User's Manual

Acuro soft

PC Programming Software

for AC58

HENGSTLER GmbH
P.O. Box 11 51
78 550 Aldingen
Phone: 0 74 24/89 - 317
Fax: 0 74 24/89 - 370

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Contents

1. Introduction

1.1. About this Manual

This manual includes all relevant information on the Acuro-Soft PC programming software for ACURO encoders and motor encoders with SSI/BiSS interface, as well as for ACURO encoders with bus cover.

Information stated in double quotes (e.g. "Open") refers to terms to be selected or entered in the program.

Also please observe all notes and remarks highlighted in *italics*!

Passages to which special attention should be paid in order to ensure
the correct use and to avoid **dangers** are marked by the symbol shown on the left.

This symbol indicates important directions for the **proper use** of the shaft encoder.
The non-observance of these instructions may lead to malfunctions in the shaft encoder or its surrounding parts.

1.2. Program description and installation

Acuro Soft is a Windows-based parameterization software for ACURO encoders and motor encoders.
It can be used for quick on-site configuration - e.g. via your laptop - of all important operating parameters, such as resolution, scaling, sense of rotation, preset, offset, as well as the associated warning and alarm functions, according to your individual requirements.

For demonstration and training purposes, the software may be operated without an encoder - in this case, simulated values are generated via a virtual port.

The program disk/CD includes a ZIP archive with all required program and driver files.

System requirements:

Windows:	Windows 95 or higher
Processor:	Pentium or higher
Memory:	16MB min.
Parallel interface	(Physical, no docking station or USB-Adapter)

Valid starting with Revision 2.0.

Depending on the operating system the zip archive may have to be unpacked by means of an "unzip" program. It is recommended that you create a new directory (e.g. ACURO) to which you may copy the archive file.

Program files are then extracted to this separate directory on the hard disk (e.g. ACURO); you may delete the original archive after this step.

This type of program installation will not create any entry in the Windows start menu. Therefore, you should create a link to the Acurosoft.exe program on the desktop or create a program entry in the start menu. The procedure depends on the Windows version being used - please consult the appropriate manuals or online-help of your Windows system.

No registry entries are created; therefore, the program can be removed from your computer in a convenient way by simply deleting the subdirectory.

1.3. Program Login

The login screen is presented after starting the AcuroSoft.exe program:

A "blank" entry (using the return key) is a permissible user entry. A password is not required. The "blank" user has exclusive read access on the encoder - this will be sufficient for checking the encoder functions.

The second user name is "acuro" (note that this name is in small characters), this user is permitted to configure the sense of rotation and presets, and the ACURO user (note that this name is in CAPITAL characters), is assigned read / write access. For further information please refer to the table in Section 3.

The dialog language can be selected from the entry mask. German and English are available for the time being.

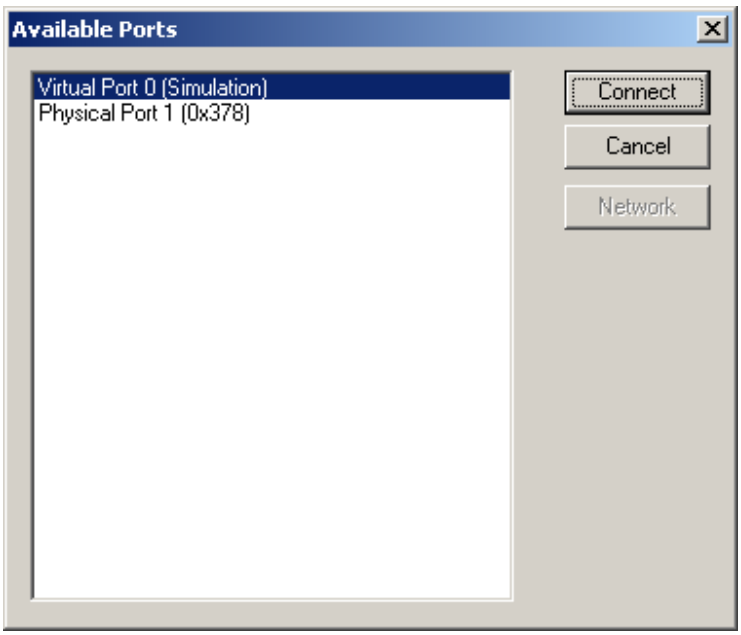
Press the >RETURN< key to view the Program screen.

From the "Edit" menu, first select the "Connect Port" command to communicate with the connected encoder (if applicable).

You may establish a connection to the encoder (connected to the parallel interface/printer port) or to the "virtual port". The virtual port is used to create simulated values.
If no Acuro encoder should be connected, select "Virtual Port 0 (Simulation)".
In this case, the program will simulate and display encoder signals.

After selecting "Physical Port 1(0x378)“ an attempt will be made to establish a data connection to the Acuro encoder via the parallel port (printer port) - also please refer to Section 4.2.1.

Click "Connect" to enable your entry; click "Cancel" to cancel your entry.



***NOTE:* If the encoder should not be connected or not be connected properly you will not be presented an error message in this field!**

The next sections include a description of the encoder. If you should not have an encoder connected, select Virtual Port 0. The individual program functions will be explained in detail in Sections 2 and 3.

1.4. Connecting ACURO to your PC

At present, three adapter kits are available for ACURO. Each kit includes different connection cables and is for a specific encoder family:

For ACURO industry SSI/BiSS:
Order no. 1 565 053: ACURO soft PC connection cable including power supply 230 VA, for Conin 12p, CCW (compatible with connection types G and H)

For ACURO drive SSI/BiSS:
Order no. 1 565 055: ACURO soft PC connection cable, including 230 VAC power supply, for PCB (12-pin)

For ACURO industry encoder with bus cover, e.g. Profibus, Can, etc.:
Order no. 1 565 070: Diagnostic kit 230 VAC for encoders with bus cover, including ACURO soft and "tico" display

ATTENTION

Prior to connecting please check the permissible operating voltage of your encoder. The kits are rated for connecting 10-30 V encoders only.

The connection of 5 V encoders or encoders with special voltage ratings may lead to encoder destruction.

The following two sections describe the connection and initial start-up of an encoder. A distinction is made between encoders with SSI/BiSS interface and encoders with bus cover.

The photographs below show the adapter kit for Acuro industry SSI/BiSS and Acuro industry encoders with bus cover. The kit for Acuro drive SSI/Biss includes a ribbon cable connector instead of a Conin connector - in all other aspects, the startup will be identical for both versions.

Kit for Acuro industry SSI/BiSS

Kit for Acuro industry encoder with bus cover

1.5. Connecting and starting up ACURO industry /drive SSI/BiSS

Requirements:

To connect an ACURO industry SSI/BiSS encoder with 12-pin Conin connector (installation in counter-clockwise direction, connection type G or H), you will need cable kit, order no.: 1 565 053: ACURO soft PC connection cable including power supply 230 VA for Conin 12p, CCW

or

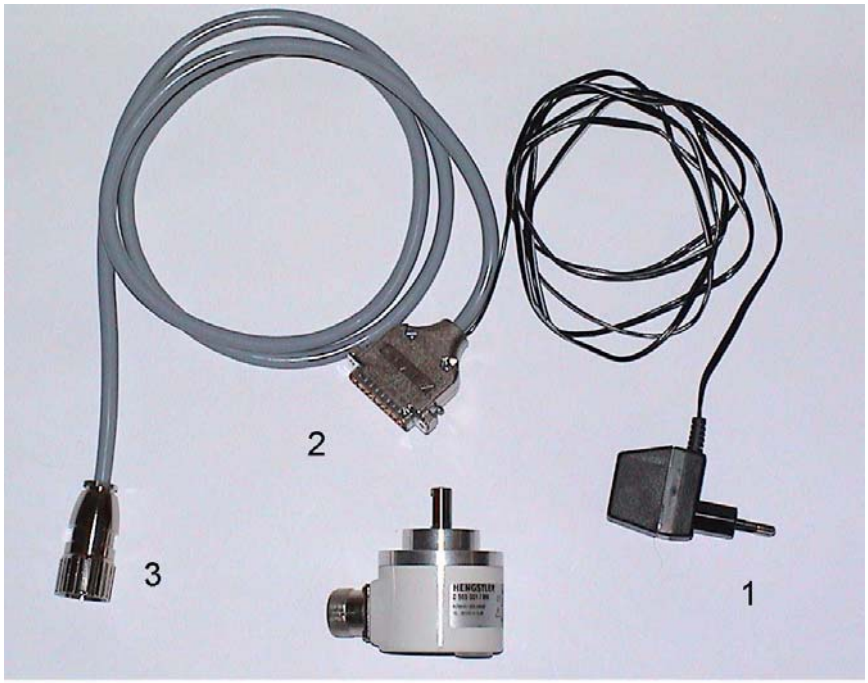
to connect ACURO drive SSI/BiSS motor encoder, you will need the cable set:
order no. 1 565 055: ACURO soft PC connection cable including 230 VAC power supply,
for PCB 12-pin.

A description of the encoder connections will follow in the next sections.

ATTENTION

Prior to connecting please check the permissible operating voltage of your encoder. The kits are rated for connecting 10-30 V encoders only.

The connection of 5 V encoders or encoders with special voltage ratings may lead to encoder destruction.



Connect the adapter cable to the ACURO industry encoder to by means of the 12-pin round plug **(3)** and to the parallel interface (PRINTER) of your PC by means of the 25-pin SUB-D plug **(2)**.

