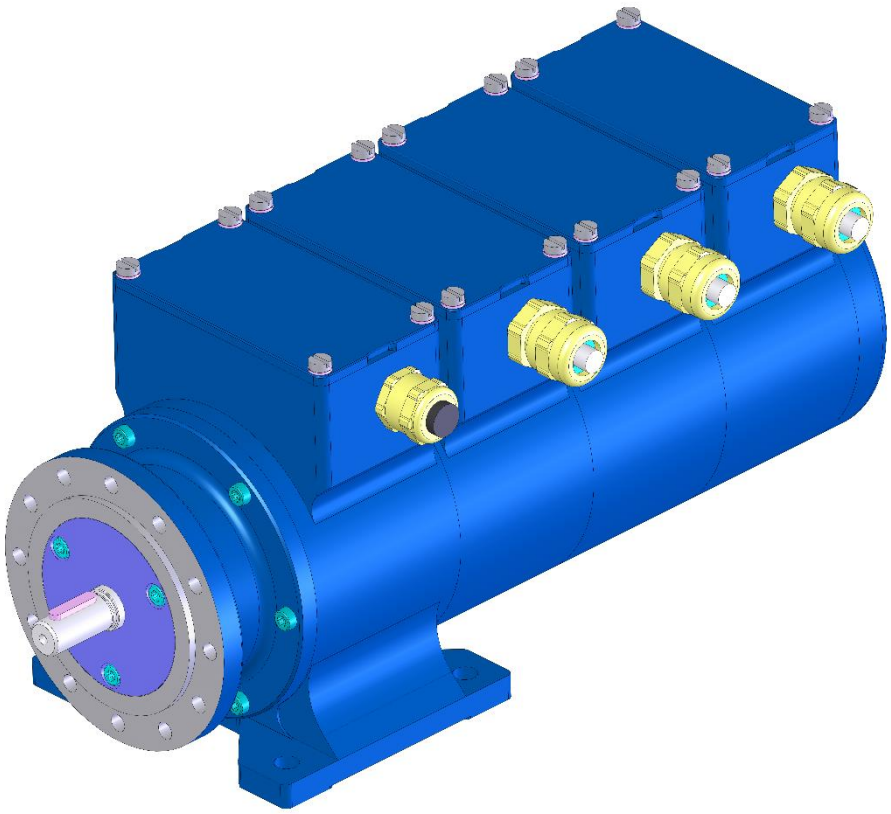
English



Configuration manual

Universal-Encoder-System U-ONE®-Compact UOC40 and Electronic Position Switch ERC40

For the following modules:

ECU C **(Module Control Unit)**

ERC C-R **(Module position switch with positively driven contacts)**

EGS C-R **(Module overspeed switch with positively driven contacts)**

Read the configuration manual prior to assembly, starting installation and handling!
Keep for future reference!

Translation of the original configuration manual ECU C issued November. 2018

ID 74539

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Subject to errors and changes due to technical improvements.

Table of contents

1 Generally

The universal encoder system U-ONE®-Compact UOC 40 and the electronic position switch ERC 40 is referred to as UOC 40 / ERC 40 in the following documentation.
This document explains how to set the parameters of the U-ONE®-Compact using the software US42Pro and then transfer the settings to the device.

1.1 Abbreviations and terminology used

UOC 40	U-ONE®-Compact universal encoder system
ERC 40	Electronic position switch
ECU C	Module control unit
ERC C-R	Module position switch with positively driven contacts
EGS C-R	Module overspeed switch with positively driven contacts

1.2 System requirements

For configuration purposes it is possible to use any commercially available Windows® notebooks/PCs that fulfil the following system requirements:

- Windows® XP SP3 / Vista / 7 / 8 / 8.1 / 10.
- Free space on the HDD: 150 MB (+ Dot Net Framework).
- Available USB 2.0 port.
- 1 GB RAM, CPU: 1GHz, screen resolution 1024 x 768.

2 Installing the software

Ensure the device and your notebook/PC are connected via the USB cable.
Close the a3utomatically started „Found new hardware wizard“ with a click on “Cancel“.

Place the supplied CD containing the software into the CD drive or, alternatively, download the *Setup.exe*. If the *Setup.exe* does not run automatically, navigate via Explorer on the CD-ROM drive and there start the *Setup.exe*.

1. The Setup guides you through the installation. Please follow the instructions on the monitor.
   If you use Windows XP, Vista or 7, continue with step 2, users higher operating system versions go on to step 3.
2. **Windows XP SP3/ Vista / 7**
   Due to the ended support for your operating system, it is no longer possible for us to sign the driver; therefore you need to confirm the installation manually. To do this, in Windows XP, click on “ Continue Anyway ”. In Windows Vista and 7 click on “ Install this driver software anyway ”. After that, the setup routine will continue.

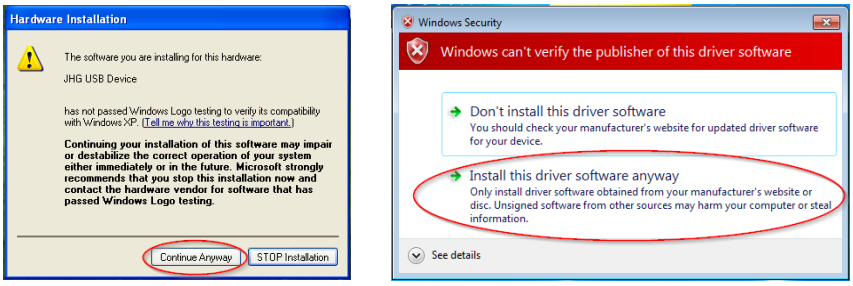


Fig. 2-1: Software Installation 1

3. **Completion**
   The software has been installed and starts automatically.

2.1 Installing the driver manually

	PLEASE NOTE! You must log into a user account with administrator rights to install the software. Ensure all programs are closed.

If it is necessary to install the driver manually, depending on your operating system, please check the following steps.
Connect the supplied USB cable with the UOC 40 / ERC 40 and your notebook/PC
By pressing “Windows key” “Pause/Break” **or** desktop “Computer” (right click) “Properties” you get into the System Properties.
Open the device manager, which lists all the connected devices. Select “JHG Dev” (right click) “Update Driver”.

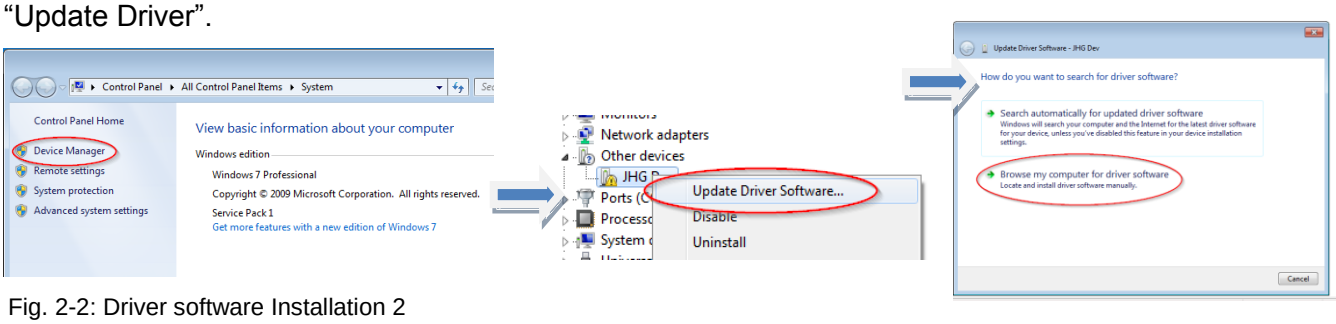


Fig. 2-2: Driver software Installation 2

Now select the installation source via “Browse” and point to path of your installation, there select the folder *drivers.* The Installation begins with a click on *Next*.

