Power Board Programming for FB07/FK07 and Fx10b ULH

iC7 Series Ultra Low-Harmonic Frequency Converters

1 Overview

1.1 Description

After installing a replacement board, use these instructions to program the board. All ultra low-harmonic (ULH) frequency converters use 2 programmable boards that can be replaced independently. Table 1 lists the boards required by each frame. The frame is listed on the product label.

Table 1: Programmable Boards Used in iC7 Series ULH Frequency Converters

ULH Frame	Power interface board	AFE control board	Inverter power board	AFE power board
FB07	X	X		
FK07	X	X		
FA10b			X	X
FB10b			X	X
FK10b			X	X

1.2 Spare Part Code Numbers

Use these instructions with the following spare parts in iC7 Series ULH Frequency Converters.

Table 2: Programmable Spare Parts, FB07/FK07 Frames

Number	Product store description
136B4610	AFE Program. Control Board FB/FK07 ULH
136B4611	Program. PIC Fx07 45/55kW BEG1 ULH
136B4616	Program. PIC Fx07 22/30/37kW BEG1 ULH

Table 3: Programmable Spare Parts, Fx10b Frames

Number	Product store description
176F4267	Program. Power Board AFE Fx10b ULH
176F4269	Program. Power Board Inverter Fx10b ULH
176F4335	Program. Power Board Inverter BEG1 Fx10b ULH

1.3 Product Label

The product label contains information to identify the product, and legal and regulatory information. Depending on the frame, the label is either on the top or the front cover of the drive. Fx10b frames have a 2nd label inside the drive.

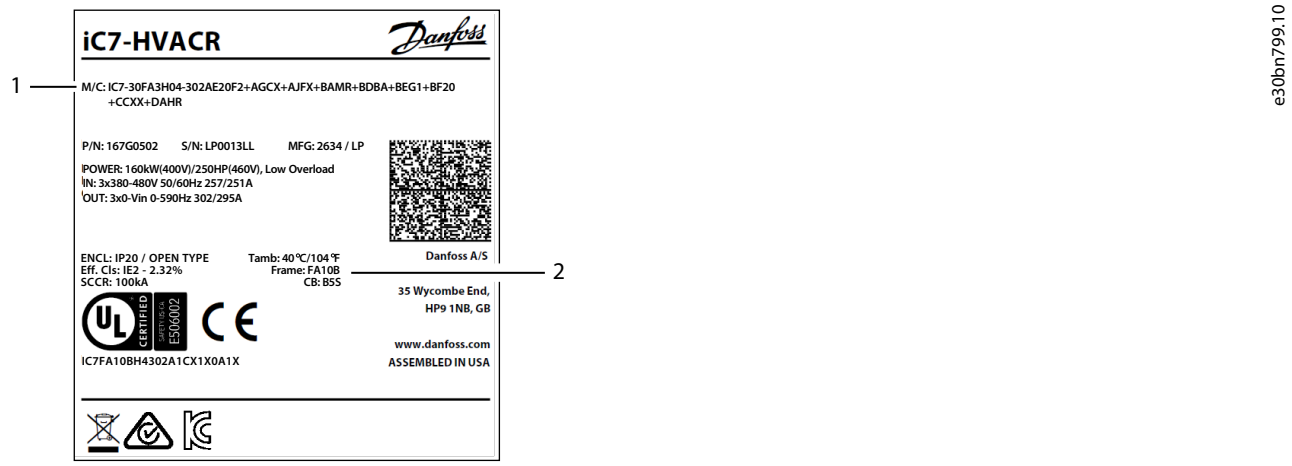

Figure 1: Product Label Example

1	Model code (M/C)	2	Frame

1.4 Model Code

The model code (M/C) is printed on the product label. The meaning of the model code is defined in Table 4. The product series, mains voltage, current rating, and options are used to select the correct configuration during power board programming.

Table 4: Elements in the Model Code

Character position	Example	Description
1–6	iC7-30	**Product series** iC7-30 iC7-60
7–8	FA	**Product type** FA = air-cooled frequency converter
9–10	3H	**Product function** 3H = 3-phased ultra low-harmonic drive 3N = 3-phase NFE (non-regenerative front end)
11–12	04	**Mains voltage** 02 = 208–240 V AC 04 = 380–480 V AC 05 = 380–500 V AC 06 = 525–600 V AC 07 = 525–690 V AC
14–17	302A	**Current rating** 03A0 = 3 A 300A = 300 A 3000 = 3000 A
Plus codes	+XXXX (for each option)	**Options** +AGCX = coated boards

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2 Programming

2.1 Downloading Software and Connecting the Drive

After a new board is installed, MyDrive® Insight is used to program the board. To download the power unit data (PUD) file and launch MyDrive® Insight, use the following steps.

NOTE: Programmable power boards are compatible with drive firmware versions 5.8.5 or higher. To update the software/firmware of the drive, refer to *Updating Software* in the service guide.

1. Note the model code, mains voltage, current rating, and frame listed on the product label. Refer to 1.3 Product Label and 1.4 Model Code.

   The product label information is used to select configuration options during programming.

2. Download the latest power unit data (PUD) file to the PC.

   PUD files are available to download from *Danfoss Service Extranet* > *Service Database* > *Field Programming*. To find the PUD file number, see Table 5. In the example programming procedure, the file is named *iC7_30_FA3H04_PowerUnitData-YYYY.M.XXXXX.varc*.

