

DriveStudio

User Manual

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Introduction to the manual

This manual gives you instructions on how to use the DriveStudio commissioning and maintenance tool and how to access DriveSPC, Solution Program Composer (SPC).

Compatibility

This manual is compatible with DriveStudio version 1.6.

Reader

The reader of this manual is expected to be an automation engineering professional and familiar with drive products and the concepts regarding their commissioning and operation, including the parameter system of ABB drives.

Contents

Chapter 1 – General briefly lists the main features of the DriveStudio software, how and where it can be run, and how to get help and additional information.

Chapter 2 – Main User Interface Components describes the main user interface components of DriveStudio, including the menus.

Chapter 3 – Parameter Browser View describes the Parameter Browser view and its usage.

Chapter 4 – Data Logger View describes the Data Logger view and its usage.

Chapter 5 – Fault Logger View describes the Fault Logger view and its usage.

Chapter 6 – Monitor Window describes the Monitor window and its usage.

Chapter 7 – Data File Viewer Window describes the Data File Viewer window and its usage.

Chapter 8 – Other Functions describes functions that are common to many views and windows and ones that are not associated with any view or window.

Related documents

- DriveStudio: Solution Program Composer User Manual
- Control program Firmware Manual of the drive.

Chapter 1 - General

What is DriveStudio

DriveStudio is an easy-to-use 32-bit Windows application for commissioning and maintaining ABB ACSM1 and similar type AC drives.

Highlights and features

- Working simultaneously with multiple drives like master and follower drives
- Signal monitoring in numerical and graphical (trending) format
- Working with drive parameters
- Viewing the actual status of the connected drive
- OPC-based commissioning and maintenance tool
- Includes an OPC server (DA 2.04) for ACSM1 and similar drives
- Uses RS232 serial communication port
- Modern graphical user interface
- Runs in Windows 2000, XP, Vista and 7
- Fully 32-bit code

DriveStudio functions

- Control operations (start, stop, set reference, etc.)
- View drive status
- Monitoring (signals)
- Parameters (changing values, comparing, groups)
- Data logger (display data, controls)
- Fault logger (display faults, controls)

Hardware and software requirements

DriveStudio hardware

- One OPCA-02 cable for each drive to be connected

Computer hardware

- IBM compatible PC
- Pentium 800 MHz or faster processor recommended
- 256 MB RAM
- 1024 x 768 display resolution with 256 colors
- At least 50 MB free hard disk space

- CD Drive
- One free serial port for each drive to be connected

Software

- Operating system Windows 2000, XP, Vista or 7

Installing and uninstalling

Determining current DriveStudio version

The version of currently installed DriveStudio can be determined by selecting the About DriveStudio command in the Help menu. The About DriveStudio dialog box containing the DriveStudio version is shown.

Installing

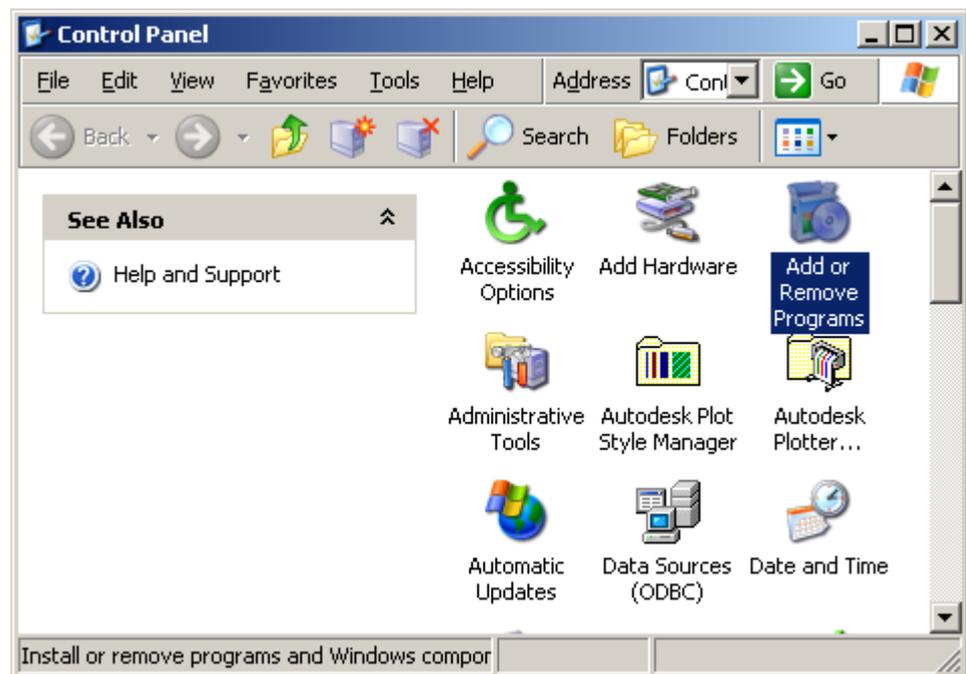
Please read carefully the license agreement (License.pdf) before installing DriveStudio. You should quit all applications before starting the installation. We recommend that you uninstall all previous versions of DriveStudio before installing.

Note! *You must have Administrator privileges to be able to do the installing.*

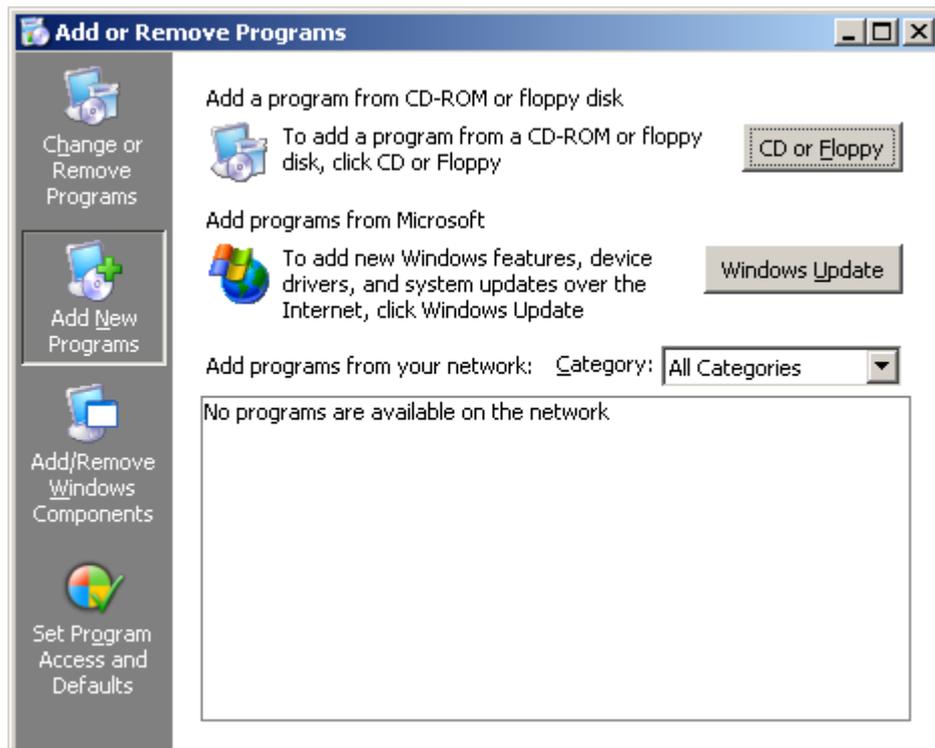
Your PC may be configured in such a way that when you insert the DriveStudio installation CD into your CD drive, installation starts automatically. Answer the questions and follow the instructions given by the installation program.

If the installation does not start automatically, you can start the SETUP program from the Control Panel as follows.

Start the Control Panel program and double-click the *Add or Remove Programs* icon.



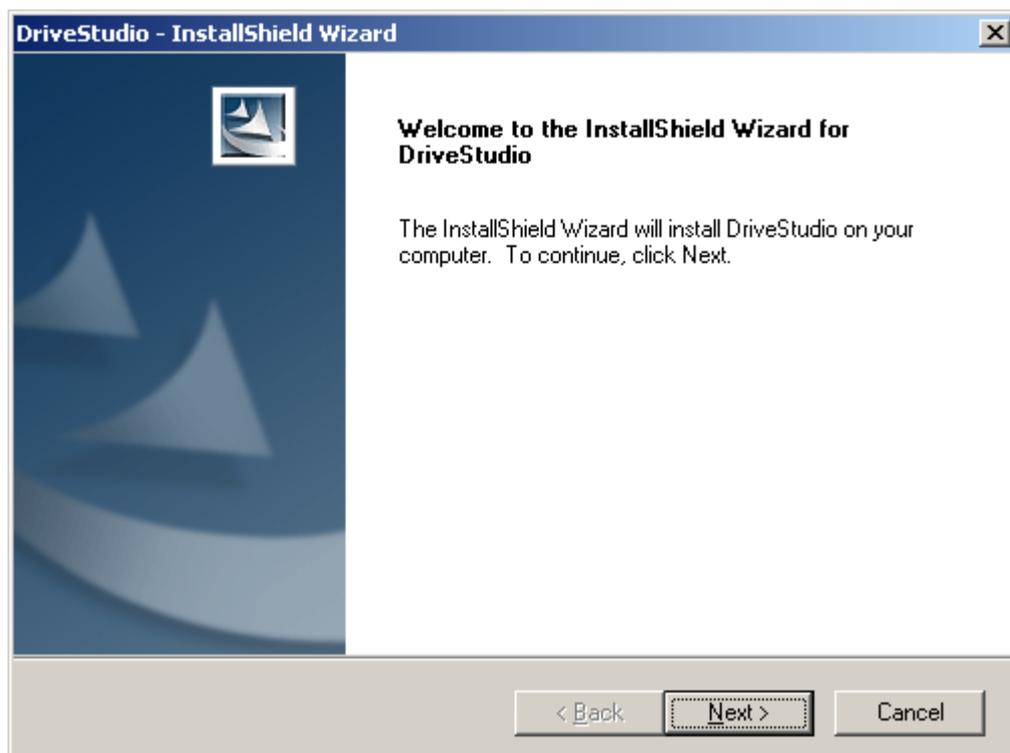
Click the *Add New Programs* button, and then click the *CD or Floppy* button.



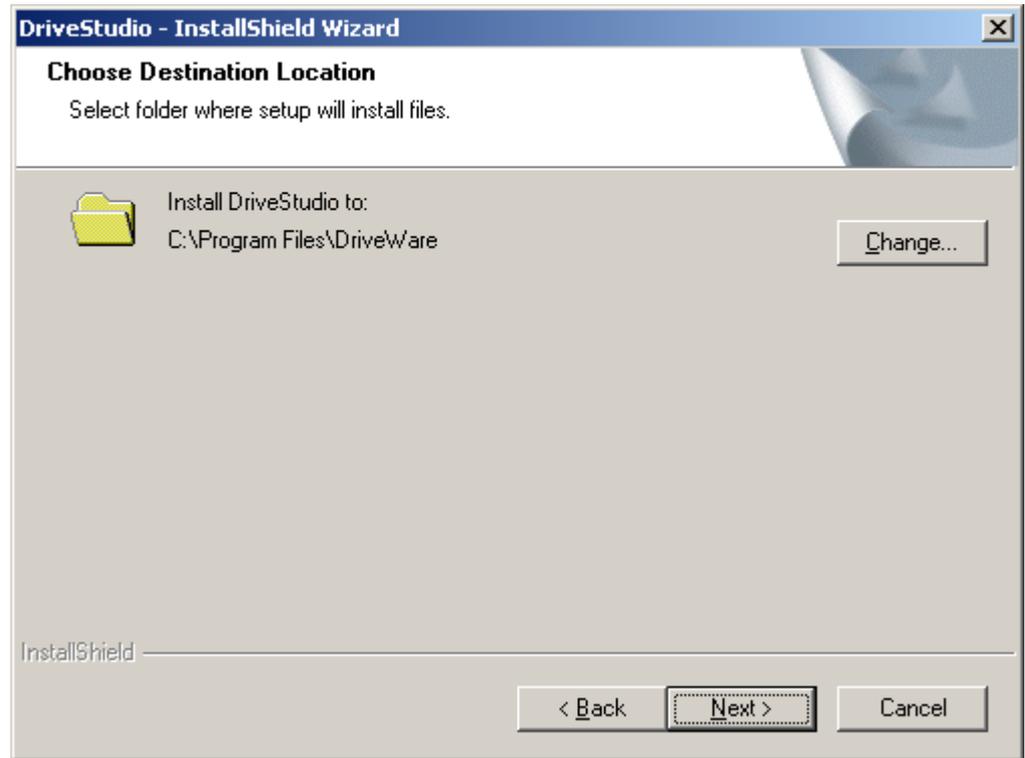
Insert the DriveStudio installation CD into your CD drive, and click the *Next >* button.

