

October 3, 2022

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



FIRMWARE
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 https://www.doble.com/support/downloads/fseries/

- 8) Select the link for the firmware that you need. Review the instructions listed at the 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. Spaces at the beginning or end of the password being copied accidentally is a common issue—avoid it.

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



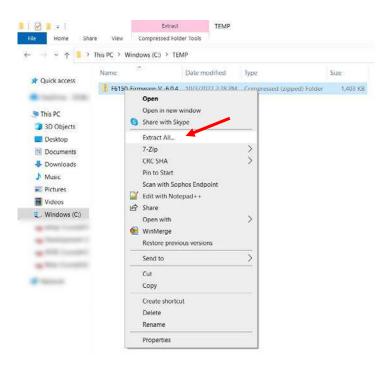


Figure 2. Extract (unzip) the downloaded file

13) Extract (unzip) the file with the supplied password. Create a folder in which to place the extracted files (for example: C:\TEMP\)

**Note**: Use Winzip or the Microsoft Windows Extract tool only. Other tools may 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.

-> × ↑ 🖡	« Windows (C:) > TEMP > F6150-F	irmware-V6.0.4	~ Ū	, Search F6150-Firmware-V6.0
	Name	Date modified	Туре	Size
Quick access	F6_fw_6.0.4.cks	10/3/2022 2:55 PM	CKS File	1 KB
California (C	F6_fw_6.0.4.pkg	10/3/2022 2:55 PM	PKG File	632 KB
This PC 3D Objects	F6_fw_6.0.4.sss	10/3/2022 2:55 PM	SSS File	1,896 KB

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)

inny, select and configure te	est instruments available on the netwo	rk	
onnect/Verify	s Calibration Common Source Config	F8 Network Configuration F8 Time Opt	ions
Instrument Details			
Connect using		Instrument Type	
O Serial Port		F6K (Except F6300)	Verify F6x Connection
IAN Connection	10 1 3 1	<ul> <li>F2K</li> <li>F63X0</li> <li>F8</li> </ul>	Reset Instrument Configuration
		010	

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)

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O Serial Port				F6K (Except F630)	0)	Verify F6x Cor	inection	F6005 -	Enhanced Amplifiers Mobile control panel
0.000			_	O F2K		-		F6351 -	Run as F6350 enabled Metering and transducer interface
LAN Connect	tion	10 1	3 1	O F63X0		Reset Instru Configura		F6803 -	Wi-Fi option
				O F8			and the second s	F6812 -	High power convertible voltage/current sources 12 analog sources
External Amplifier (I	F63X0) Details							F6835 -	
1700 C 1900 C	NORMAL PROPERTY.		2 2 0					F6860 -	Relay/FET logic output, paired logic input, first strike IEC 61850 GSE messaging support
External Amplin	er LAN Address	10 . 1 .	3.2 (	Required only if F63X0 in u	se)			F6870 -	20KHz transient sampling rate Sampled Values publication (FPGA v5)
Instrument Activity								^ F6875 -	Sampled Values subscription Variable battery simulator GPS receiver interface
Connection	External Amplifier	Base Model	Status	Firmware Build		Options		F6895 -	GPS receiver interface GPS receiver and antenna Control panel interface
			Cur	rently Active					Simulator control and automation interface Auto synchronizer
10.1.3.1	10.1.3.2	F6150sv	ок	Version 5.8.2, Build 1291	F6005 - Enh Amp, F6011 -	CP/Web, F6351 - Enbl I	6350,	10,20	The synchronized
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1 10.1.3.1	10.1.3.2	F6150sv	ок	Version 5.8.2, Build 1291	F6005 - Enh Amp, F6011 -	columb propri publi	F6350, 🗙	1	UK

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)

Calibration Common Source (		
	Config   FB Network Configura	tion F8 Time Options
F6K (Except F6300)	Channel Name 10	.1.3.1
·	•	<< Get
	•	Set >>
• • •	•	
ade	FPGA Reprog	ramming Tool

Figure 6. Location of "Update Capability Key" button

**Note**: On Protection Suite version 5.2.0, the Update Capability Key is available on Tools, F6 Series, shown in Figure 7

Figure 7. Location of "Update Capability Key" button on Protection Suite version 5.2.0

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

Instrument CPU ID				
		(memos)		
Installed Key	No. of the local distance		Remember	
New Key			Install New Key	

Figure 8. 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 9)