   Table 5: Power Unit Data Files for iC7 Series ULH Frequency Converters, FB07/FK07 and Fx10b

Product series	PUD file number	PUD file name[1]
iC7-Aqua	136E0443	iC7_30_FA3H04_PowerUnitData-*YYYY.M.XXXXX*.varc
iC7-HVACR		

   1) In the filename, YYYY.M.XXXXX represents the year and month the PUD file was created and the release code.

3. Launch MyDrive® Insight on the PC.

   To install or update MyDrive® Insight, go to https://suite.mydrive.danfoss.com. For more details, refer to the service guide.

4. Connect an Ethernet cable between the PC and the X0 terminal on the control board.

   If the PC has no Ethernet port, use a USB-to-RJ45 adapter.

5. Apply power to the drive.

   The control panel shows the iC7 startup message.

2.2 Programming the Power Board

To program a new board, use the following steps. The fan configuration is also updated during programming.

1. In MyDrive® Insight, under *All Devices*, click the name of the drive.

   A green double-arrow by the drive name verifies that the connection is established.

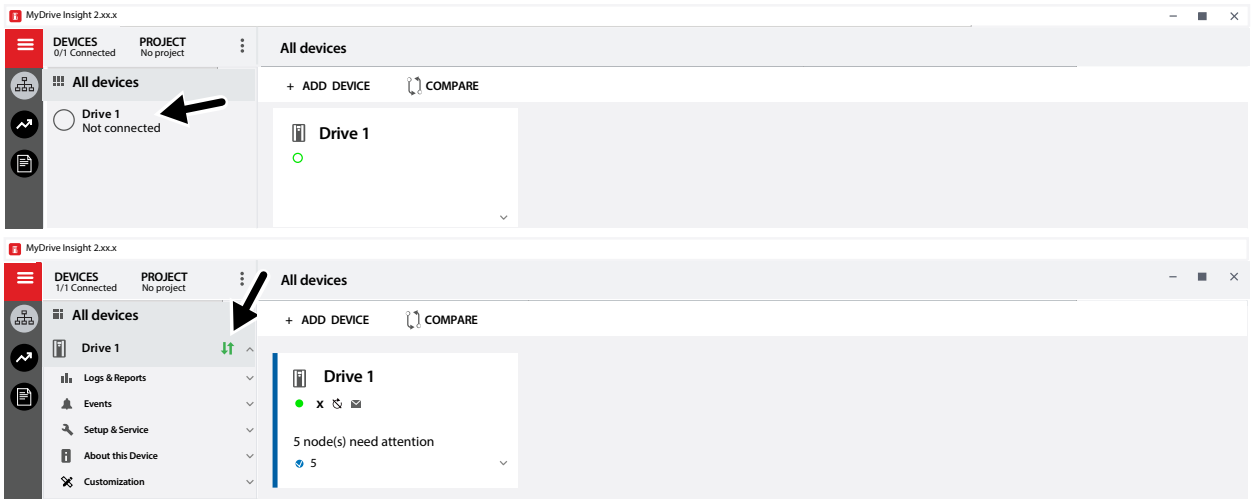

Figure 2: Drive Connection in MyDrive® Insight

2. Go to *Setup & Service* > *Software Update*.
3. At the prompt *"Commissioning: Is commissioning correct?"*, click *Yes*.

   To review the slot IDs before clicking *Yes*, go to *About this Device* > *Extended device Info* (or *Device Info*).

   The control panel also can be used to accept commissioning messages.

