Important information

When performing firmware update on a NFO Sinus Optimal unit, the NFO Sinus Manager program communicates with the built-in CPU bootloader functionality that handles erasing and programming, which is supplied by the manufacturer of the CPU.

For some reason unknown to NFO Drives, CPU's of a certain manufacturing period show a small probability to get stuck during erase, and after that the unit may become temporarily inoperable. NFO Drives can not mitigate the root cause of this problem (CPU manufacturer) but there is a workaround, see section 3.

1 Preparations for firmware update of NFO Sinus Optimal

- Uninstall any previous version of NFO Sinus Manager 3.x.x. before installing a new version.
- Download and install latest version of NFO Sinus Manager from https://www.nfodrives.se/products
- At end of installation you may launch the program, or start it by clicking the desktop icon.
- When NFO Sinus Manager has started, select Settings and then Advanced.
- Check the option *Enable developer functions* and then click *Save* button (see picture below).
- Go back to start screen by clicking the *Home* symbol.

NFO Sinus Manager 3		– 🗆 X
Sinus Manager	Welcome	NFO
Home Settings	COM Port Settings Communication Monitor Settings Misc Help	Enable developer functions Make .inv files compatible with SinusManager 2 Ignore Min-Max limits when entering value for parameters
	Advanced COP Flash Settings	
v. 3.1.3.0	Save *	

NOTE:

The firmware for the inverter is distributed as a part of the Sinus Manager application. The NFO Sinus Optimal inverter consists internally of three CPU's:

- 1. The COP (Co-Processor) for communication and control of terminals,
- 2. the GUI (Graphical User Interface) for handling of the display and keypad, and
- 3. the DSP (Digital Signal Processor) for motor control.

When the firmware is distributed, all three CPU's firmwares are packed together into the Co-Processor firmware file. Therefore, it's essential to start the update procedure by updating the Co-Processor before any of the other two.

After the firmware has been updated, the unit will keep all previous settings including the motor parameters. However, sometimes the intention of the update is to be able to use new parameters or functions. Therefore, a factory reset may be required after the new firmware has been installed.

2 Firmware update procedure

- Power up the NFO Sinus Optimal unit
- Connect a USB cable between one of the USB ports of your computer and the USB connector of the control board of the NFO Sinus Optimal. *NOTE*: It may be convenient to look at the com port list while connecting the USB cable, and see which com port number that appears in the list.



• Click on the COM port to identify the connected unit, then click the inverter symbol to read inverter data.



• After a moment, the data is read from inverter (the blue question mark turns green)

NFO Sinus Manager 3	- 🗆 X	(
Sinus Manager	Welcome NF	O ES
Home Corrections	Quick Guide Image: Constant of the second secon	
	COM ports	
	Inverters Optimal 2.2kW (COM8-1) IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIIII IIIII IIIII IIIII IIIII IIIII IIIII IIIII IIIIII	
v. 3.1.0.0	Open New N2233F0823	

• Click the inverter symbol to open the parameter pages.



• Right-click the inverter symbol and select *Firmware Update* from the menu.

	NFO	Sinus Manager 3								-		×
<(ራ	Optimal 2.2k	t LogViewer	Monitor	CSV Com	pare Copy From	n Copy To	Get All	Send All	E Save	(X) Close	
1			Mot	or Ramp	Run Cont	ol Frequency	Speed PI-r	eg Outpu	it Commu	nication	Status 1	Temperi
		Open Inverter								Opur	1012.200	
	l	Rename										
Sta	٠.	Change Inverter ID										
Mo	С	Reset	•									
Sav	÷	Firmware Update										
Sa	\star	Modbus										
\Dlv	6	LogViewer										
Sta	~	Monitor										
	۶	Volt Calibration										
	ē	Print										
	٦	Save										
	٦	Save As										
Tur	8	Close										
Т	ine N	Notor Full Tuning	~									

• Sinus Manager suggests the most recent distributed firmware included in the Sinus Manager installation. (If user wants to install another version, it's possible to click the folder button and select another file.)

Optimal Firmware Installer	×
Flash Wizard for Optimal 2.2kW (COM8-1)	
COP firmware hex file	
C:\\optimal_5108_4.hex	5108 4
Current COP: 5107.8	-Analysis
Current GUI: 5107.8	
Current DSP: 5107.8	
	• \)
(Use USB communication for flashing)	
Start	Quit

• Click *Start* and then *Install* to start the firmware update.



• The installation program will show a progress bar for a short period of time.