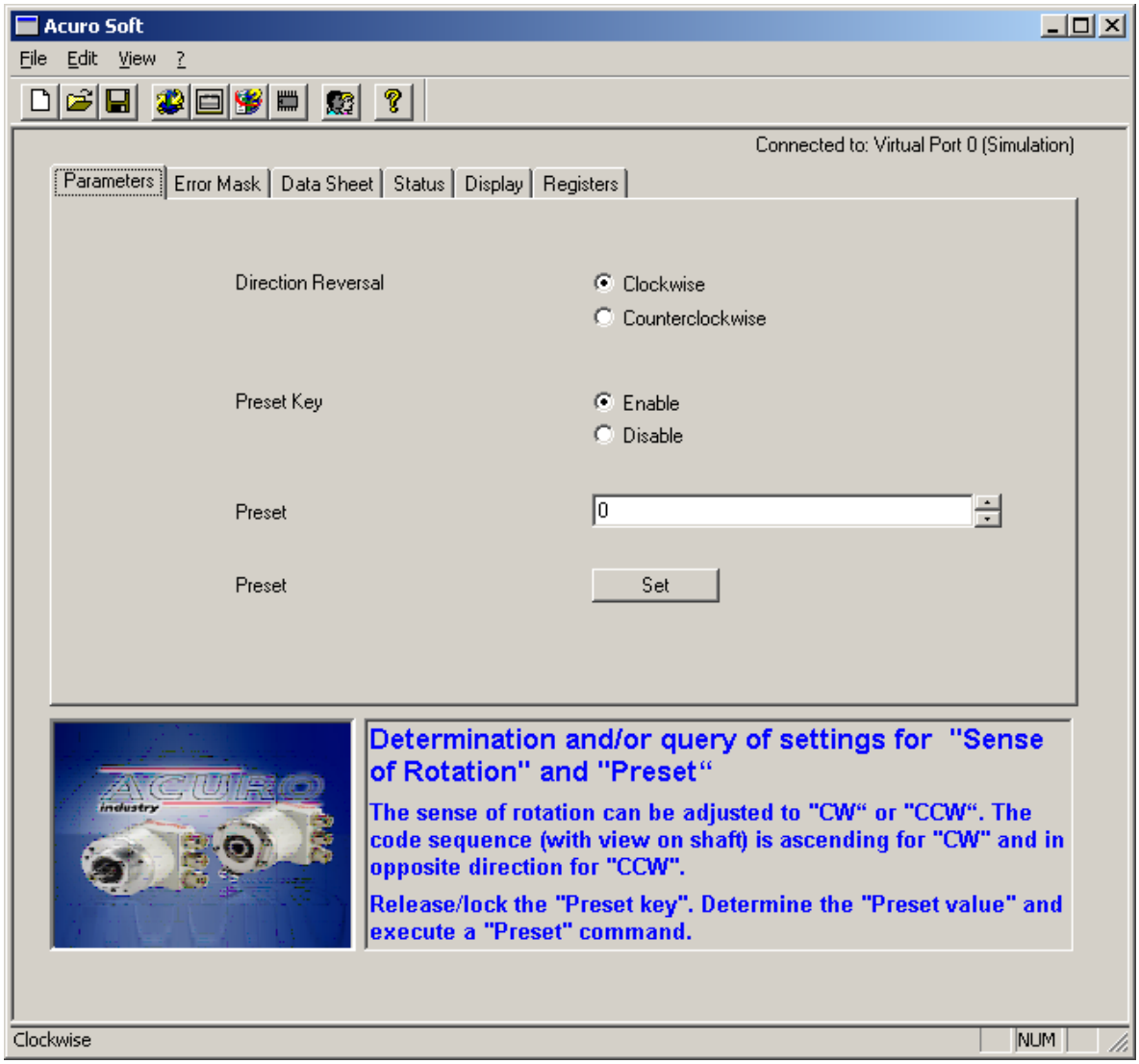
For ACURO drive: plug the 12-pin flat cable connector into the rear side of ACURO drive and connect the 25-pin SUB-D plug to the parallel interface (PRINTER) of your PC.
Plug the plug-type power supply **(1)** into a 220V power outlet to establish the electrical supply of the encoder and electronics contained in the SUB-D connector.
After completing the installation as described in Section 1.2, please start the program now.
The login screen is presented after program start:

A "Blank" user entry is permissible (Return key). A password is not required.
The "blank" user has exclusive read access on the encoder - this will be sufficient for checking the encoder functions.

The second user name is "acuro" (note that this name is in small characters), this user is permitted to configure the sense of rotation and presets, and the ACURO user (note that this name is in CAPITAL characters), is assigned read / write access. For further information please refer to the table in Section 3.

The dialog language can be selected from the entry mask. German and English are available for the time being.

Press the >RETURN< key to access the program view page.

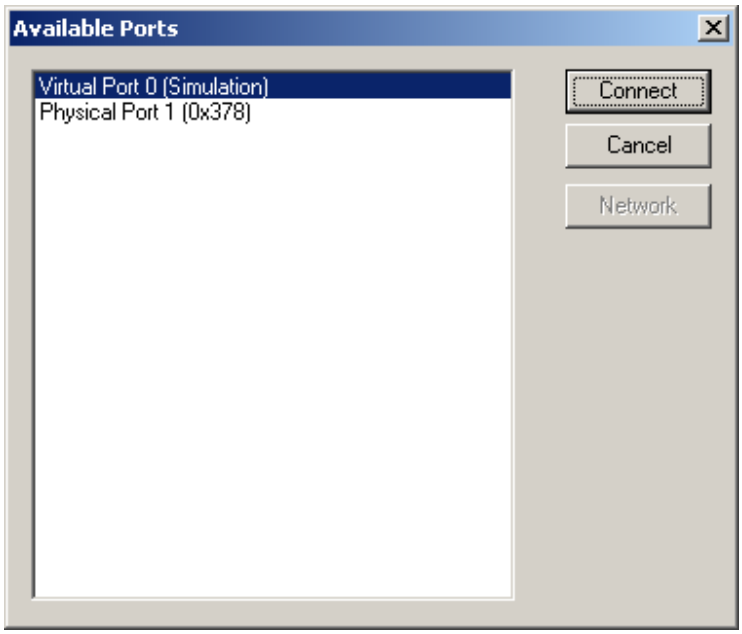


First select the menu options "Edit" "Connect Port" to establish the connection to the encoder.

You can establish a connection to the encoder (connected to the parallel interface/printer port) or to the "virtual port". The virtual port is used to create simulated values.
If no Acuro encoder should be connected, select "Virtual Port 0 (Simulation)".
In this case, the program will simulate and display encoder signals.

After selecting "Physical Port 1(0x378)“ an attempt will be made to establish a data connection to the Acuro encoder via the parallel port (printer port) - also please refer to Section 4.2.1.

Click "Connect" to enable your entry; click "Cancel" to cancel your entry.



If the encoder should not be connected or not be connected properly you will not be presented an error message in this field!

Now select the "Status" tab, in which you can view the current encoder status. When turning the encoder shaft, the value shown in the "Singleturn" field should change. Depending on the type of encoder, the values in the "Multiturn" field may also change. In addition, the error and warning bits are displayed.

Note: Only in the BiSS mode will the error and warning byte be transferred to the control system (via the interface). SSI does not support this feature in its standard version.

After selecting the "Display" tab the movement of the shaft will be graphically displayed (single-turn only).

Moreover, the "Parameter" tab can be used to read or change the sense of rotation and preset parameters. Note that you must login as an acuro user (note the spelling in small letters) to use this parameter.

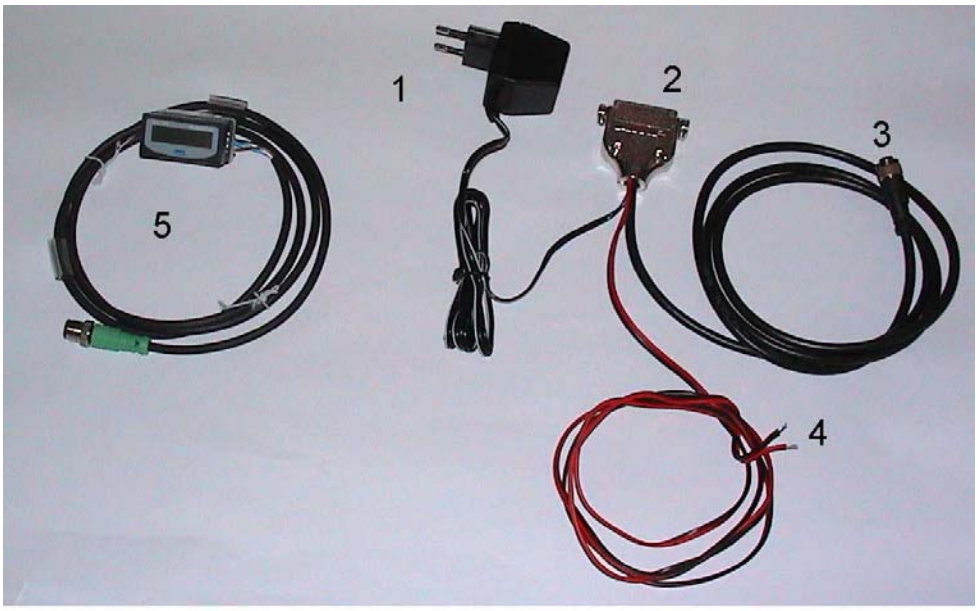
The individual tabs will be discussed in detail in Section 3.

1.6. Connecting and starting up ACURO industry with bus cover

You will need the following set of cables:
Order no. 1 565 070: Diagnostic kit 230 VAC for encoders with bus cover, including ACURO soft and "tico" display.

This diagnostic kit consists of two separate sets of cables:

One cable set is used to connect the encoder base ("bottom part" of encoder) to the PC for programming and testing (cable shown on the right). The second cable set consists of the "tico" indicator and associated cable **(5)** for connecting the bus cover (cable shown on the left).