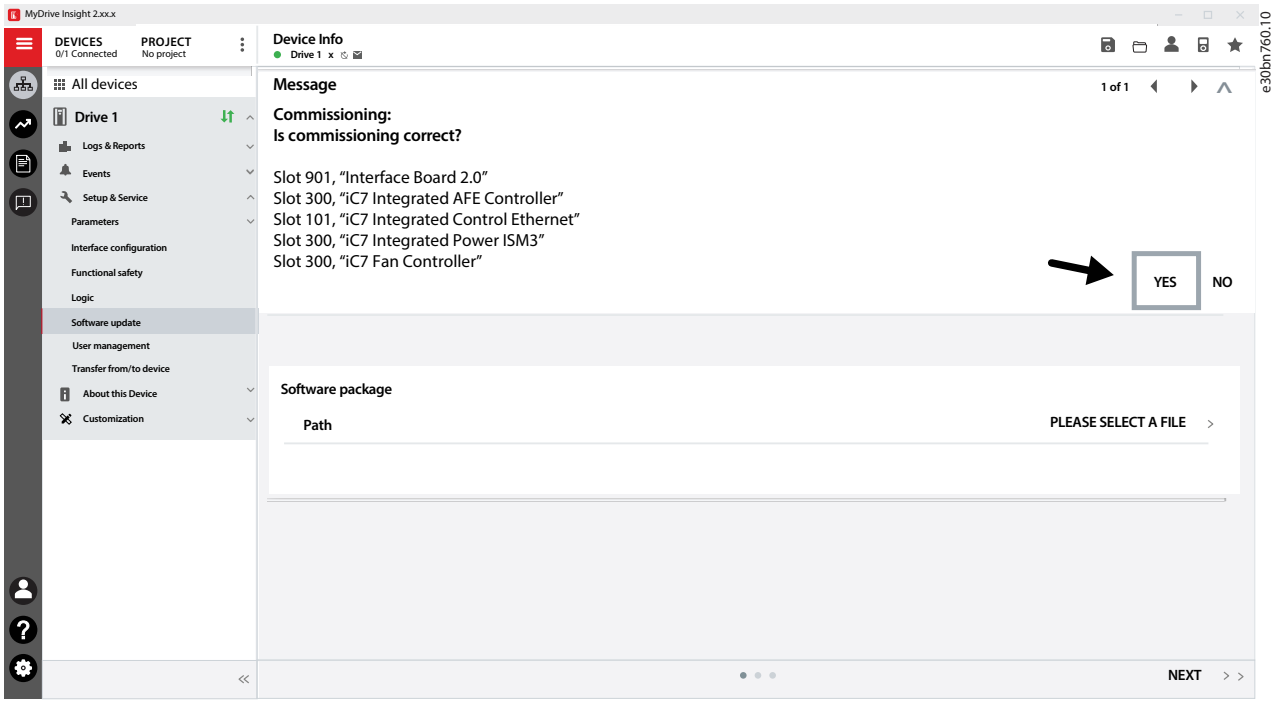

Figure 3: Programmable Board Commissioning Message

4. Wait until the prompt *"Commissioning: Approval is required"* appears, and click *Yes* to accept the defaults.

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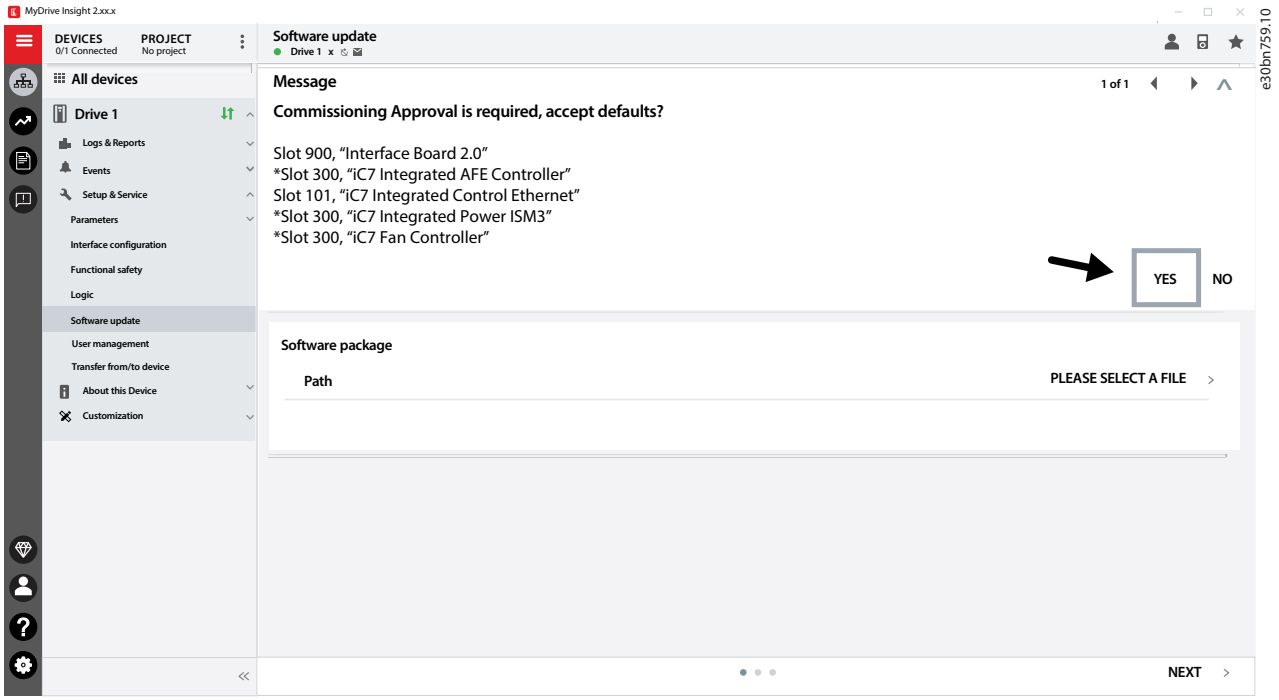

Figure 4: Commissioning Approval Required Message

5. Click *Please Select a File*, browse to the PUD file (downloaded in the previous procedure), and click *Open*.

In this example, the PUD file for configuring the spare parts is named "iC7_30_FA3H04_PowerUnitData-*YYYY.M.XXXXX*.varc".