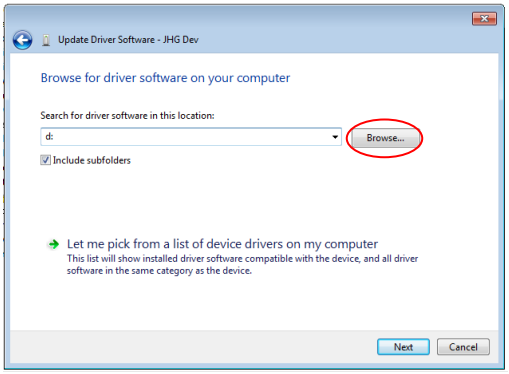


Fig. 2-3: Driver software Installation 3

Click Next, the installation of the driver software for the UOC 40 / ERC 40 has been completed.
Finish the installation with “close”.
The UOC 40 / ERC 40 is now ready to be used.

2.2 Manual driver installation under Windows XP SP3

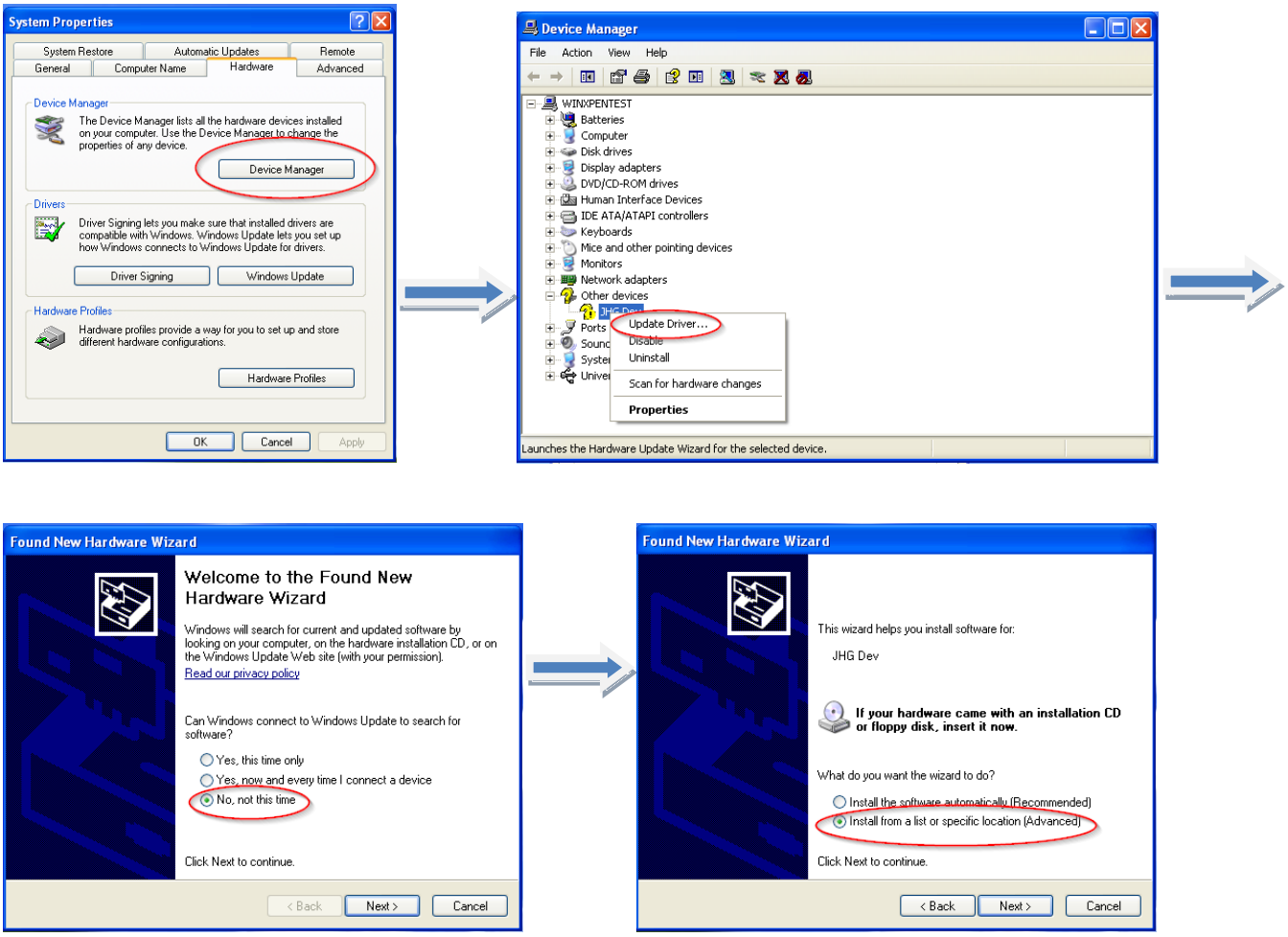


Fig. 2-4: Software Installation XP SP3

Now select the installation source via “Browse” and point to path of your installation, there select the folder *drivers.* The Installation begins with a click on *Next*.

Click Next, the installation of the driver software for the UOC 40 / ERC 40 has been completed.
Finish the installation with “close”.

The UOC 40 / ERC 40 is now ready to be used.

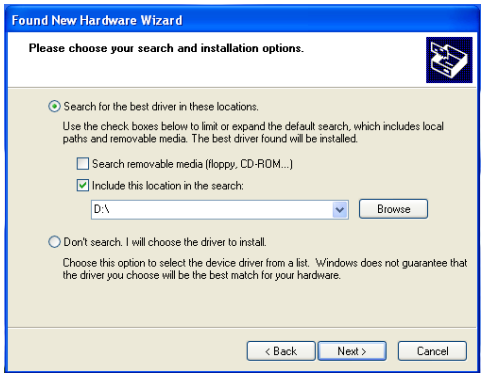


Fig. 2-5: Driver Software Installation XP SP3

3 Setting up UOC 40 / ERC 40

Allow sufficient time to plan the integration and configuration of the UOC 40 / ERC 40. Please remember that planning and configuration errors can put people at risk. Put organizational measures in place to guarantee the safe system state during configuration procedures!

Ensure that the system cannot enter any dangerous states during the configuration procedures including in that part of the system monitored by devices connected to the UOC 40 / ERC 40.

