

PG680/820 Frequency Inverter Programming

The PG680 & PG820 both come equipped with frequency inverters. The functions of these frequency inverters are as follows:

- Maximise performance of the drive motors.
- Enable Forward/Reverse control of drive motors.
- Enable speed control of drive motors.
- Regulatory / Protective functions.
- Diagnostic & Servicing functions.

From time to time, updates will be made available to help further enhance the above features. These updates can be uploaded into the frequency converters using a personal computer / laptop device.

Two different software packages are required for such updates:

- NCLoad – installs operating system into frequency converter.
- NCDrive – installs settings / parameters specific for our application into the frequency inverters.

The following manual covers:

1. How to set-up the personal computer / laptop device which will be used to install the updates to the frequency inverters.
2. How to install the updates into the frequency converters.

NCLOAD and NCDRIVE Programming tools,

Before any programming can commence the correct software is needed, this can be found and downloaded for free at www.vacon.com

You can find it in:
Supports and downloads

Vacon is a leading supplier of variable speed AC drives.

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How can we help you with your AC drive?

Vacon AC drives software. Vacon NX system and application software. Vacon NCDrive. Vacon NCLoad

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Select: Vacon AC drives and software

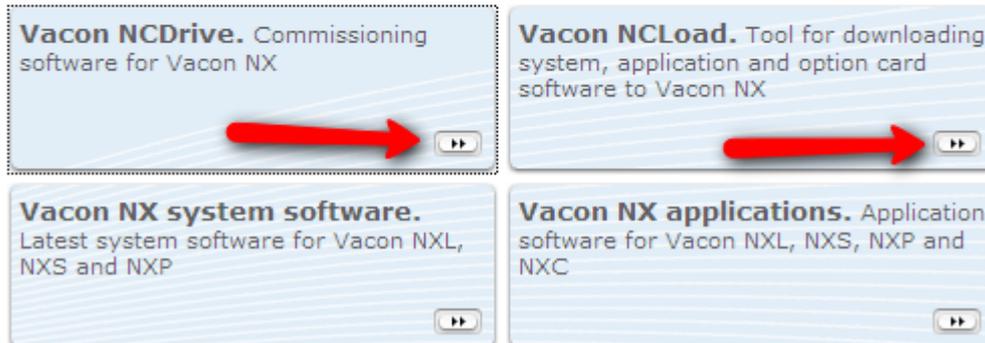
(You may like to also get a copy of the NXL manual in which case select Vacon Manuals – then select option “6 – Vacon NXL manuals” – then select the language of your choice.)

Once in **Vacon AC drives software**, install both NCDrive and NCLoad by clicking on the buttons as shown in the below image.

Vacon AC drives software

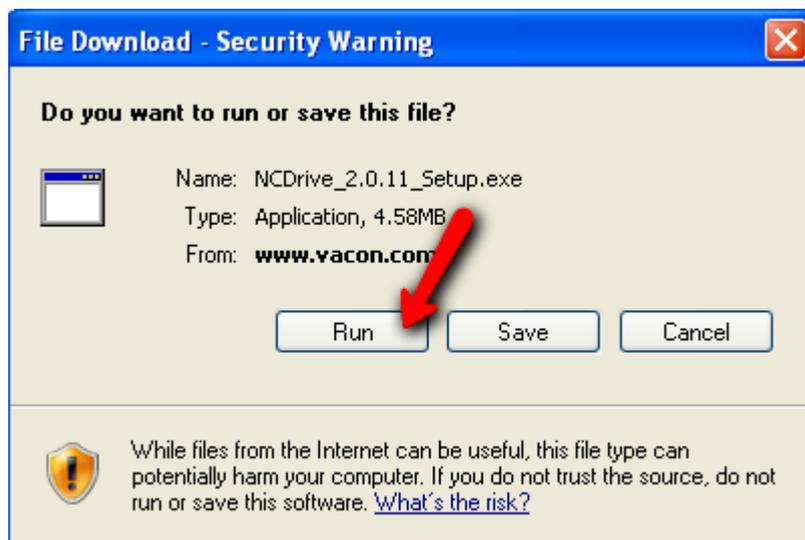
How can we help you with your AC drive? Choose what best meets your needs best. All Vacon NX system software and applications can be found from the navigation panel on the left.

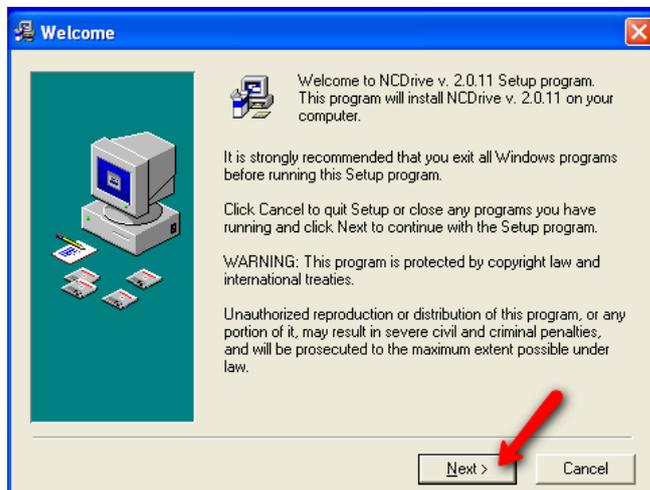
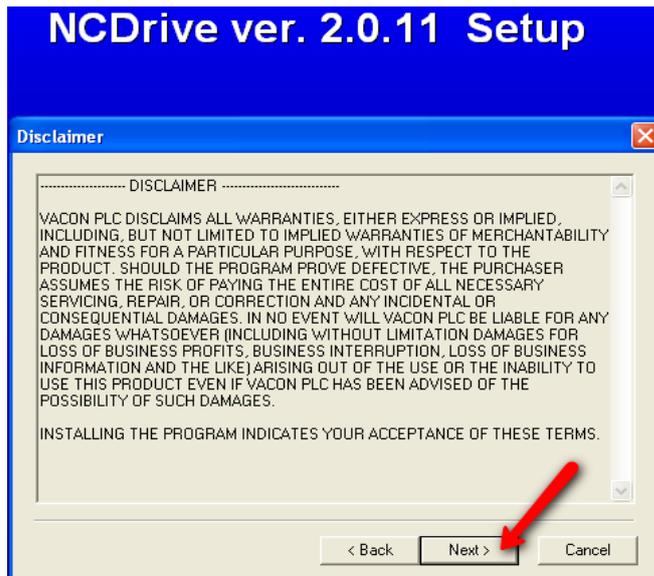
Direct software download for Vacon NX