If the proper SETUP was not found automatically, enter E:\SETUP.EXE in the Command line for the installation program (assuming E: is your CD drive), or click the *Browse* button and select the program by browsing. Finally, click the *Finish* button, which will start the SETUP.

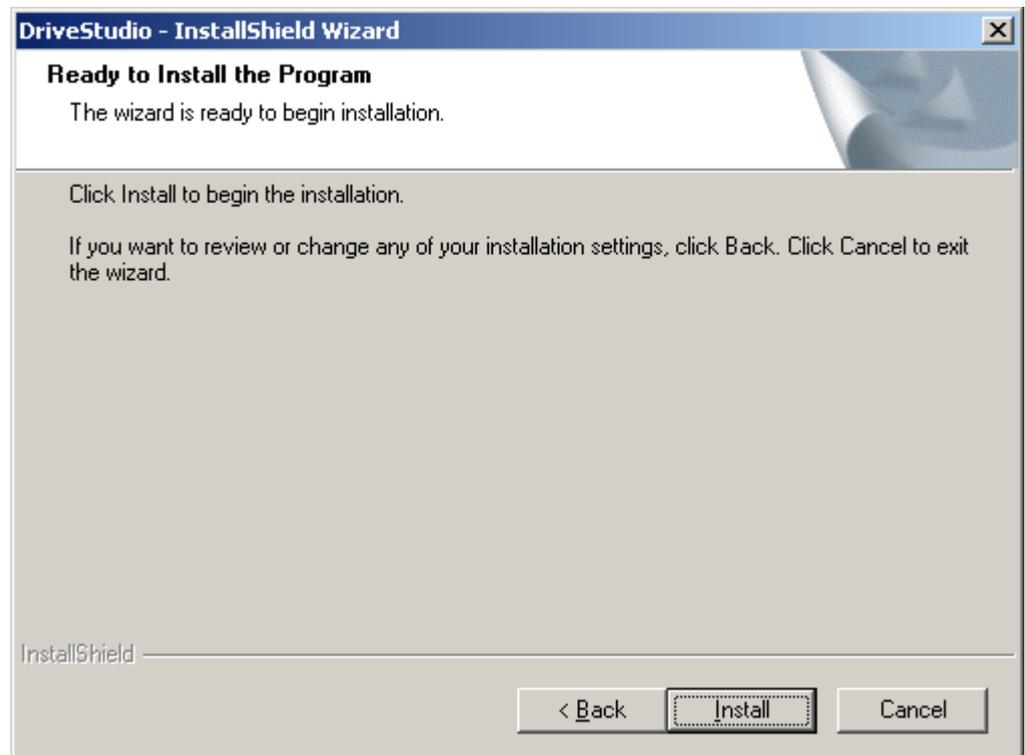
When the DriveStudio installation wizard window is shown, click the *Next >* button.



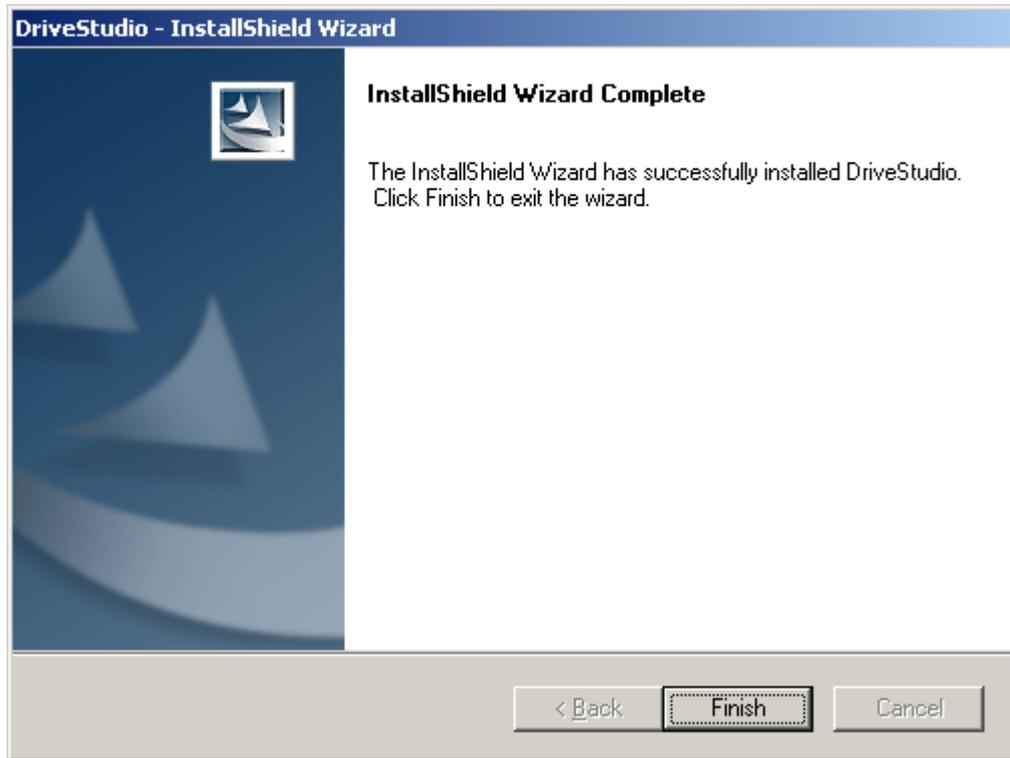
The second screen asks where to install DriveStudio. If the default location is OK, just click the *Next >* button to continue. Otherwise, click the *Change* button to define another location.



A confirmation screen is shown. You can return to a previous screen and change your selections by clicking the *< Back* button. Start the installation by clicking the *Install* button.



After the files are copied to the specified location on your hard disk, click the *Finish* button to end the installation procedure. DriveStudio is now ready for you to use.



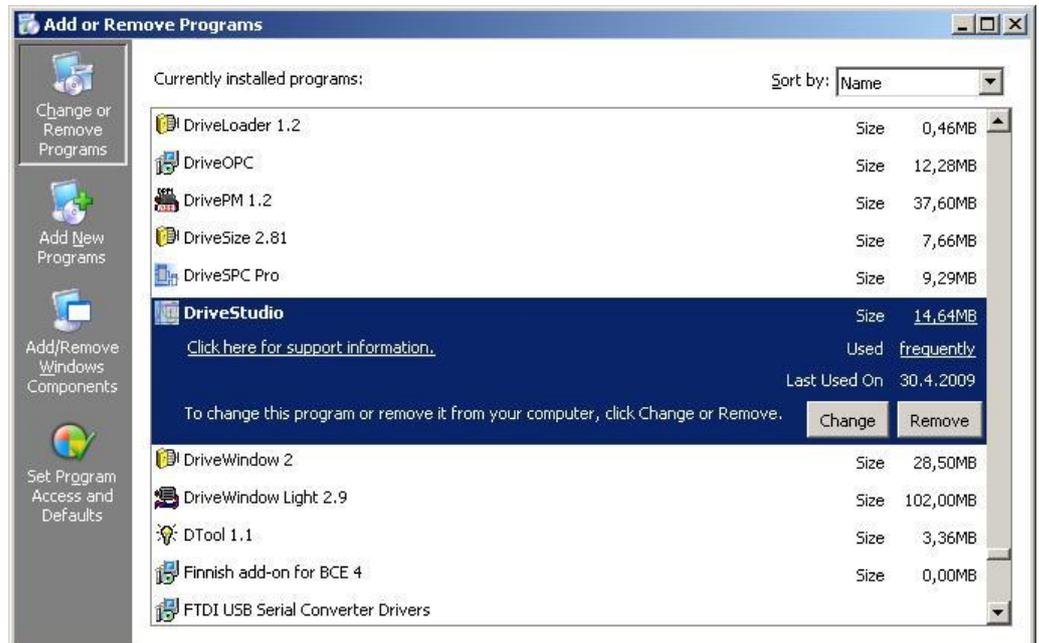
Installing hardware in Windows

In case you are using external serial ports, please follow the instructions given by the manufacturer.

Note! *You must have Administrator privileges to be able to finish the driver installation.*

Uninstalling DriveStudio

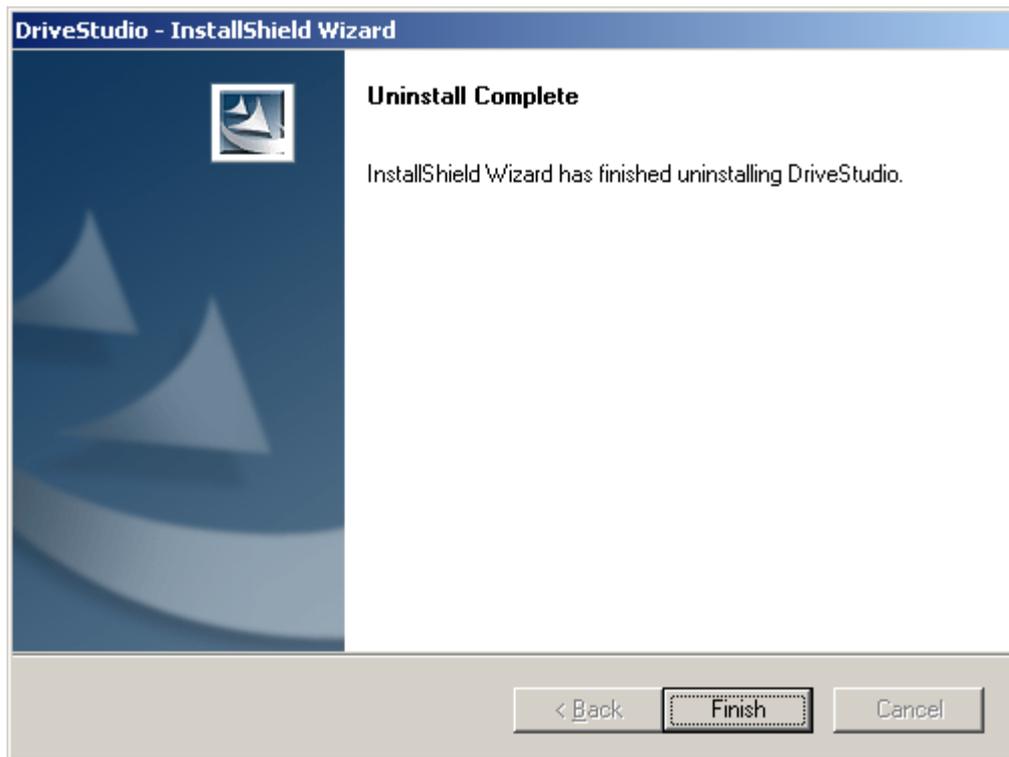
While in the *Add or Remove Programs* dialog box of the Control Panel, browse for DriveStudio in the *Currently installed programs* list, select it by clicking, and click Remove.



After you have confirmed that you want to remove the application by clicking the Yes button, the uninstallation starts.



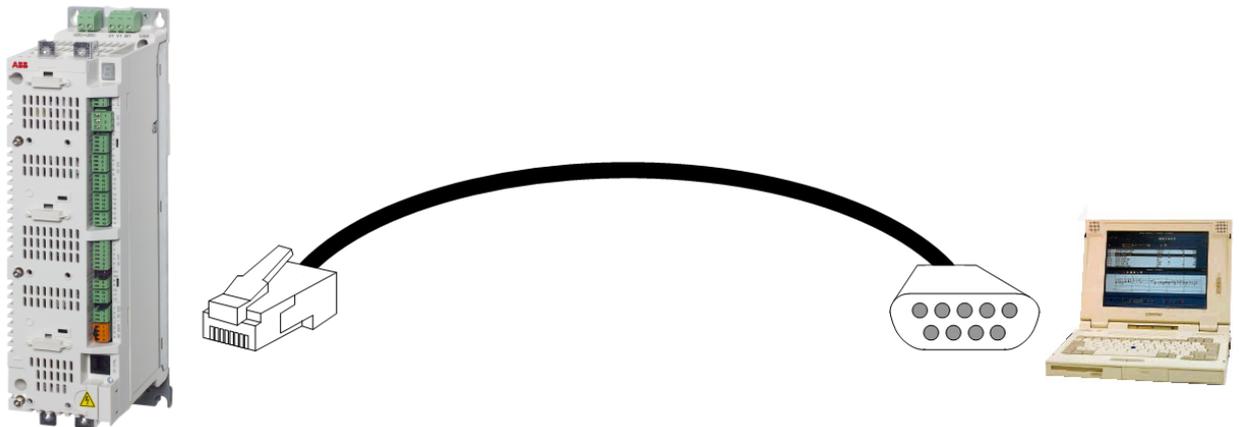
Wait until the wizard is done and then click the *Finish* button.