1.6.1. Connection and startup of the "tico“ indicator

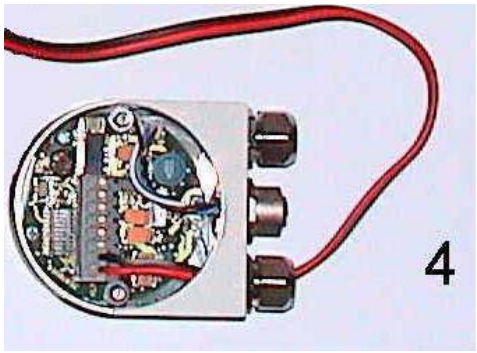
To operate the encoder with the "tico" indicator (instead of operating it via the PC and acuro soft), it is necessary to connect the power supply in the bus cover by means of cable 1 and via the red/black connection cable **(4)**. This will not be necessary if the power supply is provided by the bus line or any other electrical supply.

ATTENTION

Prior to connecting please check the permissible operating voltage of your encoder. The kits are rated for connecting 10-30 V encoders only.

The connection of 5 V encoders or encoders with special voltage ratings may lead to encoder destruction.

Open the encoder by removing the screws on the upper side and pull the bus cover off the encoder base. Insert the power supply cable through the fitting (red/black cable) **(4)** and connect it to the + terminal + (red cable) and – terminal (black cable).



Re-assemble the encoder, tighten the screws and connect the "tico" indicator **(5)** to the center terminal of the bus cover. (Note that this connection will not be possible for all encoder/bus cover types).

After plugging the power supply **(1)** into a socket the green power LED at the rear side of the encoder will be lit up. The "tico" indicator will successively show the following messages:

`Friday 25.04.03`	Current date
`Profibus`	Type of bus system
`Addr:  032`	Bus address, e.g. 032
Current actual value	
Or, in the event of a malfunction:	
`Err  001`	Error message (please consult your encoder documentation for details on the error message)

If you turn the shaft now the actual value will be changed.

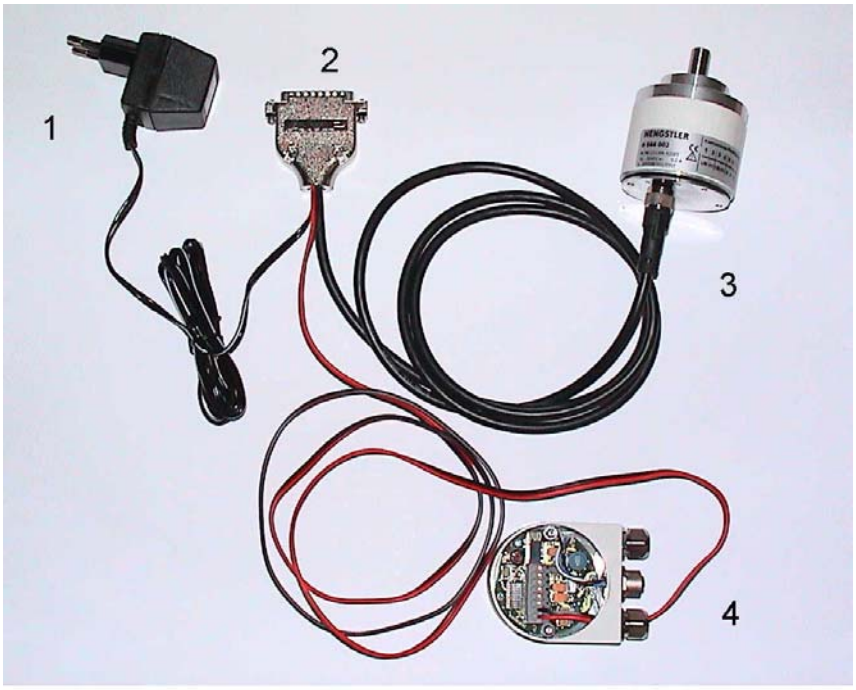
The "tico" indicator can remain connected to the field bus even during encoder operation and, thus, can be used for on-site positioning and diagnostic indication.

1.6.2. Connection and startup of the encoder on the PC

ATTENTION

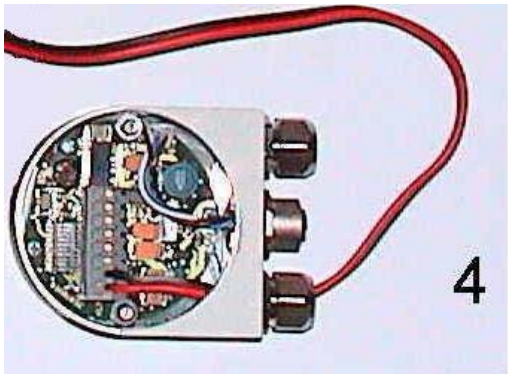
Prior to connecting please check the permissible operating voltage of your encoder. The kits are rated for connecting 10-30 V encoders only.

The connection of 5 V encoders or encoders with special voltage ratings may lead to encoder destruction.



Open the encoder by removing the screws on the upper side. Pull the bus cover off the encoder base. Connect the M12 plug **(3)** on the upper side of the encoder base.

To avoid short-circuits, insulate the free ends of the red/black cable or connect the cable to the +-terminal (red cable) and -terminal (black cable) in the bus cover. At the same time, this will enable you to check by means of the green bus cover LED whether the power supply is correct.



Connect the ACURO industry encoder base to the parallel (PRINTER) interfaces of your PC by means of the 25-pole Sub-D connector **(2)** and plug the power supply **(1)** into a 220V socket. The power supply is used to supply power to the encoder and the electronics included in the Sub-D connector.

Now start the program (after completing the installation as described in Section 1.2).

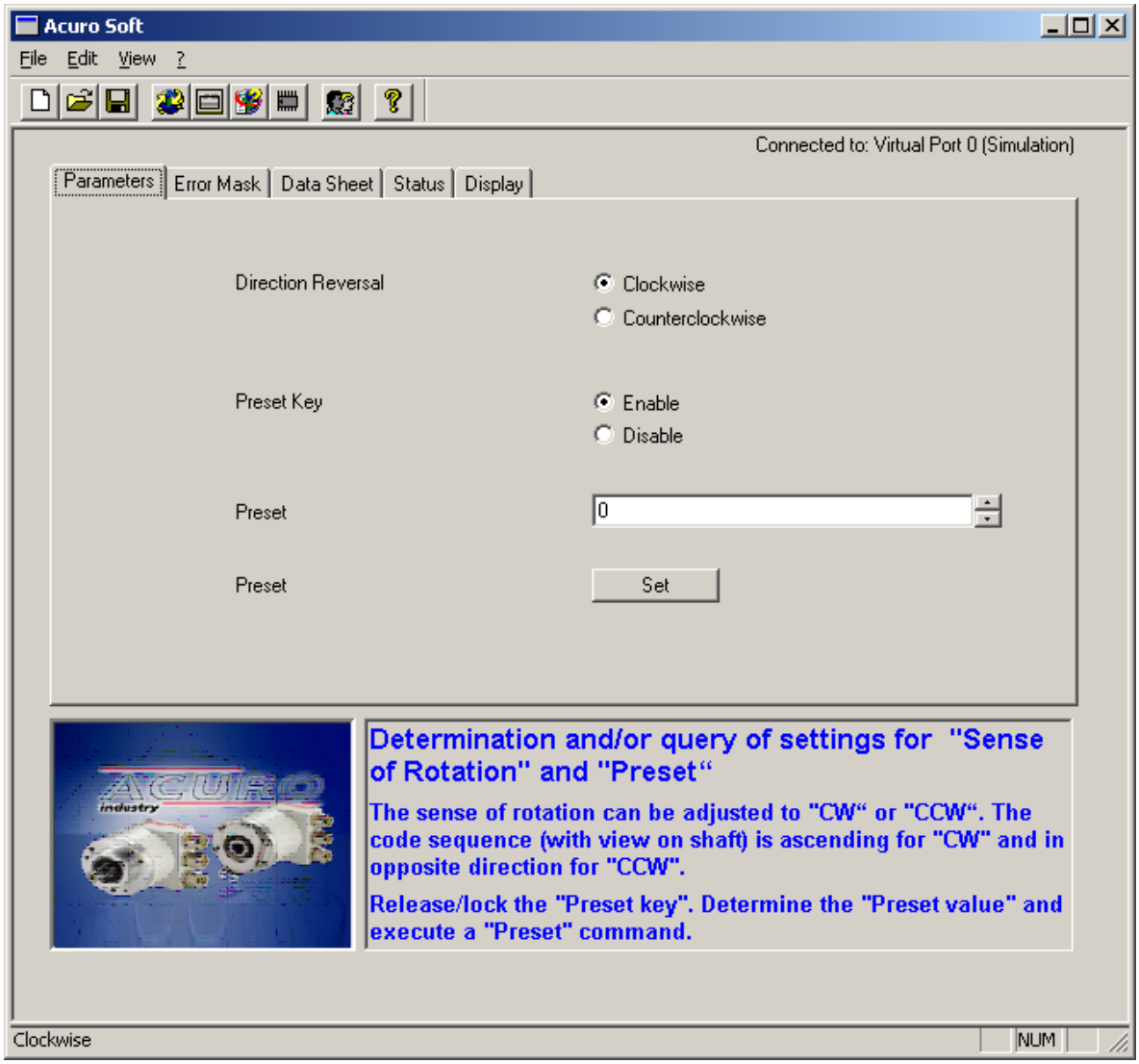
A login screen will be presented after the program start:

A "blank" entry (using the return key) is a permissible user entry. A password is not required. The "blank" user has exclusive read access on the encoder - this will be sufficient for checking the encoder functions.

The second user name is "acuro" (note that this name is in small characters), this user is permitted to configure the sense of rotation and presets, and the ACURO user (note that this name is in CAPITAL characters), is assigned read / write access. For further information please refer to the table in Section 3.

The dialog language can be selected from the entry mask. German and English are available for the time being.

