

# Modification Available Performance Enhancement Service Note

Supersedes:  
86100D-11A

## 86100D DCA-X Wide-Bandwidth Oscilloscope Mainframe

Serial Numbers: ALL

An upgrade to Windows 10 is available for all 86100D DCA-X mainframes. Units with older CPU version will also require a CPU upgrade. See text below for determining CPU version.

### Parts Required:

P/N	Description	Qty.
86100-60211	Win10 Upgrade Kit w/ Argo compatible HDD (Required for Argo upgrades if original HDD < 200 GB) (Required for all Schooner upgrades)	1
86100-60212	Win10 Upgrade Kit with no HDD (Preferred for Argo upgrades if original HDD >= 200 GB)	1
86100-60213	Argo CPU Upgrade Kit for 86100D (Required for all Schooner upgrades)	1

### ADMINISTRATIVE INFORMATION

X Calibration Required	PRODUCT LINE: 8F
<input type="checkbox"/> Calibration NOT Required	AUTHOR: MM

### ADDITIONAL INFORMATION:

This upgrade is to be performed at Keysight Service Centers with 86100D repair capability only. On-site upgrades are NOT supported.

CCC instructions for service order booking: Enter "86100D Win10 Upgrade" in the description field, SAC = UA, and SPN = RCH5A. Pricing and additional booking details are available in Services Delivery Console 86100D Product Notes.

# Instructions to the Customer

## Situation:

An upgrade to Windows 10 is available for your 86100D DCA-X mainframe.

Before ordering this upgrade, please review the “Identifying CPU Version” section below.

To order this upgrade, contact your local Keysight representative, [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus) (Support Specialist > Repair & Calibration), and request the “86100D Windows 10 Upgrade”.

## **IMPORTANT: Before sending your 86100D to Keysight:**

- Back up any important data stored on the instrument, including customer-installed software, as this will NOT be preserved during the upgrade process.

## What to expect with your 86100D Windows 10 Upgrade:

- The 86100D frame will be fully calibrated. Please note that, while a full calibration is included with this upgrade, you may be charged separately for the repair of any unrelated hardware failures found on incoming test.
- The latest version of N1010A FlexDCA and the latest version of the Legacy UI (A.13.03) will be installed. Compatibility mode will continue to function as it did before the upgrade.
- Compliance Applications will not be installed. They may be re-installed by the user if desired.
- The instrument HostID will change as a result of the upgrade. Previously installed FlexDCA and Compliance Application licenses will be re-hosted and re-installed.
- The “dca-admin” account password will be set to “N1000A” (previous default value was no password). The “dca-user” account and any accounts set up by the user will NOT be preserved.
- The 86100D computer name will be set to “K-86100D-**<last 5 digits of serial number>**”. This may be different from the original computer name and can be changed by the user if desired.
- Windows Defender Security will be installed. This is standard with Windows 10.
- After the upgrade, it is recommended to connect the 86100D to the internet and install all available Windows updates.

### Identifying CPU Version:

The 86100D may have one of two CPU motherboards installed, M900 (common name, “Argo”) or M890 (common name, “Schooner”). Windows 10 is supported with the Argo CPU only and thus the Win10 upgrade for units with Schooner CPUs must also include a CPU upgrade.

There are several methods available for determining which CPU is installed in an 86100D:

1. Serial Number:
  - a. SN  $\geq$  MY55400101 → Argo CPU. CPU upgrade is not required.
  - b. SN  $<$  MY55400101 → May have either Argo or Schooner CPU. Further evaluation is required.
2. Visual. The connections available on the 86100D rear panel differ for the two CPUs:



3. Processor. In the System Info window, or in the FlexDCA Help > About window, note if the processor is:
  - a. Intel Core i5 → Argo CPU. CPU upgrade is not required.

**System**

Manufacturer:	Keysight Technologies Inc.
Rating:	5.0 Windows Experience Index
Processor:	Intel(R) Core(TM) i5-3550S CPU @ 3.00GHz 3.00 GHz
Installed memory (RAM):	8.00 GB (7.90 GB usable)
System type:	64-bit Operating System
Pen and Touch:	Touch Input Available with 10 Touch Points

- b. Intel Core 2 DUO → Schooner CPU. CPU upgrade is required.