Note! You must have Administrator privileges to be able to complete the uninstallation.

Connecting to a drive

To establish a connection between DriveStudio and a drive, you need to connect an OPCA-02 cable between a serial (COM) port of the computer and the panel link port of the drive. A USB-RS232 adapter (ABB product code 3AFE68583667) or a galvanic isolated USB-RS232 adapter (ABB product code 3AUA0000050176) can be used if the PC doesn't have any legacy interfaces or enough of them.



On-line help

DriveStudio includes comprehensive on-line help. The user manual and the on-line help contain the same information.

Opening help

To open help, select the *Contents* command in the *Help* menu. The Windows Help program opens with its main dialog displayed. In the main dialog, you can select to view the content, view the index, or search for specific words.

You can also start the Windows help program by pressing the shortcut key F1. The Help program jumps directly inside DriveStudio help.

Context-sensitive help

To get help about a command on a menu or submenu, use the arrow keys to highlight the command and press F1. To get help about a dialog box, press F1 while the dialog box is displayed. If there is no specific topic associated with the object you requested help for, you are returned to the main page of DriveStudio help.

There are links within on-line help. When you click text that is green and underlined, the help program jumps to the topic linked to the text. You can go back by clicking the *Back* button.

To view the drive's firmware manual about a parameter, a fault or a function block (in DriveSPC), select it and press F3, or select *Help / Firmware manual*.

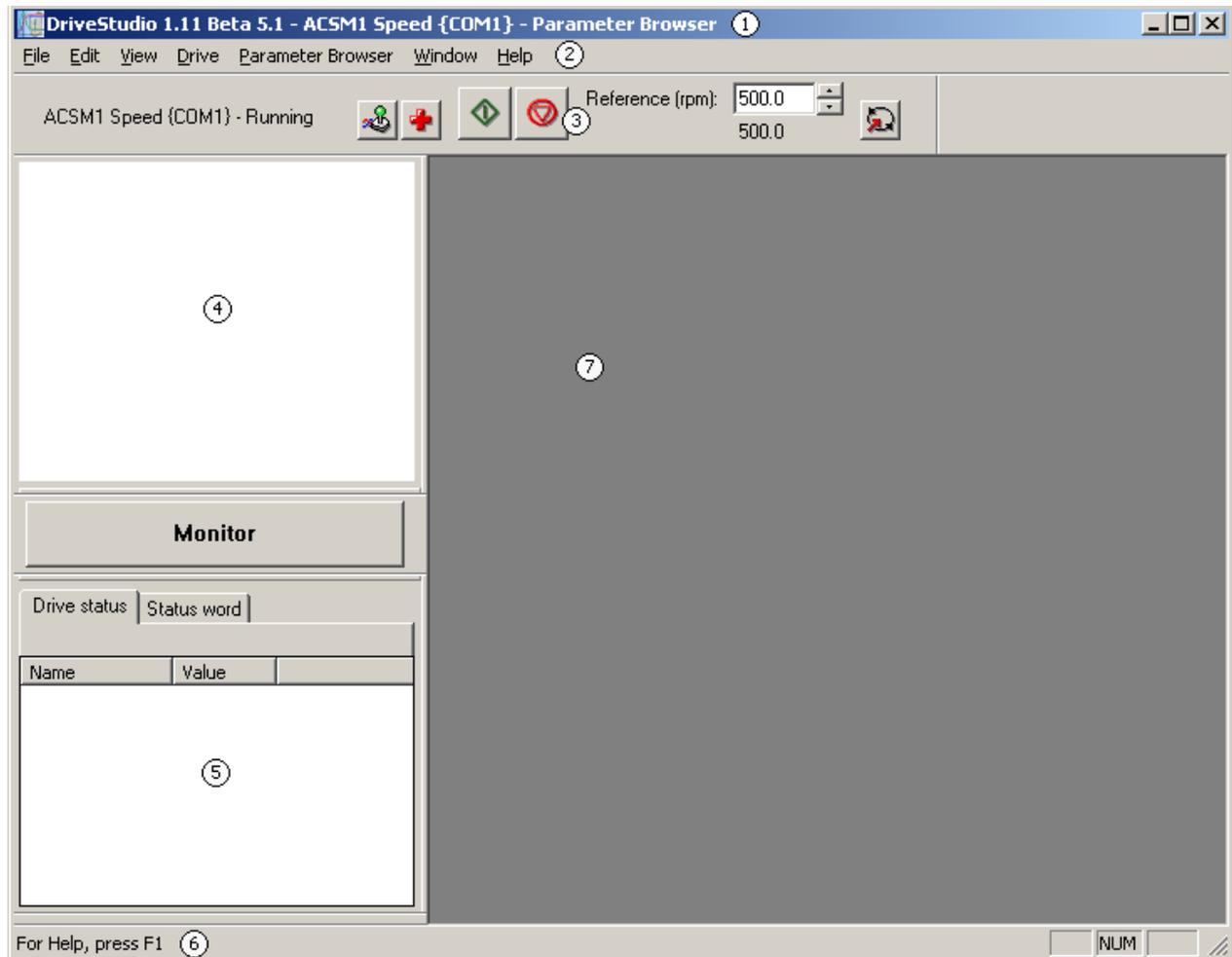
Help structure

Each part is organized as a separate "book". A book always starts with the contents of the part. The topics are ordered, so you can browse forward and backward within a part.

See *Also*: Help Menu

Chapter 2 – Main user interface components

Overview



The user interface consists of the following parts:

1. Title Bar
2. Menu Bar
3. Drive Control Panel
4. Drive List
5. Status Panel
6. Status Bar
7. Window area

The panels and Status Bar can be individually hidden by the user. Some panels can be dragged to different locations in the main window. Most windows that are not maximized can be resized by dragging any of the sides or corners. Scrollbars appear in a window if scrolling the content is possible.

Title bar



The title bar is located at the top of the main window. It consists of the following parts:

1. *System menu* button
2. Application name and version number (DriveStudio)
3. Type, COM port number and node number of a drive or filename if one is currently selected in the Drive List
4. Currently active window or view
5. *Minimize* button, same as *Minimize* in the System menu. Reduces the main window to the Taskbar or a sub-window to the window area.
6. *Maximize / Restore* button (depends on the current maximized status of the window) -- same as *Maximize* or *Restore* in the System menu.
7. *Close* button, same as *Close* in the System menu

To move the window, drag the title bar. You can also move dialog boxes by dragging their title bars. Maximized or minimized windows cannot be moved.

On the *Maximize/Restore* button, *Maximize* enlarges the window to fill the available space.

The *Restore* on the *Maximize / Restore* button returns the window to the size and position it had before it was maximized.

You can also maximize or restore by double-clicking the title bar.

Clicking the *Close* button ends your DriveStudio session. DriveStudio possibly warns you about releasing control, prompts you to save documents with unsaved changes, or reminds you about unfinished printing.

You can also close DriveStudio by double-clicking the *System menu* button, by selecting the *Exit* command in the *File* menu, by selecting *Close* in the System menu, or by pressing the shortcut key *Alt+F4*.

System menu



You can open the System menu by left- or right-clicking the *System menu* button, by pressing the shortcut key *Alt+Spacebar*, or by right-clicking within the non-button area of the title bar.

Many dialog boxes also have simple system menus. You can open their System menu, in addition to clicking the button, by right-clicking within the non-button area of their title bar, or by pressing the shortcut key *Alt+Spacebar*.

The menu contains the following commands:

- *Restore* command, the same as the *Maximize / Restore* button in the title bar, when the window is maximized. Returns the window to its size and position before you chose maximize.
- *Move* command, similar to dragging the title bar. After selecting the command, it is possible to move the window with the arrow keys. To finish the move, press *Enter*. To cancel the move, press *Esc*.
- *Size* command, similar to dragging any of the sides or corners of the window. After selecting the command, it is possible to resize the window with the arrow keys. To finish resizing, press *Enter*. To cancel resizing, press *Esc*.
- *Minimize* command, same as the *Minimize* button in the title bar. Reduces the window to the Taskbar or the window area.
- *Maximize* command, same as the *Maximize / Restore* button in the title bar, when the window is not maximized. Enlarges the window to fill the available space.
- *Close* command, same as the *Close* button in the title bar. Ends your DriveStudio session. DriveStudio possibly warns you about releasing control, prompts you to save documents with unsaved changes, or reminds you about unfinished printing.

Menu bar



The image shows a horizontal menu bar with six items: File, Edit, View, Drive, Window, and Help. Each item has a small underlined letter below it: 'F' for File, 'E' for Edit, 'V' for View, 'D' for Drive, 'W' for Window, and 'H' for Help. The menu bar is highlighted with a light gray background.

The menu bar is located immediately below the title bar. It always contains the following drop-down main menus:

- File
- Edit
- View
- Drive
- Window
- Help

One of the following main menus is visible between the *Drive* and *Window* menus only when a same kind of window is open and active:

- Parameter Browser
- Data Logger
- Fault Logger
- Monitor
- Data File Viewer

To open a drop-down menu, click its name on the menu bar. You can also use the underlined letter in the menu name. First press and hold down the *Alt* key, then press the underlined letter and release both keys. For example, *Alt+F* opens the *File* menu.

To execute a command from a menu, click its name on the menu. You can also use the arrow keys to navigate within the menu bar and menus. The highlighted

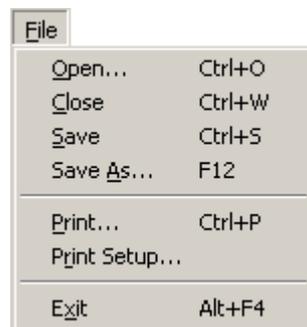
command is executed by pressing *Enter*. Pressing the *Esc* key closes the menu. You can also use the underlined access key in a command name to execute the command. For example, pressing *X*, while the *File* menu is displayed, executes *Exit*.

To get help about a command on a menu or submenu, use the arrow keys to highlight the command, and press *F1*. Another method is to first press *Shift+F1* while no menu is displayed. While a question mark is attached to the cursor, open a menu or submenu and click the command you want help for.

Note! *Shortcut keys other than F1 do not work while a drop-down menu is open.*

File menu

This menu is always located in the menu bar.



The menu contains the following commands:

- *Open...* command opens a parameter or a signal data file. Keyboard shortcut *Ctrl+O*.
- *Close* command closes the active document window. Keyboard shortcut *Ctrl+W*.
- *Save* command saves parameters or logger data from the active window into a file. Keyboard shortcut *Ctrl+S*.
- *Save As...* command presents a dialog for saving the parameters or logger data from the active window into a file with a new name. Keyboard shortcut *F12*.
- *Print...* command presents a dialog for printing the active document. Keyboard shortcut *Ctrl+P*.
- *Print Setup...* command presents a dialog for changing the printer and printing options.
- *Exit* command ends your DriveStudio session. DriveStudio possibly warns you about releasing control, prompts you to save documents with unsaved changes, or reminds you about unfinished printing. Keyboard shortcut *Alt+F4*.

Edit menu

This menu is always located in the menu bar.



The menu contains the following commands:

- *Undo* command cancels the latest command if it is possible. Keyboard shortcut *Ctrl+Z*.
- *Cut* command removes selected objects and puts them on the clipboard. Not all objects can be cut and they vary between different views. Keyboard shortcut *Ctrl+X*.
- *Copy* command copies selected objects to the clipboard. Not all objects can be copied and they vary between different views. Keyboard shortcut *Ctrl+C*.
- *Paste* command inserts the clipboard contents. Availability of the command depends on the active view and contents of the clipboard. Shortcut key *Ctrl+V*.
- *Confirmation and Options* command presents a dialog for setting DriveStudio behavior.
- *OPC Server Settings...* opens the dialog for modifying the OPC server specific settings, such as node numbers and communication speeds.

View menu

This menu is always located in the menu bar.