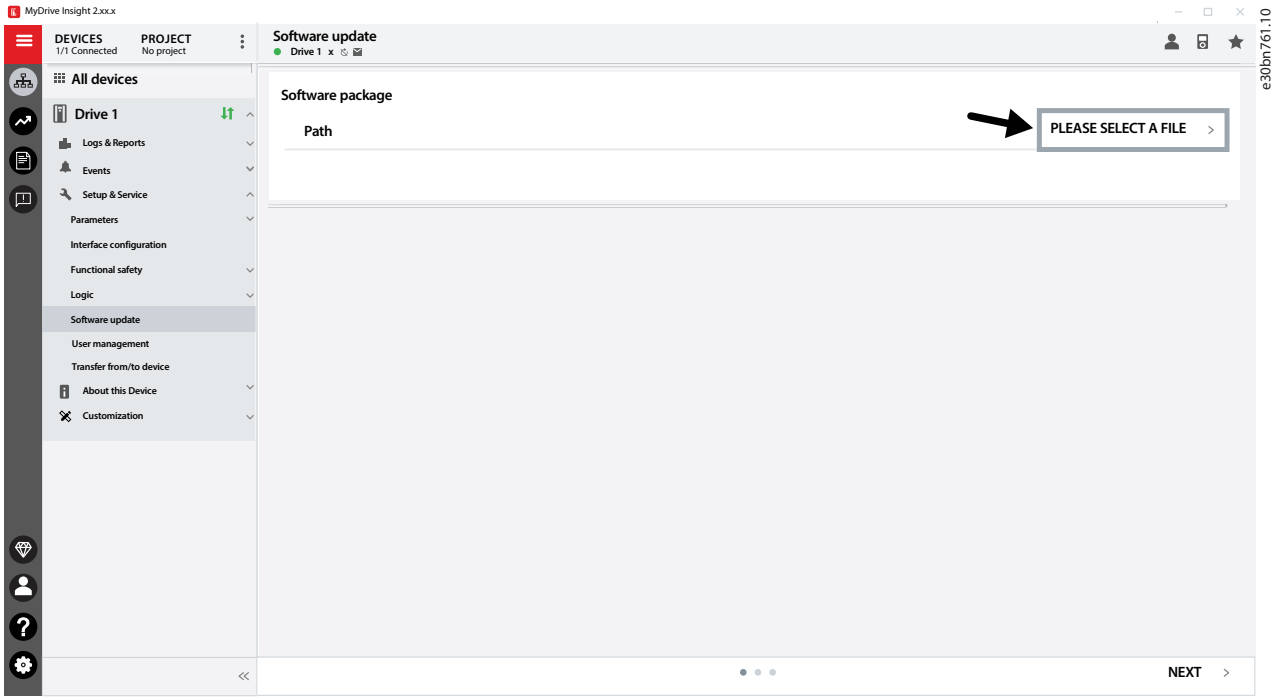

Figure 5: Software Package Selection

6. When the path of the PUD file appears under *Software Package*, click *Next*.

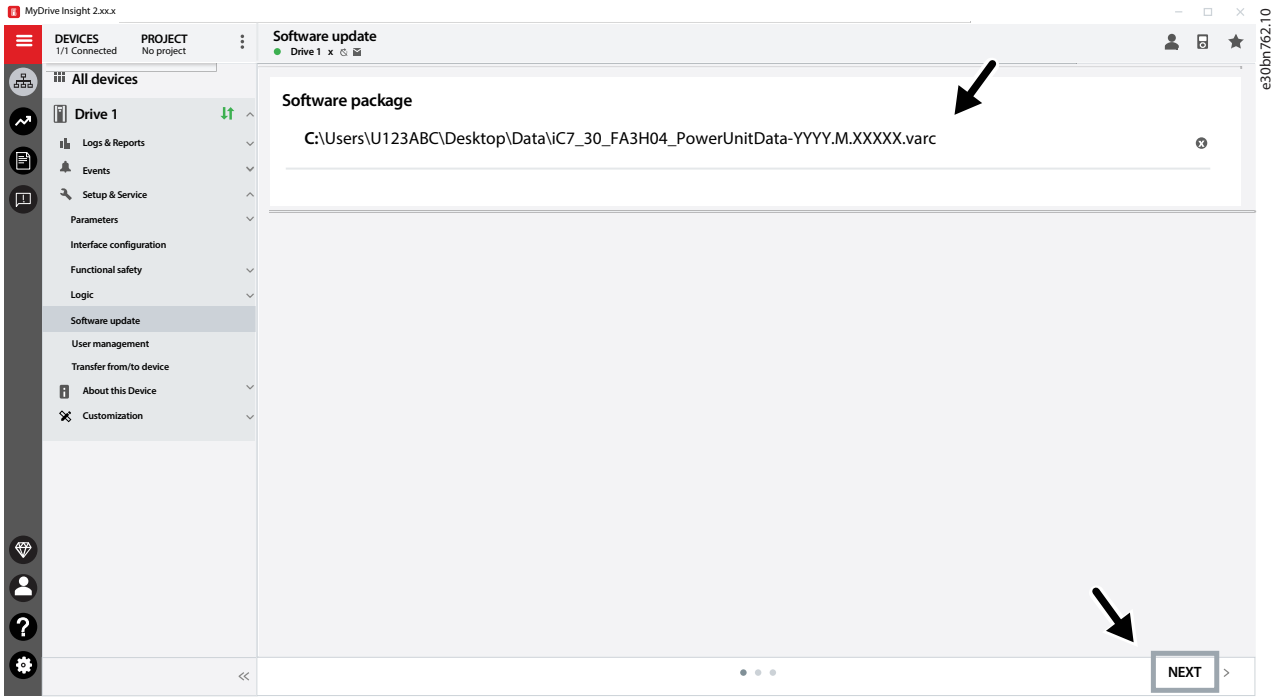

Figure 6: Power Unit Data File Confirmation

7. On the next screen, click the red link *GO CONFIGURE*.

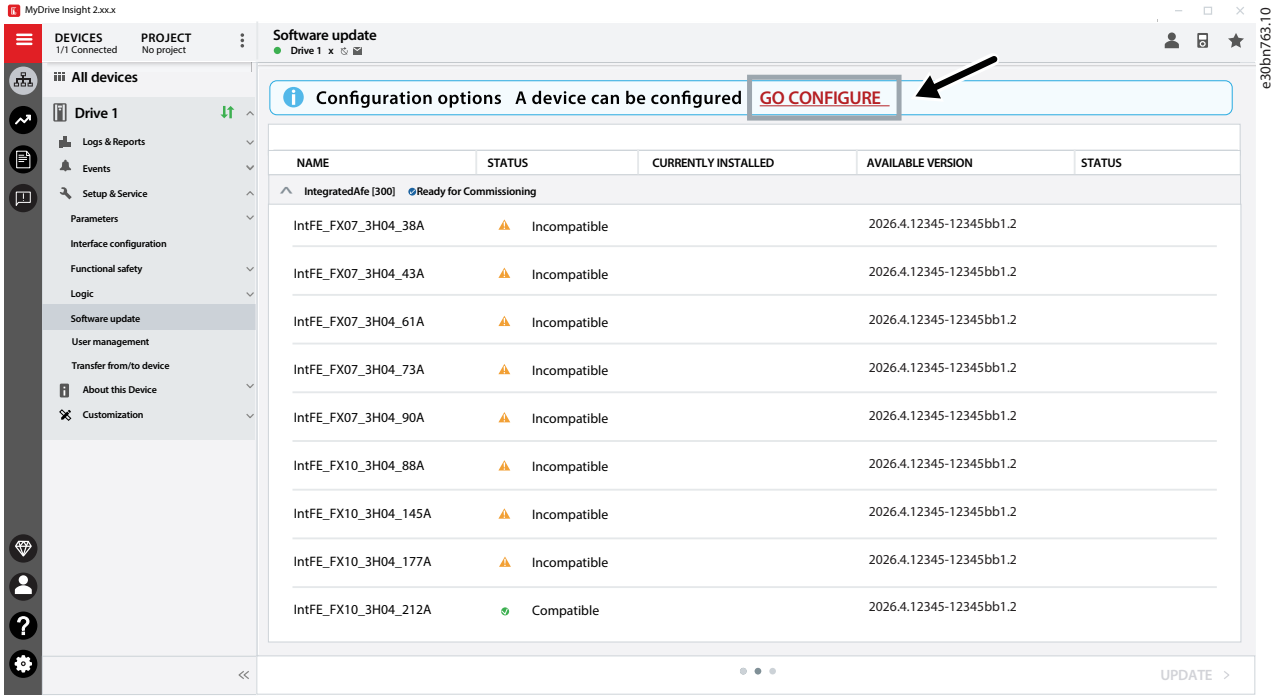

Figure 7: "Go Configure" Screen

8. On the *Configuration Options* screen, select 1 option under each section. The section names vary depending on the frame of the drive and the installed boards, for example *IntegratedAfe [300]*, *IntegratedPowerISM3 [300]*, and *Fan [300]*.

> **NOTE:** If the configuration option for a frame beginning with "FK" is not listed, use the option for the equivalent "FB" or "FX" frame.

The configuration options are named to align with the product label information.
In this example, the product label includes the following information:

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- Power rating: 302A