**System**

Manufacturer:	Keysight Technologies Inc.
Rating:	3.6 Windows Experience Index
Processor:	Intel(R) Core(TM)2 Duo CPU E8400 @ 3.00GHz 2.99 GHz
Installed memory (RAM):	4.00 GB
System type:	64-bit Operating System
Pen and Touch:	No Pen or Touch Input is available for this Display

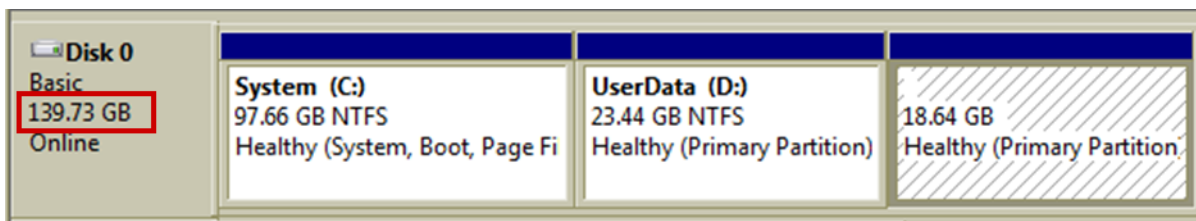
# Instructions to Service Center

## Upon Receipt of 86100D:

- Confirm the CPU version (see above).
- For Argo CPUs, confirm HDD size.
- Order appropriate upgrade kit(s) (see below).
- Run As-Received Performance Verification test. If failures are found, notify customer and quote for repair, as appropriate per normal service processes.

## Determining Installed HDD Size:

Open the Disk Management utility (Start > Run > compmgmt.msc > Storage > Disk Management) and note the total drive size (139.73 GB in the example below):



## Upgrade Kits:

For Schooner Win10 upgrades, two upgrade kits must be ordered: 86100-60211 and 86100-60213. Because Schooner compatible HDDs are not compatible with Argo CPUs, a new HDD is always required when upgrading the CPU.

For Argo Win10 upgrades, there are two Windows 10 upgrade kits available (order only one): 86100-60211 or 86100-60212. The minimum recommended HDD size for running Windows 10 on an 86100D is 200 GB. Therefore, a new HDD is required if the installed HDD is < 200 GB.

### 86100-60211 Win10 Upgrade Kit w/ Argo compatible HDD:

- Required for units with Argo CPU and HDD size < 200 GB
- Required for units with Schooner CPU
- Includes Upgrade USB Drive, Windows 10 Sticker, Argo compatible HDD

### 86100-60212 Win10 Upgrade Kit with no HDD:

- Preferred for units with Argo CPU and HDD size >= 200 GB
- Includes Upgrade USB Drive, Windows 10 Sticker

### 86100-60213 Argo CPU Upgrade Kit for 86100D

- Required for units with Schooner CPU
- Includes parts required for CPU upgrade. Does NOT include Win10 upgrade parts or HDD. Therefore, 86100-60211 must also be ordered.

## Overview of the Upgrade Process:

The 86100D Windows 10 upgrade process uses a specially prepared bootable USB drive that contains scripts necessary to perform the upgrade. This is a single-use USB drive which will be automatically wiped during the upgrade process. A new USB drive must be obtained for each 86100D frame to be upgraded. For security purposes, it is recommended that the USB drive be destroyed or discarded after use.

The upgrade process is performed in two steps:

STEP 1: Booting the instrument in the original operating system and running a script which archives some key information to the USB drive, including backups of calibration data and license files.

STEP 2: Booting from the USB drive, formatting the disk drive, and applying the Windows 10 image.

The upgrade process is partially automated and requires some interaction on the part of the technician, in particular for upgrading the HDD and/or CPU, if needed. The upgrade utility will check the drive size and prompt for replacement if needed (see screen capture at the end of STEP 1 below). For Schooner CPUs, the utility will display an error message and abort if the CPU has not been upgraded before STEP 2 is started.