The menu contains the following commands:

- *Refresh* command updates the information in the active window or panel (status information, connected drives, parameter values, etc.).
- *Parameter Browser* command brings up a window for showing the parameters of the selected drive and modifying their values.
- *Properties* command brings up a window showing properties of the selected drive.
- *Data Logger* command brings up a window showing the data logger of the selected drive.
- *Fault Logger* command brings up a window showing the fault logger of the selected drive.
- *Wizard...* command opens the commissioning wizards of the selected drive (if there are wizards available for the drive).
- *DriveSPC* (Solution Program Composer) command launches the DriveSPC software in a separate window (if DriveSPC is installed on the PC).
- *DriveCam* command launches the DriveCam software in a separate window (if DriveCam is installed on the PC).
- *Drive Control Panel* command shows or hides the *Drive Control Panel*.
- *Drive List* command shows or hides the *Drive List*.
- *Status Panel* command shows or hides the *Status Panel*.
- *Status Bar* command shows or hides the Status Bar on the bottom of the main window.
- *All Faults in all drives* command brings up the *All Faults* window which shows the latest faults in all connected drives.
- *Monitor* brings up the *Monitor* window.

Drive menu

This menu is always located in the menu bar.



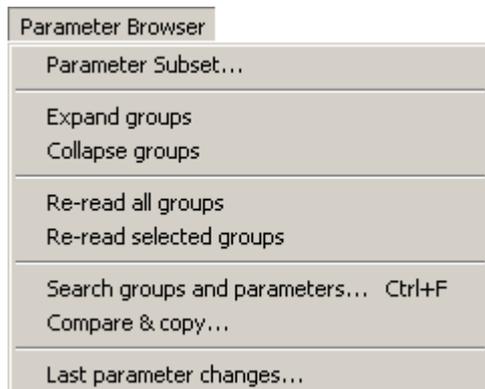
The menu contains the following commands:

- *Take control* command allows this software to control the selected drive. This is the same command as the corresponding button in the *Drive Control Panel*.

- *Release control* command releases control of the selected drive from this software. This is the same command as the corresponding button in the *Drive Control Panel*.
- *Set new reference...* command presents a dialog for setting a new value to the drive reference of the currently controlled drive.
- *Start* command starts rotating the motor connected to the currently controlled drive. This is the same command as the corresponding button in the *Drive Control Panel*.
- *Stop* command stops rotating the motor connected to the currently controlled drive. This is the same command as the corresponding button in the *Drive Control Panel*.
- *Reset* command resets the fault state of the currently selected drive if it has one. This is the same command as the corresponding button in the *Drive Control Panel*.
- *Backup* command creates a backup of the selected drive. Backup includes the parameters, the solution program and the cam file (if a cam file exists on the drive)
- *Restore* command restores the selected drive from the backup. There are several options for restoring a drive. These will be described in the Chapter 8 – Other functions / Backup/Restore.
- *Read restore report* command creates a report of the selected drive's previous restore operation.

Parameter Browser menu

This menu is located in the menu bar when a same kind of window is open and active.



The menu contains the following commands:

- *Parameter Subset...* command displays a window where several parameters can be chosen from several groups to be displayed in a separate subset group.
- *Expand groups* command shows all visible groups and their parameters in the list.
- *Collapse groups* command shows only the group names in the list.
- *Re-read all groups* command reads all available groups and parameters from the selected drive. This is needed when a parameter value modification hides

or reveals additional groups or parameters, or when e.g. the unit or a limit of a parameter changes.

- *Re-read selected group* command reads the available parameters of the selected group of the selected drive.
- *Search groups and parameters* command displays a dialog requesting for a word to search for from the names of the visible parameters and groups.
- *Compare & Copy...* command opens a dialog in which you can choose a source and target for copying and comparing parameters. See Chapter 8 – Other functions / Comparing and copying parameters for further information.
- *Last parameter changes...* command opens a dialog showing the last parameter value changes.

Data Logger menu

This menu is located in the menu bar when a same kind of window is open and active.



The menu contains the following commands:

- *Read logger data from drive* command reads and displays the contents of the data logger from the associated drive. This is the same command as the corresponding button in the toolbar.
- *Start logger* command begins logging data in the associated drive. This is the same command as the corresponding button in the toolbar.
- *Stop logger* command ends logging data in the associated drive. This is the same command as the corresponding button in the toolbar.
- *Trigger logger* command manually triggers the logger in the associated drive. The drive keeps reading signal values as long as specified in the *Post-trigger time* setting (in *Logger Settings*). This is the same command as the corresponding button in the toolbar.
- *Clear screen* command empties the data logger graph or numerical values on the screen. This is the same command as the corresponding button in the toolbar.

- *Numerical display* command shows the data logger data in numerical format. This is the same command as the corresponding button in the toolbar.
- *Graphical display* command shows the data logger data in graphical format. This is the same command as the corresponding button in the toolbar.
- *Reset zoom* command shows the graph in its original scale. This is the same command as the corresponding button in the toolbar.
- *Show Grid* command shows the grid lines on the graph area. This is the same command as the corresponding button in the toolbar.
- *Hide Grid* command removes the grid lines from the graph area. This is the same command as the corresponding button in the toolbar.
- *Show all Scales* command shows the minimum and maximum visible values of the signals on the graph. This is the same command as the corresponding button in the toolbar.
- *Show Selected Scale* command shows the value of the selected signal on each grid line. This is the same command as the corresponding button in the toolbar.
- *Change signal color* contains a submenu where the colors used in the graph can be selected.
- *Logger Settings* command brings up the *Logger Settings* window where the data logger settings of the associated drive can be modified. This is the same command as the corresponding button in the toolbar.

Fault Logger menu

This menu is located in the menu bar when a same kind of window is open and active. See Chapter 5 for more information about the *Fault Logger* view.



The menu contains the following commands:

- *Short details* command shows fault logger data of the associated drive with short details. This is the same command as the corresponding button in the toolbar.
- *Long details* command shows fault logger data of the associated drive with long details. This is the same command as the corresponding button in the toolbar.
- *Clear fault logger* command empties the fault logger data from the associated drive. This is the same command as the corresponding button in the toolbar.
- *All faults in all drives* command brings up the *All Faults* window, which shows the latest faults in all connected drives.

Monitor menu

This menu is located in the menu bar when the same kind of window is open and active.



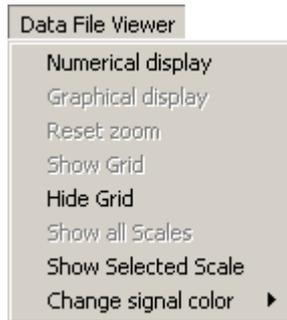
The menu contains the following commands:

- *Start Monitoring* command begins recording data in the selected drives and displaying it on the screen, or resumes scrolling if paused. This is the same command as the corresponding button in the toolbar.
- *Pause* command continues recording, but pauses or resumes scrolling the screen. This is the same command as the corresponding button in the toolbar.
- *Stop Monitoring* command ends recording data in the selected drives. This is the same command as the corresponding button in the toolbar.
- *Clear Screen* command empties the data graph or numerical values on the screen. This is the same command as the corresponding button in the toolbar.
- *Numerical Display* command shows the data in numerical format. This is the same command as the corresponding button in the toolbar.
- *Graphical Display* command shows the data in graphical format. This is the same command as the corresponding button in the toolbar.
- *Reset Zoom* command shows the graph in its original scale. This is the same command as the corresponding button in the toolbar.
- *Show Grid* command shows the grid lines on the graph area. This is the same command as the corresponding button in the toolbar.
- *Hide Grid* command removes the grid lines from the graph area. This is the same command as the corresponding button in the toolbar.
- *Show all Scales* command shows the minimum and maximum visible values of the signals on the graph. This is the same command as the corresponding button in the toolbar.
- *Show Selected Scale* command shows the value of the selected signal on each grid line. This is the same command as the corresponding button in the toolbar.

- *Change Signal Color* contains a submenu where the colors used in the graph can be selected.
- *Monitor Settings* command brings up the *Monitor Settings* window where the monitor settings can be modified. This is the same command as the corresponding button in the toolbar.

Data File Viewer menu

This menu is located in the menu bar when a same kind of window is open and active.



The menu contains the following commands:

- *Numerical display* command shows the data in numerical format. This is the same command as the corresponding button in the toolbar.
- *Graphical display* command shows the data in graphical format. This is the same command as the corresponding button in the toolbar.
- *Reset zoom* command shows the graph in its original scale. This is the same command as the corresponding button in the toolbar.
- *Show Grid* command shows the grid lines on the graph area. This is the same command as the corresponding button in the toolbar.
- *Hide Grid* command removes the grid lines from the graph area. This is the same command as the corresponding button in the toolbar.
- *Show all Scales* command shows the minimum and maximum visible values of the signals on the graph. This is the same command as the corresponding button in the toolbar.
- *Show Selected Scale* command shows the value of the selected signal on each grid line. This is the same command as the corresponding button in the toolbar.
- *Change signal color* contains a submenu where the colors used in the graph can be selected.

Compare & Copy menu

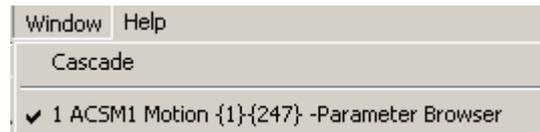
This menu is located in the menu bar when the same kind of window is open and active.



- *Expand groups* command shows all visible groups and their parameters in the list.
- *Collapse groups* command shows only the group names in the list.
- *Search groups and parameters...* command displays a dialog requesting for a word to search for from the names of the visible parameters and groups.

Window menu

This menu is always located in the menu bar.

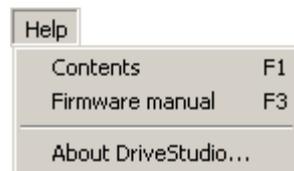


The menu contains the following commands:

- *Cascade* command arranges the open windows so that they overlap.

Help menu

This menu is always located in the menu bar.



The menu contains the following commands:

- *Contents* command brings up the online help window and shows its topics.
- *Firmware manual* command opens the firmware manual of the drive in a separate window as a PDF file. If a parameter or some other significant item was selected when this command was clicked or the *F3* key was pressed, the firmware manual displays the associated chapter.
- *About DriveStudio...* command brings up a window displaying program information, version number and copyright.

Drive Control Panel

The *Drive Control Panel* is located below the menu bar. It has buttons for controlling a connected drive.



The panel contains the following buttons and items:

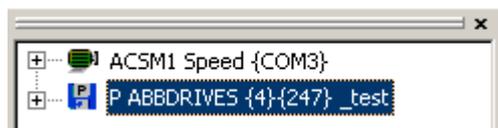
1. Name, COM port and node number of the currently controlled drive and an indication if it is running.
2. *Take control / Release control* button allows this software to control the selected drive or to release the control. The same command can be given in the *Drive* menu.

3. *Reset* button sends a reset command to the drive and, if fault is no longer active, the drive clears it. The same command can be given in the *Drive* menu.
4. *Start* button starts the currently controlled drive. A motor connected to the drive starts rotating according to the set reference value. The same command can be given in the *Drive* menu.
5. *Stop* button stops rotating the motor connected to the currently controlled drive. The same command can be given in the *Drive* menu.
6. *Reference value* field. You can enter a new reference value here. The up and down arrow buttons increase and decrease the value respectively. DriveStudio sends this reference value to the drive.
7. *Active reference* field. The reference, which is used in the drive, is shown here.
8. *Set new reference* button enforces the value in the *Reference value* field in the currently controlled drive.

See the firmware manual of the drive for parameters you must set before starting. After that, click *Take control*, type in a reference value, press *Enter* or click *Set new reference*, and finally click *Start*.

Drive List

The *Drive List* panel shows all connected drives and open files. Drives are indicated with a motor icon, parameter files with a diskette icon with the letter P, and data log files with a diskette icon with the letter L.



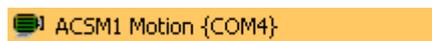
A stopped drive is indicated with a hollow black and white motor icon. Running drives have filled black and green motor icons.



A drive that has faulted is indicated with a red background and white text.



A drive that has an alarm is shown with an orange background and black text.



If a connection to a drive breaks, the drive is indicated with a light grey background and mid-grey text until connection is established again.



A drive is indicated by a black background. If a new drive with the same port/node –combination is found. Before refreshing the drive list with *F5*, the user can save all read data from the drive.