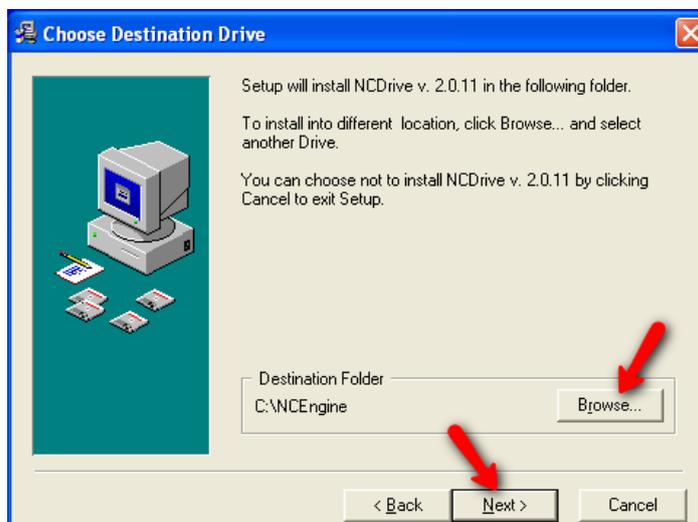
Select "RUN" to automatically install the software. You will **not** need to allocate where you would like to save both the NC Drive and NC Load program, they will go straight to your hard drive

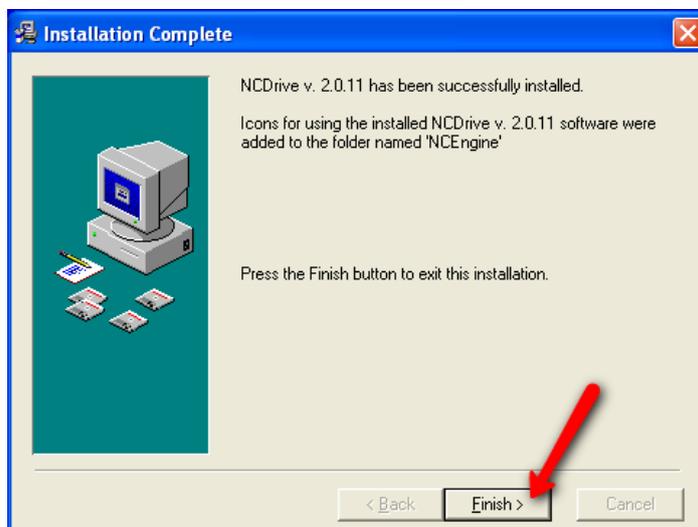
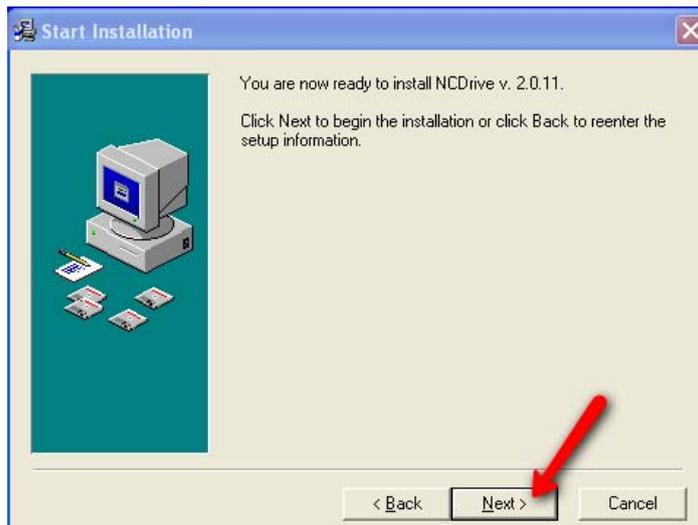
-**Vacon NCDrive** -"Run" then navigate through each window option



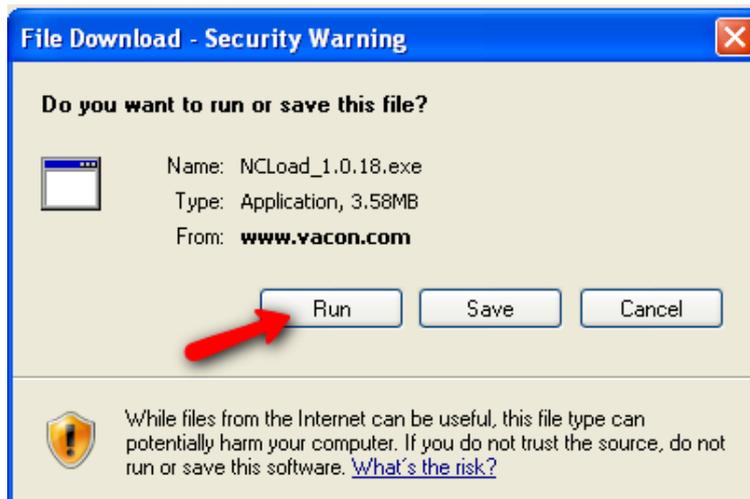


Both NCDrive and NCLoad will automatically be placed in C:\NCEngine when "Next" is selected. If you require a different target location, select using the "Browse" option (not recommended).





-Vacon NCLoad - "Run"



Run will both save and open the program for you.

PG 680/820 Programming

Once both NCLoad and NCDrive programs have been successfully installed on your computer, you will also require the following components:

-USB to Serial port adapter	(501 36 98-01)
-Vacon extension cable ***	(575 66 43-01)
-Vacon adaptor panel	(510 37 24-01)

*** Extremely important this is a genuine item as generic DB9 cables are wired differently!

Note: When using USB to Serial port adaptor (501 36 98-01) for the first time, you will need to install the driver (which is located on the CD accompanying the adaptor) via the “found new hardware wizard”. (Microsoft Windows will automatically prompt you to do this when the adaptor is plugged in to the computer).

Once you have these parts and all installations are complete, you are ready to update or install the frequency converters with the latest version of the Husqvarna Surface Preparation operating parameters.