## Upgrade Process Instructions:

### STEP 1

1. Connect a keyboard and mouse to the instrument
2. Power the instrument ON and allow it to fully boot up
3. Open Keysight License Manager and make a note of the instrument HostID and installed licenses. Confirm that you can find the licenses in KSM or contact DCA Product Support. This information will be used later to re-host the licenses.

NOTE: When searching by Host ID in KSM, it is recommended to use the second portion of the Host ID only (i.e. – for Host ID = PCSERNO,AB12345678, search for Host ID contains AB12345678). In some cases, KSM formats the Host ID with a space after the comma and search results may be incomplete if the full Host ID is entered.

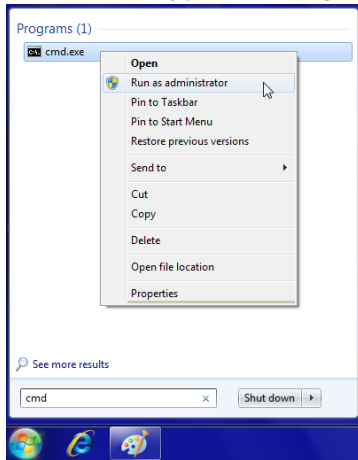
Host ID: PCSERNO,\_\_\_\_\_

Installed Licenses:

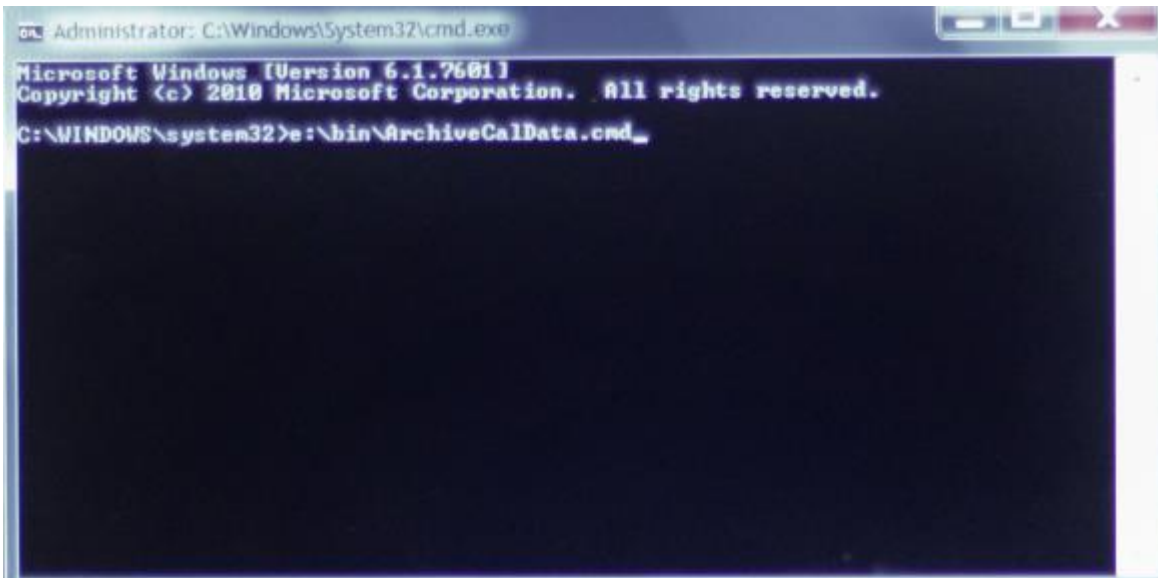
4. Insert the Upgrade USB Drive into a **rear panel** USB port
  - a. Using a USB 3.0 port (blue) will allow the upgrade to complete faster
  - b. Windows will dynamically assign a drive letter to the USB stick (typically, E:\)
5. Open an **elevated command prompt**.

**IMPORTANT:** If the script is not run as administrator, the archive script will appear to run to completion and will return a “200 error” message that is subtle and can be easy to miss.