- Mains voltage: 380–480 V AC
- Frame: FA10b

The correct configuration options for this example are:

- IntegratedAfe [300] option: *Integrated Front End Configuration for iC7-30FA3H04-302A..., 380-480VAC, 302A*
- Fan [300] option: *Fan Configuration for Frame FA10 of iC7-30FA3H04-302A..., 380-480VAC, 302A*
- IntegratedPowerISM3 [300] option: *iC7-30FA3H04-302A..., 380-480VAC, 302A, Fx10, iSM3*

9. After selecting a configuration option in each section, click *Next*.

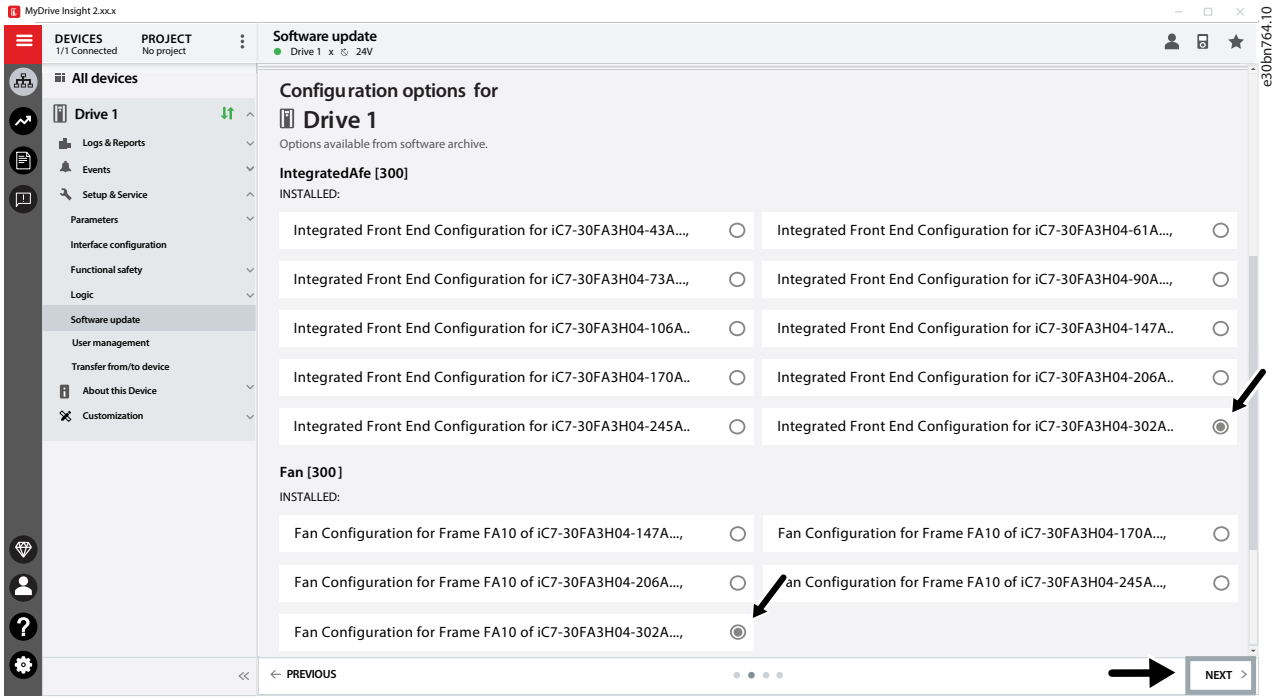

Figure 8: Programmable Board Configuration Options

10. The next screen shows that the nodes are ready to be configured. Click *Update* at the bottom corner of the screen.

> **NOTE:** The current ratings shown on this screen may differ from the current rating selected on the previous screen. This is expected behavior. The 1st screen uses the current rating from the model code. The 2nd screen may show other ratings such as high overload current ratings.