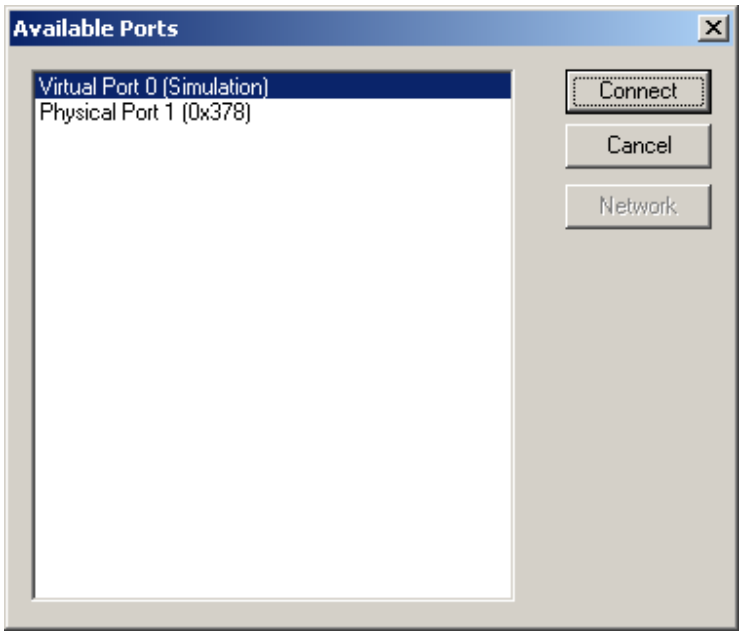
Press the >RETURN< key to access the program view page.



From the "Edit" menu, first select the "Connect Port" command to communicate with the connected encoder (if applicable).

You may establish a connection to the encoder (connected to the parallel interface/printer port) or to the "virtual port". The virtual port is used to create simulated values.
If no Acuro encoder should be connected, select "Virtual Port 0 (Simulation)".
In this case, the program will simulate and display encoder signals.
After selecting "Physical Port 1(0x378)“ an attempt will be made to establish a data connection to the Acuro encoder via the parallel port (printer port) - also please refer to Section 4.2.1.

Click "Connect" to enable your entry; click "Cancel" to cancel your entry.



***Note:* If the encoder should not be connected or not be connected properly you will not be presented an error message in this field!**

Now select the "Status" tab, in which you can view the current encoder status. When turning the encoder shaft, the value shown in the "Singleturn" field should change. Depending on the type of encoder, the values in the "Multiturn" field may also change. In addition, the error and warning bits are displayed.

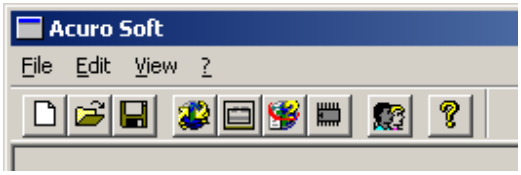
Note: Only in the BiSS mode will the error and warning byte be transferred to the control system (via the interface). Most field bus standards (e.g. Profibus or Interbus will not support his feature).

After selecting the "Display" tab the movement of the shaft will be graphically displayed.

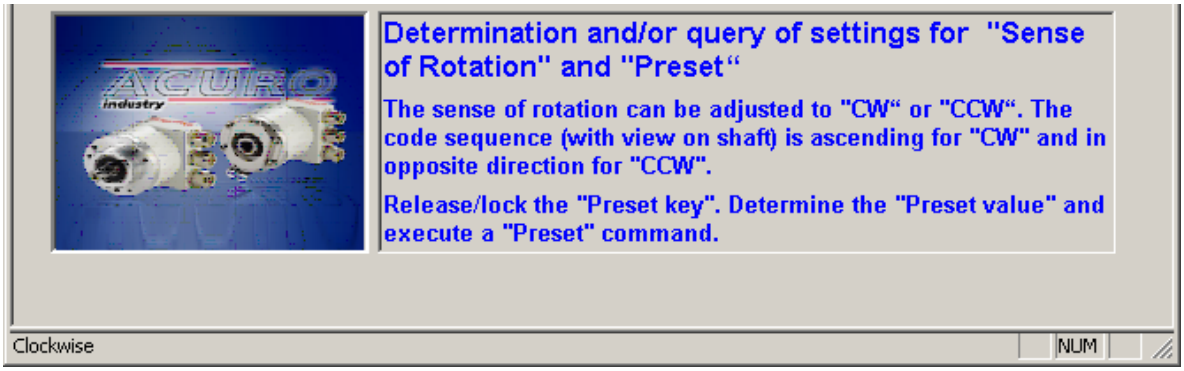
The individual tabs will be discussed in detail in Section 3.

2. The Screen structure

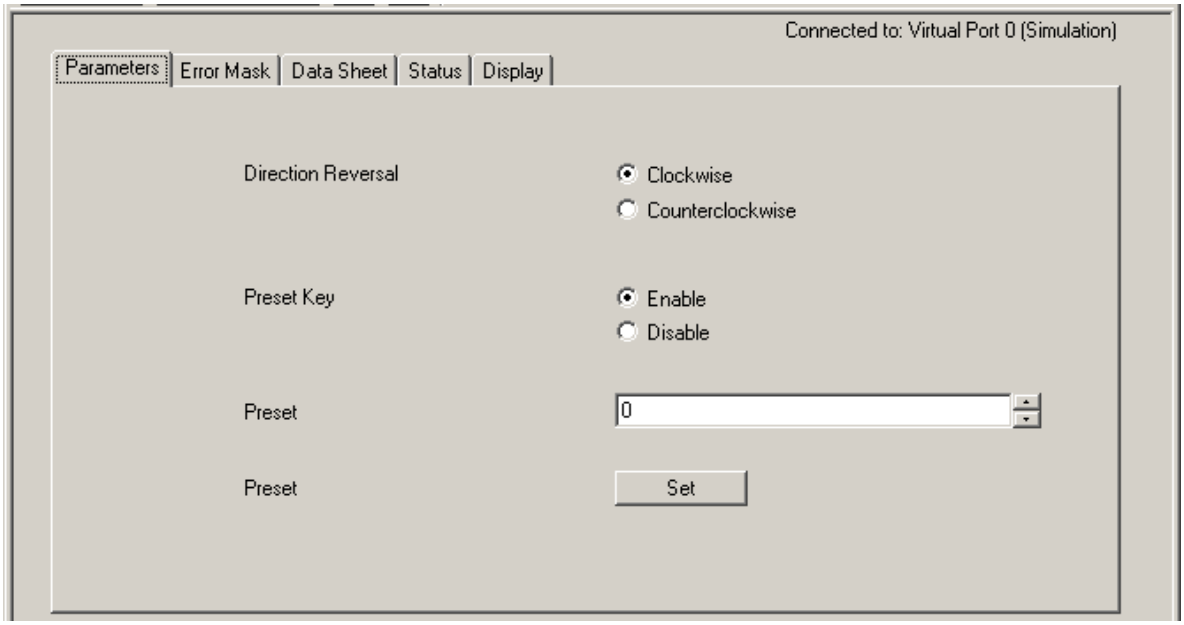
The structure of your screen corresponds to the standard setup of Windows programs. The menu bar is at the top - it includes a toolbar and quick access icons.



At the bottom of screen there is a status bar with an associated explanatory/help dialog.



The center part of the program window can be used to display the different data screens. These screens are not freely accessible (as they depend on the access rights of individual users) and therefore, are masked out.



The active encoder connection (Port) is shown in the upper right corner of the window.

3. Tabs

The program is built up in the form of a stack of "tabs" - there is a tab for each "topic", which is used for either data input or output. It must be noted that not all users have access to all tabs - access on these tabs is dependent on the user rights (user level) assigned to a specific user name. In this way, some users can be assigned "read only" rights, whereas other users are granted "read and write" access.

The following table shows which user levels have access on which tabs (screens):

Tab	Display Level	Edit Level	Function
Parameter	0	2	Parameterization of rotating direction, reset key and preset value
Error mask	4	4	Mask definition for alarms and warnings, as well as temperature range
Data sheet	0	-	Parameterization of manufacturing data and resolution
Status	0	-	Positioning values and error/warning status
Display	0	-	Display of actual values and Run Chart

-: Read only; cannot be edited

Standard User and Level

User	Password	Level	Function
(Blank entry)	(not applicable)	0	Demo, Test, Display Only
acuro	acuro	2	Standard User Level
ACURO	ACURO	4	Service Level