- a. Press **Start**, type **CMD**, right click on **CMD** and select **Run as Administrator**



6. When the command prompt opens, run the command **e:\bin\ArchiveCalData.cmd**
  - a. Note that the drive assigned by Windows when the USB stick is inserted may be different than E:\. If so, use that drive letter instead of E:\



7. The following will be displayed when ArchiveCalData.cmd has completed:

```
=====  
==== Keysight Technologies 86100D Windows 10 Upgrade  
==== Version 2019.09.06-1  
====  
==== This script will archive Calibration and License files from drive D: on  
==== this instrument. The archive will be temporarily stored on the USB stick  
==== and will be copied to the Windows 10 image during step 2 of the upgrade  
==== process.  
====  
====  
==== Calibration data and License files have been successfully archived.  
====  
==== The disk in this system is 139 GB in size. That is too small to  
==== support Win 10.  
====  
==== Turn the instrument off and replace the SSD with a larger disk as  
==== per the instructions.  
====  
====  
==== Step 1 of the Win 10 upgrade is complete. Please refer to the instructions  
==== for completing step 2.  
====  
====  
E:\>
```

8. Power the instrument OFF

**9. PERFORM REQUIRED HARDWARE UPGRADES:**

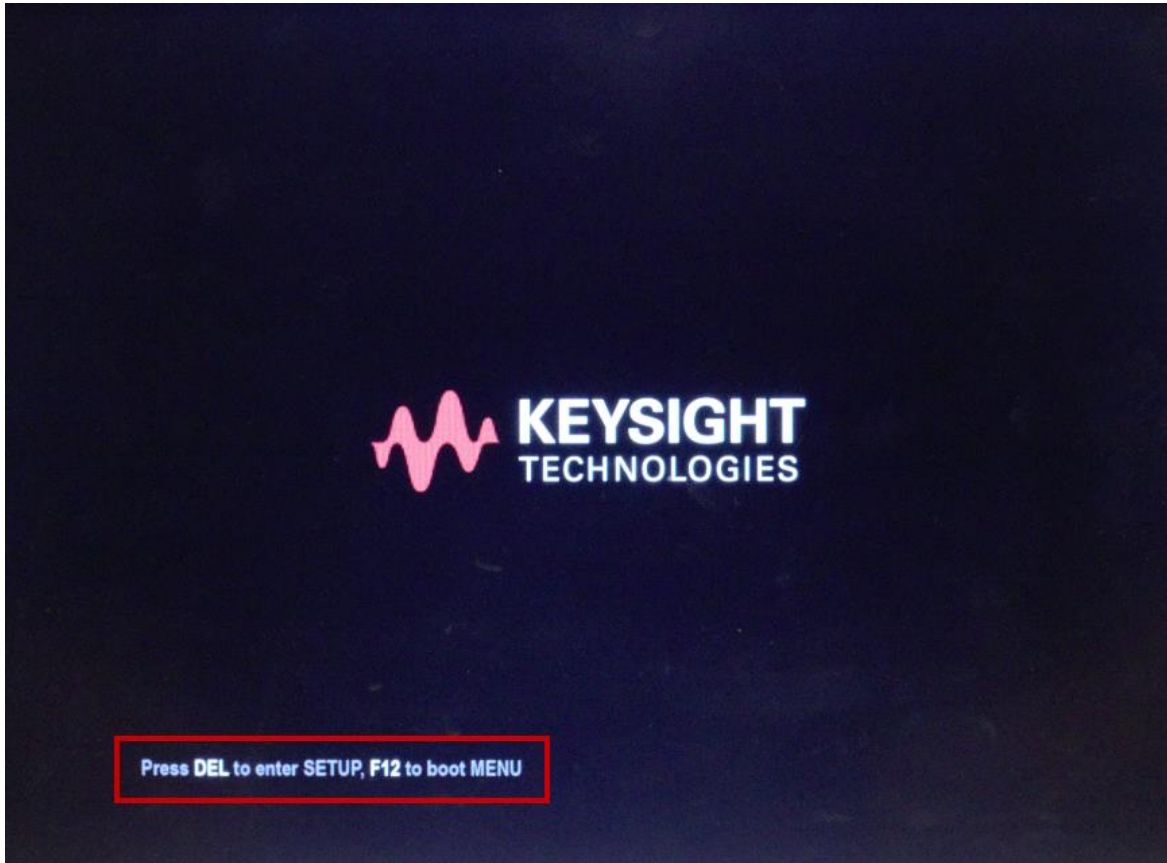
- A. FOR SCHOONER FRAMES, UPGRADE THE CPU USING PARTS INCLUDED IN 86100-60213 AND REPLACE THE HDD WITH DRIVE INCLUDED IN 86100-60211.
- B. FOR ARGO FRAMES WITH HDD < 200 GB, REPLACE THE HDD WITH DRIVE INCLUDED IN 86100-60211.
- C. FOR ARGO FRAMES WITH HDD > 200 GB, NO HARDWARE UPGRADES ARE REQUIRED.