Note:

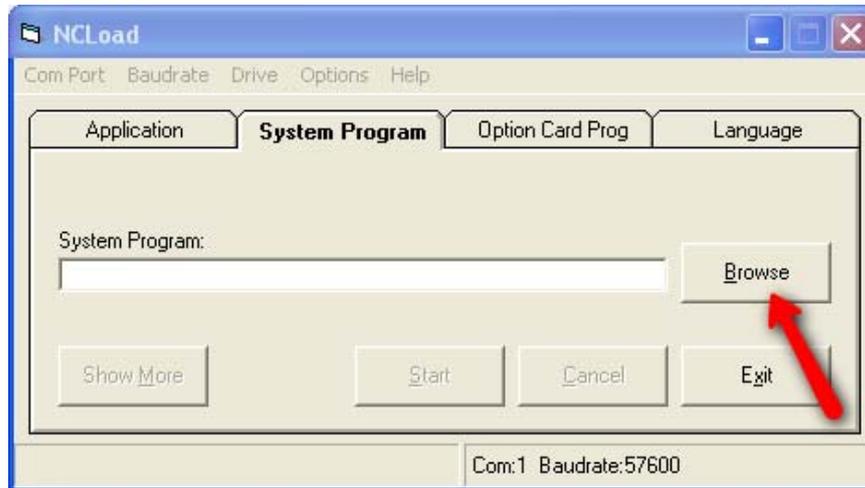
Installations into the frequency inverters should always be done in the following order:

1. NCLoad – operating system update.
2. NCDrive – settings / parameter update.

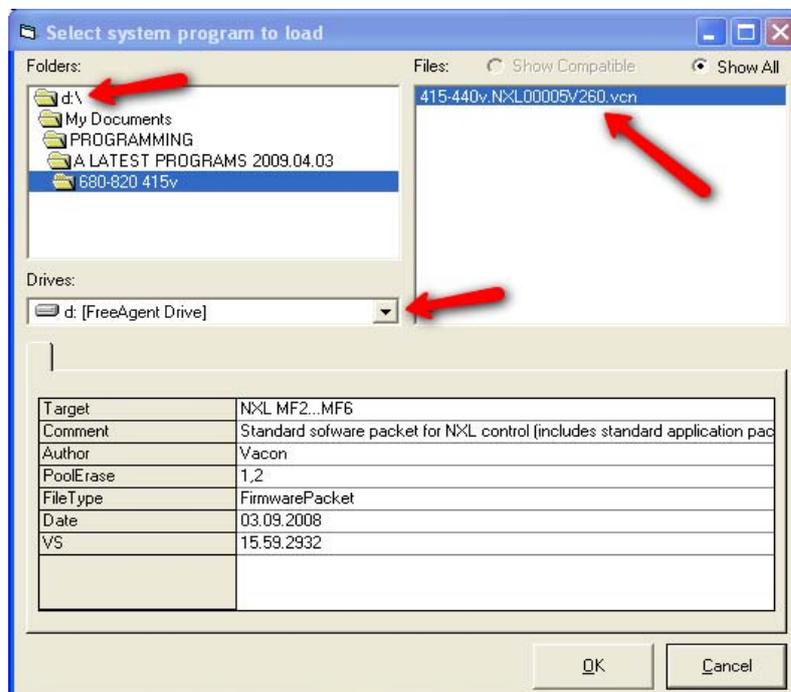
INSTALLATIONS USING NCLoad.

Open NC load (using Windows desktop shortcut)

Using the **Browse** option, select the operating system file (.vcn) you wish to install (for this example we will use -NXL00005V260.VCN) into the frequency inverter.



The first time you run NCLoad you may need to manually select the file path (including Drive, Folder and File) for the NCLoad program as to where you have the programming files saved, after this NCLoad should remember the path for any future installations. Once selected press "OK".



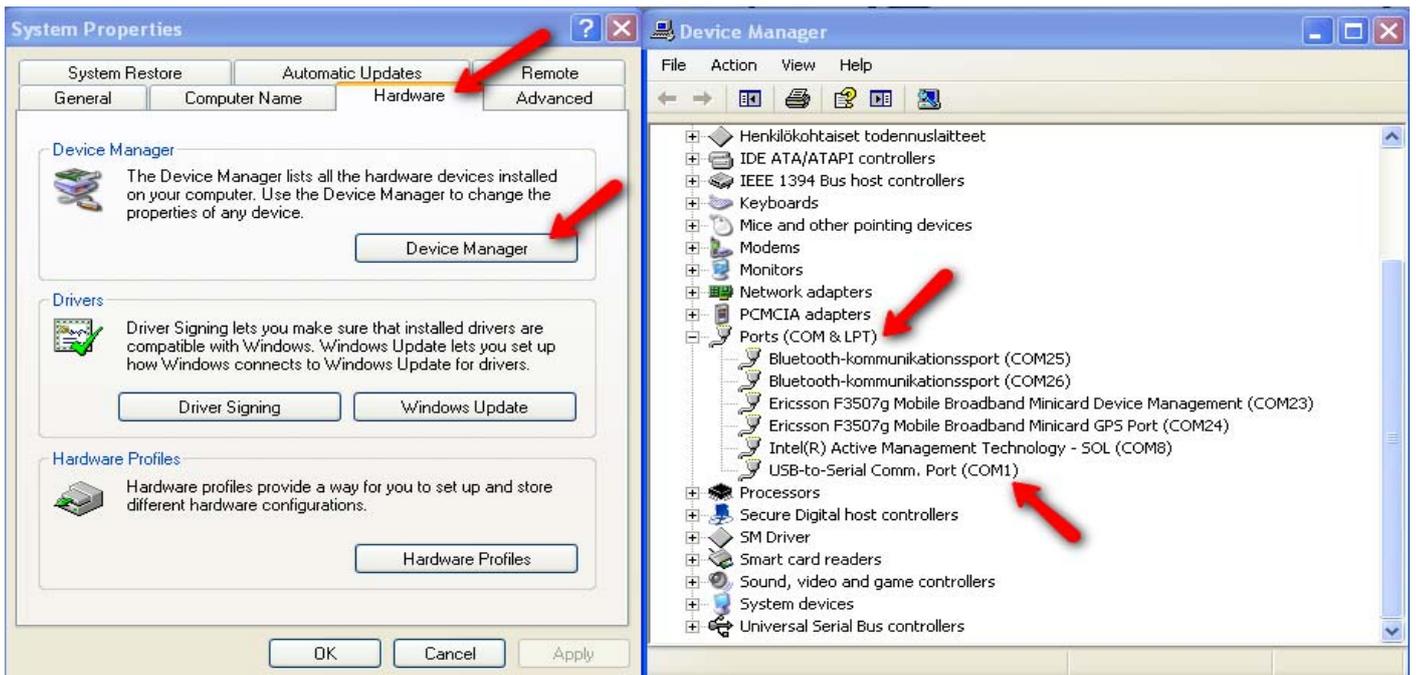
-Set Baudrate to maximum speed "57600" (This will ensure the installation goes the fastest.)