To configure the UOC 40 / ERC 40 you require the following:

- Operating-and configuring instructions belonging to the UOC 40 / ERC 40
- Notebook/PC running a Windows® operating system
- The configuration software US42Pro (administrator rights are required to install the software)
- USB-Connecting cable to connect the notebook/PC with the UOC 40 / ERC 40

3.1 Planning

Caution!

Ensure you have planned the application thoroughly before you begin to configure the UOC 40 / ERC 40!

Amongst other considerations the planning must include:

- A detailed safety analysis of the planned application
- A complete list of all required devices, their connections as well as the signals and switching points provided or required by UOC 40 / ERC 40.

In addition, the following conditions must be fulfilled:

- The UOC 40 / ERC 40 must be connected to the power supply.

Read also the appropriate operating and assembly instructions.

4 Software description US42Pro

In this chapter you will learn how to configure the UOC 40 / ERC 40 in its respective device combination using the configuration software US42Pro. For the purpose of clarity the user interface is divided up into different sections.

The drawing below offers a schematic overview:

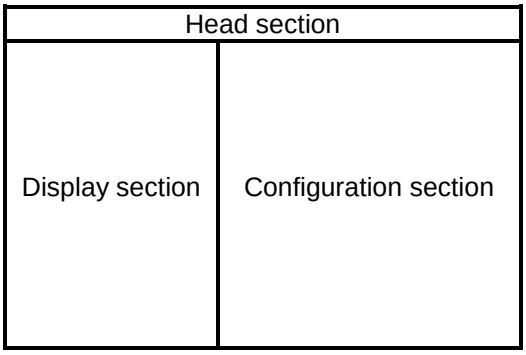


Fig. 4-1: schematic overview of the user interface

- **Head section**:
  This is where the elements used to control the software are displayed (see Chapter 4.1.1).
- **Display section**:
  The display section is always visible and is used to show the available modules and their status. (See chapter 6.2.1).
  In the upper section the current speed, the current position and the optional analog output current is displayed.
- **Configuration section:**
  This is where the module parameters are entered on the tab pages (see Chapter 5).

4.1 Fundamental procedure

The UOC 40 / ERC 40 is configured by taking the following steps:

1. Turn on the Notebook/PC
2. Connect the UOC 40 / ERC 40 to the USB port of the Notebook/PC
3. Switch on the UOC 40 / ERC 40
4. Launch the software US42Pro and set up connection (see chapter 5.1)
5. Log onto the UOC 40 / ERC 40 (please refer to Chapter 4.1.6)
6. Configure UOC 40 / ERC 40 (please refer to Chapter 5).
7. Check parameter settings
8. Approve the parameters in the UOC 40 / ERC 40
9. Test the parameter settings of the UOC 40 / ERC 40 on a secured system

The UOC 40 / ERC 40 is ready for operations after completing these steps.

4.1.1 User interface head section

The menu bar containing basic commands to operate the software is located in the head section.

4.1.2 Pulldown menu: File → Import Parameters

- To check the content of saved parameter sets when the device is not connected click “Import Parameters”.
- When the device is connected it is possible to load parameters into the input masks that were saved using the “Export Parameters” function.
- When the device is connected and the user signed in, it is possible to save imported parameters to the device.

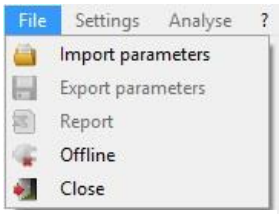


Fig. 4-2: File

4.1.3 Pulldown menu: File → Export Parameters

To save device parameters to a Notebook/PC click “Export Parameters”.

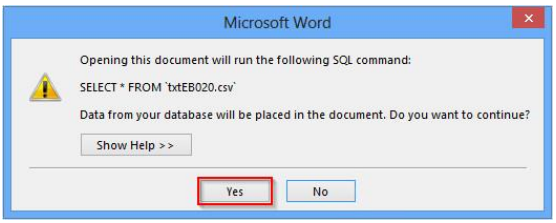
4.1.4 Pulldown menu: File → Report

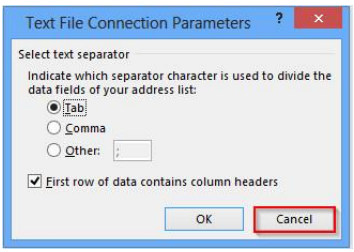
Click “Report” to save device parameters to a CSV file.

Using the Form Letter function in Word (for example, Word 2013), it is possible to save device parameters for documentation purposes in Word templates as follows:

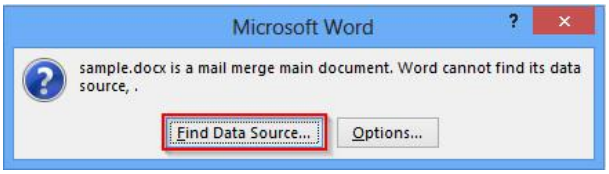
1. Open the associated template file for the device

(for example, UOC 40_ReportDDA_Rx.dotx). Then select the (successive) buttons framed in red.

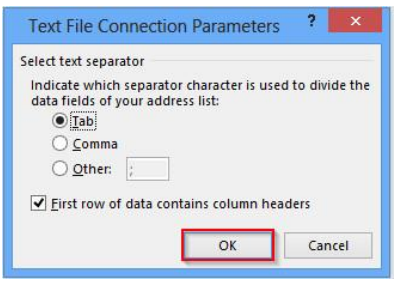


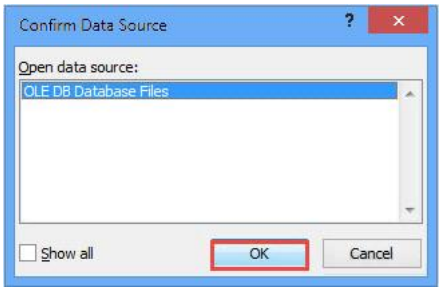


2. Open the previously saved “CSV file”.



3. Click OK 2x to confirm





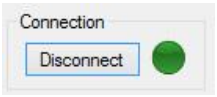
The parameters have been saved to the template. You can make any changes you like to the template. Using the Word function “Insert Merge Field” it is possible to add more parameters.

4.1.5 Pulldown menu: File → Offline

In offline mode, a device parameter set can be created without UOC 40 / ERC 40 as follows:

- A virtual UOC 40 / ERC 40 is created by entering the type designation.
- The parameterization of the virtual UOC 40 / ERC 40 can be carried out.
- With „Export parameters“ the parameters are stored and can be loaded by a UOC 40 / ERC 40 with the same type designation.

  The offline-state will be exited via



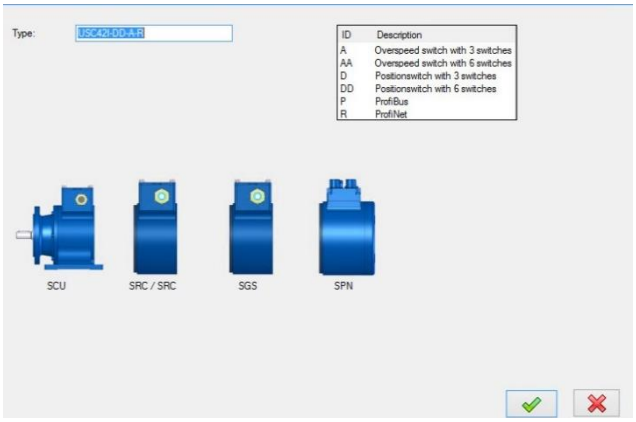


Fig. 4-3: Offline

4.1.6 Pulldown menu: Options → Language

Depending on the regional setting of your Windows operating system the software language is determined. The language 'English' is selected if no corresponding data record is available. It is possible to select a different language via the menu item 'Language'.

