

Installation software of NCT drive

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2. General review of the software

2.1. What is the program used for?

The task of the NCT servo amplifiers is to achieve the appropriate speed control for the basic signal, for the synchronous and asynchronous motors. This control is achieved in a digital way with the help of a high speed target processor (DSP, Digital Signal Processor). This ensures the accuracy, stability and reliability of the achieved control. The connection between the drive and the computer is attained on a standard serial RS232 serial port. The program is for the installation of the NCT' synchronous servo and asynchronous drives. It is serviceable for the parameter adjustment of the drives during operation, and to examine the behaviour of them. The program can be used in On-line and Off-line mode too. In On-line mode it is capable to the real-time adjustments of the drives. That means during the changes of certain parameters we can examine how the drive behaves when it is affected by a certain parameter change. Certain elements of the control-loop can be adjusted by sliders which makes the parameter variation easier. The program is conformable, it is a well-arranged user-friendly software.

2.2. System requirements

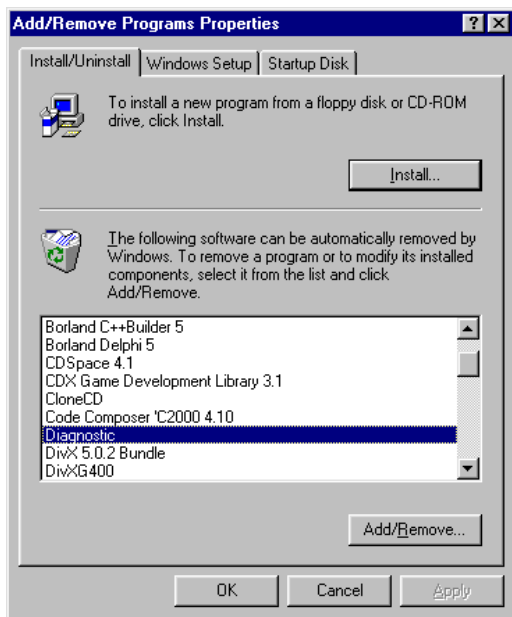
- IBM PC compatible computer (The recommended configuration is Pentium or faster)
- Microsoft Windows 95/98/ME/NT4.0/2000/XP
- RS232 serial port
- At least 3MB free space on the hard disk
- Mouse with minimum 2 buttons
- VGA monitor with minimum 640x480 resolution

3. The software installation, uninstallation and setup

3.1. Software installation

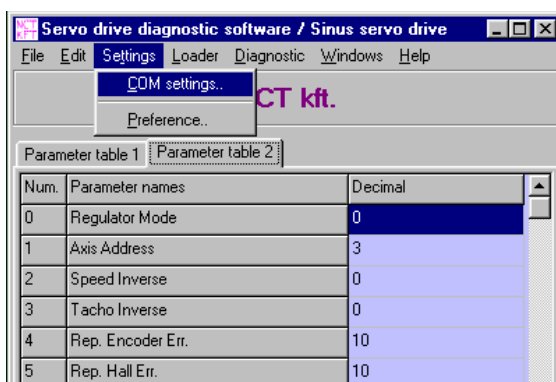
The parameter adjusting software can be installed by the running of SETUP.EXE. After the start of the installer follow the commands. The target folder can be given where the program will be installed in, and then we can set under what catchword can we find our program in the Start menu. After all these the installer will do the necessary job.

3.2. Software uninstallation



The software can be removed in a way that we click on the Control Panel and in Add or Remove Programs menu we have the chance to remove the software.

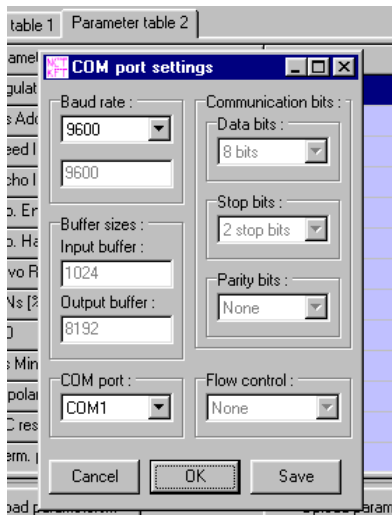
3.3. Correct settings of the parameter variation software



After all this running the program the communication channels should be set, through these the software connects to the drive.

Here we can set through which serial channel and what speed will we be able to communicate.