- Select correct COM Port setting. This will need to be set inline with computer / laptop since Windows will automatically assign a COM Port setting to the USB to serial Port Adaptor when the adaptor is plugged into your computer / laptop. To check which COM Port setting should be selected in NCLoad, follow the following procedure:

Go to **Start/ My Computer** and Right click on **Properties**



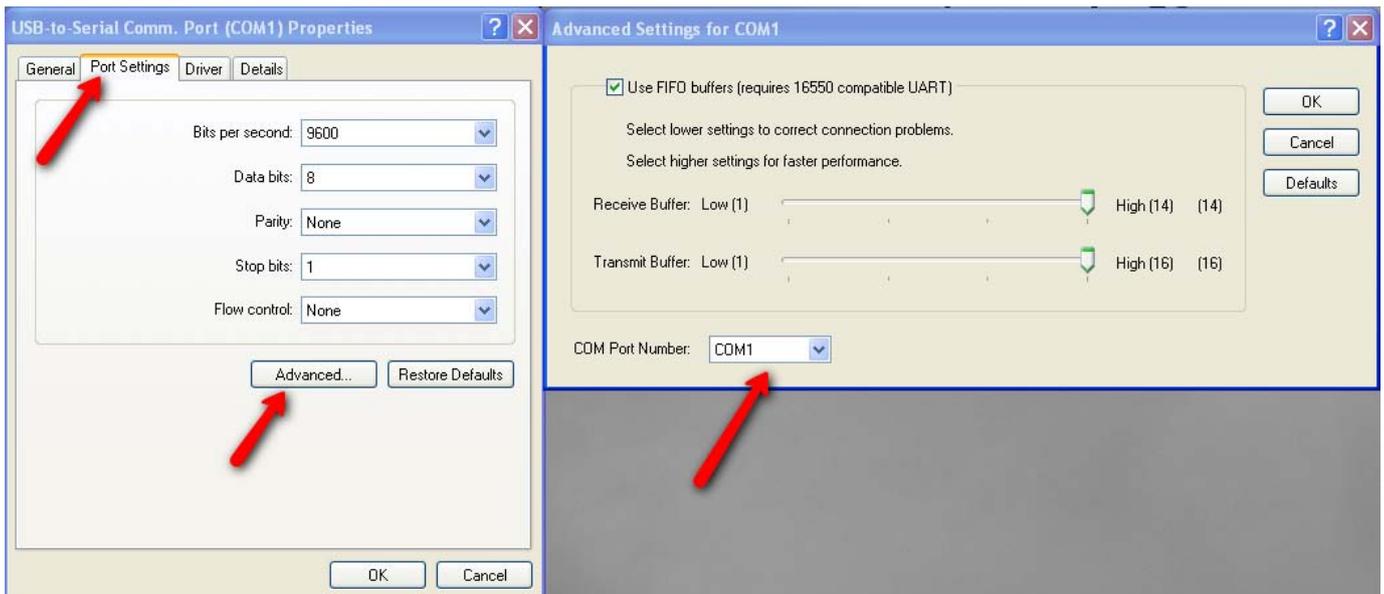
Once in the **Properties** window go to **Hardware / Device Manager**
Then find the **Port (COM & LPT)** to check which COM Port Windows has assigned the adaptor to (in this case **COM1**)



COM Port settings may vary from computer to computer. If the COM Port setting assigned by Windows is above 8, then we will experience a communication problem when using NCLoad & NCDriver since both programs only offer 8 options for COM Port selection. If on your computer / laptop Windows has assigned a COM Port setting higher than 8, please change as shown below.

Right click on **USB to serial comm. Port**

Go to **Properties / Port Settings / Advanced.**

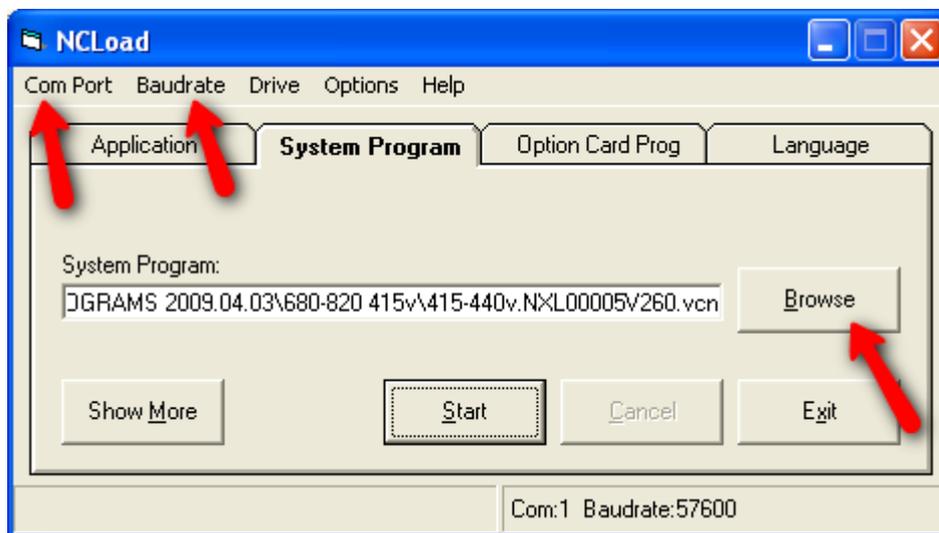


Here you will find a box enabling you to change the COM Port setting. Change the COM Port setting to number “8” or below and not already in use. Then click “OK” twice so you exit back to Device Manager. The new COM Port setting that you have selected for ATEN USB to Serial Bridge should now be visible. This is the COM Port setting you need to select in NCLoad and NCDrive.