11. An alert appears advising not to interrupt the update. Click *Yes* to continue.

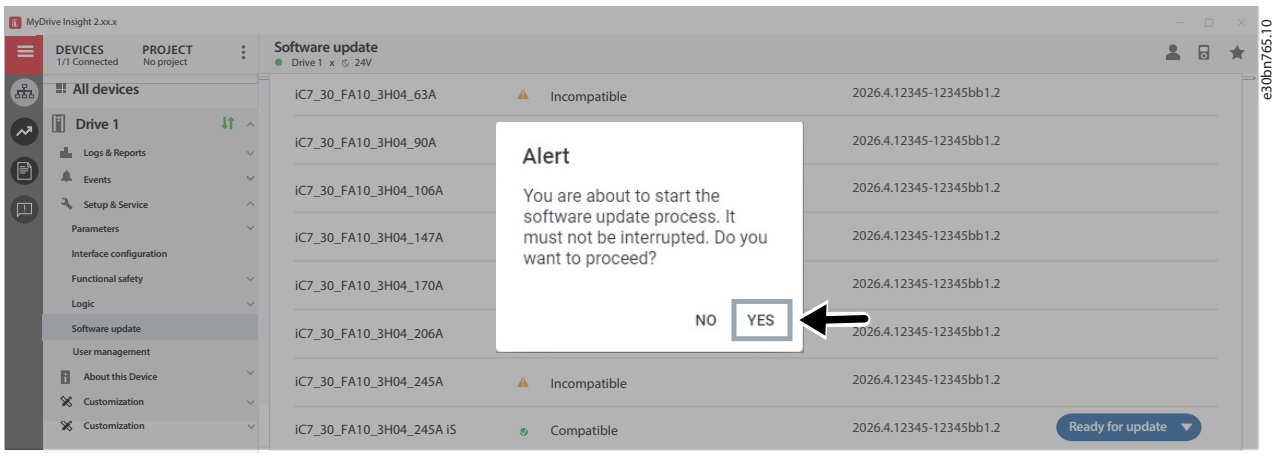

Figure 9: Software Update Alert

12. At the prompt *"Software Update in Progress"*, click *OK*.

Messages and a status bar show the progress of the board configuration.

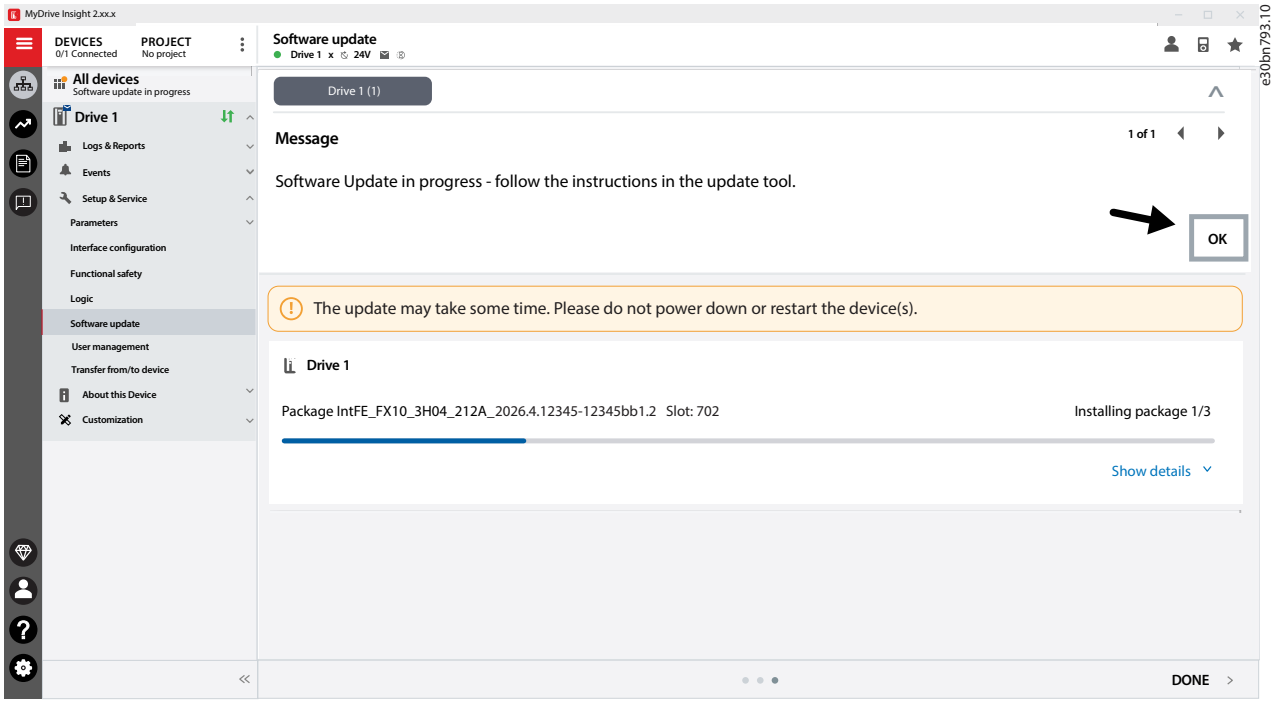

Figure 10: Software Update in Progress

13. When the status message reads *"Update Complete"*, click *Done*.
14. At the prompt *"A configuration change requires a restart to take effect. Do you want to soft-cycle now?"*, click *Restart Now*.