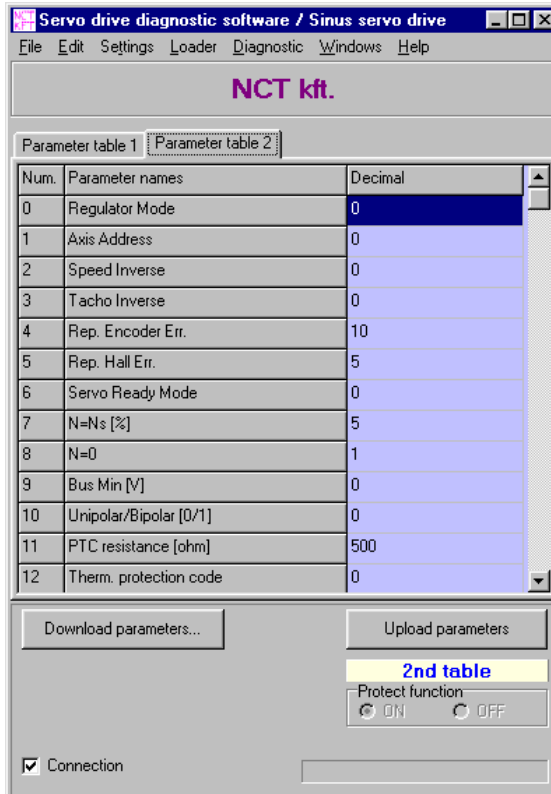
The Baud rate in actual drives should be set 9600bps. The serial communication port (COM port) should be set on a free serial port in the computer. The serial port can be set from COM1 till COM4. In case of the use of the set serial port it cannot be opened by the parameter variation software, and the user is also informed. When pressing Cancel the setting won't be accepted and the old settings will apply. When pressing OK the settings will be accepted, but they only be executed when exiting the



program. When pressing Save button the setting will be executed immediately and the next start these will be in existence. The setting is successful if after pressing OK or Save the program doesn't send error message, and a drive in operation is connected to the computer. It is indicated by the disappearance of the animation and the red text from the left corner of the main window and it is also indicated by the pipe next to the Connection title. After the successful connection the program loads the parameters of the drive. The other parameters can be set only after switching on the service option. The review of the latter is mentioned later.

4. The use of the software

4.1. General information about the parameter table



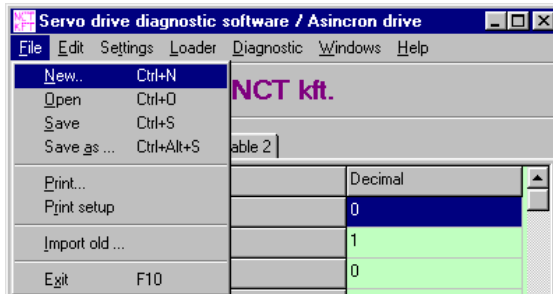
There are two parameter tables in each NCT drive. The two parameter tables can store two different settings which can be chosen with the help of 24 volts signal switched on the input of the drive. If there is no such input then the 1st table will be the active one. In case of Parameter table changing (for example from parameter table to two) the drive after a short reset will use the Parameter table suitable for the input signal. Parameter table changing is only possible in “not allowed” state of the drive. The parameter variation software writes the number of the active Parameter table in the left corner of the main window. The colour of the title, in case of the first parameter table, is light green and in case of the second Parameter table it is light blue. This draws our attention to the fact that the colour of the editing table, in the middle of the

main window, should be the same as the colour of the active parameter table’s title. Because the two Parameter table can be edited separately. Not only the active table can be edited but the inactive too. The difference is that the changes in the active Parameter table will be executed immediately, but these changes become lost as the supply voltage of the drive is switched off. Not to lose these parameters the table should be loaded into the drive.

There are parameters which are protected and as a result of this they cannot be easily edited. This protection protects the drive as the changing of these parameters can cause error. These parameters can be changed only by the use of the password. The password can be written in the Settings/Preference... pop-up window after the pressing of the Enable Service Functions button. Then a password window appears. Typing the password and pressing OK the program lets you now whether it is accepted or not. If it is accepted, after closing the window in the right bottom corner of the main window the Protect function field will become active, where the protection can be switched on/off. If the protection is switched off these parameters will behave in the same way as the others. The Protect function field becomes inactive if the parameters are downloaded or the program is restarted. In case of the necessity of the activating password the user should contact the manufacturer.