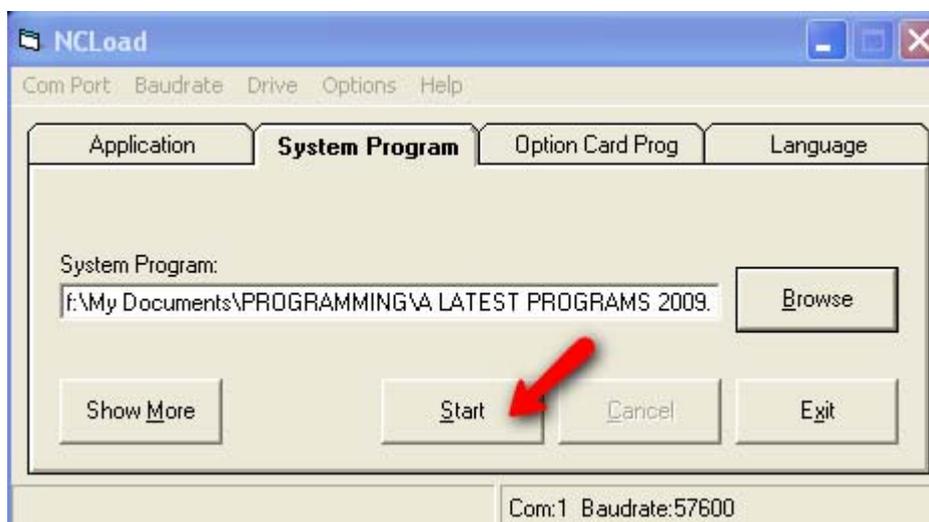
Note:

For each future software installation into the frequency inverter you perform, it is important you insert the USB to Serial port adapter into the same USB port in your computer / laptop. If you insert into a different USB port, Windows will assign it to a different COM Port setting in which case you will need to change the COM Port setting in NCLoad & NCDrive and possibly also in Device Manager.

Once you have finished checking the COM Port setting above, continue with COM Port selection in NCLoad.



Once the Programming file and COM Port have been selected then click “Start”.



“Loading loader” will appear in the left hand corner of the window, this may take a few minutes to complete.

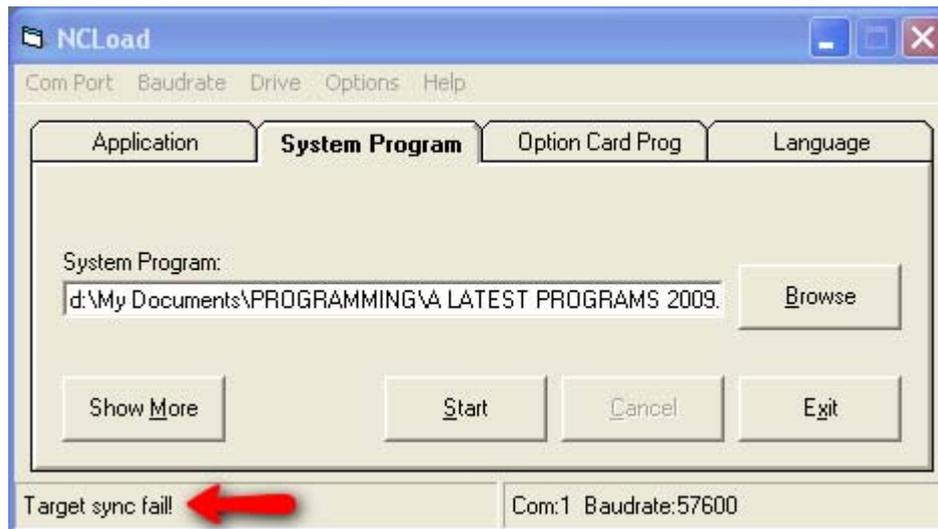
“Ready!” in the bottom left hand corner of window indicates successful down load, you need this to be able to continue to the next step of parameter installation.

NCLoad Trouble Shooting

-“Error in opening comport”

- Check cable connection
- Are you connected to frequency converter?
- Is the frequency converter powered up?
- Check the COM Port settings in Windows and NCLoad match (as outlined in previous section).

“Target Sync failed”



This may occur when the computer is not recognising the frequency converter

- Check your cable connection
- Are you connected to frequency converter?
- Is frequency converter powered up?
- Check that the Vacon adaptor panel is connected properly Vacon adaptor panel
- Check that the Vacon adaptor panel is not damaged (check pin ports on back of card)
- Do you have the correct Vacon extension cable; a generic 9 pin cable will not work.
- Try different USB ports/-retry against different comport settings

Once the operating program has been successfully installed, you are ready to move on.

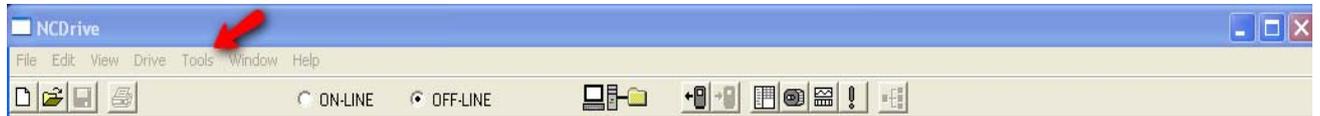
Close NLOAD!

This is very important as the NC LOAD and NC DRIVE programs both read some of the same data to preform their tasks. This can cause operation conflict when both programs are open at the same time.

INSTALLATIONS USING NCDrive.

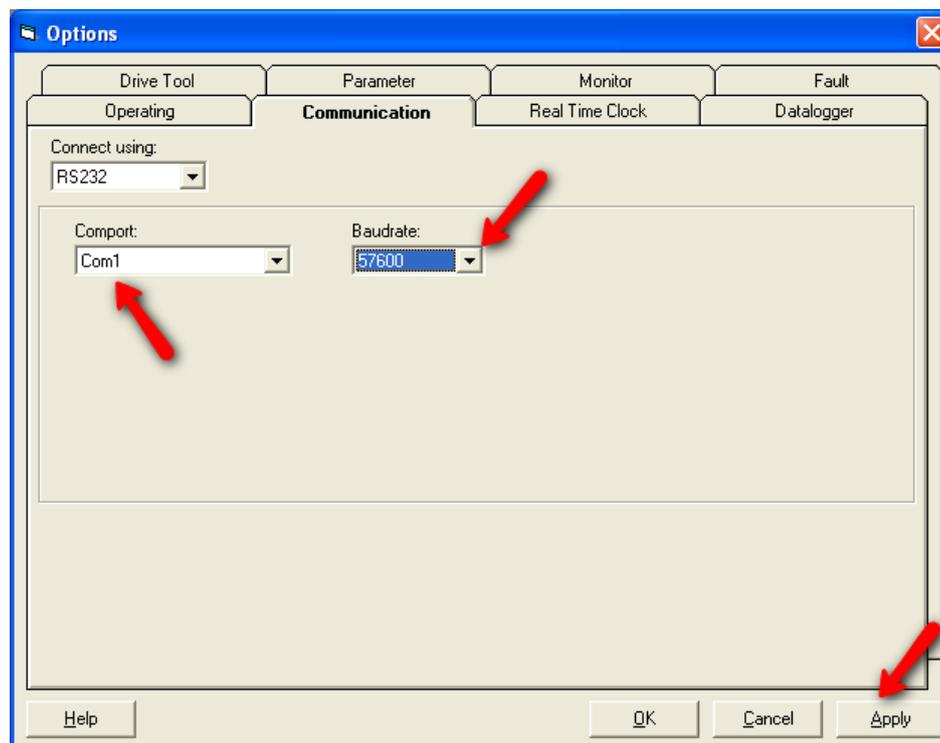
Open NC load (using Windows desktop shortcut)