NOTE: After programming FB07/FK07 boards, perform a full power cycle of the drive to ensure that the board configuration is complete. In Fx10b drives, the soft-cycle restart is sufficient.

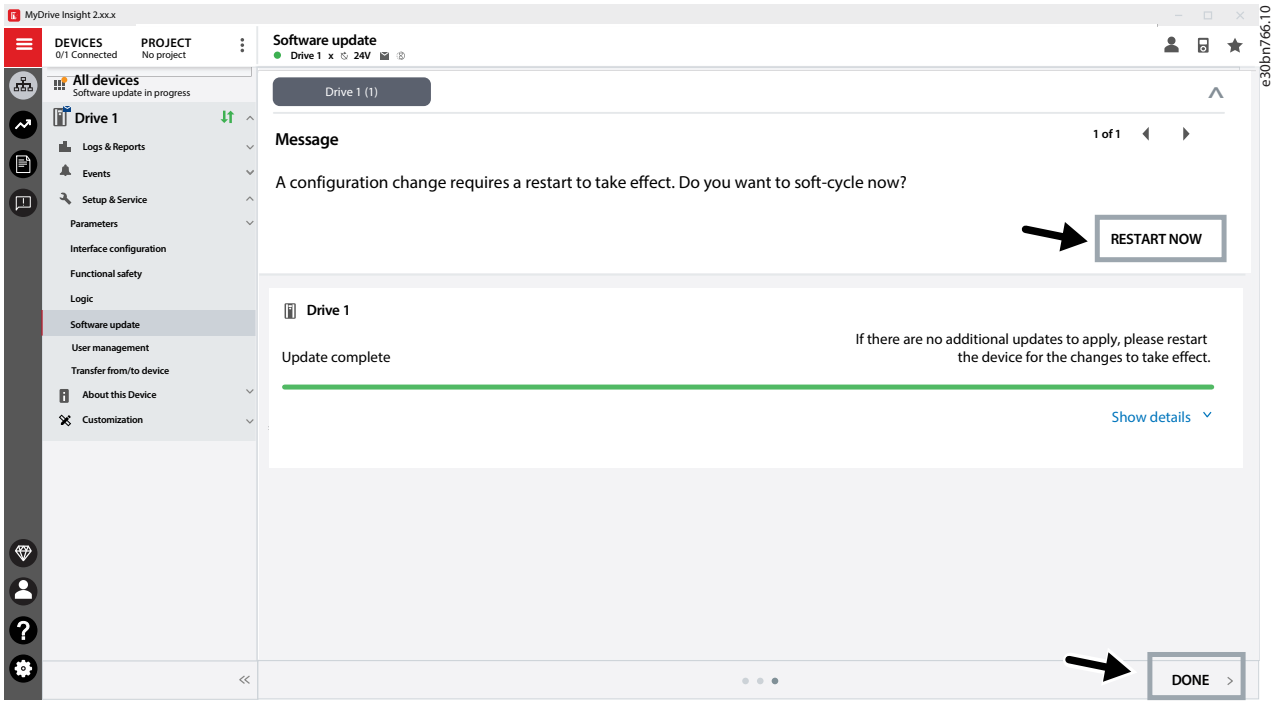

Figure 11: Software Update Complete and Soft-Cycle Messages

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15. After the drive restarts, wait until the message *"Commissioning: Approval is required"* appears again and click *Yes*. See Figure 4.
16. When programming is complete and the drive is ready to operate, the control panel shows the message *Drive Ready*.

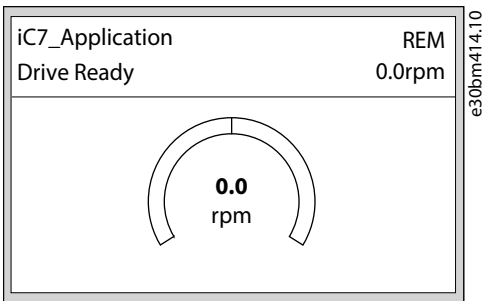

Figure 12: Drive Ready Status

NOTE: If error messages appear, resolve the messages before operating the drive.
Refer to 3 Troubleshooting for details.

NOTE: To prevent compatibility issues after programming a new board, check that the drive is using the latest software. If a newer version is available, updating the drive software is recommended.

3 Troubleshooting

Table 6: Programmable Board Troubleshooting

Condition	Possible cause	Troubleshooting
Error in package file: Win7 Socket [6]: no such device or address.	The PC is not connected to the drive.	Use an Ethernet cable to connect the PC to the X0 terminal on the control board.
Ground Fault 1: A high impedance ground fault is detected on the output.	The current scaling board is not installed.	Remove the current scaling board from the old power board, and install it at MK601 on the new inverter power board.
A green LED on the power board is lit, but the control panel is dark.	The power board jumper cable is not installed.	Remove the jumper cable from the old power board, and install it at MK903/MK904 on the new inverter power board.
The progress bar does not turn green or show the installation as complete.	A commissioning message is awaiting a response.	To accept the *Commissioning* message, click *Yes* in MyDrive® Insight or on the control panel.
After programming the board and soft cycling the drive, a message says: *Power Board Supply Fault: A power supply fault on the power board is detected.*	Configuration options selected during programming differ from the drive information shown on the product label.	To reprogram the power board, see 3.1 Checking the Board Details, 1.3 Product Label , and 1.4 Model Code.
After programming the board and soft cycling the drive, an error message about firmware appears.	The drive firmware may not be compatible with the new power board firmware.	Check that the drive firmware version is 5.8.5 or higher. In MyDrive® Insight, go to *About This Device* > *Device Info.* If the firmware is not compatible, update the drive software. See *Updating Software* in the service guide.
After programming the board and soft cycling the drive, an error message about node compatibility appears.	AFE control board may require a full power cycle.	Power cycle the drive, shutting down the power completely. Approve commissioning upon restart.