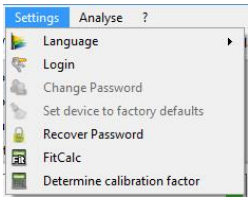


Fig. 4-4: Settings

4.1.7 Pulldown menu: Options →Login

To access and work on the assigned user level, the user must log into UOC 40 / ERC 40 via the menu item 'Login password' with his or her password.

4.1.8 Pulldown menu: Options →Change password

Admin and Tester passwords are assigned via the menu item 'Change password'. A closed padlock in the header indicates that a user-specific password has been assigned.

Authorization levels:
Three authorization levels are available to the user; however, it is only possible to activate two of these levels by means of password authentication. The password must be between 6-12 ASCII characters (0x20 - 0x7E) in length.

Level 0: Observer (no password required)
The following functions are available on this level:
- Establish communications with UOC 40 / ERC 40
- Enter password
- Display assigned parameters
- Display saved parameter sets

Level 1: Tester (password level 1)
On this level the following functions are available in addition to those on level 0:
- Perform test of switch
- Generate test logs

Level 2: Admin (password level 2)
On this level the following functions are available in addition to those on level 1:
- Change parameters
- Save parameter sets

Fig. 4-5: Partial view header

Default passwords on delivery are 'huebner1' for password level 1 and 'huebner2' for password level 2. A padlock with an open shackle symbolizes that the password “huebner2” has not yet been changed; consequently, the configuration is not secured against unauthorized changes.

A closed padlock shackle indicates the configuration is securely protected against unauthorized changes. How to save the configuration is described in chapter 5.4. The authorization level is displayed in plain text to the left of the padlock symbol (here the level is: Admin), with which the user is logged into the UOC 40 / ERC 40 .

PLEASE NOTE!
The login password is set ex-works to 'huebner1' or 'huebner2'.

ATTENTION!
Change the Admin password as soon as possible to protect the configuration from unauthorized access! (Chapter 4.1.8)

4.1.9 Pulldown menu: Options → firmware update

The UOC 40 / ERC 40 is prepared for a firmware update by electrically connecting terminal 1 (+ U) and terminal 2 (Error1) during power up. After switching on, this connection must be removed again.

The button  .selects the update file.

„Transfer“ starts the update process.

After the update process, the device must be restarted.

NOTE!
Before the restard, the connection must be removed.

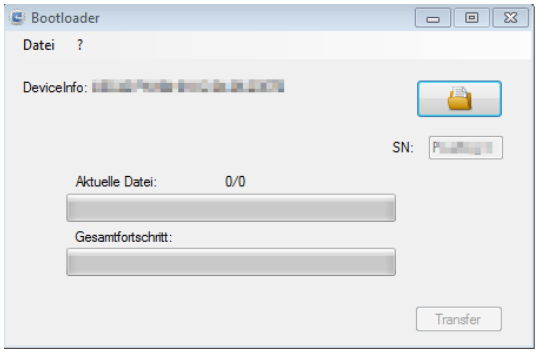


Fig. 4-6: firmware update

4.1.10 Pulldown menu: Options → Reset to factory settings

All parameters and the UOC 40 / ERC 40 will be deleted and reset to factory settings.

Factory settings:

Password level1 Password level2	huebner1 huebner2
Operating mode (UOC 40 only)	Position-speed mode
Reset and preset input	Deactivated

Programmed switching points	Deleted
Current output	Deactivated
Current output source	Position dependent
Incremental output (optional)	4096

4.1.11 Pulldown menu: Options →Recover password

If a user forgets his/her password, it is possible to assign a new password using the “Recover Password” function and following the steps below:

- Select “Recover Password”.
- To generate a recovery key click the Generate recovery key button, then click the button to send the request to the manufacturer immediately or later if there is no Internet connection.
- A recovery password will be generated and sent back to the designated recipient.
- It is possible to assign a new password once the recovery password has been entered in the appropriate field.

Fig. 4-6: recover password

4.1.12 Pulldown menu: Options → Determine calibration factor

see chapter 5.3.2

4.1.13 Pulldown menu: "Analysis" → switch test

It is possible to alter the switch status by means of a switch test incorporated in the configuration software US42Pro. The switch test is only available when the encoder shaft is at a standstill.
It is possible to oversee the changes to the statuses of the switches via the Switch test dialog box.

To confirm and activate the switch test click 

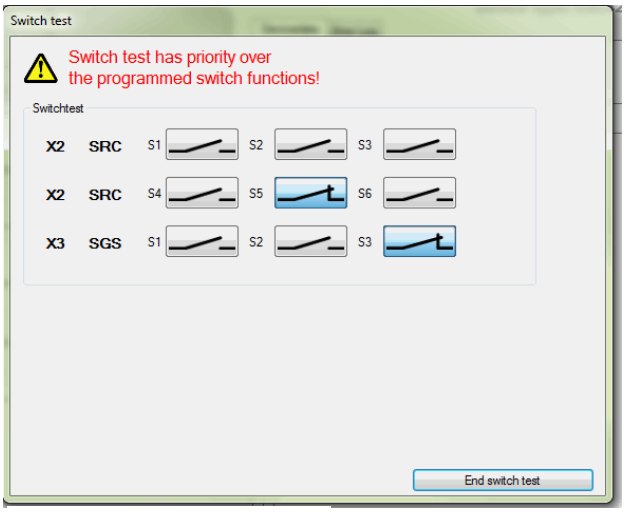
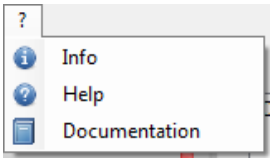


Fig. 4-7: Switchtest

	**CAUTION!** An error will be triggered if the encoder shaft turns during the switch test.

	**CAUTION!** The switch test has priority over programmed switching functions.

4.1.14 Pulldown menu „?“



- **Info**
  Displays the software version and Johannes Hubner contact details.
- **Help**
  Opens the current configuration data in PDF format.
- **Documentation**
  Opens the folder containing the UOC 40 / ERC 40 documentation. This is where the connection diagrams, dimension drawings and operating and assembly instructions and the configuration manual are stored.

4.1.15 Generate support file

In the pull-down menu "?" Under "Info" with the button Generate support file a support file is generated, which serves for the error analysis.

	NOTE! Please send the support file with a short description of the conditions under which the error occurred, by email to the manufacturer.

If the e-mail checkbox is activated, the file is transferred directly to the installed e-mail program.