Select Tools / Options / Communication.



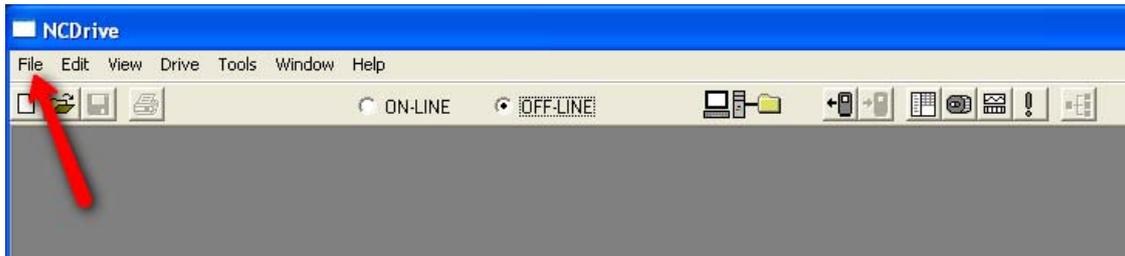
Set Baudrate to 57600 (Apply)

Check comport settings are the same as per NCLoad.



Opening the Parameter file

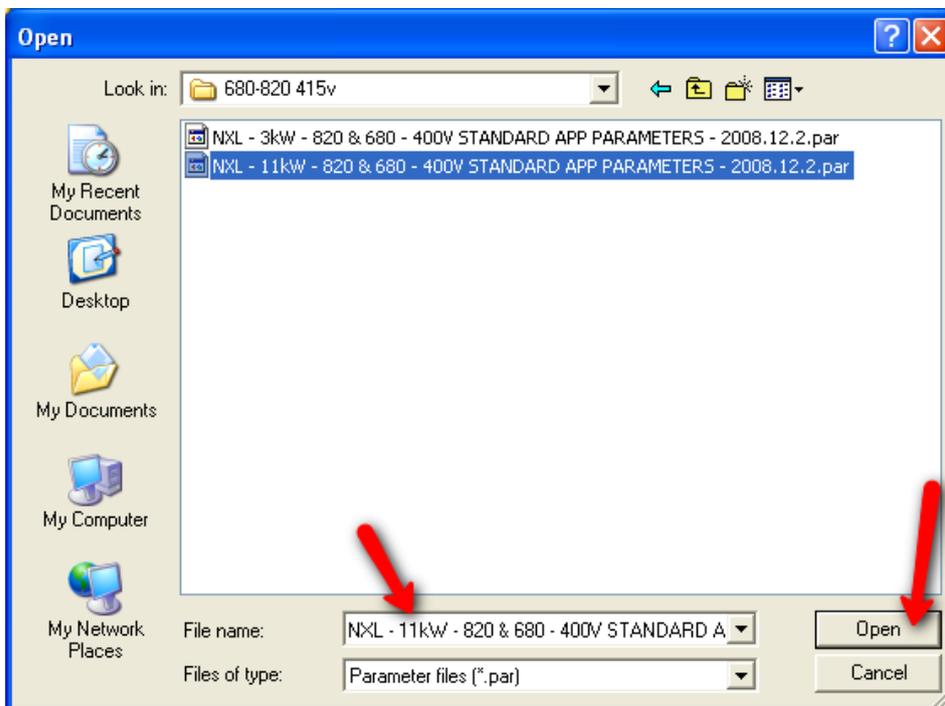
Go to File



The first time you run NCDrive you may need to manually select the file path for the NCDrive program as to where you have the parameters files saved, after this it should remember the path for any future installations.

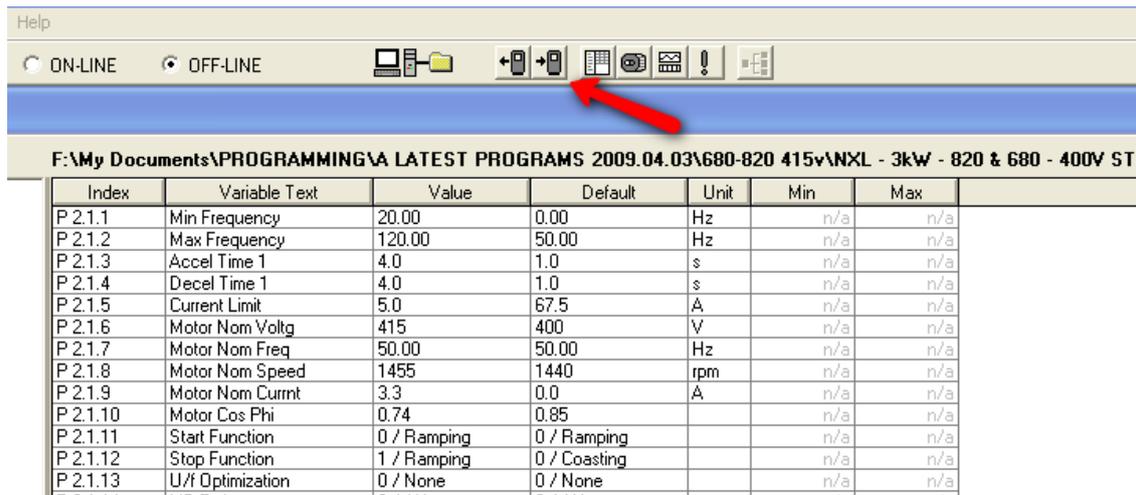
Select the parameter file (.par) you wish to install and click “Open”. Unlike in NCLoad where we use the same system software for both frequency converters, in NCDrive, we have separate parameter files for each frequency converter. In this example we will use the following files:

- 1kW-820 & 680 - 400V STANDARD APP when connecting to the larger frequency converter.
- 3kW-820 & 680 - 400V STANDARD APP for the smaller frequency converter



When selected, the file will open with full parameter listings appearing on the screen.