3.1 Checking the Board Details

To verify that the programmable board is configured correctly, use MyDrive® Insight to review the device info for the board.

1. In MyDrive® Insight, go to *About This Device* > *Extended Device Info*.
2. Scroll to the information for the new power board, and find the *Hardware* section.

Before programming, the hardware information does not show a *Product Identity Name* or *Product Identity Version*. See Figure 13.

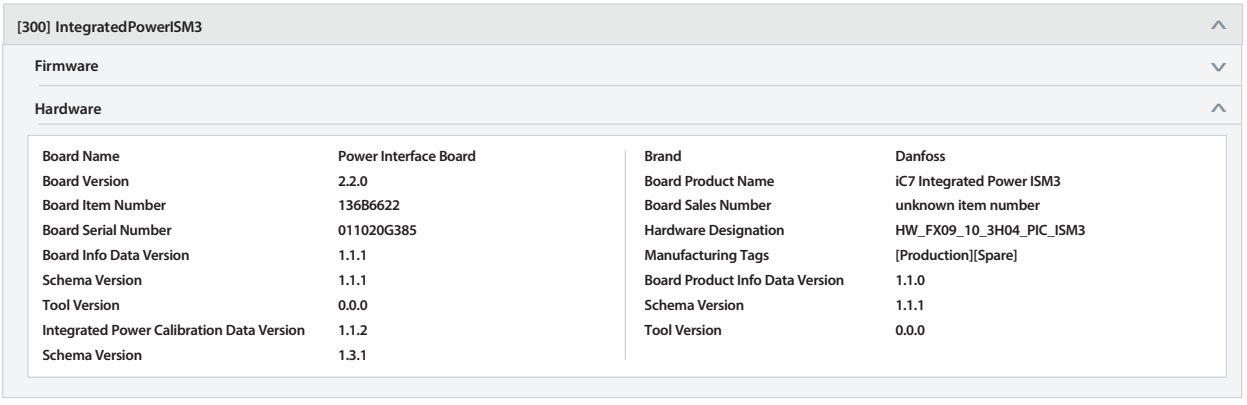

Figure 13: Example of Power Board Info Before Programming

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After the board is programmed, the new configuration information is listed. See Figure 14.

- The *Product Identity Name* shows the name of the configuration option selected during programming.
- The *Product Identity Version* shows the date of the PUD file version (not the date of installation).

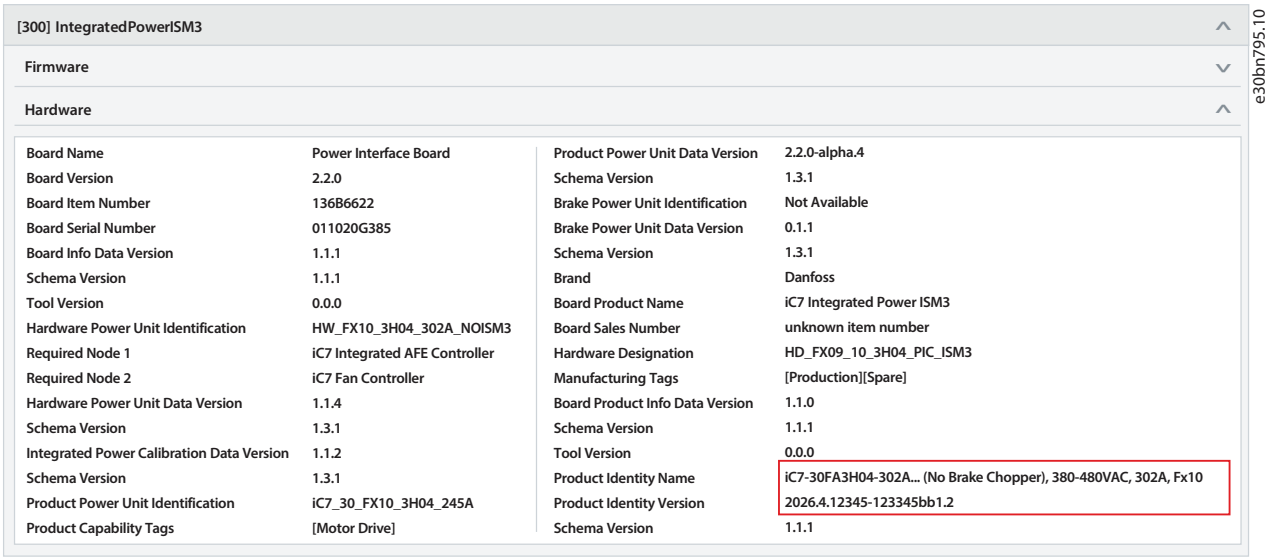

Figure 14: Example of Power Board Info After Programming

3. If the *Product Identity Name* and *Product Identity Version* do not show the expected information, repeat the programming procedure taking care to select configuration options that match the information on the product label. Refer to 1.3 Product Label .

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