Each drive and parameter file is displayed as a tree that can be expanded and collapsed by clicking the plus or minus icon. The items in the tree represent different views that are shown in a window associated with the drive or file.

The views for a drive - *Parameter Browser, Data Logger, Fault Logger, Properties and Wizard* (if such are available for the drive) - can be shown by clicking the corresponding icons in the tree. Parameter files have only a Parameter Browser view.

If an active window (the window on top) is associated with a drive or a file, the corresponding tree item is highlighted in the *Drive List*.

This panel is initially docked on the left edge of the main window, but you can drag it to the right edge, too. You can make it a floating window by dragging it off the window edges and releasing the mouse button.

Status Panel

The *Status Panel* displays information about the drive highlighted in the *Drive List*.

Drive Status		Status Word
#	Name	Value
0	READY	0
1	ENABLED	0
2	STARTED	0
3	RUNNING	0
4	EM_OFF(OFF2)	0
5	EM_STOP(OFF3)	0
6	ACK_STARTINH	0
7	ALARM	0
8	AT_SETPOINT	0
9	LIMIT	0
10	ABOVE_LIMIT	0
11	EXT2_ACT	0
12	LOCAL_FB	0
13	ZERO_SPEED	0
14	REV_ACT	0
15	Not used	0
16	FAULT	0
17	LOCAL_PANEL	0
18	FOLLOWING_ERR	0
19	TGT_REACHED	0
20	HOMING_DONE	0
21	TRAV_TASK_ACK	0
22	MOVING	0
23	IP_MODE_ACTIVE	0
24	REG_LEVEL	0
25	POSITIVE_LIMIT	0
26	NEGATIVE_LIMIT	0
27	Not used	0
28	SW B12	0
29	SW B13	0
30	SW B14	0
31	SW B15	0

Click the tabs to show the *Drive Status* view or the *Status Word* view.

This panel is initially docked on the left edge of the main window, but you can drag it to the right edge, too. You can make it a floating window by dragging it off the window edges and releasing the mouse button.

You can adjust the widths of the columns by dragging the vertical lines in the column headers.

The signal values in the *DriveStatus* view are cyclically updated. You can allow or prevent the updating in the *Confirmation and Options* window.

Status bar

The status bar is situated at the bottom of the main window. It shows informational and error messages in various situations.

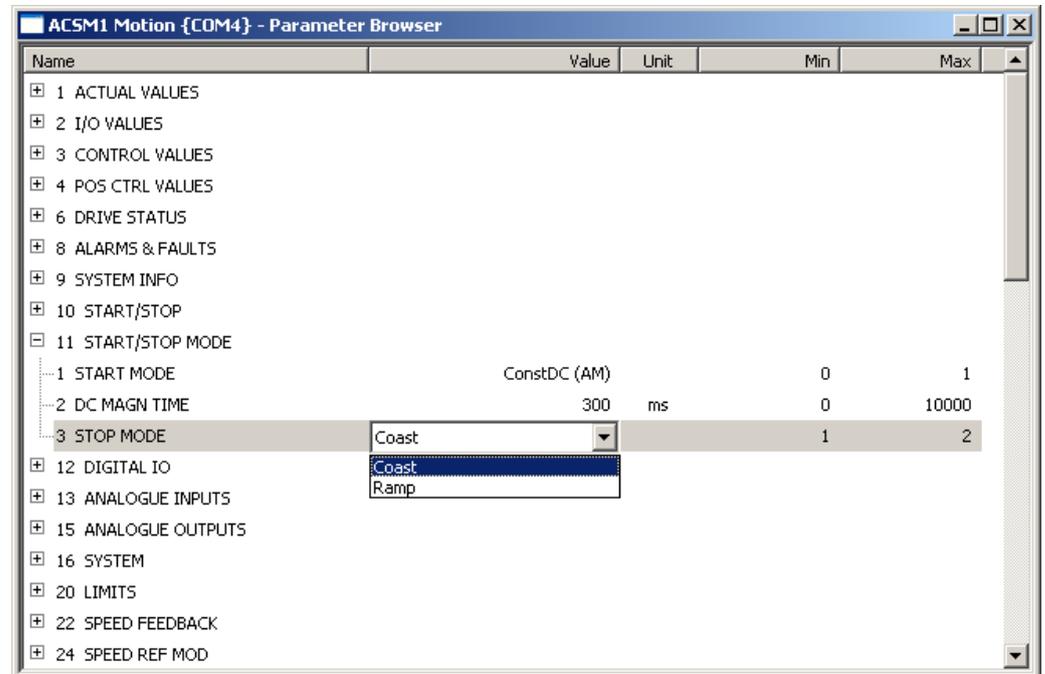


Window area

The sub-windows of the main window are shown in this area. You can move the windows freely within this area and resize most of them to suit your work needs.

Chapter 3 – Parameter Browser view

The *Parameter Browser* view displays parameter groups, parameters, and their values of the associated drive or file.



The window consists of a tree of parameters and groups. It uses the following icons to denote different kinds of parameters and groups:

Icon	Parameter Group
+	Collapsed parameter group
-	Expanded parameter group

The *Parameter Browser* contains four different types of parameters. Some of these types are identified by the icons shown in the table below:

Icon	Parameter
	Parameter
🔒	Signal or locked by the drive's DriveSPC program
🔊	Parameter signal
🔄	Value changed from the file

The most common type is the regular parameter. Parameters are normally readable and writable. However, when the drive is running, some parameters may be write-protected. Parameter names, values, and units are shown in the *Parameter Browser*. The value of a parameter is read only once. If you want to update this value, you have to use the *View / Refresh* menu command. The command is also available in the secondary mouse button shortcut menu.

Signals are like parameters, but you cannot edit their values. They are updated cyclically in the *Parameter Browser*. You can allow or prevent the updating in the *Confirmation and Options* window. See Chapter 8 – Other functions for more information.

Parameter signals are also updated frequently, but you can edit their values.

When working on a parameter file, parameters are marked with a value changed icon when a new value is written or a previously saved parameter file is opened, but not yet copied to a drive.

Navigating parameters and groups

You can use the *Parameter Browser* to navigate parameters and signals and to modify parameter values. Parameters are organized as groups in a tree structure. Clicking the plus or minus icon expands or collapses the group. Double-clicking on a parameter group name does the same. You can also expand/collapse groups with the *Enter* key, or left or right cursor keys. All parameter groups can be expanded with the *Parameter Browser / Expand groups* menu command and collapsed with *Parameter Browser / Collapse groups*.

Note! *The parameters are read from the drive the first time a group is opened.* Expanding all groups at once may take a while, depending on the communication speed. If the *Parameter Browser* is associated with a file, all operations are instantaneous.

When the *Parameter Browser* is associated with a drive, the values shown should match the values in the drive. Parameter values are updated if they are edited. The signals are updated cyclically, so some delays may occur. You can **update the values** in the view at will with the *View / Refresh* menu command or by pressing the *F5* key.

In special cases where hidden parameters and groups become available by modifying some parameter values, the *Drive / Re-read selected group* and *Drive / Re-read all groups* menu commands **update the list** of parameters and groups. The same commands can also be found in the shortcut menu, which is displayed by clicking the secondary mouse button.

Parameter values can be **modified** by double-clicking on the parameter or by pressing *Enter* on a highlighted parameter.

You can **change the format** of how a parameter is displayed by clicking it with the secondary mouse button, and selecting *Default*, *Hexadecimal*, *Binary* or *Decimal integer*.

You can change the widths of the columns by dragging the vertical lines between the column headers. Double-clicking a line automatically resizes the column to accommodate its contents.

Working with files

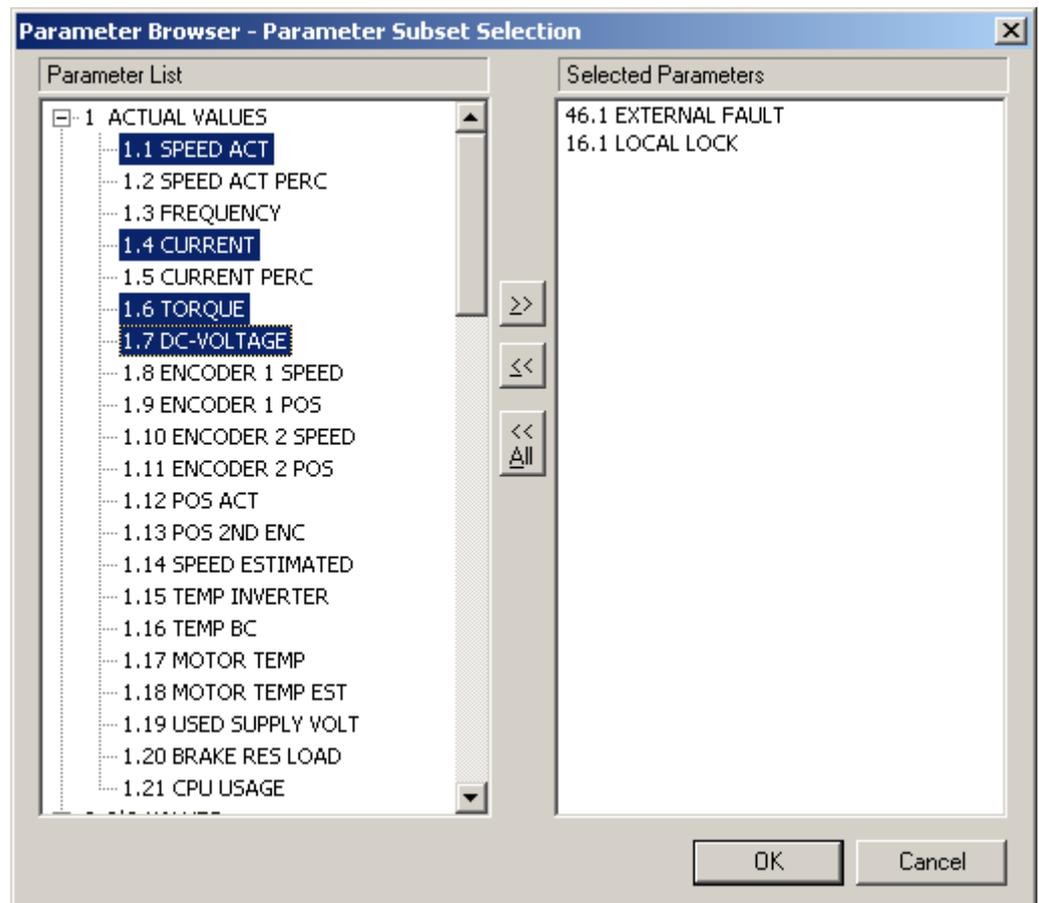
You can save the parameter names and values in a DriveStudio Parameter file (.DSP) with the *File / Save* or *File / Save As...* menu commands. The .DSP files can be opened in *Parameter Browser* windows of their own. They can be navigated and the parameter values modified just like with connected drives.

The file can be transferred into a connected drive with *Parameter Browser / Compare & copy...* menu command. This is also known as downloading.

Note! DriveStudio doesn't check the drive type and software version when copying parameters from a file to a drive.

Parameter subset

You can use the *Parameter Browser / Parameter subset* menu command to create a virtual parameter group of your own. The command opens a *Parameter Browser – Parameter Subset Selection* window where parameters from all available groups can be selected. The created subset of parameters is shown as the first group in the *Parameter Browser*.