	Is Calibration Common Source	Config F8 Network Configur	ration F8 Time Options
P Address and Mask Instrument Type	F6K (Except F6300)	Channel Name 1	0.1.3.1
Instrument Configuration			
IP Address	· · · ·	•	<< Get
IP Mask	· · · ·		Set >>
Gateway Address		•	
Instrument Log			
6 Series Tools			
6 Series Tools Firmware	Upgrade	FPGA Repro	gramming Tool

Figure 9. Location of "Firmware Upgrade" button

26) Observe the Flash Loader, shown in Figure 10

Firmware Installer		
File Status	C:\TEMP\F6150-Firmware-V6.0.4\F6_fw_6.0.4.pkg	Browse Verify Firmware Install Firmware
		Close

Figure 10. Flash Loader example for F6 CPU3 (Protection Suite 5.2.5 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 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 11)



				lesults/History	Reports Instr	IEC 61850	Tools Tools	Admin Control Pan	el Preference	5
entify, select and	configure test	instruments av	ailable on	the network						
Connect/Verify	strument Tools	Calibration	Common So	ource Config	F8 Network Configuration	n F8 Time Options				
Instrument Details Connect using O Serial Por IAN Cons External Amplifie	: rection		1.3	•	Instrument Type	0)	Res	F6x Connection et Instrument onfiguration		
External Am	lifier LAN Addre	ss 10 .	1.3	. 2 (R	lequired only if F63X0 in i	ise)				
Instrument Activi					Firmware Build	-			^	
Connection	External Am	iplifier Base Mo	xder	Status	Firmware Build		Options			
10.1.3.1	10.1.3.	2 F6150s	iv	ок	Version 5.8.2, Build 1291	F6005 - Enh Amp, F	6011 - CP/Web, F635	51 - Enbl F6350,		
		1		Rec	entiy Active					
1 10.1.3.1	10.1.3.2	F6150s		ок	Version 5.8.2, Build 1291	F6005 - Enh Amp, F		n o-blocata	×	

Figure 11. 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 12)

		unique test maru	iments available	on the netwo	rk				
onne	ct/Verify Instr	ument Tools Calil	bration Commo	n Source Config	F8 Network Configuration	F8Time Options			
Instr	ument Details								Instrument Options ×
Co	nnect using				Instrument Type				
	O Serial Port	Г		-	F6K (Except F630)	20	Verify F6x Connection	m	CPU ID: 67195118 (3V30 F6005 - Enhanced Amplifiers F6011 - Mobile control panel
	LAN Connect	tion	10 ] 1 ]	3 1	<ul> <li>F2K</li> <li>F63X0</li> <li>F8</li> </ul>		Reset Instrument Configuration		F601 - Induite Collidu panel F603 - Aunua F 6530 c nabled F6000 - Metering and transducer interface F6030 - Mich poption F6010 - High power convertible voltage/current sources F6012 - 12 analog sources
Exte	rnal Amplifier (I	F63X0) Details							F6820 - Analog input measurement module (recording) F6820 - Analog input measurement module (recording) F6835 - CPU3 F6844 - Relay/FET logic output, paired logic input, first strike
	External Amplifi	er LAN Address	10 1 .	3 . 2	(Required only if F63X0 in us	se)			F6860 - IEC 61850 GSE messaging support F6865 - 20KHz transient sampling rate F6870 - Sampled Values publication (FPGA v5)
Instr	ument Activity								A F6871 - Sampled Values subscription F6875 - Variable battery simulator
	Connection	External Amplifier	Base Model	Status	Eirmware Build		Options		F6885 - GPS receiver interface F6895 - GPS receiver and antenna
	-		1	(	serently Active			A	F6909 - Control panel interface F6910 - Simulator control and automation interface
	10.1.3.1	10.1.3.2	F6150sv	OK	Version 6,9/4, Build 1397	F6005 - Enh Amp, F6011	- CP/Web, F6351 - Enbl F6350, .	1447	F6920 - Auto synchronizer
	-			-	Locently Active				
								and and	OK
1	10.1.3.1	10132	F6150sv	OK	Version 6.0.4, Build 1307	F6005 · Enh Amp, F6011	CP/Web, F6351 + Enbl F6350,	×	

Figure 12. 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.

	(memos)	
7LE44K41TJVTP		Remember
7 'RZ 💌		Install New Key

Figure 13. Installing new key code after update

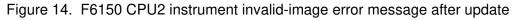
- 38) If the F6150 still miss an option after the key code install, e-mail the following information to <a href="mailto:support@doble.com">support@doble.com</a> :
  - a) F6150 instrument serial number
  - b) F6150 CPU ID
  - c) Documentation of the Instrument Options before the firmware update (screenshot 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 14.





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
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- E-Mail: <u>support@doble.com</u>

