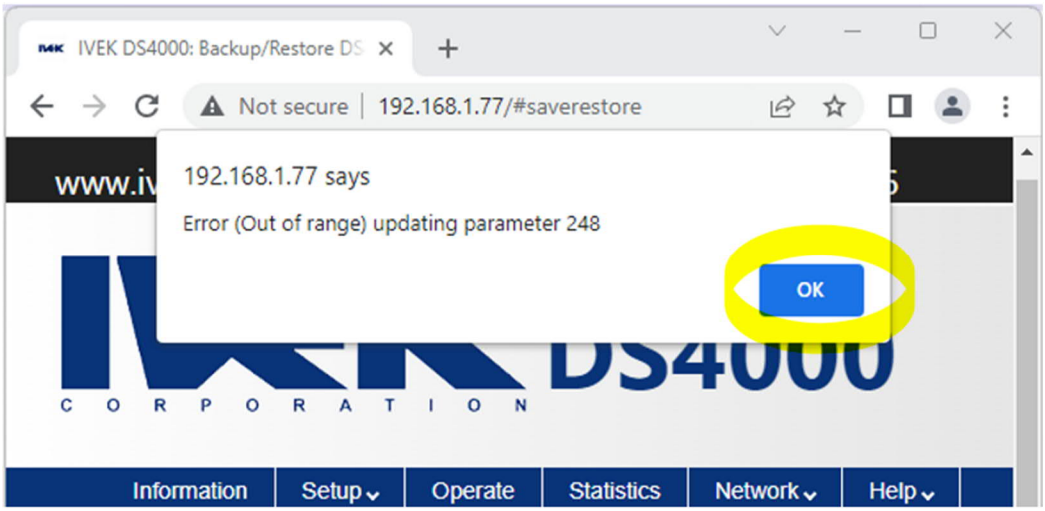
NOTE: It is recommended to perform a factory reset (ERASE PARAMS) after a DS4000 firmware upgrade before performing a restore operation.

NOTE: Restoring a backup from a newer DS4000 firmware version to an older version is not supported.

5.1. Handling “Out of range” Errors

When settings or parameters have been modified for a new DS4000 firmware version, it is possible that a backup value exceeds the new allowable range. When this occurs, a popup window will appear in the browser. Note that the DS4000 firmware safely handles any attempts to write out-of-range values.

If a popup window appears during the restore operation, simply acknowledge the issue by clicking ‘OK’. Once the restore operation is complete, the operator should verify that the value of the given parameter is correct for their application.

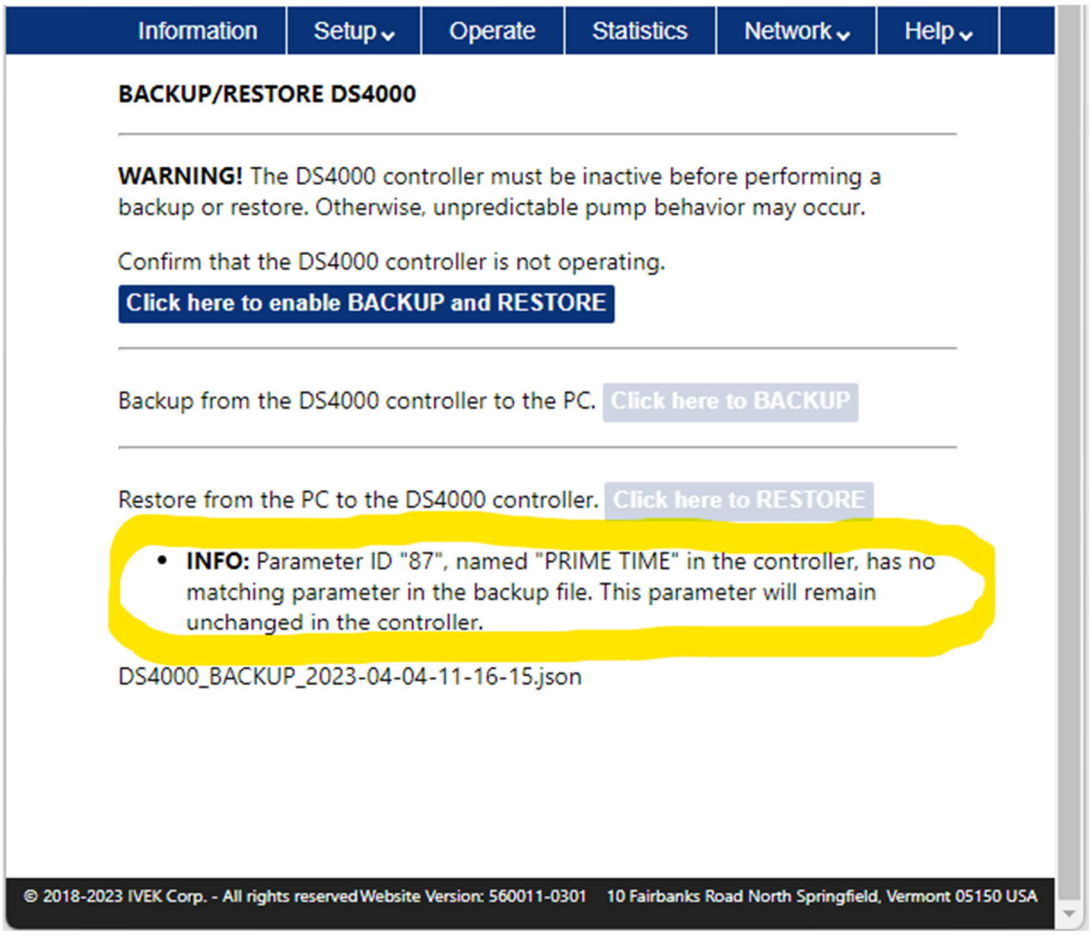


5.2. Example 1: Restoring Version 0202 Settings to a Version 0203 Controller

In this case, a backup was made by a DS4000 running 0202 firmware. The backup file was restored to a DS4000 running 0203 firmware.

The version 0203 firmware contains a new parameter, “PRIME TIME,” that was not available in version 0202. The ‘INFO’ message displayed after the restore operation tells the operator that the new parameter’s value will not be affected by the restore.

By default, the value of “PRIME TIME” is 120 seconds. The operator should verify that this value is appropriate for their application and adjust if needed.



5.3. Example 2: Restoring Version 0201 Settings to a Version 0203 Controller

In this example a backup by a DS4000 version 0201 firmware is restored to a DS4000 with version 0203 firmware. The ‘INFO’ output is provided so that the operator can manually resolve any discrepancies.

If the restore operation is unable to correctly restore a parameter, it will be left unchanged. The operator should verify the values of any unmatched parameters.