

November 12, 2020

For more information, contact support@doble.com

### Obtaining and Updating Firmware for F6 Instruments

This application note describes the process for updating Doble F6 instruments. It is Doble's policy that you use the latest firmware release; you will benefit from the latest feature upgrades, bug fixes, and software compatibility.

Note: it is **no longer necessary to match firmware versions** for end-to-end testing. Doble has provided a start-delay setting in the instrument web-based configuration page (available with a web browser connected to the instrument IP address). Contact <u>support@doble.com</u> for more information.

You must have a connection to the Internet to download the firmware. You must have an email account to receive the unzip password. When requesting the firmware password contact <u>support@doble.com</u>. Include your serial number(s) and use your business e-mail address.

The instrument displays the CPUn number (n is a numeral indicating the hardware-revision number) and the installed firmware version on the vacuum-fluorescent display after applying power to the instrument. The firmware differs for each hardware revision:

CPU3/4: v6.nn CPU2: v4.nn CPU1: v2.23

Be sure to download and update the correct firmware for your instrument hardware revision.

#### **Firmware Update Process**

Complete the following steps to update the instrument firmware:

- 1) Apply power to the instrument
- 2) Decide the firmware that you need:
- 3) CPU3/4: v6.nn
- 4) CPU2: v4.nn
- 5) CPU1: v2.23
- 6) Open a web browser
- 7) Navigate to the protection download page (Figure 1) at <a href="https://www.doble.com/support/downloads/fseries/">https://www.doble.com/support/downloads/fseries/</a>



#### **F** Series Current Products

Download the latest power system simulator user guides, software, firmware and drivers. (Password required where indicated).

#### Want to stay informed about Doble's Protection Product/Software updates?

Subscribe to our protection email list to get notified about Doble Protection software, firmware and security updates.

#### HARDWARE USER GUIDES

F6 Hardware User Guide F6080 User Guide F6816 User Guide F5850 User Guide F6052 User Guide

#### SOFTWARE

Protection Suite	
F6080 Calibration Software for F6 Instrur	ments
F6080 for F2 Instruments	
F6 Multiple Amplifier Configurator	
F6TesT	
61850 TesT	
F6011 Mobile Control Panel	

Updating Firmware for F6 Instruments F6 CPU3/4 Firmware F6 CPU3 Firmware F6 CPU2 Firmware F6 CPU1 Firmware

#### DRIVERS

F6080 Windows 7 Driver for USB RS232 Cable USB Driver For The Updated F6150 (CPU2 and CPU3) Front Panel

Figure 1. F-Series firmware-download section at <a href="https://www.doble.com/support/downloads/fseries/">https://www.doble.com/support/downloads/fseries/</a>

- 8) Select the link for the firmware that you need. Review the instructions listed at this link
- 9) Request the firmware password from <a href="mailto:support@doble.com">support@doble.com</a> (per the instructions)
- 10) Click on the firmware name to download the .zip file to your computer
- 11) Read the return e-mail from Doble that contains the unzip password. Copy this password

**Note**: be careful to copy only the characters in the password. Do not copy additional spaces behind and in front of the password—there are no spaces at the beginning and at end of the firmware password.

12) Open a Windows Explorer window and navigate to the downloaded **.zip** file (see Figure 2)



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Figure 2. Extract (unzip) the downloaded file

13) Extract (unzip) the file with the supplied password. Create a folder in which to place the extracted files (for example: My Documents/Doble Engineering/Firmware/CPUn)

**Note**: use Winzip or the Microsoft Windows Extract tool only. The use of a different tool might modify the file structure.

14) Make a note of this folder location and the resulting file "**.pkg**." Figure 3 shows an example of the unzipped firmware file (and the unzipped release-notes file)

**Note**: other files exist in the extracted folder. The firmware-update process uses only the **.pkg** file.

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		F6_cpu3_5.8.0.pkg		5/30/2017 10:28 AM	PKG File	613 KB	
		F6_cpu3_5.8.0.sss		5/30/2017 10:28 AM	SSS File	1,838 KB	
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Figure 3. Unzipped F6 CPU3 firmware files and release notes

- 15) Open Protection Suite
- 16) Navigate to Instrument > Connect, Verify (format is "top tab > bottom tab;" see Figure 4)

nnect/Verify bols Calibr	ation 61850, SV Tools			
nstrument Details				
Connect using		Instrument Type		
Serial Port		F6K (Except F6300)		
		© F2K		
Lan Connection	10 • 1 • 3 • 1	© F63X0	Verify F6x Connection	

Figure 4. Connect to the F6150 instrument

- 17) Select the Instrument Type corresponding to the F-series instrument that you are updating
- 18) Click on Verify F6x Connection to connect to the instrument
- 19) Click the box with the ellipsis (three dots) to view the instrument options (see Figure 5)
- 20) Record the instrument options (a screenshot or photograph works well)

Files	Relay, De	vice	Test Plan:	NewTestPlan	Details	Results/History	Reports	Instrument	Tools	F6 Control Panel	Preferences	Help	
Identi	fy, select ar	nd con	figure tes	t instruments	available	on the network							
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Figure 5. F6150 instrument options before firmware update

**Note**: this step is a precaution, to compare options on the F6150 instrument after the firmware update.

21) Navigate to Instrument > Tools or Instrument Tools on newer Protection Suite versions 22) Choose Update Capability Key (in the F6 Instrument Tools section, shown in Figure 6)