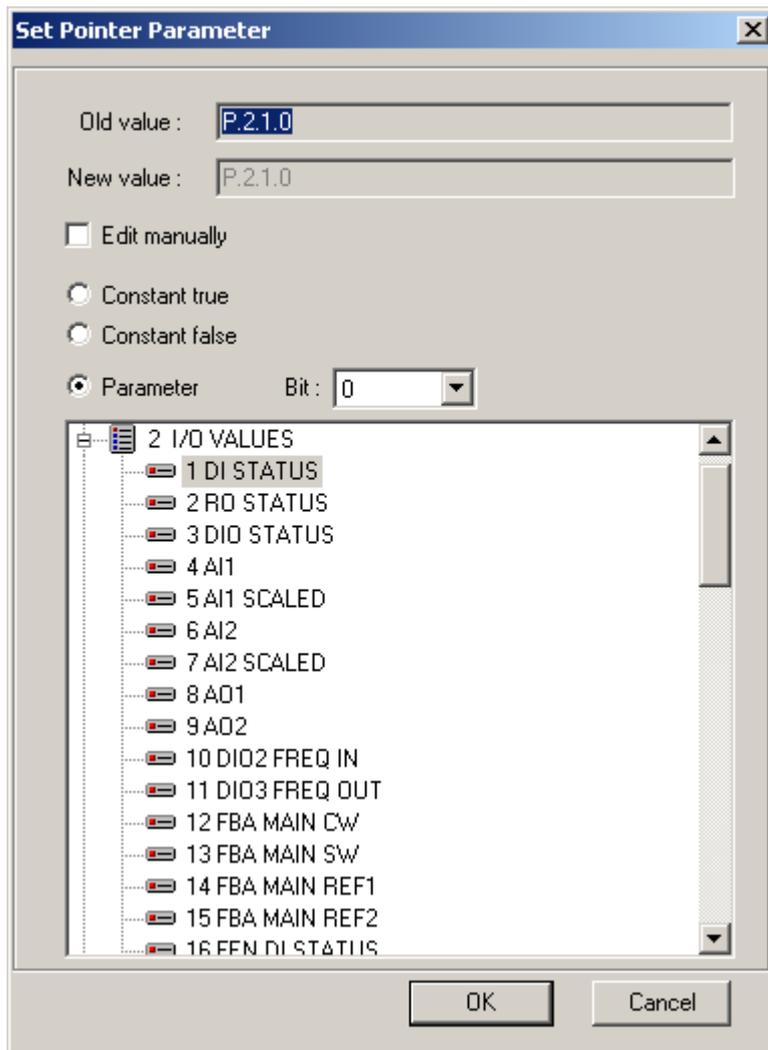
Select the parameters you want to include in the subset from the *Parameter List* and click the '>>' button to add them to the *Selected Parameters* list. The *Ctrl* and *Shift* keys can be used to select multiple parameters. Selecting a parameter group selects all parameters of that group. Removing parameters from the subset is similarly done with the '<<' or '<< All' buttons.

Parameter subsets are saved in a *subset.dss* file. One subset for each drive type is saved.

Pointer parameters

One special type of a parameter is a pointer parameter. The value of a pointer parameter is read from the parameter it points to. Depending on the pointer parameter, its target can be an entire other parameter or one of its bits. Some pointer parameters can be assigned a constant value of true or false.

Modifying a pointer parameter is done in a *Set Pointer Parameter* window:



First choose if you want the parameter to point to a *Constant true*, *Constant false* or another *Parameter*, and click an option button accordingly. You can select a parameter in the list and then its bit from 0 to 31.

You can also enter a value there with the keyboard by manually selecting *Edit*. The value must follow the form 'P.#.#.#', where the first # is the parameter group number, the second # is the parameter number and the third # is the bit number without leading zeros. For example: P.2.1.2

Manually entered values for constants are C.True or C.False.

In some cases, the most common settings are offered as a selection list.

Note! In the parameter browser, the parameter numbers are replaced with the actual parameter name as shown below.

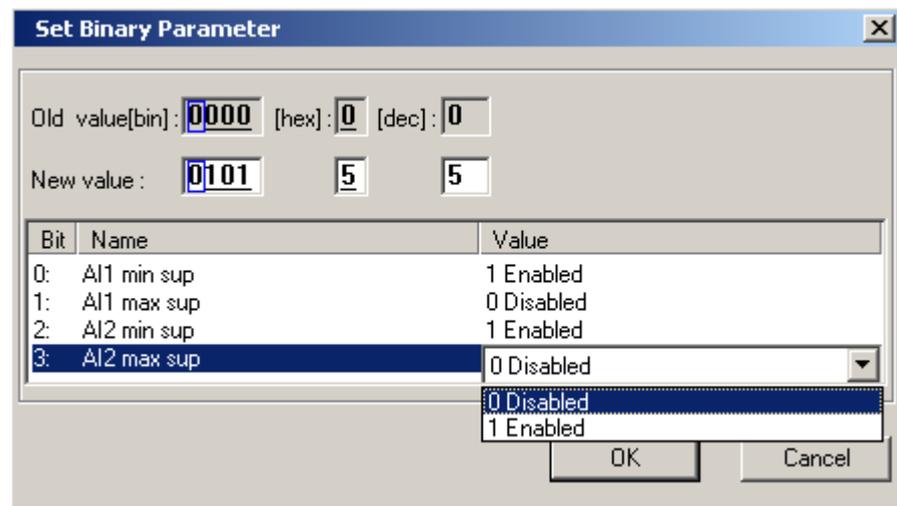
☐ **10 START/STOP**

- ├─ 1 EXT1 START FUNC In1
- ├─ 2 EXT1 START IN1 P.DI STATUS.2

Binary parameters

Binary parameters have a special meaning for each of their bits. These parameters are edited in a special *Set Binary Parameter* dialog. The value can be edited numerically in binary, hexadecimal or decimal format. You can also edit the value bit-by-bit by selecting the value for each bit from the drop-down list. If some of the bits are not allowed to be edited, those bits are shown grayed.

Signal values, which are in binary format, can be viewed in a similar dialog.



Search for groups and parameters

You can search the names of parameters and groups with the *Parameter Browser / Search groups and parameters...* menu command. Alternatively, you can press *Ctrl+F*. The following window is shown:



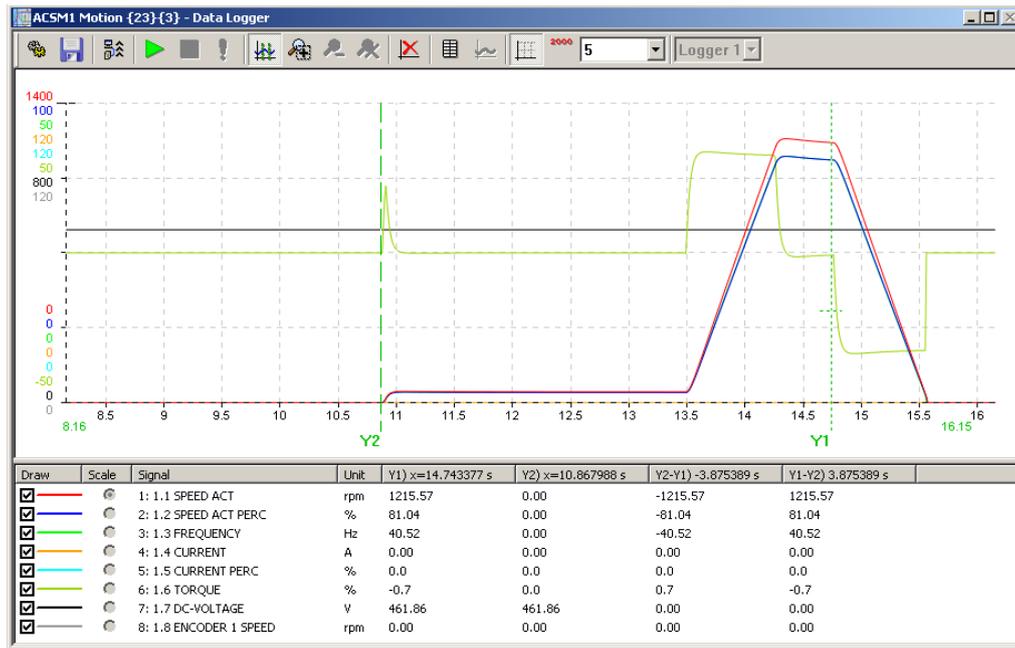
Type the word to search in the *Find what* box. The word can be partial, but it must appear exactly the same way in the parameter name. Upper or lower case is considered only if you select the *Match case* checkbox.

When you click the *Find Next* button, DriveStudio searches the next parameter up or down the parameter list depending on the selection in the *Direction*. The found parameter is highlighted in the *Parameter Browser*. When the search reaches the end of the browser, you can continue the search from the other end.

Chapter 4 – Data Logger view

The drives have data logger(s) that can record data from various signals of the drive even without being connected to a PC. They are operated with the *Data Logger* view. This can be used for troubleshooting or diagnostics, for example.

Data collecting can be stopped by either a specific stop command or automatically by a triggering condition becoming true in the drive. After stopping, the collected data can be read to DriveStudio and studied. The *Data Logger* view resembles the *Monitor* window in many aspects.



The *Data Logger* view is always associated with a single drive and resides in its window. The window consists of the following parts:

- Toolbar
- Current logger selection
- Graph area
- Y-axis
- X-axis
- Legend area
- Status bar

The toolbar has the following buttons:

Button	Description
	<i>Logger Settings</i> button brings up the <i>Logger Settings</i> window where the logger settings can be modified and the logged signals selected.
	<i>Save</i> button saves the collected logger data to a signal data file.
	<i>Read logger data from drive</i> button reads all logger data from the selected logger of the associated drive and displays it in the window.
	<i>Start</i> button begins recording data in the current logger of the drive.
	<i>Stop</i> button ends recording data in the drive.
	<i>Trigger</i> button triggers the associated logger.
	<i>Cursor tool</i> button switches on the cursor tool.
	<i>Zoom box tool</i> button switches on the zoom box tool that enlarges a selected area of the graph or zooms in 50% when the graph is clicked.
	<i>Zoom out</i> button zooms out 100% when the graph is clicked.
	<i>Reset zoom</i> button restores the original graph scale.
	<i>Show numerically</i> button shows the signal values in text format.
	<i>Show graphically</i> button shows the signal values in graphical format.
	<i>Show/Hide grid</i> button inserts or removes the graph area grid lines.
	<i>Show all scales/Show selected scale</i> button changes how the scales are shown on the Y-axis. In <i>All scales</i> mode, DriveStudio shows the min and max value for all signals. If the scale is shown only for the selected signal, the value on each horizontal grid line is also shown.

On the right of the toolbar buttons there are two drop-down menus. One is for selecting the number of horizontal grid lines and the other selects the current logger. If the drive supports more than one data logger, you can choose the one you want to operate with.

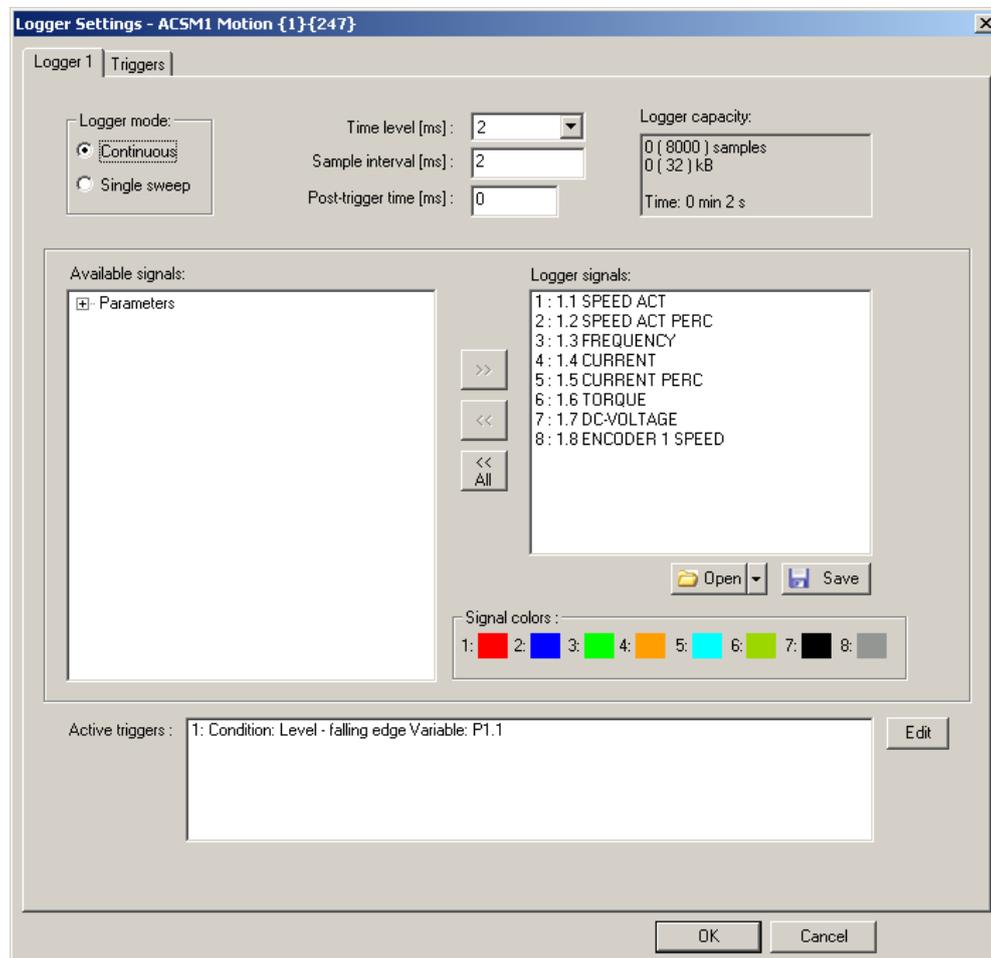
Graph area

The graph area shows selected signal values. It offers similar functionality as the *Monitor* and *Data File Viewer* windows. The common functionalities are described in Chapter 8 – Other functions / Graph area functions.