Select “Download” tab (the correct terminology should really be upload) to install parameters from computer to frequency inverter.



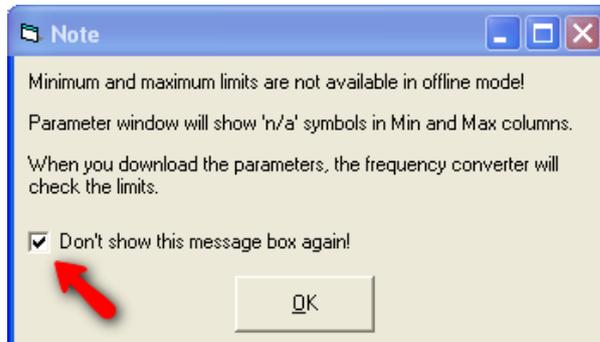
Help

ON-LINE OFF-LINE

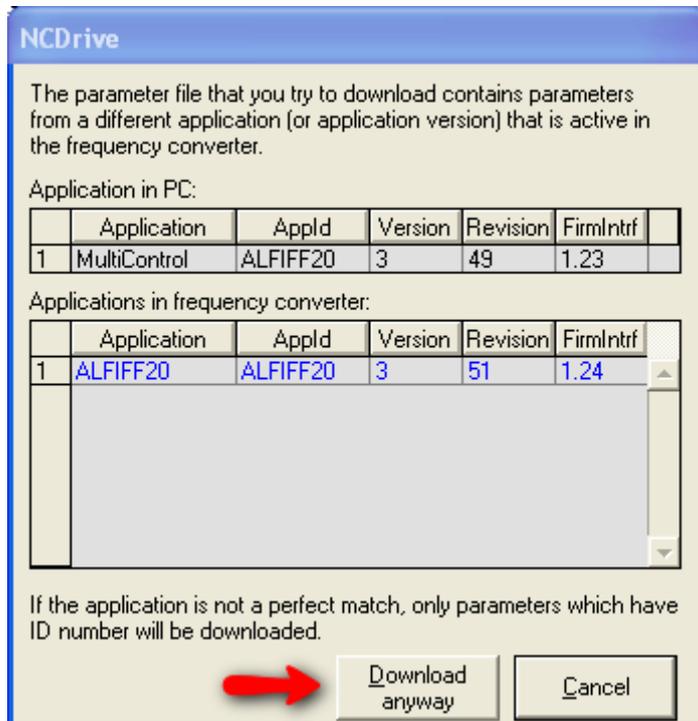
F:\My Documents\PROGRAMMING\A LATEST PROGRAMS 2009.04.03\680-820 415v\NXL - 3kW - 820 & 680 - 400V ST

Index	Variable Text	Value	Default	Unit	Min	Max
P 2.1.1	Min Frequency	20.00	0.00	Hz	n/a	n/a
P 2.1.2	Max Frequency	120.00	50.00	Hz	n/a	n/a
P 2.1.3	Accel Time 1	4.0	1.0	s	n/a	n/a
P 2.1.4	Decel Time 1	4.0	1.0	s	n/a	n/a
P 2.1.5	Current Limit	5.0	67.5	A	n/a	n/a
P 2.1.6	Motor Nom Voltg	415	400	V	n/a	n/a
P 2.1.7	Motor Nom Freq	50.00	50.00	Hz	n/a	n/a
P 2.1.8	Motor Nom Speed	1455	1440	rpm	n/a	n/a
P 2.1.9	Motor Nom Currnt	3.3	0.0	A	n/a	n/a
P 2.1.10	Motor Cos Phi	0.74	0.85		n/a	n/a
P 2.1.11	Start Function	0 / Ramping	0 / Ramping		n/a	n/a
P 2.1.12	Stop Function	1 / Ramping	0 / Coasting		n/a	n/a
P 2.1.13	U/f Optimization	0 / None	0 / None		n/a	n/a

When the “Download” begins there will have a few pop up windows the first is to be ignored and has no relevance to our application.



The second window may say that some parameters could not be copied, or have a different application, this is not a problem and what we are actually addressing, click Download **anyway**



Parameters will automatically install.

NCDrive Trouble Shooting

“Communication Error!”



- Check the USB to Serial port adapter and the Vacon extension cable are connected properly and securely
- Check the Vacon adaptor panel is properly inserted.
- Check Vacon adaptor panel is not damaged (check pin ports on back of panel)
- Check comport settings
- Use the Device Manager in Windows to check the comport settings as outlined in **NCLoad Trouble Shooting**
- Check you have a genuine extension cable.

Once installation is complete, a green ready indicator can be seen at the bottom of the screen informing you that the parameters have been received by the frequency converter. The **LOADED** sign should also appear at the top of the window.

Parameter Window

Compare...