4.2. Operations with parameter tables

4.2.1. Make a new parameter table



A new parameter table can be created by choosing New in the File menu or by pressing CTRL + N key sequence.

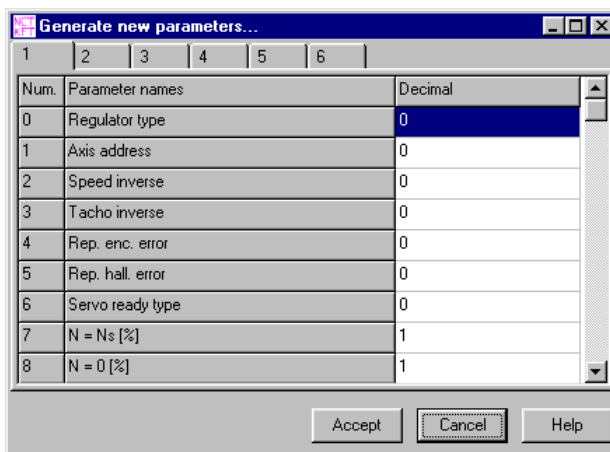
In the window which appears a definition table suitable for the type of the drive should be given. If a drive is sensed on the input then only



the definition table which is suitable for the type of the drive can be loaded and that name is in the drive. At loading the program interrogates this name from the drive and if the two names are not the same a message is sent to the user that this definition table cannot be changed.

The parameters can be loaded into the drive only according to the definition table which is connected to the version number of the drive. This definition table cannot be changed in the drive. In the data definition file editing is not allowed.

If the DFT file is successfully loaded then a window appears in which parameters can be edited

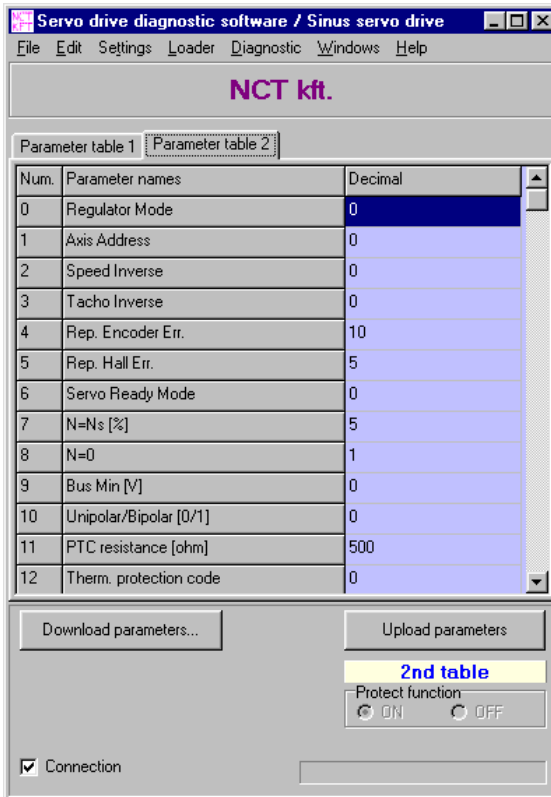


according to parameter groups. The parameters are divided into different a functional groups which will be discussed later. It is the table in which the parameters can be filled. At the opening of the window the minimum values of the parameters will be stated in the tables. After the appropriate changes of the parameters they can be made valid by pressing Accept and

these values will go into both parameter tables. The new parameters will be valid only after loading.

4.2.2.Editing of the parameter table

The editing of the parameter table can be carried out in the main window of the program or in the



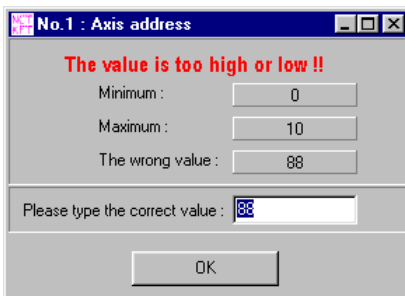
window which comes up by clicking on Edit/Blockedit... and which is very similar to the window used at the creation of the new parameter table. While editing in the main window we can choose one from the two tables which we like to edit, this can be done with the tabs. The first table is light green and the second one is light blue. The blue or green title in the right bottom part of the window indicates which parameter table is active in the drive. While editing in the active table the edited parameter is executed immediately if we press Enter or move the mouse or the cursor from the edited parameter. Afterwards the drive will operate with the new parameter. The changes in the inactive table will have no impact on the drive as long as the hole

parameter table (first and second one) is not downloaded into the drive. If the active parameter table has changed in the drive during editing then we will be informed about this event when the drive make an autopolling at the time of the parameter editing. In this case the changed parameter won't be downloaded into the drive.