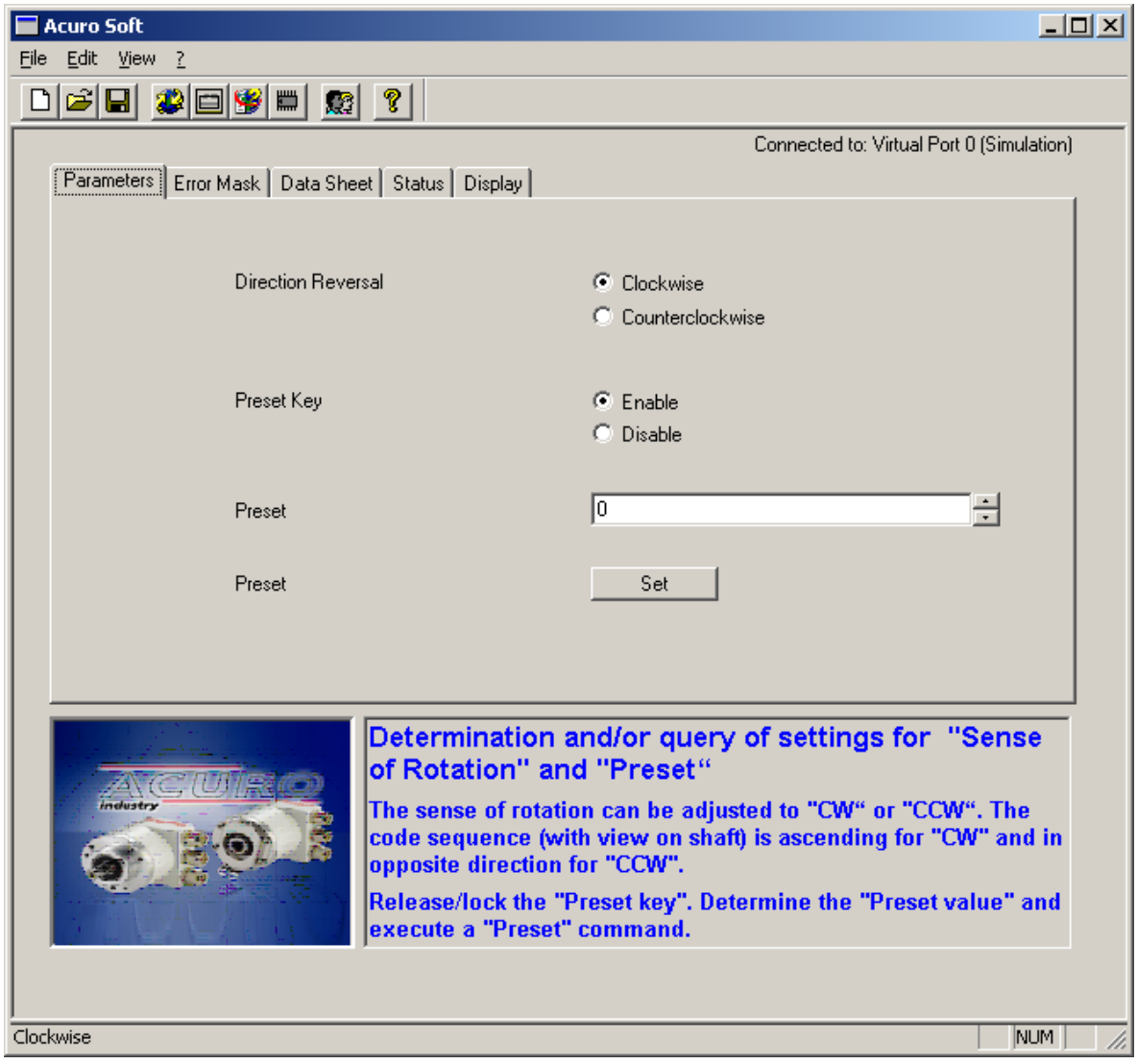
Depending on the program version, further masks and user levels may be created, e.g. for customer-specific versions.

General remarks for operation:

After changing data in a tab you must click the  button or use "Edit - Write Displayed Values" to transfer these data to the encoder (also please refer to Section 4.2.3).

3.1. Parameters

This tab can be used to set the rotating direction and Preset parameters. In addition, the encoder Preset button can be locked.



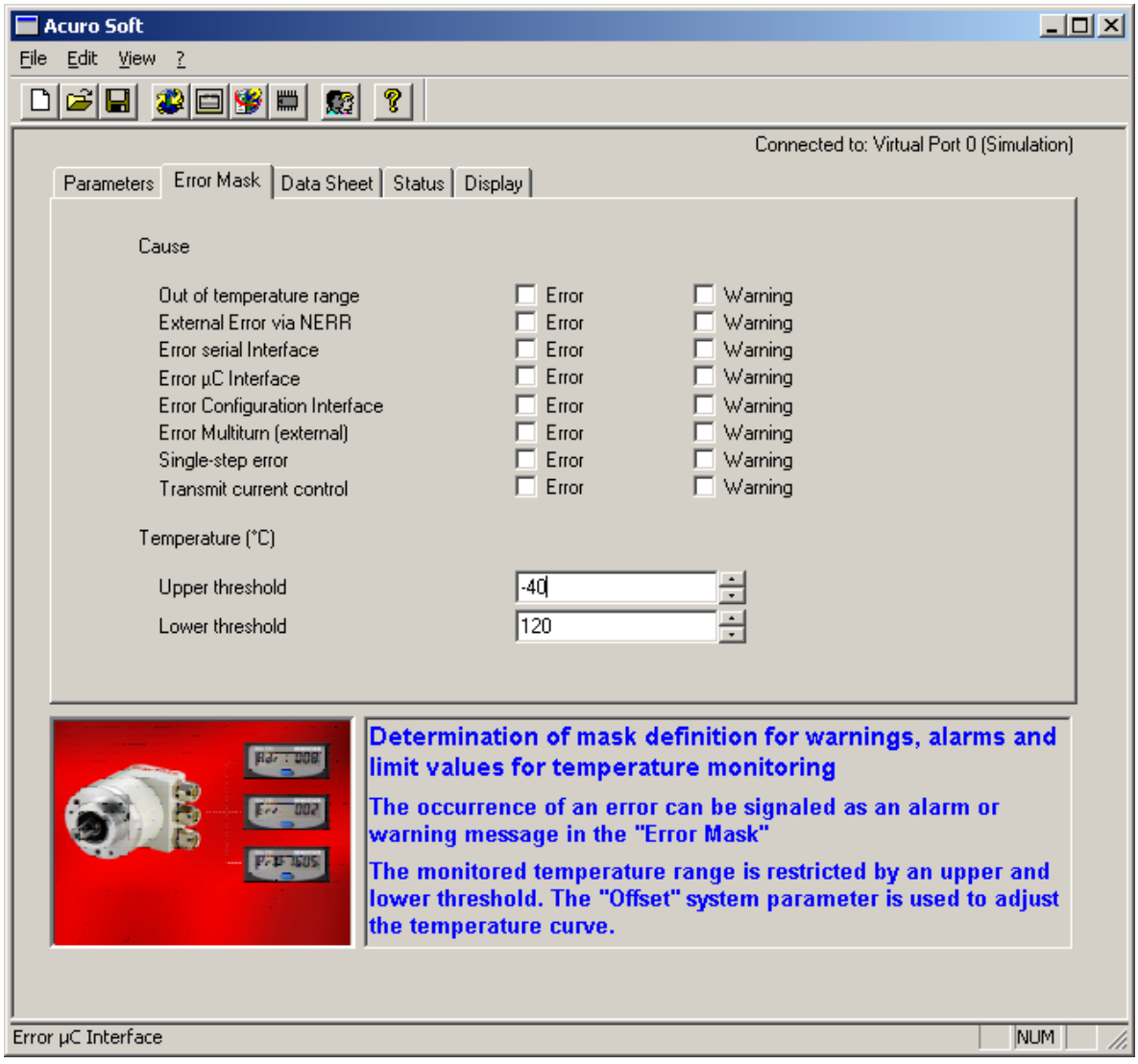
The displayed values can be transferred to the encoder by clicking the "Set" button, or by clicking the  button, or by selecting "Edit - Write Displayed Values".

***Note:* Please note that during the transfer of this tab the "Preset" value will correspond to the entry displayed here. If you only wish to lock the "Preset" key or change the sense of rotation you must enter the appropriate encoder value into the "Preset" field!**

You may also read the current values from the encoder by selecting "Edit - Read values" prior to changing and re-writing your data.

3.2. Error mask tab

This tab is used to control error or warning signals, both referring to the encoder LED and the signals transmitted by the encoder.



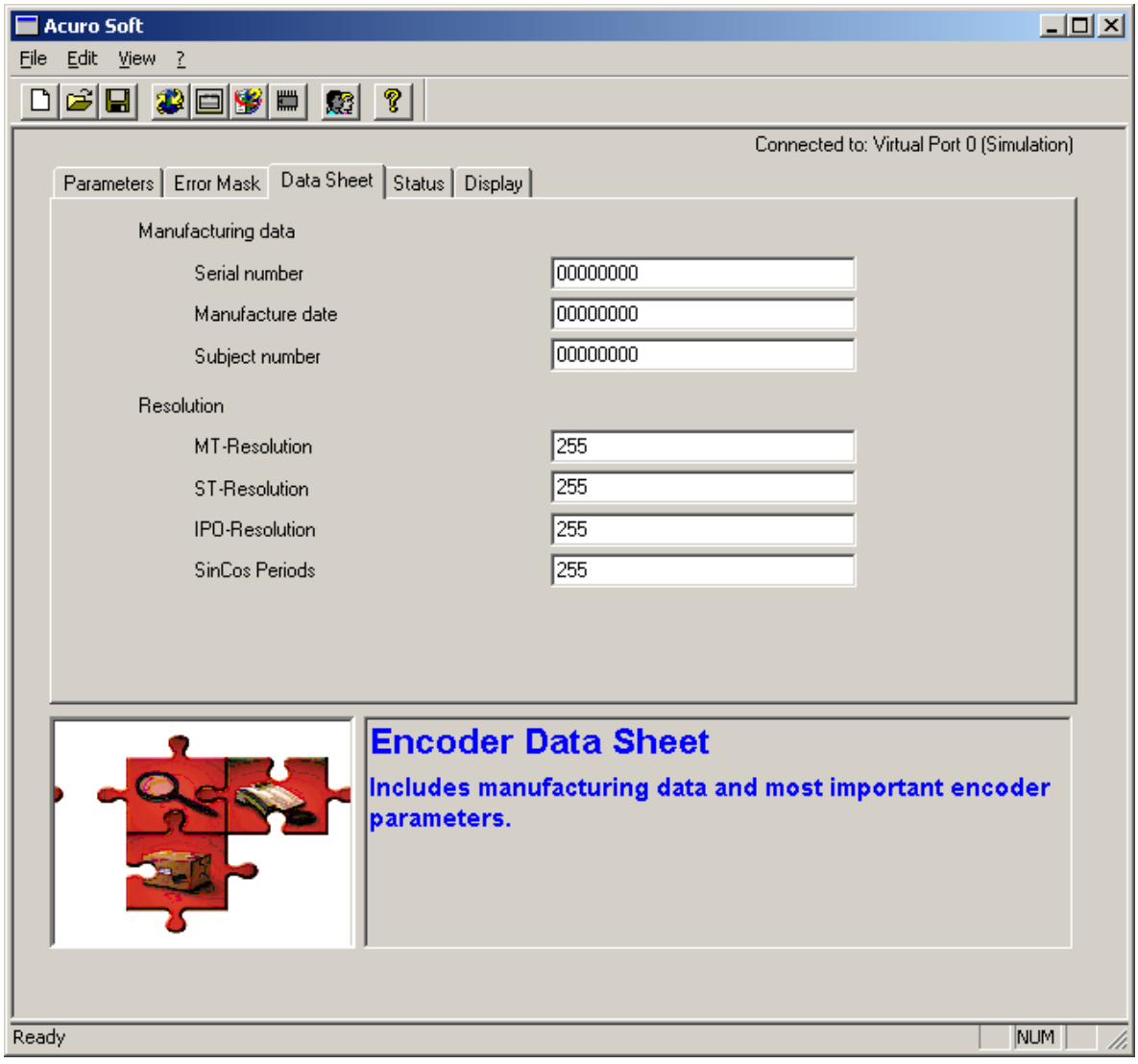
The standard version includes error detection and evaluation via OptoAsic. However, evaluation can be suppressed by deselecting an error or warning message, e.g. to restrict an error in cases where the interface only transmits a summarized error message. In contrast, it can be very useful to create a warning message if a certain temperature range is left (for example, in order to activate heating or cooling of the encoder or stop operation so as to avoid damage).
The "upper limit" and "lower limit" parameters are offered for this purpose - these parameters can be used to restrict the range of warning and/or error messages.