INSTRUCTIONS FOR HDD REPLACEMENT AND CPU UPGRADE ARE INCLUDED IN THE [86100D SERVICE GUIDE](#).



## STEP 2

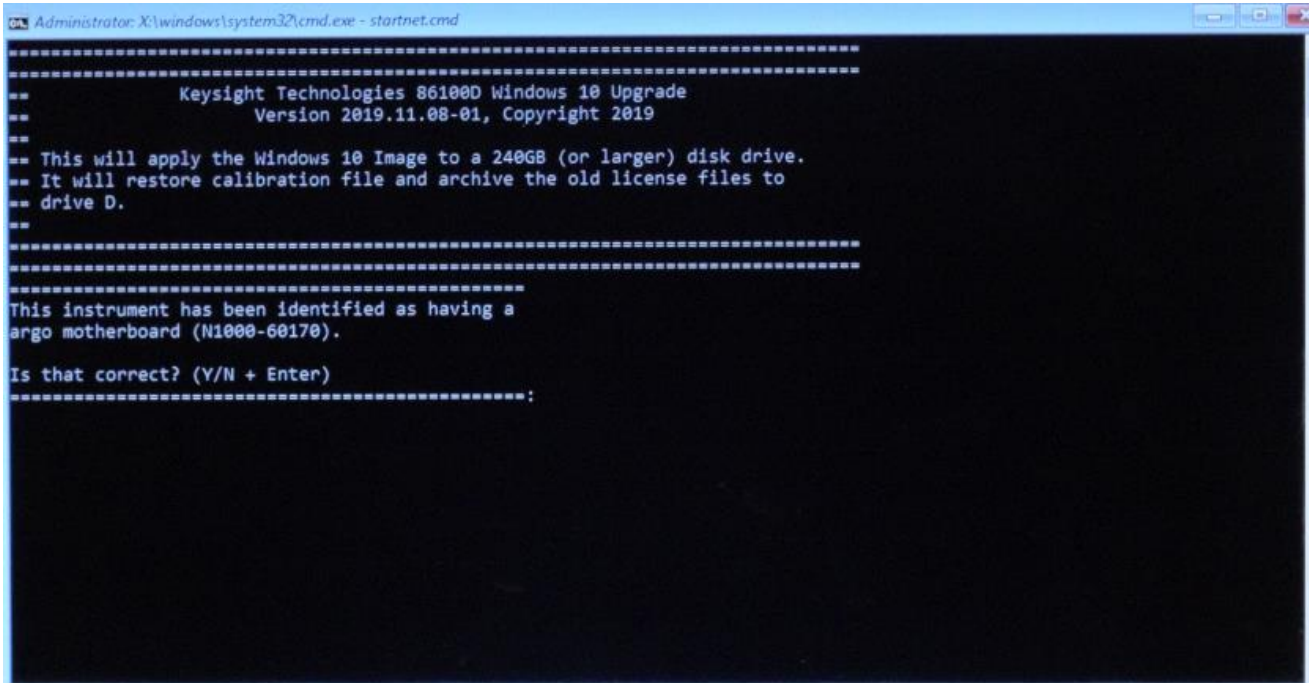
10. If the USB drive has been removed, re-insert it in a rear-panel port
11. Connect a USB keyboard and mouse to the instrument
12. Restart the instrument and boot from the USB drive:
  - a. Watch for prompt and press the F12 key
  - b. Select the USB drive in the Boot Menu (typically, "SanDisk")



