

August 20, 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 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

Updating Firmware for F6 Instruments E6 CPU3/4 Firmware
F6 CPU3 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 https://www.doble.com/support/downloads/fseries/

- 8) Select the link for the firmware that you need. Review the instructions listed at this link
- Request the firmware password from <u>support@doble.com</u> (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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$\bigcirc \bigcirc$	<b>→</b> 🚺 «	Firn	nware   CPU3  Version 5.8.1	<b>▼</b> 4 <sub>7</sub>	Search Version 5.8.1			٩
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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.

Correction 5.8.0.1262(final) ← 4 Search Version 5.8.0.1262(final)										
Organize 👻 Include in li	brary	✓ Share with ▼ Burn	Nev	v folder		i≡ <b>-</b> □	0			
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Computer		F6_cpu3_5.8.0.cks		5/30/2017 10:27 AM	CKS File	1 KB				
SD SDHC (E)					F6_cpu3_5.8.0.pkg		5/30/2017 10:28 AM	PKG File	613 KB	
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4 items										

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)

Files Relay, Device Test Plan: 1 Identify, select and configure test	NewTestPlan1 Details Results/History	Reports Instrument Jools	Admin	F6 Control Panel	Preferences	Help
Connect/Verify Dools Calibrat	ion 61850, SV Tools					
Connect using		Instrument Type				
<ul> <li>Serial Port</li> <li>Lan Connection</li> </ul>	• 10 • 1 • 3 • 1	<ul> <li>F6K (Except F6300)</li> <li>F2K</li> <li>F63X0</li> </ul>		Verify F6x Con	nection	
Slave (F63X0) Details Slave Lan Addres	is 10 • 1 • 3 • 2 (Re	quired only if F63X0 in use)				

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, Dev	vice 1	Test Plan:	NewTestPla	n1 Details	Results/History	Reports	Instrument	Tools	F6 Control Panel	Preferences	Help	
Ident	ify, select an	d con	figure tes	t instrumen	ts available	on the network							
									- 1				
Con	nect/Verify	Tools	Calibra	tion 61850	, SV Tools								
_ In	strument Deta	ils —							Instrum	ent Options			
	Connect usin	ıg					Instrume	nt Type	CPUI	D: 67195118 (3V3I)			
	Serial F	Port				•	F6K	(Except F6300)	F6005 F6011	<ul> <li>Enhanced Amplifie</li> <li>Mobile control pan</li> </ul>	rs el		
	Ian Co	onned	tion	10	• 1 •	3.1	F2K	<i>(</i> 0	F6351 F6800	<ul> <li>Run as F6350 enabl</li> <li>Metering and trans</li> </ul>	ed ducer interface		
	F6803 - WiFi option     F6803 - WiFi option     F6803 - High power convertible voltage/current sources     cross at a power convertible voltage/current sources									ces			
	F6812 - 12 analog sources F6820 - Analog input measurement module (recording)									ng)			
S	ave (F63X0) D	Details							F6844	- Relay/FET logic out - IEC 61850 GSE mes	put, paired logic aging support	input, fir	st strike
	5	Slave L	an Addre	ss 10	1 • 3	8 • 2 (Req	uired only if	F63X0 in use)	F6865	- 20kHz transient san - Sampled Values pu	npling rate blication (FPGA	/4)	
In	strument Activ	vitv						*	F6871 F6875	<ul> <li>Sampled Values sul</li> <li>Variable battery sin</li> </ul>	bscription nulator		
			Pass						F6895	- GPS receiver interra - GPS receiver and ar	ice itenna face		
	Connection	Slave	Model	Status F	rmware Build	Opti	ions		F6910 F6920	- Simulator control a	nd automation i	nterface	
				Curre	tly Active								
	10.1.3.1	10.1.3 ,2	F6150sv	ок	ersion 5.8.1, Build 1278	F6005 - Enh Amj	p, F6011						ОК
				Recei	tly Active							_	
1	10.1.3.1	10.1.3.2	F6150sv	ок	ersion 5.8.1, Build 1278	F6005 - Enh Amp	p, F6011	🗙 🗉					
2	192.168.1.2	10.1.3.2	F6150sv	ок \	ersion 5.8.1, Build 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: NewTe	estPlan1	Details	Results/Histo	ory Re		2	Instrum	ent
Identif	y, select and co	onfigure test instr	uments a	vailable	on the networ	rk				
_										
Conn	ect/Verify Too	Is	61850, S	V Tools						
		I	P Addres	s and Mas	k					
				Instrume	nt Type	F6K	(Exce	pt F6	300 <b>)</b>	
				Channel	Name	10.	1.3.1			
				IP Addre	ss		0	•	0	].[
				IP Mask			0	•	0	].[
				Gateway	Address		0	•	0	•
				Instrume	nt Log					
		F	6 Tools							
			Firm	ware Upgra	ide	Uploa	ad Mobil	e Cont	trol Pane	al

Figure 6. Location of "Firmware Upgrade" button

23) Observe the Flash Loader, shown in Figure 7

Flas	h Loader		
	File	C:\Doble\Firmware\CPU3\Version 5.8.0\F6_cpu3_5.8.0.pkg	Browse
	Status		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 12
- 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**: 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.

- 27) Power cycle the instrument when prompted. Wait a few seconds when powering the test set on again
- 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 Calib	oration 61850, SV Tools			
Instrument Details		Instrument Type		
Serial Port	•	F6K (Except F6300)		
Ian Connection	10 • 1 • 3 • 1	© F63X0	Verify F6x Connection	

Figure 8. Reconnect to the F6150 instrument

- 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       Tools       F6 Control Panel       Preferences       Help         Identify, select and configure test instruments available on the network							
Connect/Verify Tools Calibration 61850, SV Tools							
Instrument Details Connect using Serial Port Lan Connection Instrument Type F6K (Except F6300) F2K F63X0 Slave (F63X0) Details	CPU ID: 67195118 (3V3) F6005 - Enhanced Amplifiers F6011 - Mobile control panel F6351 - Run as F6350 enabled F6800 - Mctering and transducer interface F6803 - WiFi option F6810 - High power convertible voltage/current sources F6812 - 12 analog sources F6820 - Analog input measurement module (recording) F6844 - Relay/FET logic output, paired logic input, first strike						
Slave Lan Address 10 • 1 • 3 • 2 (Required only if F63X0 in use)	F6860 - IEC 61850 GSE messaging support F6865 - 20kHz transient sampling rate F6870 - Sampled Values publication (FPGA v4) F6871 - Sampled Values subscription F6875 - Variable battery simulator						
Connection Slave Base Model Status Firmware Build Options	F6895 - GPS receiver interface F6895 - GPS receiver and antenna F6990 - Control panel interface F6910 - Simulator control and automation interface F6920 - Auto synchronizer						
Currently Active           10.1.3.1         10.1.3 .2         F6150sv         OK         Version 5.8.1, Build 1278         F6005 - Enh Amp, F6011	ОК						
Recently Active           1         10.1.3.1         10.1.3.2         F6150sv         OK         Version 5.8.1, Build 1278         F6005 - Enh Amp, F6011         ms         X           2         192.168.1.2         10.1.3.2         F6150sv         OK         Version 5.8.1, Build 1278         F6005 - Enh Amp, F6011         ms         X							

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, e-mail the following information to <u>support@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 v6, or v6 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>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: <u>support@doble.com</u>