***Note:* The complete contents of this tab will be transmitted to the control system.**

At the moment, some encoder functions are not yet active. Therefore, carefully check your changes as some of them may lead to malfunctions!

3.3. Data sheet

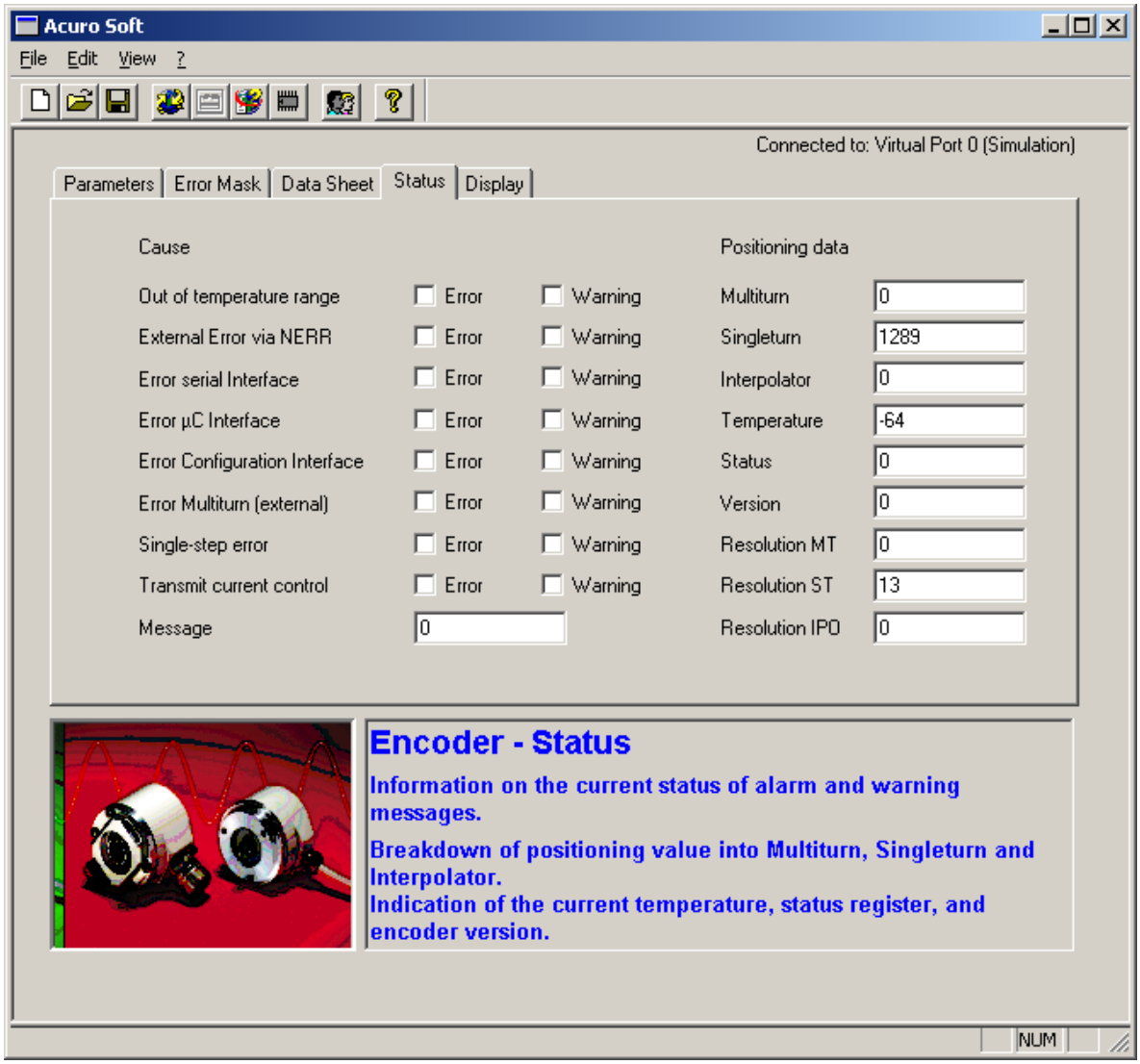
This screen mask is used to set the manufacturing parameters, such as manufacturing number, manufacturing date, reference number, as well as the encoder resolution data.



Note: ***These parameters are factory-adjusted and should not be changed as any changes may result in encoder failures.***

3.4. Status

This tab is used to display the current warnings and errors. In addition, the positioning data (singleturn, multiturn, and interpolator), temperature, internal status and resolution, are displayed.

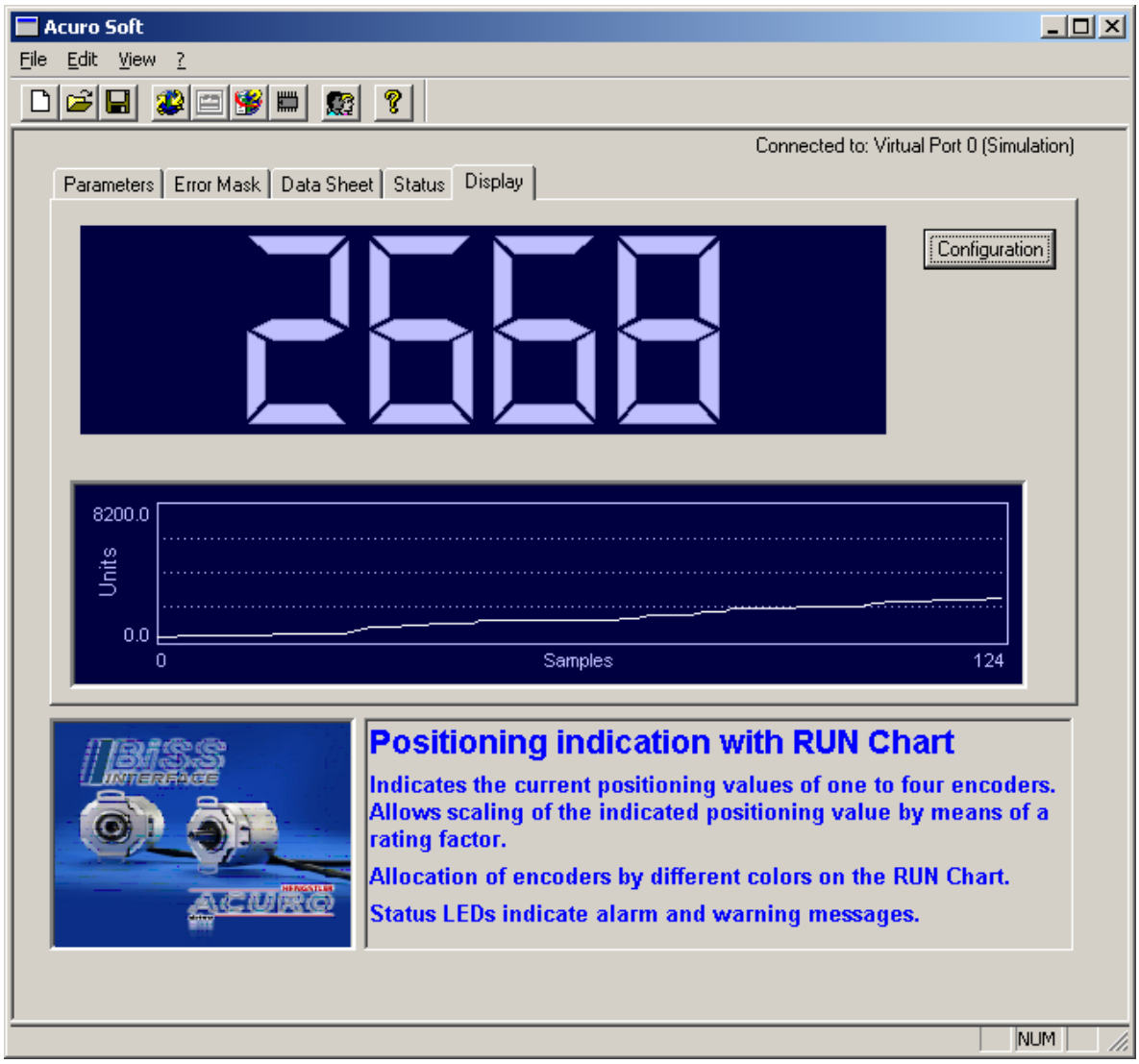


Please note that errors and warning bits will only be displayed if selected in the error mask.