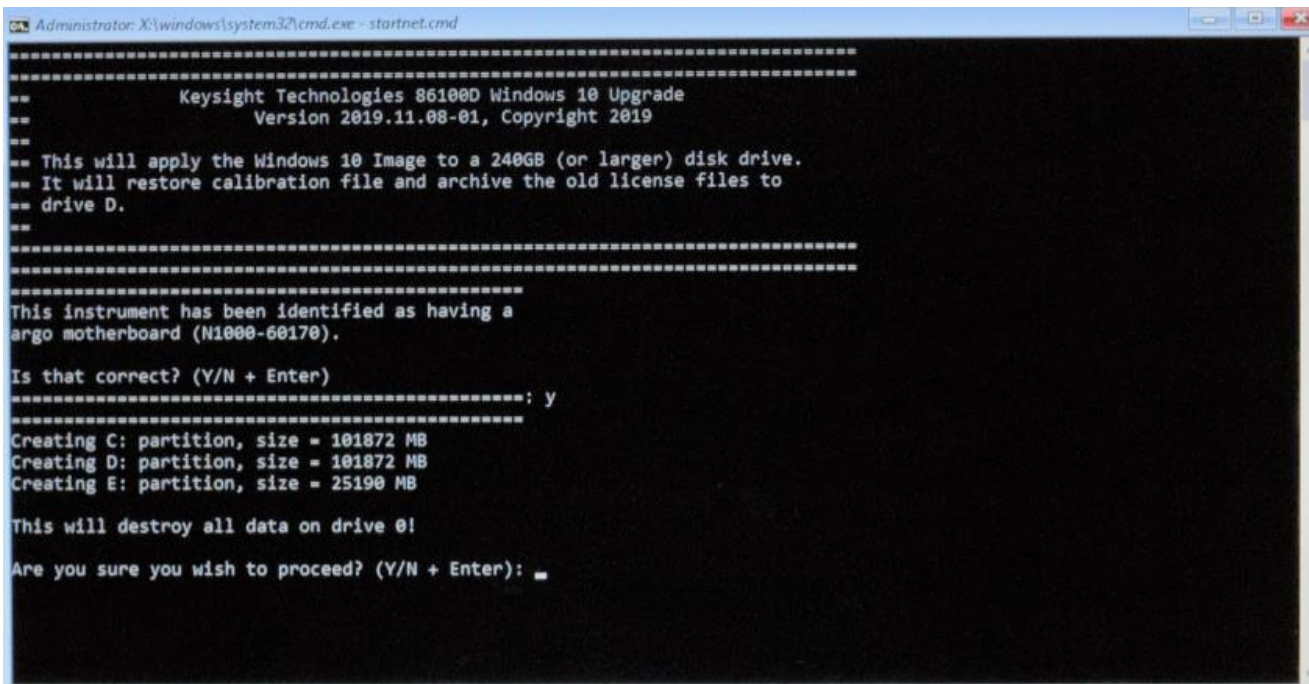


The following screen captures show the upgrade sequence. Respond to all prompts with “Y” or “N” and <enter>, as appropriate.

- 13. The CPU version is identified (it will take a few moments to get to this screen):
  - a. If a Schooner CPU is detected at this time, an error message will be displayed and the upgrade process will be aborted.



- 14. Partition size notification:



15. Image progress notification (this step will take several minutes):

```
Administrator: X:\windows\system32\cmd.exe - startnet.cmd
DISKPART>
100 percent completed

DiskPart successfully formatted the volume.

DISKPART>
DiskPart successfully assigned the drive letter or mount point.

DISKPART>
DiskPart succeeded in creating the specified partition.

DISKPART>
Partition 3 is now the selected partition.

DISKPART>
100 percent completed

DiskPart successfully formatted the volume.

DISKPART>
DiskPart successfully assigned the drive letter or mount point.

DISKPART>
Leaving DiskPart...

Deployment Image Servicing and Management tool
Version: 10.0.10586.0

Applying image
[=====] 14.0%
```