During editing two important messages can be received from the program. The first message is created when we attempt to edit protected parameter. Then a pop-up window warns us that

this parameter is protected and its value cannot be changed. These parameters can be changed only by switching off the protective function.



The other message is created if the value written by us is not in the latent range of the parameter. Then the pop-up window informs us about the parameter which can be seen in the header, and its minimum/maximum value and the incorrect value written by us. The window cannot be closed unless we write in the correct value. After giving the correct value and pressing OK we can continue

with editing.

Num.	Parameter names	Decimal
0	Regulator type	0
1	Axis address	0
2	Speed inverse	0
3	Tacho inverse	1
4	Rep. enc. error	20
5	Rep. hall. error	0
6	Servo ready type	0
7	N = Ns [%]	5
8	N = 0 [%]	1

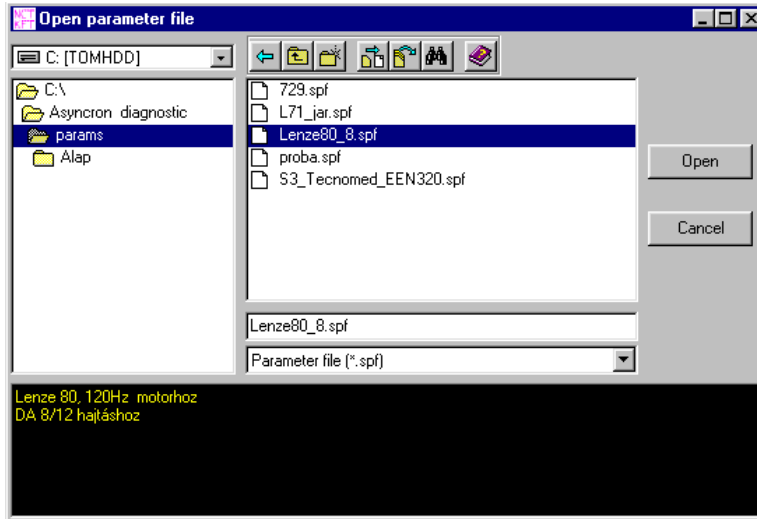
The editing can also be done in the above mentioned Blockedit window. The values of the table which is chosen for editing will go to this window. The background of the tables in the window will be the same as the background colour of the table marked for editing in the main window. Here we can edit the parameters according to groups. The

groups can be chosen by the tabs on the top of the window. As the editing is finished pressing the Accept button the modified values will be written in the table of the main window. If the active parameter table was edited in this window then it would be executed after pressing Accept. When pressing Cancel the modifications will become lost. The two pop-up windows mentioned before are also valid in this case, if we edit a protected parameter or the value written in is not in the latent range.

An automatic error correction is operating in both edit windows which does not allowed that incorrect characters will be typed in the given filed. The incorrect characters are disregarded by editor and only the valuable characters will be considered.

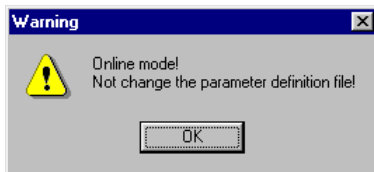
4.2.3. Load of parameter table from file and save it to file

4.2.3.1. Load parameter table



Parameter table can be loaded by clicking on Open in the File menu. Then the window above appears. It is this window in which we can choose the file that should be loaded. When choosing the file in the dialog box at the bottom part of the window the information connected to the file appears which is a short review regarding the parameter tables in the file. We are unable to write in this field.

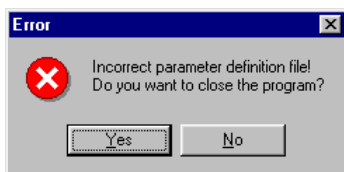
Three types of file types can be chosen. The first type is the .sps, which contains the parameter table connected to asynchronous drives in default. The second one is the .ses which contains the tables connected to synchronous drives. The third one is .spf which is a simple parameter table file. This type can store a parameter table connected to any kind of drives. It is stored in the file which drive the stored table is connected to.