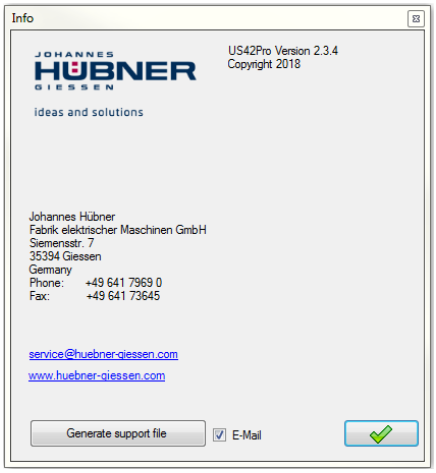
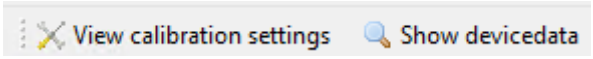


Fig. 4-8: Info

4.1.16 Display calibration settings

The calibration settings are displayed here and also changed with „Start parameterization“.



4.1.17 Display device data

All device data, grouped according to the terminal boxes, are displayed here.

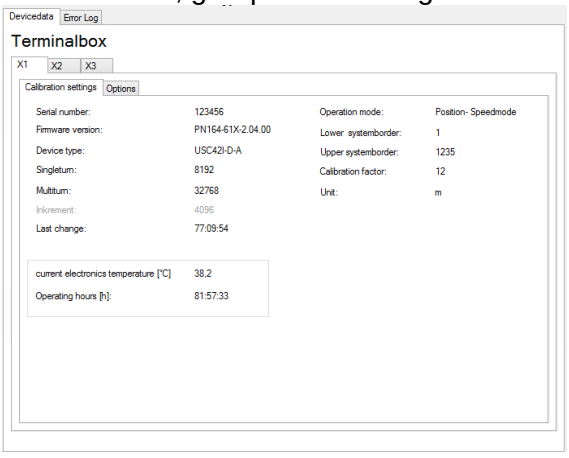
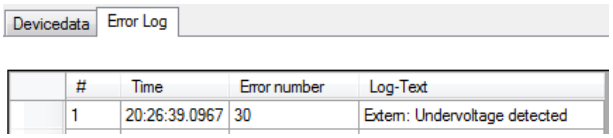


Fig. 4-9: Device data

4.1.18 Fault memory



#:	Memory
Time:	Time of error occurrence (Operating hours)

The error memory is a ring memory and can accommodate 100 error entries. Internal errors should be sent to the manufacturer for analysis. An error analysis record is generated as follows:
The button  in the display area of the fault memory generates an error log file, which can then be saved.

4.2 User interface - display section

The display section (left column):

- Displays the device type
- Displays present position, speed and current values.
- Lists all modules of the UOC 40 / ERC 40.
  The assignment to the individual terminal boxes is displayed as X1, X2, X3 in the same sequence that mirrors how the modules are arranged (see Fig. 5-3).
  X1 is always the terminal box of the ECU C.

5 Configuring UOC 40 / ERC 40

You must first calibrate the position system before configuring UOC 40 / ERC 40 (chapter 5.3). Device calibration and device configuration operations are only possible on the password level “Admin”.

!	**CAUTION!** **It is only possible to assign parameters and calibrate the device when the device is at a standstill!** The UOC 40 / ERC 40 enters a safe state if rotary motion is detected when parameters are being assigned

5.1 Launching the software US42Pro

When the software is launched, the start screen is displayed.

Click 'Connect' to establish communications with the UOC 40 / ERC 40 device. The connection status is indicated on the right of the button.

Display	Status
grey	not connected
change light green / dark green	connected

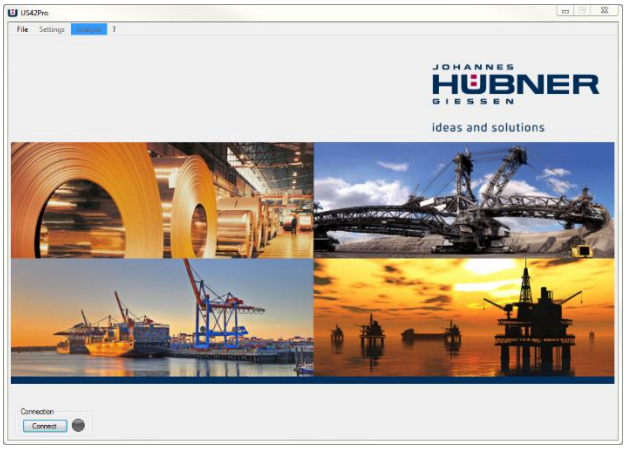


Fig. 5-1: Start screen

After the connection setup, the device data are read out. To calibrate and configure the UOC 40 / ERC 40 the user must first log in using the Admin password.

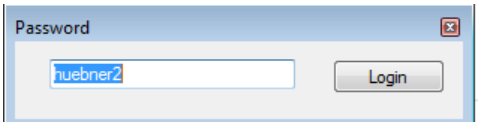


Fig. 5-2: Login

⚠	**ATTENTION!** Change the Admin password 'huebner2' to protect the configuration from unauthorized access. (Chapter 4.1.6)

5.2 Operating mode (UOC 40 only)

The ERC 40 is always operated in the position mode.

5.2.1 Speed mode

Select the operating mode “Speed mode” if no position dependent switching points or position dependent current values 4 mA…20 mA are used.
It is not necessary to calibrate the UOC 40 / ERC 40 in this operating mode.

5.2.2 Position and speed mode

Select the operating mode “Position and speed mode” if position dependent switching points or position dependent current values 4 mA…20 mA are used.
In this operating mode it is necessary to calibrate the UOC 40 / ERC 40 (see Chap.5.3).

5.3 Calibrating the position system

To calibrate the position system (adapt the internal device processing to mirror actual conditions at the place of installation) it is necessary to determine the system limits, calibration point, calibration factor and unit.

- The system limits define the max. possible working range. An error will be triggered if values exceed or fall below the defined range.

	**PLEASE NOTE!** To avoid system limit errors ensure sufficient clearance between the system limits and the switching points.

- The operating range must not exceed 32768 rotations of the device shaft.
- The preset position value is a defined position point (calibration point).
- The calibration factor is the adaption factor between system units and device units.
  It is assumed that this ratio is constant.
  If unknown, it is possible to determine the calibration factor via the menu item “Options → Determine calibration factor” (see Chap.5.3.2).
  In this instance it is possible to determine the calibration factor with the aid of 2 calibration points, the interval between which should be as great as possible but must not exceed the system limits.