16. Copying the updated image to the recovery partition (this step will take several minutes):

```
Administrator: X:\windows\system32\cmd.exe - startnet.cmd
DiskPart successfully assigned the drive letter or mount point.

DISKPART>
Leaving DiskPart...

Deployment Image Servicing and Management tool
Version: 10.0.10586.0

Applying image
[=====100.0%=====]
The operation completed successfully.

Directory: d:\

Mode                LastWriteTime         Length Name
----                -
d-----          11/25/2019   9:36 AM             DcaUtil DO NOT MODIFY OR DELETE

Directory: e:\

Mode                LastWriteTime         Length Name
----                -
d-----          11/25/2019   9:36 AM             bin
d-----          11/25/2019   9:36 AM             RecoveryImage
Copying recovery image...please wait...
```

17. Image application complete:

```
Administrator: X:\windows\system32\cmd.exe
Mode                LastWriteTime         Length Name
----                -
d-----          11/25/2019   9:36 AM         bin
d-----          11/25/2019   9:36 AM     RecoveryImage
Copying recovery image...please wait...

Microsoft DiskPart version 10.0.10586

Copyright (C) 1999-2013 Microsoft Corporation.
On computer: MININT-VOPACNH

DISKPART>
Disk 0 is now the selected disk.

DISKPART>
Partition 3 is now the selected partition.

DISKPART>
DiskPart successfully set the partition ID.

DISKPART> =====
== Windows 10 upgrade complete in 6 minutes. Remove the USB stick
== and restart the instrument. Licenses will need to be rehosted.
=====
Z:\>
```

18. Remove the USB drive

**IMPORTANT:** If the USB drive is not removed before the instrument is restarted, the instrument will permanently have the User Data partition labeled “E:” instead of the standard “D:”.

19. The instrument can now be restarted and will boot to Windows 10

- a. Type “exit” to restart, or
- b. Press and Hold the power button to shut down. Then power the instrument on.

20. The instrument will reboot twice, prompt you to accept the EULA (click “Agree”), and then reboot a final time. Allow it to do this until the instrument has booted normally (FlexDCA should automatically start).

#### After the Upgrade Process is Complete:

- Re-host and install customer licenses. For assistance, contact DCA Product Support.

NOTE: When searching by Host ID in KSM, it is recommended to use the second portion of the Host ID only (i.e. – for Host ID = PCSERNO,AB12345678, search for Host ID contains AB12345678). In some cases, KSM formats the Host ID with a space after the comma and search results may be incomplete if the full Host ID is entered.

- Install the Windows 10 Sticker on the 86100D rear panel, replacing the old Windows sticker.
- Perform a full calibration, including timebase adjustment.
- Verify that the touchscreen is working as expected. If up/down and left/right are reversed, it is likely that it is a resistive touchscreen. Run the Touchscreen (Version 1) Adjustment found in the 86100D Service Guide.

- If HDD was replaced, destroy/shred the original drive to protect any sensitive customer data.
- Destroy or discard the USB drive. In the unlikely event that malware was transferred from the instrument, it should not be re-used. There is some useful backup information written to the USB drive, therefore, it is recommended to confirm that the upgrade was successful before disposing of the USB drive.

**Troubleshooting:**

Key information collected from the pre-upgrade HDD is archived during the upgrade process and includes the original cal.dat file, HostID (“PCSERNO”), license files, and computer name. In most cases, it is expected that this information will not be needed. It is provided for troubleshooting purposes only.

These files remain on the upgrade USB drive and are copied to the 86100D Windows 10 drive, D:\DcaUtil\DO NOT MODIFY OR DELETE. Note that this is a hidden drive. Set folder options to “show hidden files and folders” to access this location.

For further technical assistance, please contact DCA Product Support.

**Revision History:**

Date	Service Note Revision	Author	Reason for Change
18 May 2020	01	MM	As published
01 Sept 2020	02	MM	Schooner CPU upgrade support added
02 June 2023	03	MM	Compliance application software no longer included in drive images