Coptimal Firmware Installer	×
Writing block# 31 Address: 0x804F7FC Size: 2048bytes Writing block# 32 Address: 0x804FFFC Size: 2048bytes Writing block# 33 Address: 0x80507FC Size: 2048bytes Writing block# 34 Address: 0x8050FFC Size: 2048bytes Writing block# 35 Address: 0x80517FC Size: 2048bytes Writing block# 36 Address: 0x80517FC Size: 2048bytes Writing block# 37 Address: 0x80527FC Size: 2048bytes Writing block# 38 Address: 0x80527FC Size: 2048bytes Writing block# 39 Address: 0x80537FC Size: 2048bytes Writing block# 40 Address: 0x80537FC Size: 2048bytes Writing block# 41 Address: 0x80547FC Size: 2048bytes	~
Progress: 57%	

3 Possible workaround for bug in the built-in CPU erase function

- One of the first parts of the firmware update procedure is to erase the flash memory of the Co-Processor. As mentioned at the beginning of this document, CPU's of a certain manufacturing period show a small chance to get stuck during erase. Normally the erase shall finish in about 5 seconds or less. If the CPU automatically moves on to Writing block# sequence, there is no problem. Then just continue to to section 4.
- If the text in the information box doesn't move on after 10 seconds or more, the erase function is stuck.



• Pull out the USB cable from computer, click **OK** if any error message appears.

Error!	×
Lonhandled exception occurred: Ett undantag uppstod under åtgärden, vilket gör resultatet ogiltigt. Mer information finns i InnerException-objekte	t.
ОК	

- Close the Sinus Manager program (if it doesn't automatically close).
- Power off the inverter an let it black out.
- Start the Sinus Manager program again.
- Plug in the USB cable.
- Sinus Manager will now detect an inverter with incomplete installation. Click Yes to continue.

Reinstall Firmware	×
An inverter with an incomplete COP installation detected, do you want to reinstall COP for this inverter?	?
Yes	

• Select the firmware file you intend to install and click Start.



• Confirm that you want to install the selected firmware by clicking *Install*.



• After a few seconds the progress bar shall begin to indicate that the Co-Processor is being programmed.

Optimal Firmware Installer	×
Writing block# 31 Address: 0x804F7FC Size: 2048bytes Writing block# 32 Address: 0x804FFC Size: 2048bytes Writing block# 33 Address: 0x80507FC Size: 2048bytes Writing block# 34 Address: 0x8050FFC Size: 2048bytes Writing block# 35 Address: 0x8051FFC Size: 2048bytes Writing block# 36 Address: 0x8051FFC Size: 2048bytes Writing block# 37 Address: 0x8052FFC Size: 2048bytes Writing block# 38 Address: 0x8052FFC Size: 2048bytes Writing block# 39 Address: 0x8053FFC Size: 2048bytes Writing block# 40 Address: 0x8053FFC Size: 2048bytes Writing block# 40 Address: 0x8053FFC Size: 2048bytes Writing block# 41 Address: 0x8054FFC Size: 2048bytes	~
Progress: 57%	

• When programming is completed, click *Done* and pull out the USB cable.



- Power up the inverter
- Insert the USB cable and click the port number. (Same procedure as when we started the update, before the error occurred)



• Right click the inverter symbol and select Firmware Update

COM ports	8					
Inverters	D					
Optimal 2.2kW	1	Read Inverter				
(COM8-1)	С	Reset	• -			
	÷	Firmware Update				
Open New	×	Modby Undate firmura	ra for	this investor		
Recent Inverter	EQ Ş	LogViewer Volt Calibration		unis inverter		
Flywheel_ 0:\G3\test\2k	0	Close	04 M	ť /_5104_new_m	osfet.inv	

• Click *Start* to begin firmware update but click *Skip* in the next pop up box to skip the update of Co-Processor.



• The Sinus Manager will now move on to update of the GUI (and then DSP) which is the same as if the erase fault has never happened. Move on to next section.

4 Continue programming in normal sequence

• When finished with Co-Processor, the installer will prompt to continue with GUI. Click *Install* to continue.



• Again, the installation program will show a progress bar. Wait for installation of GUI to finish.



• When GUI is finished, the installer will prompt to continue with DSP. Click *Install* to update the DSP.



• Again, the installation program will show a progress bar. The DSP takes the most amount of time, about two minutes are required.



• When finished all three CPU's, the installer will show a summary screen. Click **Done** to close it.

Optimal F	Firmware Installer		×
Installatio COP FW: GUI FW: DSP FW:	n Complete! 5108.4 5108.4 5108.4 5108.4		
		Done	

• The firmware update is now completed, and user may want to re-read all parameters from the inverter. If so, click the *Get All* option on the tool bar.



5 Factory reset

- To be sure that the inverter will operate with the default setting of the parameters of the new firmware, it's recommended to perform a factory reset.
- Right-click on the inverter, then select Reset and Factory Reset



• Click **Yes** to continue



• Go to the inverter. After a factory reset, the user must select application.

Pump	OEMUacpum		
	Select.		
e Leav	/e		
0.00 A	0.00 kW	0.00pf	
Standby	Not Tuned	Auto	

- Use arrow up/down buttons to select the application that correspond to, or is the most correct, for the actual installation. Selectable options are *Pump* (e.g. water pump), *Ventilation*, or *OEM Vacuum pump*.
- Press ENTER button to save the selection, then press ESCAPE to return to main screen.
- After a factory reset, user must enter correct motor data and perform an autotuning. Please see manual.