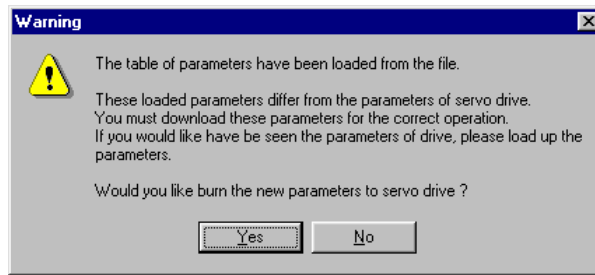


In the parameter file it is stored that which data definition table is connected to it. When we load a parameter table the definition file connected to it is automatically loaded before. That does not cause a

problem as long as the program does not sense an On-line drive. If the program senses On-line drive it compares the definition tables stored in the parameter file in the drive. If the two of them are the same then the parameter table is loaded. If they are different then the program sends a message that the given operation cannot be executed.

A parameter table can only be loaded if the definition file connected to the parameter file exists and the program can reach it. If a file like this does not exist then the given parameter list file cannot be loaded by the program. In this case one should contact the manufacturer. The dialog box offers the possibility to exit the program or continue working.





If the program has loaded the parameter table from the file then it warns us after the load that other parameters can be found in the drive and asks whether we want to load the table into the drive to use these parameters by

the drive. If we click on Yes then a parameter load will be executed and the parameters in the drive and the table will be the same after the load. If we click on No the two parameter tables will be different. In this case the changes on the active parameters can results in extraordinary effects in the system. So it is not suggested to tamper with the active parameter table. If we do this we should do it carefully or switch off the drive before.

4.2.3.2. *Save parameter table*

Parameter table can be saved by choosing Save/Save as... in the File menu. Save will save with the same filename as long as we ask for a parameter upload or we make a new parameter table. If we did all this the Save command will behave in the same way as the Save as... command.

By clicking on Save as... we get a window similar to the one which we get clicking on Open. The difference is that the header has different title and bottom text box can be written. In this box we can type a text of any length regarding the drive and the motor. If we want to save our data on an existing parameter file then clicking on it the informational text connected to it is loaded which can also be edited.

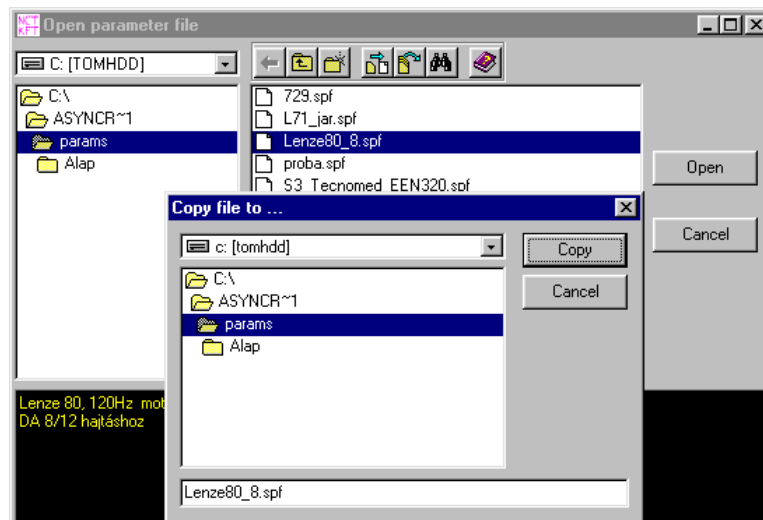
Clicking on Save the parameter file and the informational file connected to it is created.

4.2.3.3. *File manager buttons*

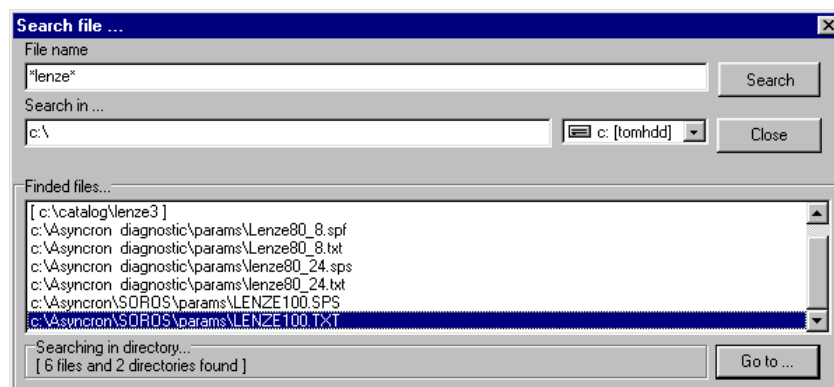


In dialog windows which come up at the saving or loading parameters these buttons can be seen. The function of the buttons from left to right:

- Move back to the previously used folder. While changing the folders the last ten folders are stored. As an effect of the pressing of the button we can go back to the folders as long as the button does not become grey.
- Move back in the folder structure to a folder which is up one level. By pressing the button we can move back to the root folder..
- Creation of the new folder. In the marked folder we can create a new folder. In the pop-up window we can give the name of the new folder and by clicking OK the folder is created. As the folder is created it becomes the folder in which we can save new data. If there is an error during the creation of the folder then the program will inform us.
- Copy of file. This button is active only if any of the files are marked. When we pressed the button the dialog window of the picture underneath appears in which we can give the target folder where we want to copy the marks file and we can give a new name to the target file. Pressing the Copy button a copy is made from the file to the given place.



- Moving of the file. The button is only active if we have already marked a file. When pressing the button a dialog window similar to the previous one comes up. After given the target data pressing the move button the file will be moved to the marked place.
- Searching of the file. The window underneath appears as we press the button. We can



give the file name which is searched in which the ? and * characters are allowed. We can give the drive and the folder where we want to search. The search starts as we press Search. It lists the files and the folders which are found. If w choose a file from the list and click on Go to... button then in the Open or Save window the found file will be marked on which we can execute operations.

- Help.

4.2.4. The burn of the parameter table and its upload from the drive

4.2.4.1. Burn of the parameter table into the drive

The finalization of the parameter can be done by clicking on the Download parameters... button or by clicking on Parameter download in the Loader menu. Then a message window pops up which asks whether the operation should be done. As the Yes button is pressed the process needed for parameter burn, is started.

First the programme carries out a checking on the parameter table not to have incorrect data in the drive. It checks the latent range of certain drives and if something different is found it warns the user about the incorrect parameters. In the pop up window the correct value should be given. The programme will not continue running until we give an acceptable value.

If the checking is finished a message will be sent to the user about the parameters which will not change. It will be executed if the parameter protection is not switched off.

After all this starts the burn of the parameters into the memory of the drive. If the burning process is successfully done the programme will run a checking operation as well. This operation compares the burnt parameter table to the original table and if they are the same a message is received about the success of the burn.

In case of any errors the user will get a message about the unsuccessful operation. In this case the burning operation should be repeated as long as it succeeds.

4.2.4.2. Upload of parameter table from the drive

The upload of the parameters can be done by clicking on the Upload parameters button or by clicking on Parameter upload in the Loader menu. While uploading, the parameter table of the drive appears in the table of the program's main window, where we can edit the parameters later on.

4.2.5. Printing of parameter tables

It is possible by clicking on Print... in the File menu. As a result both parameter tables will be printed next to each other, together with parameter names.

4.2.6. Copy of parameter tables

We have the chance of copying between parameter table one and parameter table two. The Copy PAR1 to PAR2 and Copy PAR2 to PAR1 will activate this function in the Edit menu. Logically the first point will copy the content of parameter table one into parameter table two, the second point is the same but the other way around. If the inactive parameter table is copied into the active parameter table then the changes in the active parameter table will be executed in the drive immediately.

4.2.7. Comparison of parameter tables

We have the possibility to check whether the values of the first and the second parameter tables are the same. It can be done by choosing PAR1 and PAR2 in the Edit menu. The differences between the two parameter tables is listed by the programme, the indenture number of the parameters in the table is present that value is different.