Logger Settings window

The *Logger Settings* window contains two or more tabs, depending on the number of supported loggers in the drive. The first tabs are called *Logger N*, where *N* is the ordinal number of the associated logger. The *Logger* tabs have some general settings, and you can select the signals that are to be logged. The last tab is called *Triggers*, and there you can configure the triggering of the drive's loggers.

Click the *OK* button to enforce any entered values and close the window. Press *Cancel* to ignore changes in the *Logger* tabs.



In a *Logger* tab, you can select either *Continuous* or *Single sweep Logger mode*. *Single sweep* stops recording data when the logger is filled to capacity. *Continuous* overwrites the oldest data until the logger is stopped or triggered.

The *Sample interval* determines how often the logger reads samples of the signal values in milliseconds. *Time level* shows the available lengths of the internal cycle time of the drive. The *Sample interval* must be a multiple of the *Time level*.

After triggering, the drive keeps reading the signal values as long as is specified in the *Post-trigger time* field in milliseconds.

The *Logger capacity* panel on the right shows how many samples and how much memory is consumed and how long the data logging can be done according to the number of signals, the time level and the sample interval.

The *Available signals* panel displays a tree of all signals available for logging in this drive. You can expand and collapse tree branches by clicking the plus and minus icons, respectively. Click on a signal you want to record and then click the '>>' button. You can also select several signals at once by holding down the *Ctrl* key while clicking the tree items. Clicking a group name selects all its signals.

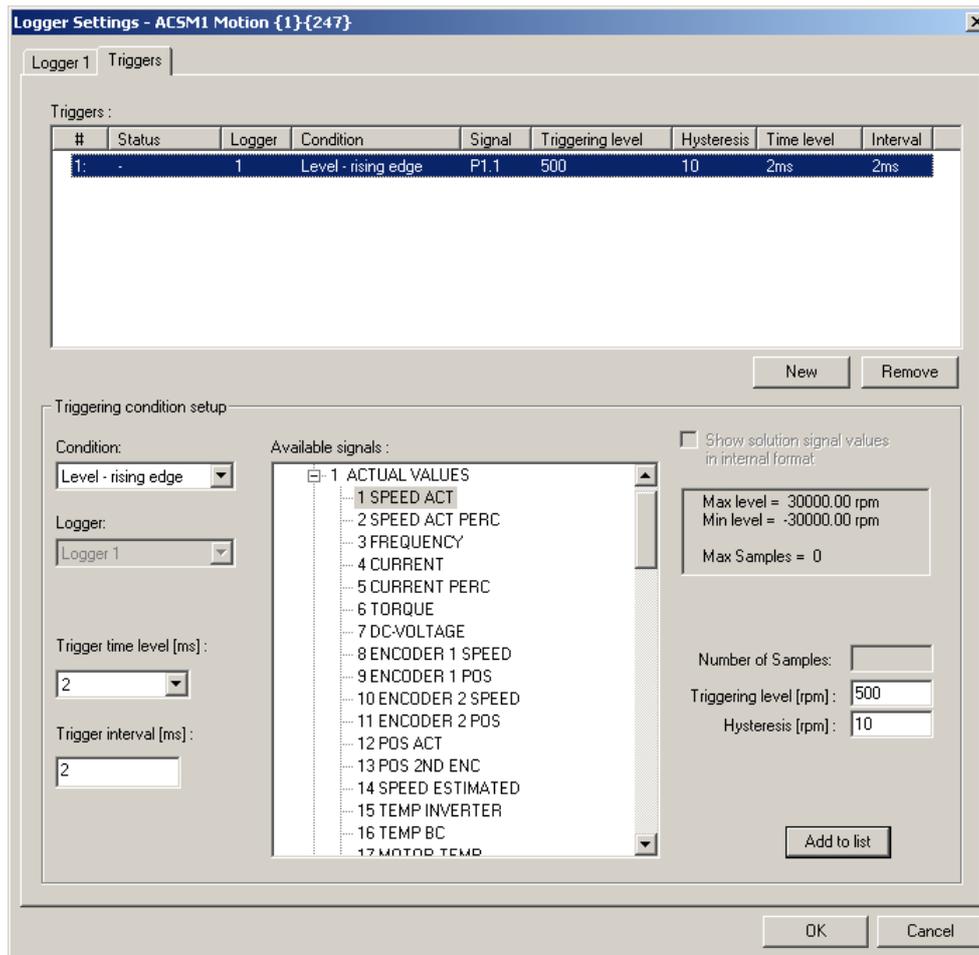
The *Logger signals* panel shows a list of signals selected to be recorded. The ordinal numbers correspond to the *Signal colors* panel. You can remove a signal by clicking it to select it, and then clicking the '<<' button. The '<< All' button removes all signals from the list.

Note! *The maximum number of signals that a logger can record at one time depends on the drive.*

The list of logger signals can be saved to a file by clicking the *Save* button and retrieved later with the *Open* button. The *Open* button is split; clicking the down arrow on the right displays a list of recently saved files.

If you want to change the color of a signal, click the corresponding square in the *Signal colors* panel.

The *Active triggers* list on the bottom shows all triggers that are set for this logger. You can select one and click the *Edit* button, which takes you to the *Triggers* tab, where you can modify its settings. Double-clicking does the same.



In the *Triggers* tab, the *Triggers* list displays the triggers that are currently set in the loggers of the associated drive. It also shows pending triggers, which have been configured in DriveStudio but the configuration has not yet been sent to the drive (by pressing *OK*). The status of active triggers is shown. Pending triggers are indicated by a dash. You can select one trigger in the list and edit its values in the *Triggering condition setup* panel or remove it with the *Remove* button.

The trigger that caused the logger to stop is indicated with a red exclamation mark. All triggers that have been triggered are indicated by *italics*.

Adding a trigger

Click the *New* button to add a new triggering condition. The *Triggering condition setup* panel becomes enabled and you can enter the desired values there.

First choose the triggering condition in the *Condition* drop-down list from the following choices (some may not be available at all times):

- *Fault*, stops when the drive reports a fault.
- *Alarm*, stops when the drive reports an alarm.
- *Level – rising edge*, stops according to the selected signal, *Triggering level* and *Hysteresis* values.
- *Level – falling edge*, stops according to the selected signal, *Triggering level* and *Hysteresis* values.
- *Sample count*, stops when a set number of samples have been collected.

- *Limit*, stops when the drive reports reaching a limit.

The *Trigger interval* determines how often the trigger conditions are checked. Time is given in milliseconds. *Trigger time level* shows the available cycle times in the drive. The *Trigger interval* must be a multiple of the *Trigger time level*.

Note! *There is a limited number of triggers in the drive.*

If the connected drive supports more than one data logger, you can choose one in the *Logger* drop-down list.

With the *Level – rising edge* and *Level – falling edge* condition types, a signal has to be selected in the *Available signals* panel. After that, enter values for the *Triggering level* and *Hysteresis*. The panel above shows the maximum and minimum values that can be used for the level condition with the selected signal.

With the *Sample count* condition, the number of desired samples has to be entered into the *Number of Samples* box.

When you finally click the *Add to list* button, the new triggering condition is added to the *Triggers* list. The pending trigger conditions are sent to the drive when the *OK* button is pressed. If the *Cancel* button is pressed when there are pending trigger conditions in the *Triggers* list, those configurations are discarded.

Similarly, when you click the *Remove* button, the selected trigger is removed from the drive when the action is confirmed with the *OK* button. If the operation is cancelled using the *Cancel* button, the trigger is not removed from the drive.

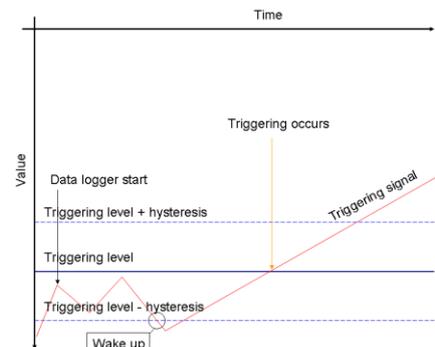
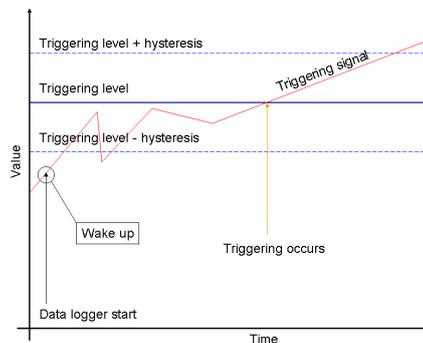
Using level triggers

Triggering to level can occur only after the function is woken up. When using *Level - rising edge* condition, the function wakes up when the actual value of the triggering signal is below the *triggering level – hysteresis*. In the same way, when using the *Level – falling edge* condition, the function wakes up when the actual value of the triggering signal is above the *triggering level + hysteresis*.

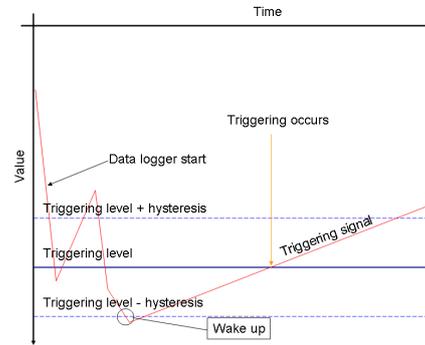
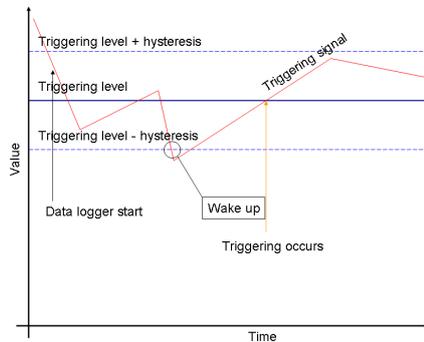
Note! With solution signals, you can select whether the triggering level and hysteresis values are given in the internal or scaled float format.

Rising edge

- Triggering signal is below triggering level when the data logger is started
 - triggering occurs when signal goes above the triggering level

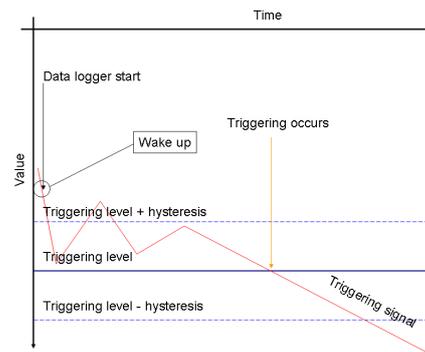
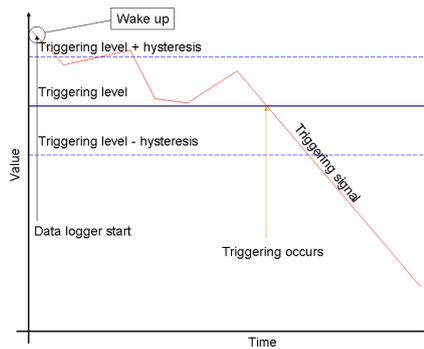


- Triggering signal is above triggering level when the data logger is started
- triggering occurs when the signal goes above the triggering level, but before that the signal must go below the triggering level – hysteresis

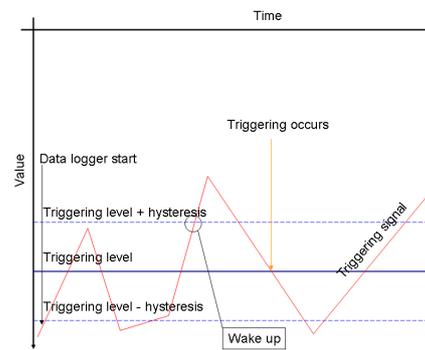
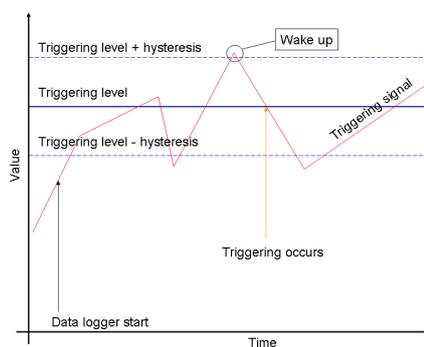


Falling edge

- Triggering signal is above triggering level when the data logger is started
- triggering occurs when signal goes below the triggering level

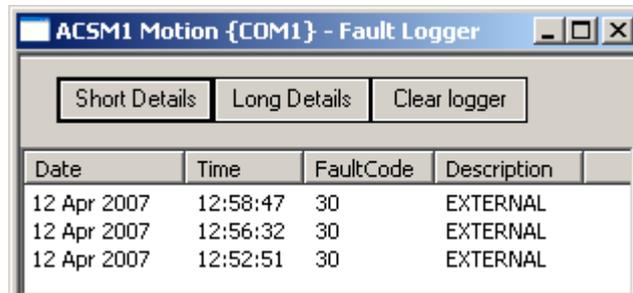


- Triggering signal is below triggering level when data logger is started
- triggering occurs when signal goes below the triggering level, but before that the signal must go above the triggering level + hysteresis



Chapter 5 – Fault Logger view

The *Fault Logger* view displays the contents of the fault logger of a connected drive.