LOADED 

Index	Variable Text	Value	Default	Unit	Min	Max
P.2.1.1	Min Frequency	20.00		Hz	0.00	80.00
P.2.1.2	Max Frequency	80.00		Hz	20.00	320.00
P.2.1.3	Accel Time 1	4.0		s	0.1	3000.0
P.2.1.4	Decel Time 1	4.0		s	0.1	3000.0
P.2.1.5	Current Limit	25.0		A	7.6	46.0
P.2.1.6	Motor Nom Voltg	415		V	180	690
P.2.1.7	Motor Nom Freq	50.00		Hz	30.00	320.00
P.2.1.8	Motor Nom Speed	1465		rpm	300	20000
P.2.1.9	Motor Nom Curmt	19.8		A	7.6	46.0
P.2.1.10	Motor Cos Phi	0.85			0.30	1.00
P.2.1.11	Start Function	0 / Ramping			0	2
P.2.1.12	Stop Function	0 / Coasting			0	1
P.2.1.13	U/f Optimization	0 / None			0	1
P.2.1.14	I/O Reference	0 / AI1			0	5
P.2.1.15	AI2 Signal Range	2 / 4-20 mA			1	4
P.2.1.16	Iout Content	1 / O/P Freq			0	12
P.2.1.17	DIN2 Function	1 / Forw - Rev			0	10
P.2.1.18	DIN3 Function	4 / Fault Reset			0	17
P.2.1.19	Preset Speed 1	10.00		Hz	0.00	80.00
P.2.1.20	Preset Speed 2	50.00		Hz	0.00	80.00
P.2.1.21	Autom. Restart	0 / Disabled			0	1
P.2.1.22	Param Conceal	0 / All Visible			0	1
P.2.1.23	Drive Setup	0 / No Action			0	4
P.2.2.1	Exp DIN1 Funct	7 / Preset Sp 2			0	13
P.2.2.2	Exp DIN2 Funct	4 / Fault Reset			0	13
P.2.2.3	Exp DIN3 Funct	11 / Freq Control			0	13
P.2.2.4	DIN4 (AI1) Funct	2 / ExtFaulClose			0	13
P.2.2.5	AI1 Signal Sel	AnIN:A.1	AnIN:0.1		AnIN:0.1	AnIN:8.10
P.2.2.6	AI1 Signal Range	3 / 0-10 V			0	4
P.2.2.7	AI1 Custom Min	0.00		%	0.00	100.00
P.2.2.8	AI1 Custom Max	100.00		%	0.00	100.00
P.2.2.9	AI1 Signal Inv	0 / No Inversion			0	1
P.2.2.10	AI1 Filter Time	0.10		s	0.00	10.00
P.2.2.11	AI2 Signal Sel	AnIN:A.2	AnIN:0.1		AnIN:0.1	AnIN:8.10
P.2.2.12	AI2 Signal Range	2 / 4-20 mA			1	4
P.2.2.13	AI2 Custom Min	0.00		%	0.00	100.00



I/O Terminal Idle Ready  Run  Fault  Alarm 

CHECKING YOUR INSTALLATION.

Successful program installation of the frequency converter can be checked using the frequency converter display panel when operating the grinding machine using the switches on the control panel located near the handle bars of the grinder.

NOTE: ENSURE MOTORS ARE UNPLUGGED BEFORE PERFORMING CHECKS!

Stop/Run Switch:

The frequency converter pictured below is powered up but still in a “STOP” mode, this can be seen by the 2nd arrow on the left hand side. It is also displaying the Output Frequency (default display setting) of the frequency inverter. Since the machine is in stop mode, the Output Frequency will be shown as 0.00Hz.



When switch is set to “RUN”

“STOP” will change to “RUN” and the display panel will begin to reflect the current speed control settings on the speed control dial (potentiometer) on the control panel near the grinder handle bars.

- Head speed (left hand potentiometer on control panel). When potentiometer set to zero, display on small frequency inverter should read 20Hz. When potentiometer set to 10, display on small frequency inverter should read 120Hz.
- Disc speed (right hand potentiometer on control panel). When potentiometer set to zero, display on small frequency inverter should read 20Hz. When potentiometer set to 10, display on small frequency inverter should read 80Hz.

Direction Switches:

Changes made to the direction switches on the control panel near the grinder handle bars can only be seen when the machine is in RUN mode.

To check FWD/REV programming of the frequency inverter is working correctly, set the speed of each potentiometer to full and then switch the machine into run mode. As mentioned above, the frequency inverters should ramp up to 120Hz and 80Hz.

Then change the direction of the FWD/REV switches and the frequency converter should ramp back down to 0.00Hz (**this should take 4-5 seconds and it is very important that it does take this amount of time**). They will then ramp back up to 120Hz and 80Hz in the opposite direction (one direction will be indicated by a negative (-) sign in front of the frequency value, the other direction will be indicated as a positive reading).

If the above tests perform as outlined, you can be sure the program installations have been received properly by the frequency inverters.

MOTOR ID RUN “P2.6.11”

Once all checks are done the last step is to perform a Motor ID run on the Machine. This process will fine tune the frequency inverter drive with the motor it is connected to and should be done each time a motor is changed or frequency inverter reprogrammed or replaced. By doing this procedure we are optimizing the performance of the grinder. Without the Motor ID run, the machine will still work effectively but will not as optimally.

Setting the ID RUN.

The procedure for performing the ID RUN can be done by the following procedure.

The Display screen will usually be as follows when the frequency inverter is powered up.



By pressing the left Arrow twice navigate back to the Monitor “page”. This is represented by **M1**,
1st press **left**.



2nd press left.



Up arrow once will display the Parameter "page". This is represented by P2.



Right once will enter the Parameter settings.



Up arrow till setting P2.6



Right arrow to enter P2.6.1



Up arrow till P2.6.11



It is essential to set both Frequency drives at the same time, even if only one has had work done (eg. Change of motor or Frequency drive)
This will synchronise all components together at the same time.



Right arrow once



This will engage the parameter settings and the **0** will begin to **flash**



Up arrow once will change the flashing 0 to a 1



Press **ENTER**.

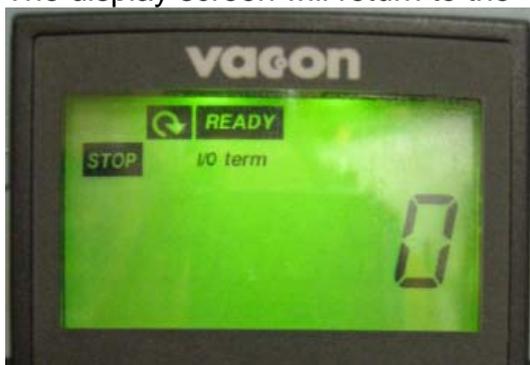


This display screen on the frequency inverter is on a timed window and will return back to the standard “0” if left unattended for too long. Both display screens should be at the same display “page” and ensure both motors are connected before switching to RUN at the control panel.



A low pitched squeak can be heard as the frequency inverters synchronise with the motors (this is normal). The Grinder should not start operating. If this happens switch back to **STOP** and check the process again.

The display screen will return to the “0” once completed.



Press the **Left** arrow to return to **P2**



Press the **Down** arrow to return to **M1**



Press the **Right** arrow to return to **V1.1**



Press **Right** once more to display the "Output Frequency" as displayed by "**Hz**"



Both display screens should be at this "page" before turning the Machine off.

The process should now be complete.