Example: If there should be a malfunction in the ***send current control***, e.g. by a high degree of aging of the scanning LED due to non-permissible operating temperatures, this malfunction will only be transmitted to the control or error LED as an error or warning and only displayed on this tab if the corresponding errors have been selected (marked) in the error mask.
Encoder operation can be continued despite the occurrence of an error or fault. To this end, the appropriate error bit must NOT be activated in the error mask.
However, this is not possible in the event of microprocessor errors (µC) or memory errors.

3.5. Display

Use this tab to indicate the current positioning value and Run chart.

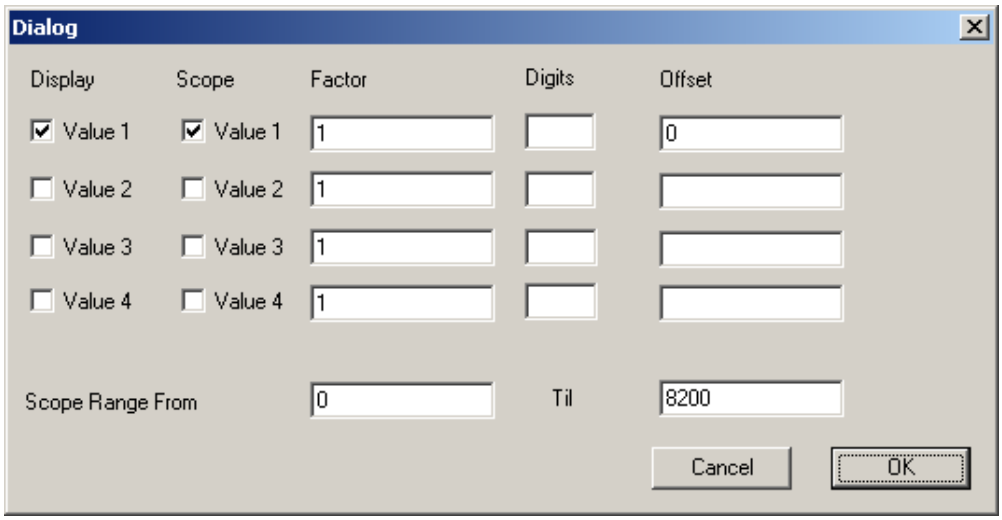


Please note that the total value (Multiturn+Singleturn+Interpolator) will be shown on the numerical display while the graphics display will only show Singleturn+Interpolator.

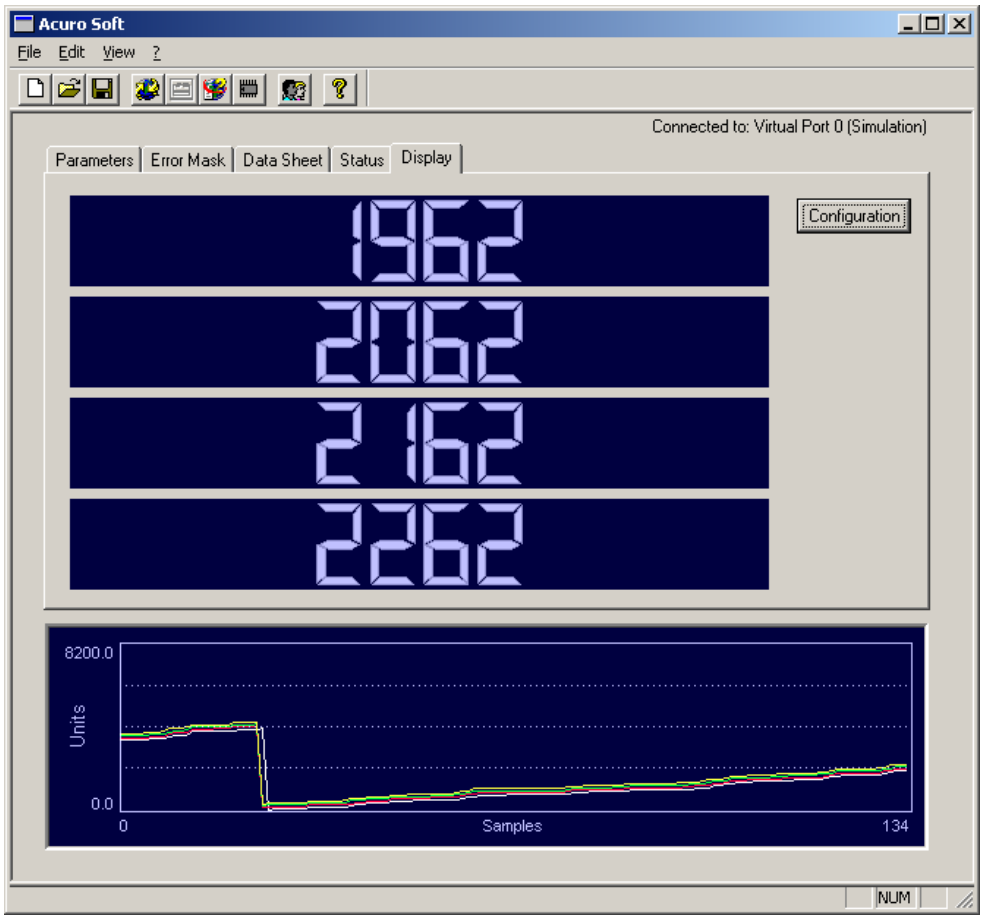
This field allows displaying up to 4 encoder values simultaneously. This is done in different colors.
(In this case you would need a special interface for the printer port of your PC).

Note: **The "Display" mask currently only supports encoders in the Standard SSI mode, i.e. malfunctions may occur in connection with BiSS or "Extended SSI mode" encoder operation.**

The following mask will be displayed after selecting the Configuration button:



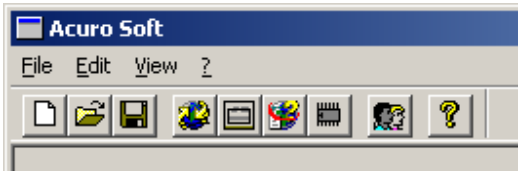
This field allows selecting up to 4 encoder values to be displayed.



In addition, each encoder value can be scaled and provided with an offset value.

4. Menu bar and Toolbar

The menu commands and symbols are used to control the program functions, maintain the parameter sets and send them to or read them from the encoder. Interface selection and user administration is also included in these options.



4.1. File menu

The »File« menu is used for loading and storing files, and for exiting the program.
All encoder parameter settings can be stored into a file or loaded from a file. In this way, all settings become reproducible and can be duplicated as required.

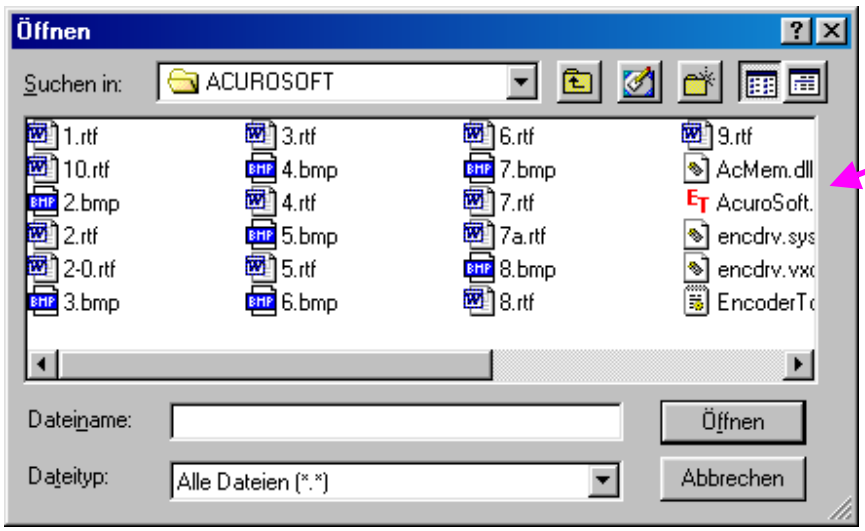
Menu commands are:
New
Open
Close
Save
Save as
Exit

4.1.1. File - New

The »New« command resets all the parameters to their standard values (zero values).

4.1.2. File - Open

The »Open« command is used to read in a parameter file. This is done by opening a Windows file selection menu, from which can select a disk drive, path, or file.



Hinweis für H.Meissner/Haller: Dieser Screenshot ist noch deutsch!

4.1.3. File - Close

The »Close« command terminates the program sequence.

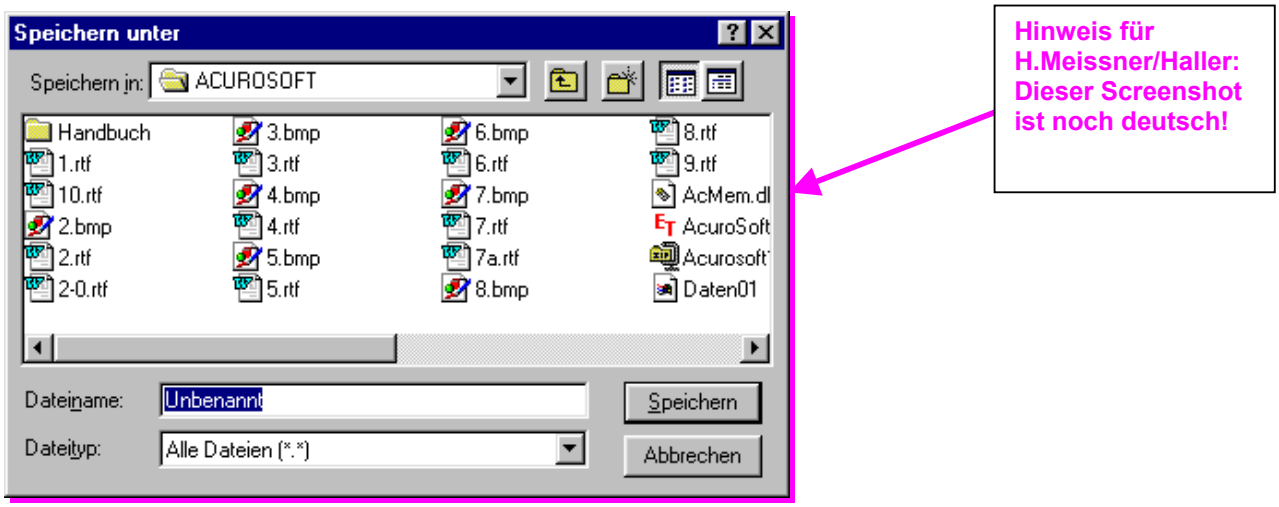
4.1.4. File - Save

The »Save« command saves the parameters of the last file that was opened (the name of this file is shown in the headline of the window). If another file exists under the same name it will be overwritten. If no file is opened (in this case "File not Named" will appear in the headline), the command "Save as" will be activated automatically.

