

December 12, 2018

For more information, contact <u>fserieshelp@doble.com</u>

## 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>fserieshelp@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>fserieshelp@doble.com</u>. Include your serial number(s) and use your business email 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: v5.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: v5.nn
- 4) CPU2: v4.nn
- 5) CPU1: v2.23
- 6) Open a web browser
- 7) Navigate to the protection download page (Figure 1) at https://www.doble.com/support/downloads/fseries/



#### **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 Instruments F6080 for F2 Instruments F6 Multiple Amplifier Configurator F6TesT 61850 TesT F6011 Mobile Control Panel

FIRMWARE F6 CPU3 Firmware F6 CPU2 Firmware F6 CPU1 Firmware

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:fserieshelp@doble.com">fserieshelp@doble.com</a> (per the instructions)
- 10) Click on the firmware name to download the .zip file to your computer

11) Read the return email 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)
- 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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Organize 👻 Include in li	brary		Nev	v folder		•== •		0
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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)

ntify, select and configure te	st instruments available on the networl	k		
connect/Verify <b>Dools</b> Calibra	61850, SV Tools			
Connect using		Instrument Type		
Serial Port	•	F6K (Except F6300)		
Ian Connection	10 • 1 • 3 • 1	<ul> <li>F2K</li> <li>F63X0</li> </ul>	Verify F6x Con	nection
Slave (F63X0) Details				

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)

File	es Relay, De	vice Test Plan	: NewTestPlan1	Details	Results/History	Reports	Instrument	Tools	F6 Control Panel	Preferences	Help	
Iden	ntify, select an	nd configure te	st instruments	available o	on the network							
										_		
Co	onnect/Verify	Tools Calibr	ation 61850, \$	SV Tools					10.5	_	×	
-I	instrument Deta	ails						Instru	ment Options			
	Connect usir	ng				Instrume	nt Type	CPL	J ID: 67195118 (3V3I)			
	Serial	Dort			•	F6K	(Except F6300)	F60	05 - Enhanced Amplifie 11 - Mobile control pan			
	U Jenan	FUIL				© F2K		F63	51 - Run as F6350 enabl	ed		
	Lan Co	onnection	10 •	1 • 3	3 • 1	F63>	<b>KO</b>	F68	00 - Metering and trans 03 - WiFi option			
									10 - High power conver 12 - 12 analog sources	tible voltage/cu	rent sources	
									20 - Analog input meas 35 - CPU3	urement module	e (recording)	
-9	5lave (F63X0) I	Details							44 - Relay/FET logic out 50 - IEC 61850 GSE mes		: input, first strike	
	9	Slave Lan Addr	ess 10 ·	1 • 3	• 2 (Rec	quired only if	F63X0 in use)	F68	55 - 20kHz transient sar 70 - Sampled Values pu	npling rate		
								F68	71 - Sampled Values sul	bscription	/4)	
I	nstrument Acti	ivity					<u> </u>	F68	75 - Variable battery sin 85 - GPS receiver interfa	ice		
	Constantion	Clause Base	Status Firm	ware Build	0-1				95 - GPS receiver and ar 09 - Control panel inter			
	Connection	Slave Model	Status Firm	ware Build	Opt	tions			10 - Simulator control a 20 - Auto synchronizer	nd automation i	nterface	
	ě	â.	Currently	Active								
	10.1.3.1	10.1.3 .2 F6150sv		ion 5.8.1, ild 1278	F6005 - Enh Am	p, F6011					ОК	L
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:	2 192.168.1.2	10.1.3.2 F6150sv		ion 5.8.1, Id 1278	F6005 - Enh Am	p, F6011	🗙			-		

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
- 22) Choose Firmware Upgrade (in the F6 Tools section, shown in Figure 6)

Files Relay, Device Test Plan: NewTestPlan	n1 Details Results/His	story Reports Instrument
Identify, select and configure test instrumen	ts available on the netw	vork
Connect/Verify Tools Calibration 61850	), SV Tools	
IP Add	ress and Mask	
	Instrument Type	F6K (Except F6300)
	Channel Name	10.1.3.1
	IP Address	0.0.
	IP Mask	0.0.
	Gateway Address	0.0.
	Instrument Log	
F6 Too	ls	
F	Firmware Upgrade	Upload Mobile Control Panel