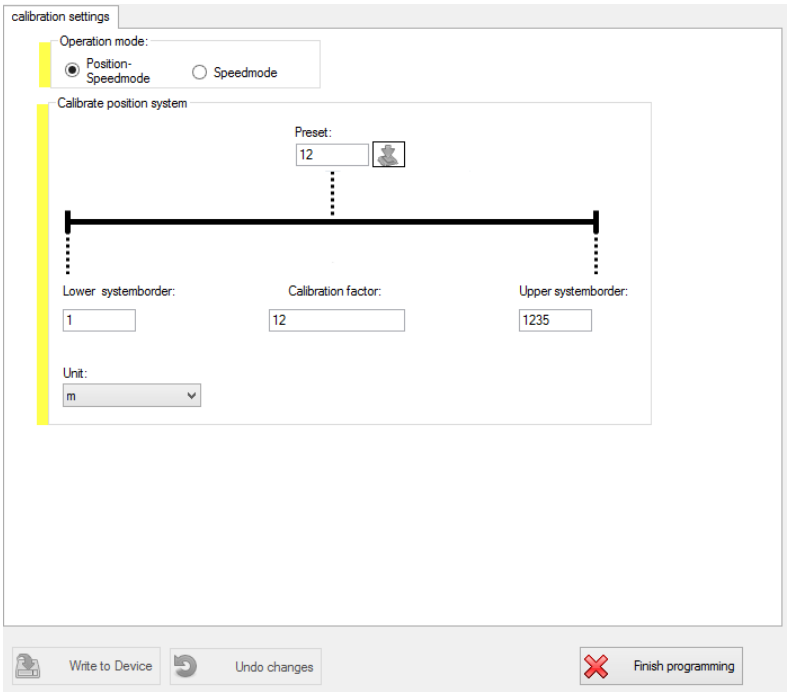
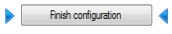


Fig. 5-3: Calibrating the system

5.3.1 Calibration

1. Select the desired unit via the pulldown menu.
2. Enter the values for the system limits and the calibration point (preset).
   The following constraint applies:

   Lower system limit **<** calibration point **<** upper system limit
3. Enter calibration factor. For information on calculating the calibration factor see chap. 5.3.3.
4. To save values to the UOC 40 / ERC 40 click 

, see chap. 5.4.
5. Move to the calibration point (preset), shut down the drive and click the  button.
   The current position is saved as the calibration point.
6. To complete the calibration procedure click 

button. The UOC 40 / ERC 40 is calibrated and can now be configured.

5.3.2 Determining the calibration factor with two calibration points

1. Enter calibration point 1 and calibration point 2.
   The following constraints apply:
   - Lower system limit < calibration point 1
   - Calibration point 1 < calibration point 2
   - Calibration point 2 < upper system limit

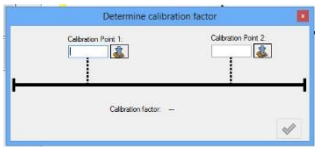


Fig. 5-4: Determining the calibration factor

2. Move to calibration point 1 and shut down the drive, click the button  The current position is saved as calibration point 1.
3. Move to calibration point 2 and shut down the drive, click the button  . The current position is saved as calibration point 2.
4. The calibration factor has been calculated, saved to the clipboard and can now be inserted in the appropriate dialog box.

5.3.3 Determining the calibration factor by calculation

Calibration factor = (device shaft rotations) x 8192 / Actual path in number of plant units

Example:
34.5 m travel corresponds to 125.7 rotations of the device shaft.

Calibration factor = 125.7 x 8192 / 34.5 = 29847.37

5.4 Saving configuration- or parameterisation data in the UOC 40 / ERC 40

All entries are formally checked prior to data transmission.
Incorrect entries are highlighted red and data transmission to the UOC 40 / ERC 40 are prevented.
If the entries comply with the conditions above (chapter 5.3.2), the values are transmitted to the UOC 40 / ERC 40 , checked, activated and saved temporarily.
The compare dialog box displays the values entered in the input mask and the values read out of the UOC 40 / ERC 40 (Fig. 5-5). The user confirms the values are correct by clicking the green tick.

The values are only now permanently stored.

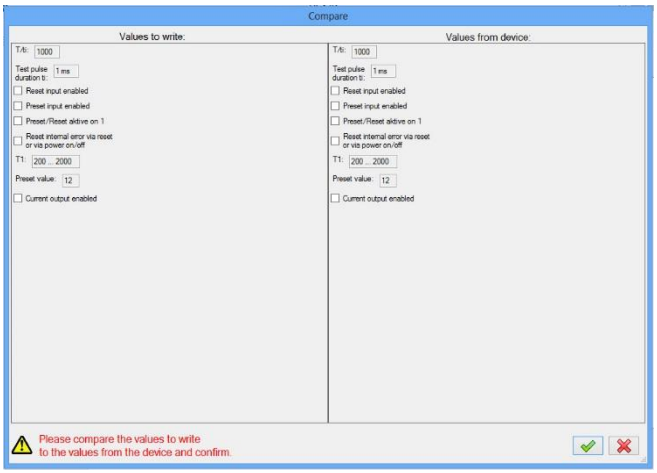


Fig. 5-5: Comparison dialog box

6 Functions

6.1 ECU C module

The ECU C module (Control Unit) is the central control unit of the UOC 40 / ERC 40.

To assign the module a user-defined designation click the symbol . That makes it easy to allocate the device on site (for example, “drive 2"). The length of the designation is limited to 12 characters.

On the tabbed page “Options” it is possible to make the following settings.

6.1.1 Digital inputs

The inputs must be activated prior to use. Both inputs are 2-channel types and active low; in other words, when quiescent the inputs must be high. A falling edge at both channels initiates the process. Valid rising edges initiate the process. The duration of the low level signal T1 can be configured - and is the same for both inputs.

- **Reset input:**
  A reset procedure re-initializes the whole UOC 40 / ERC 40 system and resets errors.
- **Preset input:**
  A preset procedure sets the current position to the preset position configured in the device. A low level signal at the status output (approx. 1s) acknowledges a valid preset procedure.

  The **time T1** can be set between 20 ms … 200 ms or 200 ms … 2000 ms
  (factory setting: 200 ms … 2000 ms).

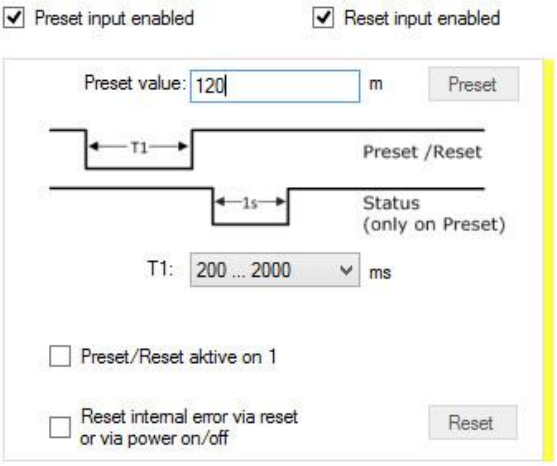


Fig. 6-1Preset inputs

The behaviour of the Reset and Preset inputs can be changed from Low active to High active with “Preset/Reset 1 active”.

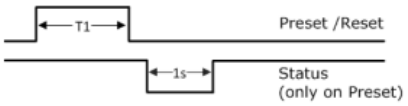


Fig. 6-2Digital inputs

	**CAUTION!** It is only allowed to set a preset “on the fly” if a risk analysis determines the application is suitable to allow this function.

	**CAUTION!** A preset does not influence the position value of the bus module. It is only possible to alter this position value via the bus interface.

6.1.2 Digital outputs

There are 2 digital outputs: Status- and error output.

- **Error output:**
  When the status is error-free, the error output has a high level.

  An error is indicated by a low-level signal at the error output, which can be reset via the configuration software "US42Pro". It is possible to set the error performance via interrupting the supply voltage (> 2s) or by initiating a reset at the reset input.