Note: You should use this command only if you wish to change an existing file or save it under the same name! If you wish to change an existing file and save it under a new name, then you should use the "Save as…." command.

4.1.5. File - Save as ...

The »Save as ...« command shows a dialog in which you can enter the desired file name. The "Files" field shows all existing files. The file created by using this command can be entered as a parameter at program start and will be loaded automatically.



4.1.6. File - Exit

The »Exit« command will terminate your program.

4.2. Edit Menu

The »Edit« command is used send or receive parameters to/from an AC58-encoder.
In addition, it can be used to select the port.

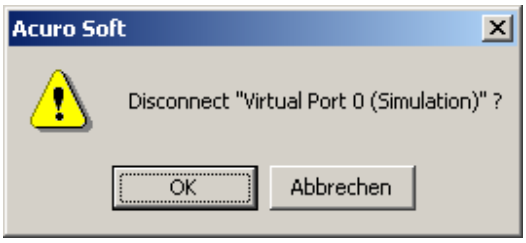
Menu entries:

- Connect Port
- Write Displayed Value
- Read Values
- Write Analog Tuning Settings (currently not supported)
- Write Values to EEPROM

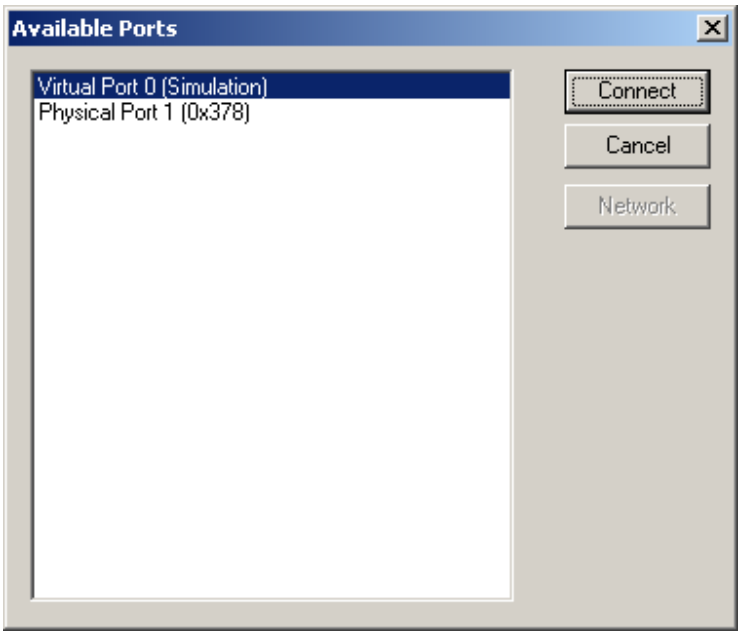
4.2.1. Edit - Connect Port

The "Connect Port" command is used to establish the connection to the encoder or a "virtual port".
The "virtual port" is used to generate simulated values.

If a connection should exist already, a warning message will be displayed:



Thereafter, the following selection menu will appear:



If no Acuro encoder should be connected, select "Virtual Port 0 (simulation)". This program simulates and displays encoder signals.
After selecting "Physical Port 1 (0x378)" a data link to the Acuro encoder is established via the parallel port (printer connection).

Click "connect" to enable your selection; click "Cancel" if you wish to cancel your entries.

NOTE: ***No error message will be returned if the encoder is not installed / not installed correctly.***

Subsequently, click "Write" to transfer the contents of the tabs on the right-hand column to the encoder.

Press "Cancel" if you wish to cancel the transfer process.

4.2.2. Edit - Write Displayed Value

Use this command to transfer the values of the active tab to the encoder.
Note that these values will only be stored in the main memory of the encoder. After a power failure the values are loaded from the EEPROM and transferred to the main memory. Therefore, it is necessary to write these settings to the EEPROM after testing.

4.2.3. Edit - Read Values

This command is used to read all encoder values and display them on the tabs.

4.2.4. Edit - Write Values to EEPROM

Use this command to write all values of the active tab into the encoder EPPROM. The "Write displayed values" command is transferred to the encoder (where these new values are then processed), but after a voltage drop (power failure) the values stored in the EEPROM will be reactivated. The benefit is that you will be able to test various settings and always return to the initial status (EEPROM status).

4.3. Menu View

The »View« command allows selecting and deselecting the toolbar and status bar (see Section 1.6).

Menu items:
Toolbar
Status bar

A tick mark (√) in front of the selected menu item indicates that the associated bar is visible.

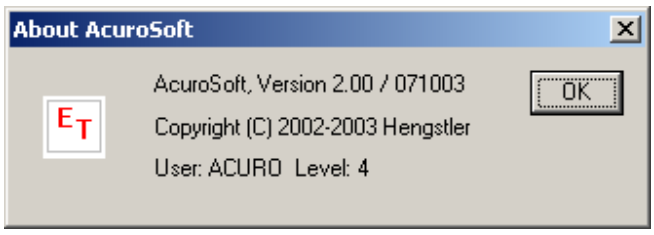
A description of toolbars and status bars and the associated entries is given in Section 1.6.

4.4. Menu ?

This menu item is used to display the version (revision) number and software revision level, as well as the name and user authorization of the logged-in user.

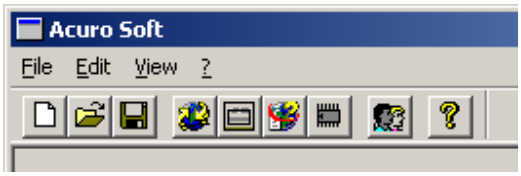
Menu items:
About Acuro soft...

The following information dialog is presented after selecting the menu item:



Explanation (in this case):
Software version 2.00
Software revision level dated 07.October 2003
Logged-in user: ACURO
Assigned user level: 4

4.5. Toolbar



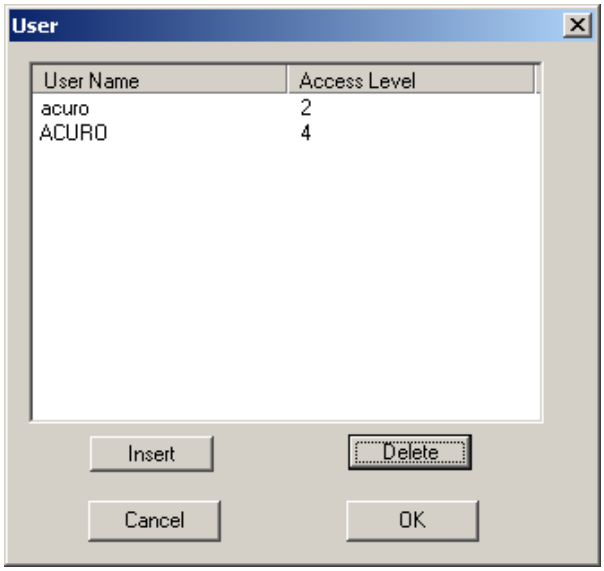
The toolbar is used to access the most important program functions directly via the associated menu.
If the mouse pointer is placed over the icon, the status bar shows a short icon description.

Below listed is a short description of icons with reference to the appropriate section of the user's manual.

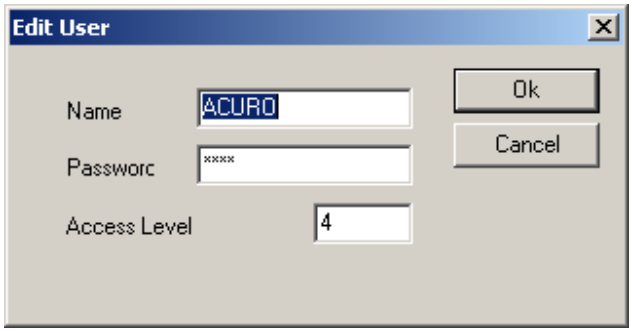
Icon	Section	Function
	4.1.1	File – New: Resets to default values
	4.1.2	File – Open: Loads parameter file
	4.1.4	File – Save: Saves parameter file
	4.2.1	Edit – Connect Port: Connects interface
	4.2.3	Edit – Write indicated Values: Transmits the values of the displayed dialog to the encoder.
	4.2.4	Edit – Read values: Reads the currently active encoder values into the PC
	4.2.5	Edit – Writes values to the EEPROM: The values of the displayed dialog are written to the EEPROM and permanently stored.
	4.8	User administration
	4.6	Menu ?: Shows version number, copyright, etc.

4.6. User administration

User administration is used to assign individual user rights (access authorization). This prevents users from changing encoder settings, but allows them to view possible encoder errors or positioning data. The access right assigned determines which data entry fields (tabs) are visible. (Also please refer to Section 3).



Access rights are changed by double-clicking the associated user name. The "Insert" command may be used to create a new user entry.



Use "Delete" to remove a user entry from the list.

After confirming this prompt the user entries will be deleted.

Click "OK" to save your entries in the user administration; click "Cancel" if you wish to cancel your entries.

5. Error messages:

Possible cause: Encoder connection error or incorrect installation of encoder; no voltage supply (please check the status LED on the encoder)