P Address and Mask Instrument Type			
Channel Name IP Address IP Mask Gateway Address	F6K (Except F6300) 192.168.1.19	< c C	
Instrument Log			
6 Tools			

Figure 6. Location of "Update Capability Key" button

23) Record the Installed Key number (a screenshot or photograph works well)

Instrument CPU ID		
Installed Key	(memos)	 Remember
New Key	<b>_</b>	Install New Key

Figure 7. Location of "Installed Key" number

24) Navigate to Instrument > Tools or Instrument Tools on newer Protection Suite versions

25) Choose Firmware Upgrade (in the F6 Tools section, shown in Figure 8)

Connect/Verify Instrument Tools	Calibration Master So	ource Config		
Instrument Type	F6K (Except F630	0)		
Channel Name	192.168.1.19			
IP Address	•			
IP Mask	•	•	•	
Gateway Address	· -	•	•	
Instrument Log				
F6 Tools				
	Firmware U	pgrade		Upload Mobile
		iming Offset		FPGA Reprog

Figure 8. Location of "Firmware Upgrade" button

26) Observe the Flash Loader, shown in Figure 9

Loader		
File	C:\Doble\Firmware\CPU3\Version 5.8.0\F6_cpu3_5.8.0.pkg	Browse
Status		Verify
		Program
		Close

Figure 9. Flash Loader example for F6 CPU3 (Protection Suite 4.2 and later)

27) Browse to the folder that contains the .pkg file identified in Step 14

28) Select the .pkg file

**Note**: the Verify function checks the downloaded firmware file against the installed firmware—routine updates do not use this function.

29) Click on Program

**Caution:** do not disturb the file upload while in progress (keep cables attached and power applied continuously).

**Note**: do not use a Wi-Fi connection for the firmware upgrade process. The firmware upgrade process takes a few seconds when using a hardwire Ethernet cable, and a few minutes when using a serial (USB) cable.

- 30) Power cycle the instrument when prompted. Wait a few seconds when powering the test set on again
- 31) Observe that the front-panel, vacuum-fluorescent display shows the new firmware version during the boot process
- 32) Wait for five seconds after the instrument fans reduce speed
- 33) Navigate to Instrument > Connect, Verify (format is "top tab > bottom tab;" see Figure 10)

onnect/Verify Dools Calibra	tion 61850, SV Tools		
Instrument Details Connect using		Instrument Type	
<ul> <li>Serial Port</li> </ul>	-	F6K (Except F6300)	
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e can connection		© F63X0	Verily Fox Connection

Figure 10. Reconnect to the F6150 instrument

- 34) Select the Instrument Type corresponding to the F-series instrument that you are updating
- 35) Click on Verify F6x Connection to reconnect to the instrument
- 36) Click the box with the ellipsis (three dots) to view the instrument options (see Figure 11)



onn	ect/Verify	Tools	Calibra	tion 61	850. SV Tools						1	
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										2 - 12 analog sources	rement module (recording	2)
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Inst	trument Acti	ivity								5 - Variable battery sim 5 - GPS receiver interfa		
		-							F6895	5 - GPS receiver and an	tenna	
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	10.1.3.1	10.1.3	F6150sv	ок	Version 5.8.1, Build 1278	F6005 - Enh	Amp, F6011					ОК
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2	192.168.1.2	10.1.3.2	F6150sv	OK	Build 1278	F6005 - Enh	Amp, F6011	··· ×				

Figure 11. F6150 CPU3 instrument options after update

37) Check that the Instrument Options after the firmware update are the same as the ones before the firmware update. If an option is missing, load the installed key number recorded on step 23 by using the Update Capability Key option; insert the recorded key on the New Key box followed by a click on Install New Key button. Power cycle the F6150 test instrument.

Instrument CPU ID 7094		
	(memos)	
Installed Key 2	N	Remember
New Key 2L	ZN V	Install New Key

Figure 12. Installing new key code after update

- 38) If the F6150 still miss an option after the key code install, e-mail the following information to <a href="mailto:support@doble.com">support@doble.com</a> :
  - a) F6150 instrument serial number
  - b) F6150 CPU ID

- c) Documentation of the Instrument Options before the firmware update (screenshot or photograph)
- d) Documentation of the Instrument Options after the firmware update (screenshot or photograph)

**Note**: when updating multiple F6150s at the same time, be sure to gather the information above for each F6150 instrument separately.

#### Troubleshooting

Although it seldom occurs, it is possible to "brick" an instrument upon uploading new firmware (front-panel display does not appear upon restoring power). Another possibility is sending the incorrect F6 CPU firmware version (v4 to CPU3 v6, or v6 to CPU2 v4). In this case, the front-panel display shows a message similar to Figure 13.



Figure 13. F6150 CPU2 instrument invalid-image error message after update

There is a process for recovering from these conditions. Contact <u>support@doble.com</u> or view the F6 Hardware User Guide for instructions on recovery from flash-load failure: Flashload Failure Recovery Techniques.

#### **Contact Us**

Please contact us if you have any questions regarding this release or any other Doble Engineering Company protection-testing product:

- Telephone: US +1 617 926 4900
- Fax: US +1 617 926 0528
- E-Mail: <a href="mailto:support@doble.com">support@doble.com</a>