  The reset always initiates a system reboot including a complete system test. If an error is determined again, the device remains in an error condition. Error logs are saved in the error memory.

	**CAUTION!** The "fault reset via the reset input or power supply interruption" option may be used only if a risk analysis has shown that the application is suitable.

- **Status output:**
  The status output indicates the operating status in conjunction with the error output of the UOC 40 / ERC 40 (see separate operating and assembly instructions, chapter: operating statuses and indicators).

6.1.3 Current output

The current output can be set to speed (UOC 40 only) or position dependent on the menu and must be activated before use.

6.1.3.1 Configuring the position-dependent current output

To configure the position-dependent current output it is necessary to enter 2 position values, which must be within the system limits.
The smaller position value is assigned current I_{min} = 4 mA and the larger position value I_{max} = 20 mA.

The following restriction applies

- Pos1 < Pos2

If the current position is outside of the defined position range, the current output is switched to high impedance (I = 0 mA). (Factory setting).
Alternatively, it is possible to select a setting to take effect in the event the value falls below or exceeds the determined position range 4 mA or 20 mA.

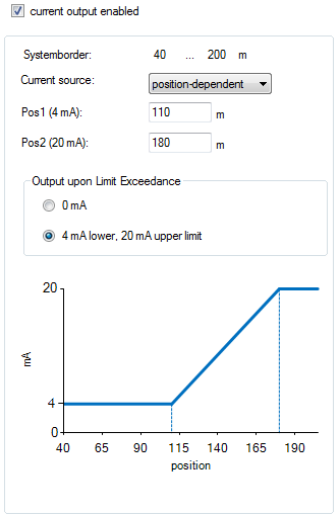


Fig. 6-3: Configuring position dependent-current output

6.1.3.2 Configuring the speed-dependent current output (UOC 40 only)

To configure the speed-dependent current output it is necessary to enter the speed $_{n20\ mA}$. When at a standstill a current of 4 mA flows.
The following constraint applies:

- $n_{20\ mA}$ < (approved mechanical speed -10%)

If the speed exceeds the speed range ($n_{current}$ > $n_{20\ mA}$), the current output is switched to high resistance
(I = 0 mA) – (factory setting) and an error is triggered.
Alternatively, it is possible to select a setting to take effect in the event the value exceeds the determined position range 20 mA.

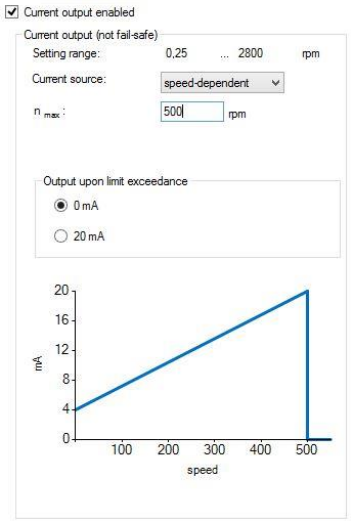


Fig. 6-4: Configuring speed dependent-current output

6.1.4 Configuring the incremental output (UOC 40 only)

The incremental output is optional. To configure the incremental output it is possible to select a pulse rate of 1024 or 4096
(factory setting: 4096).

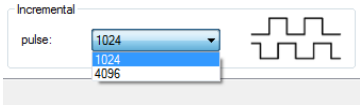


Fig. 6-5 Configuring incremental output

6.2 ERC C module

The ERC C module is a position switch module and contains 3 or 6 position switches. The position switch opens or closes depending on the position value. It is possible to implement a cam with a single switch; in other words, a switch-on and switch-off position and the associated hysteresis switching points.
The position values to be entered must be within system limits. It is possible to assign each position switch an application-specific designation (max. 12 characters). Switching modules with 6 position switches are configured on 2 monitor display screens. The parameters are entered in the table as shown opposite.

The values are highlighted yellow if there is a possibility that the minimum time interval (2 ms) between 2 switching conditions could be undershot. If such an event occurs the user must check the time interval in his application.

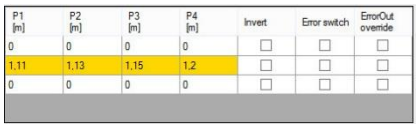


Fig. 6-6: Warning notice

- **P1:** Hysteresis switching point of P2.
- **P3:** Hysteresis switching point of P4.

  The following condition applies:
  P1 < P2 < P3 < P4
- **Inverted:** The switch operates inverted (see switch S3).
- **Error switch:** Switch opens only in the event an error occurs (see switch S2).
- **Open if an error occurs:**
  Switch operates as configured, but opens if an error occurs.

The switching points are depicted in their correct position in the graphic opposite.

The green marker indicates the current position.
Click "Write to device" to finish configuring the module

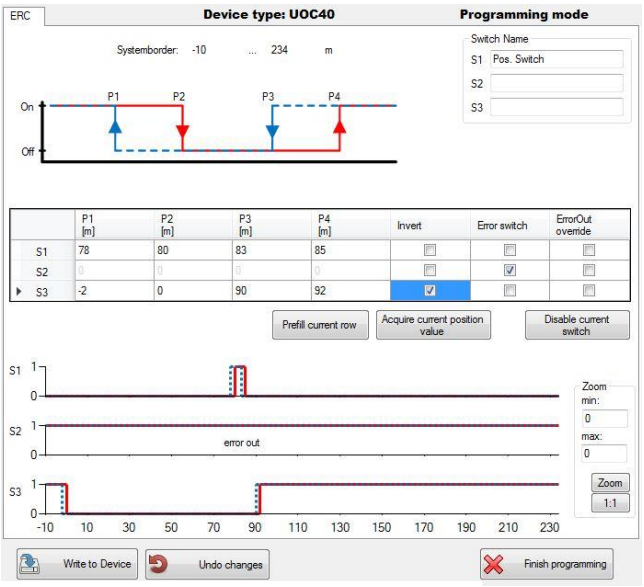
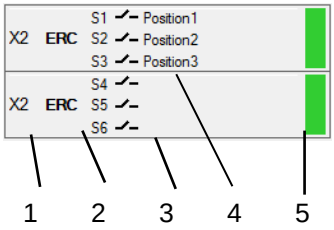


Fig.: 6-7 Configuration ERC C module

6.2.1 Depiction in the display section

The module is depicted as follows in the display section:
The switching states of the individual switches are represented by switch symbols .



	Description	Meaning
1	Module position	X2: 2. Terminal box
2	Module type	ERC: Position switch module
3	Switch statuses	Switch symbol Black: Error-free Gray: Not configured Red: Error
4	User designation	Switch designation assigned by user
5	Module status	Gray: Not configured Green: Error-free Red: Error

Fig.: 6-8 Display Area

6.3 EGS C module (USC 40 only)

The EGS C-module is a speed switch module. The speed switch opens or closes depending on the speed. A speed switch module has 3 or 6 speed switches. Switching modules with 6 speed switches are configured on 2 configuration screens. Fundamentally, all switching speed inputs must be within the device-specific switching range 0.5-2520 rpm.

The speed-dependent functions are depicted in a graphic in the top part of the screen.