4.2.8. Switch off the protective function

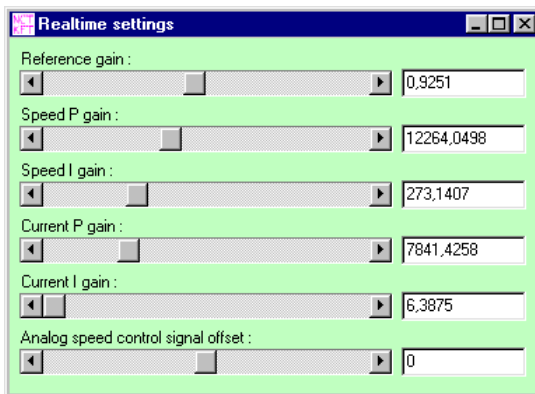
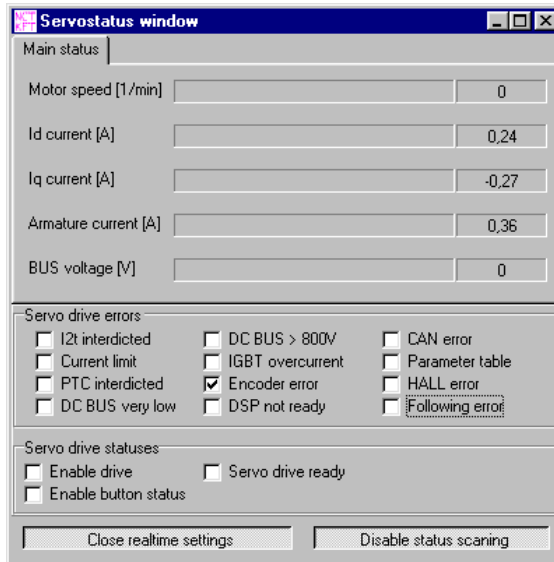
There are some parameters in servo amplifiers which can be adjusted next to advanced inspection, before modifying these values please contact the manufacturer. If these parameters are adjusted in a wrong way then the servo system (motor and amplifier) will not operate properly or it can brake down. Because of this these parameters are protected in order not to disadjust them by any chance. The protection can be switched off by a password. The password for authorized persons should be given by the manufacturer.

The password can be activated in a password window by clicking on Enable service functions button in the Settings/Preference menu. After activating password there are many other possibilities for adjustment. The protection can be switched off by using the buttons in the right bottom corner of the main window. As long as the password is inactive these buttons will not work. The password is active as long as we do not log off, or do not burn the parameter table into the drive. Afterwards the password can be written again if it is needed.

The password is not for encryption, but it protects the servo system from break down. The protected parameters should be used for own liability.

4.3. Drive diagnostics

4.3.1. Display of the drive state

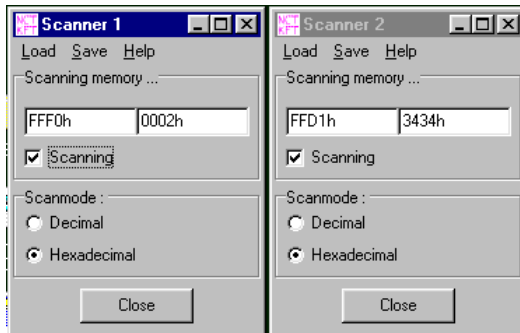


This operation displays the error register, and the status register of the drive, and indication of the information regarding the motor in real-time is possible by it. The real-time query can be switched on and off by clicking on the button in the right bottom part of the window. The parametric variation window can be opened by the button in the left bottom part where with the help of the sliders the control-loop elements of the drive can be adjusted. The drive will respond to these immediately,

thus a reel-time parameter adjustment can be executed. The background colour of this window is always the same as the active parameter table in the main window. In the window the adjustment of a parameter can be done by the slider or we can type the new values in to the txt field next to the slider which can be activated by pressing Enter. The real-time parametric variation window is

in close relation with the table of the main window. The changes which are present here are also appear in the main window table. At the same time if we change one of the parameters of the control-loop in the parameter table in the main window and the changes in the active parameter table the change will appear immediately in the real-time parametric variation window.