Figure 6. Location of "Firmware Upgrade" button

23) Observe the Flash Loader, shown in Figure 7

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

Figure 7. Flash Loader example for F6 CPU3 (Protection Suite 4.2 and later)

24) Browse to the folder that contains the .pkg file identified in Step 11

25) Select the .pkg file

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

26) Click on Program

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

**Note**: the firmware upgrade process takes a few seconds when using an Ethernet cable, and a few minutes when using a serial (USB) cable.

- 27) Power cycle the instrument when prompted
- 28) Observe that the front-panel, vacuum-fluorescent display shows the new firmware version during the boot process
- 29) Wait for five seconds after the instrument fans reduce speed
- 30) Navigate to Instrument > Connect, Verify (format is "top tab > bottom tab;" see Figure 8)

Connect/Verify Dools	Calibration 61850,	SV Tools				
Instrument Details			Instrument Type			
Serial Port		•	F6K (Except F6300)			
Lan Conne	ction 10 •	1.3.1	<ul> <li>F2K</li> <li>F63X0</li> </ul>	[	Verify F6x Connection	ı

Figure 8. Reconnect to the F6150 instrument

- 31) Select the Instrument Type corresponding to the F-series instrument that you are updating
- 32) Click on Verify F6x Connection to reconnect to the instrument
- 33) Click the box with the ellipsis (three dots) to view the instrument options (see Figure 9)



Files       Relay, Device       Test Plan: NewTestPlan1       Details       Results/History       Reports       Instrument         Identify, select and configure test instruments available on the network	Tools F6 Control Panel Preferences Help
Connect/Verify Tools Calibration 61850, SV Tools	
Instrument Details Connect using Serial Port Instrument Type F6K (Except F6300) F2K Lan Connection Instrument Type F6K (Except F6300) F2K F63X0	CPU ID: 67195118 (3V3) F6005 - Enhanced Amplifiers F6011 - Mobile control panel F6351 - Run as F6350 enabled F6800 - Metering and transducer interface F6803 - Wife joption
Slave (F63X0) Details Slave Lan Address 10 • 1 • 3 • 2 (Required only if F63X0 in use)	Fotoo - Wird prover convertible voltage/current sources F6810 - High power convertible voltage/current sources F6820 - Analog input measurement module (recording) F6835 - CPU3 F6844 - Relay/FET logic output, paired logic input, first strike F6860 - IEC 61820 GSE messaging support F6865 - 20kHz transient sampling rate F6870 - Sampled Values publication (FPGA v4) F6871 - Sampled Values subscription
Instrument Activity           Connection         Slave         Base Model         Status         Firmware Build         Options	F6875 - Variable battery simulator F6885 - GPS receiver interface F6895 - GPS receiver and antenna F6909 - Control panel interface F6910 - Simulator control and automation interface F6920 - Auto synchronizer
Currently Active 10.1.3.1 10.1.3 F6150sv OK Version 5.8.1, 10.1.3.1 F6150sv OK Build 1278 F6005 - Enh Amp, F6011	ОК
Recently Active	
1         10.1.3.1         101.3.2         F6150sv         OK         Version 5.8.1, Build 1278         F6005 - Enh Amp, F6011         Image: Second	

Figure 9. F6150 CPU3 instrument options after update

- 34) Check that the Instrument Options after the firmware update are the same as the ones before the firmware update. If an option is missing, email the following information to <u>fserieshelp@doble.com</u>:
  - a) F6150 instrument serial number
  - b) Documentation of the Instrument Options before the firmware update (screenshot or photograph)
  - c) 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 v5, or v5 to CPU2 v4). In this case, the front-panel display shows a message similar to Figure 10.





Figure 10. F6150 CPU2 instrument invalid-image error message after update

There is a process for recovering from these conditions. Contact <u>fserieshelp@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: <u>fserieshelp@doble.com</u>