The input fields for entering speed switching points are displayed in the lower part of the screen in table form. One line is allocated to each respective switch (S1-S3 or S1R to S3L).
The columns are assigned to the respective speed switching points P1 to P4, and the switching delay P4 (max. 300 ms).

The following condition applies:
P1 < 0.9 x P2 < 0.9 x P3 < 0.9 x P4
or P1 = P2 = 0

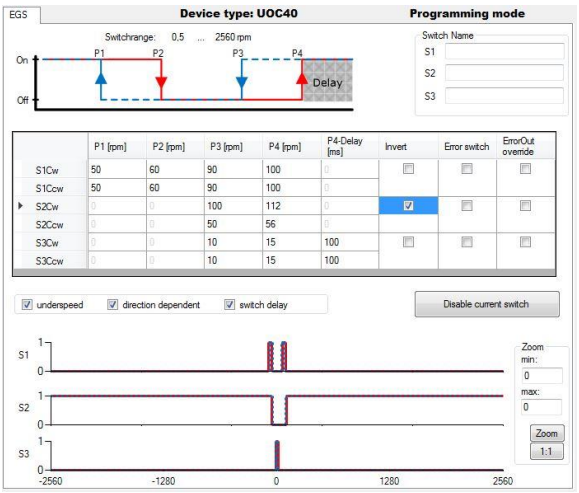


Fig. 6-9: Configuration EGS C module

The switching points are depicted in the graphic opposite.

A marker indicates the current speed.

The switches listed in the lines are allocated as follows	
S1R	Switching speeds of switch 1 for clockwise direction of rotation
S1L	Switching speeds of switch 1 for anticlockwise direction of rotation
S2R	Switching speeds of switch 2 for clockwise direction of rotation
S2L	Switching speeds of switch 2 for anticlockwise direction of rotation
S3R	Switching speeds of switch 3 for clockwise direction of rotation
S3L	Switching speeds of switch 3 for anticlockwise direction of rotation

The values listed in the columns are allocated as follows	
P1	Hysteresis switching speed for underspeed detection
P2	Cut-in speed for underspeed detection
P3	Hysteresis switching speed for overspeed detection
P4	Cut-off speed for overspeed detection
P4 - Delay	Delay time before cut-off of the switching point P4 [ms]

Only those lines and columns are displayed that are relevant to the respective function selected by checking the appropriate boxes.

An input value "0" in the fields P1 … P4 deactivates the corresponding switch.
An input value "0" in the fields P1 … P2 deactivates underspeed detection
(see Chapters: 6.3.1, 6.3.2).

CAUTION!
When switching delay is activated the actual cut-off speed can be higher than the set cut-off speed!
Observe also the information on determining switching accuracy described in the Operating and Assembly Instructions "UOC 40 / ERC 40 _Manual"!

The module is depicted in the display section as in Fig.: 6-10
Click "Write to device" to finish configuring the module.

6.3.1 Underspeed

Underspeed is detected. The respective switch closes first when speed P2 is exceeded; the switch is opened again when the speed falls below the P1 threshold. The input columns for "P1" and "P2" are depicted if underspeed detection is activated.

6.3.2 Rotation direction dependent

The switching speeds S1R … S3R apply to clockwise direction of rotation. The speeds S1L … S3L apply to anticlockwise direction of rotation.

The input lines for S1R-S3R as well as S1L-S3L are depicted if 'rotation direction dependent switching' is activated.

If no 'rotation direction dependent switching' is activated the switches S1 ... S3 are not labelled with a direction of rotation indicator R or L; the entered switching speeds apply independent of the direction of rotation.

PLEASE NOTE!
If 'rotation direction dependent switching and underspeed are selected, the underspeed function must be equal for both directions of rotation. Either active or inactive.

6.3.3 Switching delay

The adjustable switching delay makes it possible to prevent the overspeed switch switching if the limit speed is exceeded only briefly. That can be appropriate during load shedding, for example. If the speed P4 is exceeded the switches S1, S2 and S3 close, and open only after the delay time set in the "Delay" field has elapsed. It is possible to set the time between 0 and 300 ms. The cut-off function is not triggered if the speed again falls below the P4 figure within the set delay time.

	PLEASE NOTE! The delay time applies only to the cut-off function when the speed **P4** is exceeded. All other switching operations are triggered immediately.

6.4 Input accuracy of switching points

EGS C-Module (UOC 40 only):

Switching speed n	Input accuracy
n < 100 rpm	XX.YY (e.g.: 15.87)
100 < = n < 1000 rpm	XXX.Y (e.g.: 280.3)
n >= 1000 rpm	XXXX (e.g.: 2050)

X: Integer places
Y: Decimal places

ERC C-Module:

The input accuracy of the position switching points depends on the calibration factor. The input of position switching points is limited to 9 decimal places. The number of places after the decimal point is limited to 3 decimal places.

Calibration factor k	Input accuracy position switching points	
k < 10	XXXXXXXX	e.g.: 27354
10 < = k < 100	XXXXXXX.Y	e.g.: 27354.3
100 < = k < 1000	XXXXXX.YY	e.g.: 27354.34
k >= 1000	XXXXX.YYY	e.g.: 27354.345

X: Integer places
Y: Decimal places

6.5 Error handling

Numerous diagnostic measures check the functions and operating conditions of the UOC 40 / ERC 40 at power up and during runtime.

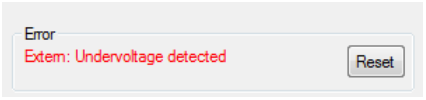


Fig. 6-10: Error message

In the event of a deviation, the error state is initiated and the error is stored in the error memory.
An error distinction is made between "internal errors" and "external errors".

External errors are caused by external influences, e.g. exceeding the max. permissible speed or exceeding the max. permissible temperature. The errors are explained in the parameterization software with a brief description of the error, as described in Chap.6.5.1 displayed.
Internal errors are e.g. triggered by deviations of the device-internal program sequence. The errors are displayed in the parameterization software with error number and the designation "internal error". An analysis of the cause of the error is only possible with expert knowledge. To do this, the user must send the contents of the fault memory to the manufacturer (see chapter 4.1.18).
Faults are reset by a reset (reset input or reset button in the US42Pro software) or by interrupting the supply voltage (> 2s).
Regardless of the category, the error condition is initiated when an error occurs. Resetting the error triggers a system restart with a complete system check. If an error is detected again, the UOC 40 / ERC 40 remains in fault state.
The error state can be assigned to a switching output with the parameterization software.

6.5.1 Error table

Error no.	Description
30	Undervoltage detected
31, 32	Overvoltage detected
35	Fell below min. temperature
36	Max. temperature exceeded
40	Error reset input
45	Error preset input
48	Error Error output
50	Fall below system limit
51	System limit exceeded
52	Operating range (system limit) too great
55	Maximum device speed exceeded
60	Start-up during parameterization
61	Start-up during switch test
62	Start-up during preset (software only)
63	Invalid condition for preset
65	Timeout during parameterization
66	Switched off during parameterization
67	Switched off while saving parameters
68	Start-up during factory reset
100-255	Internal diagnostics error detected