4.3.2. The scan of the drive's memory register

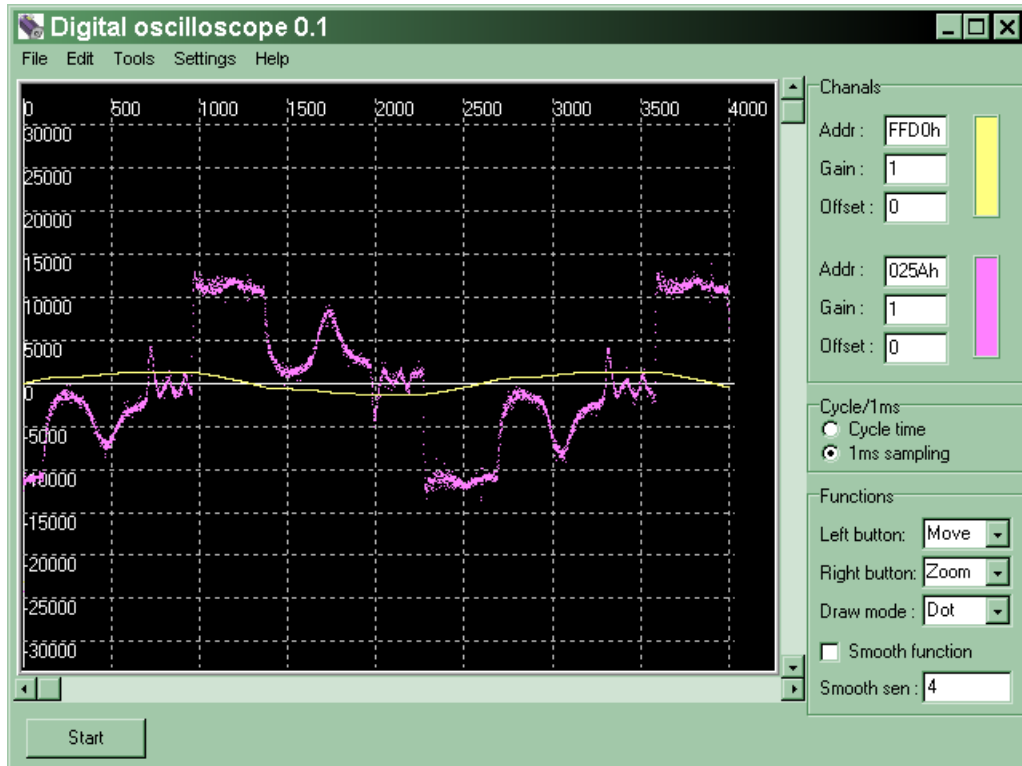


Besides the motor operation information, drive state- and error register written in the previous chapter many other data can be monitored in the drive if the values of the memory registers are interrogated. Units are not connected directly to these values. A new memory scan window can be opened by clicking on New memory scan window... in the Diagnostic

menu of the main window or by pressing F3 function key. More windows can be opened parallel with each other in which differently addressed memory registers can be interrogated. In certain memory interrogating windows the memory addresses determined by the manufacturer can be loaded by clicking on Fix registers in the Load menu, or we can type the address of the memory register into the left hand side text field on the Scanning memory... panel. If the address is given, by clicking on the markable Scanning box the continuous memory scan starts. The received data is the value of the 16bit memory register on the given memory address. The displaying mode can be changed on the Scanmode panel into hexadecimal or decimal.

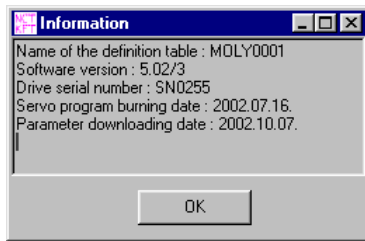
4.3.3. Use of oscilloscope

By the oscilloscope the events in the servo amplifiers during operation can be shown in graphic style. The inner registers of the servo amplifier can be shown, which is done in a way that in case of receiving the processor in the drive records the data of two channels. It takes 4000 samples then these will be sent through the serial port. The upload starts at the moment of recording. The oscilloscope will show these 4000 samples in two channels.



It can be chosen whether the sample taking would be cyclical (125microsecond) or it would be 1 millisecond. The address of the examined register should be given in hexadecimal (Addr). After pressing start the upload and the visualization of the 4000 samples begins. We can regulate the visualisation with the help of the Gain and Offset parameters if it is needed. After the overwriting of the two parameters and pressing Enter the re-drawing of the channel will be executed. The reaction of the oscilloscope to the left or right button of the mouse can be chosen. Two types of drawing mode can also be chosen which are the drawing of the points or the drawing by lines. By switching on the Smooth function the noise functions can be smoothed. The degree of the smooth is determined by the Smooth sen. Parameter. The fixed functions can be saved in the file and can be loaded from there.

4.3.4. Ask for drive information



modified appears here.

Program and version information about the drive can be asked by clicking on Drive information in the Diagnostic menu of the main window or by pressing Ctrl-I. The type of the definition table, the software version and serial number of the drive, the burning time of the program which operates the drive and the last time when the parameter table was