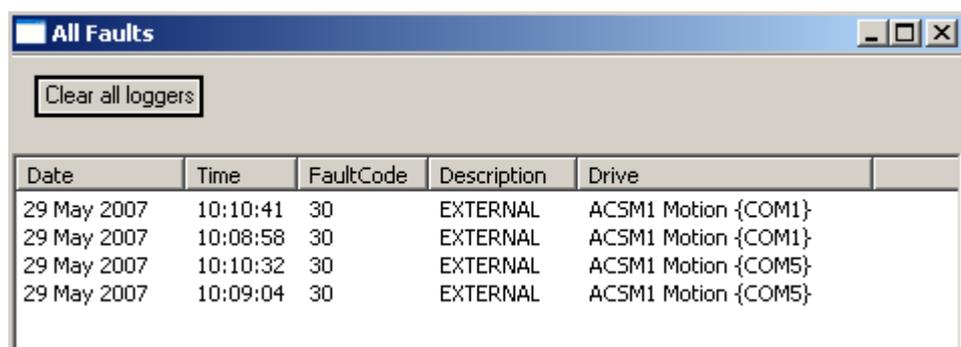
The *Fault Logger* view is always associated with a single drive and resides in its window. The window consists of the following parts:

- Button bar
- *Short Details* button shows only the basic information about the faults.
- *Long Details* button shows all the information about the faults.
- *Clear logger* button empties the contents of the fault logger in the drive and the screen.
- Fault list

To get help about the particular fault, click a fault and press *F3*.

Faults from all drives window

To view the latest faults from all drives at once in a separate window, select the *All faults in all drives* menu command in the *View* menu or the *Fault Logger* menu.

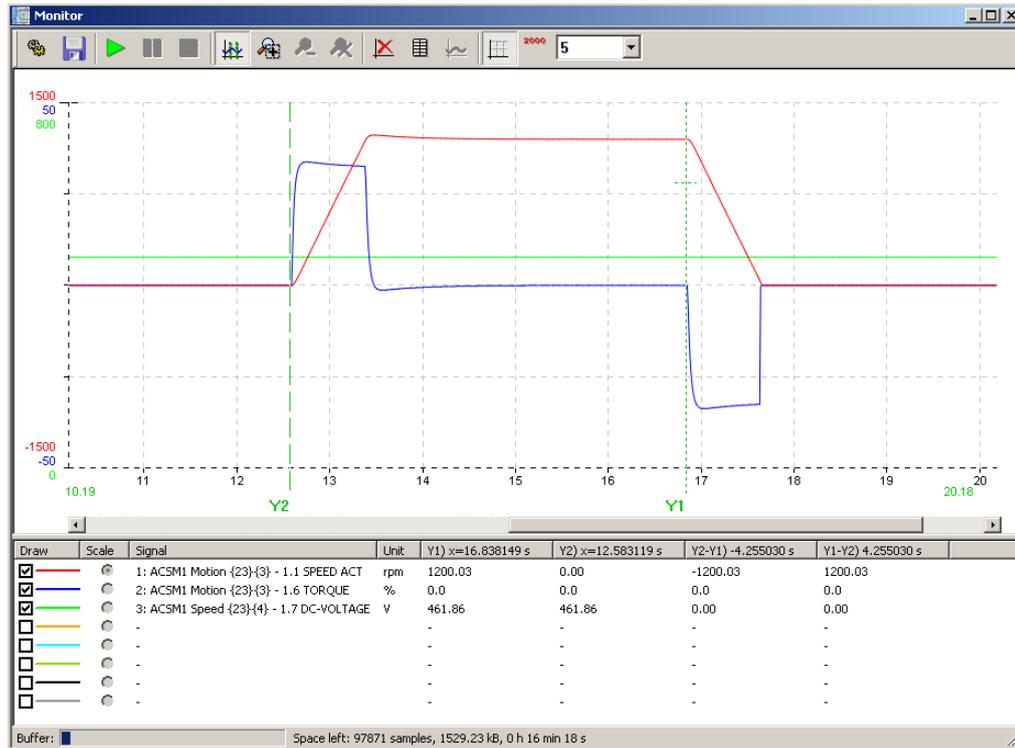


Placing and holding the cursor on a fault will display a tooltip containing the details of the fault. If you double-click a drive, its own window with the *iFault* Logger view is brought on top.

Chapter 6 – Monitor window

You can use DriveStudio to observe the operation of connected drives. The *Monitor* window displays signal values in graphical or numerical format live as new values are retrieved from connected drives. The monitor data can be saved to a file for later use.

The *Monitor* window can be opened with the *Monitor* button below the *Drive List* panel or the *View / Monitor* menu command.



The *Monitor* window consists of the following parts:

- Toolbar
- Graph area
- Y-axis
- X-axis
- Legend area
- Status bar

The toolbar has the following buttons:

Button	Description
	<i>Monitor Settings</i> button brings up the <i>Monitor Settings</i> window where the monitor settings can be modified and the monitored signals selected.
	Save button saves the accumulated monitor data to a signal data file.
	<i>Start</i> button begins recording data in the selected drives and displaying it on the screen.
	<i>Pause</i> button continues recording but pauses or resumes scrolling the screen.
	<i>Stop</i> button ends recording data in the selected drives. The graph or numerical values remain on the screen.
	<i>Cursor tool</i> button switches on the cursor tool.
	<i>Zoom box tool</i> button switches on the zoom box tool that enlarges a selected area of the graph.
	<i>Zoom out</i> button restores a previous zoom level.
	<i>Reset zoom</i> button restores the original graph scale.
	<i>Clear screen</i> button erases the graph or numerical values in the window and clears the monitor data from computer memory.
	<i>Show numerically</i> button shows the signal values in text format.
	<i>Show graphically</i> button shows the signal values in graphical format.
	<i>Show/Hide grid</i> button inserts or removes the graph area grid lines. The number of horizontal grid lines can be selected from the selection box.
	<i>Show all scales/Show selected scale</i> button changes how the scales are shown on the Y-axis. In all scales mode, DriveStudio shows the min and max value for all signals. If the scale is shown only for the selected signal, the value on each horizontal grid line is also shown.

Graph area

The graph area shows selected signal values. It offers similar functionality as the *Data Logger* view and the *Data File Viewer* window. The common functionalities are described in Chapter 8 – Other functions / Graph area functions.

When you click the *Show numerically* button, the graph and legend areas are replaced with textual values of the selected signals. New values are written to the top or bottom of the window. You can flip the direction by clicking the *Time stamp* header.

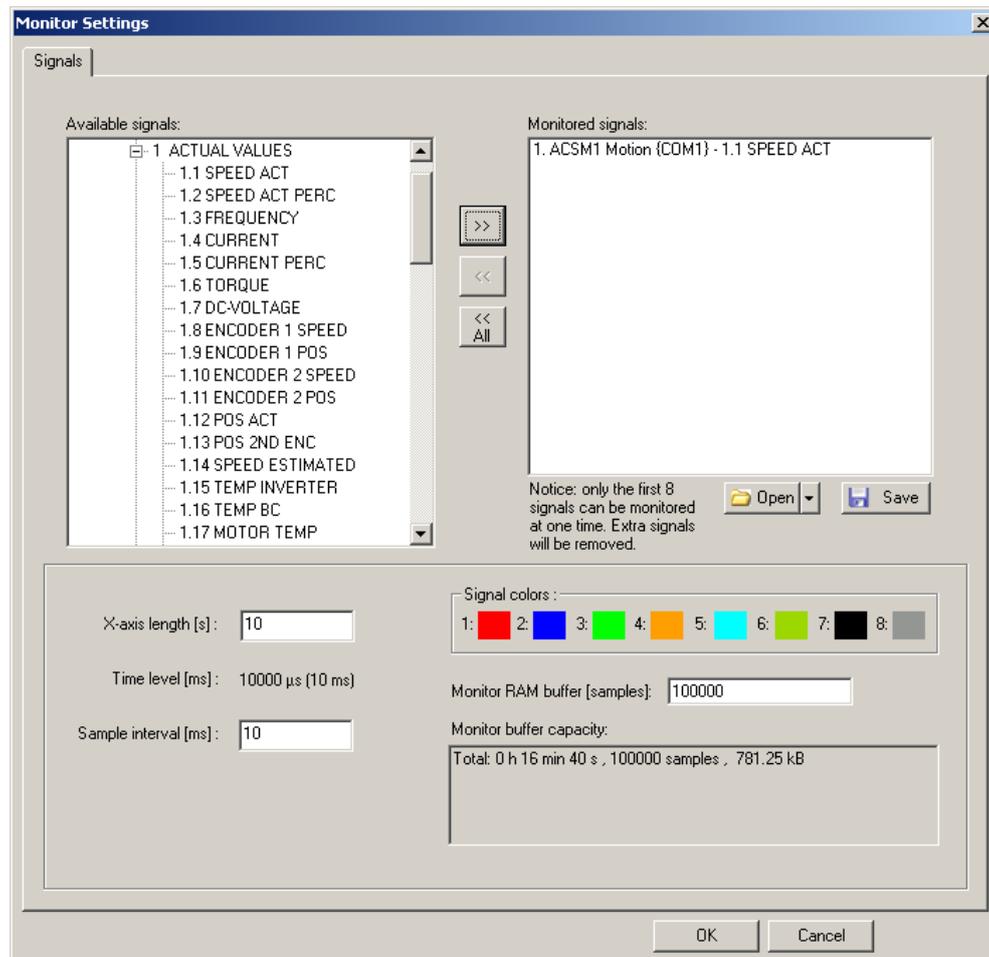
General

There is only one *Monitor* window instance. Saved data files are opened in their own *Data File Viewer* windows, which work similarly to the *Monitor* except for the *Start*, *Pause* and *Stop* commands.

Monitor Settings window

In the *Monitor Settings* window, the *Signals* tab is for some general settings and selecting the signals that are to be monitored.

Click the *OK* button to enforce any entered values and close the window. Press *Cancel* to ignore graph-related changes in the *Signals* tab.



In the *Signals* tab, the *Available signals* panel displays a tree of all connected drives and their signals and parameters. You can expand and collapse the tree branches by clicking the plus and minus icons, respectively. Click on a signal you want to monitor and then click the '>>' button. You can also select several signals at once by holding down the *Ctrl* key while clicking the tree items. Clicking a group name selects all its signals

The *Monitored signals* panel shows a list of signals selected to be monitored. Their drives are shown too. The ordinal numbers correspond to the *Signal colors* panel. You can remove a signal by clicking it to select it, and then clicking the '<<' button. The '<< All' button removes all signals from the list.

Note! Only a limited number of signals can be monitored at one time. Extra signals will be removed from the list when this window is closed. Currently with the ACSM1 drives, the limit is the first 8 signals.

The list of monitored signals can be saved to a file by clicking the *Save* button and retrieved later with the *Open* button. The *Open* button is split and clicking the down arrow on the right displays a list of recently saved files.

If you want to change the color of a signal, click the corresponding square in the *Signal colors* panel.

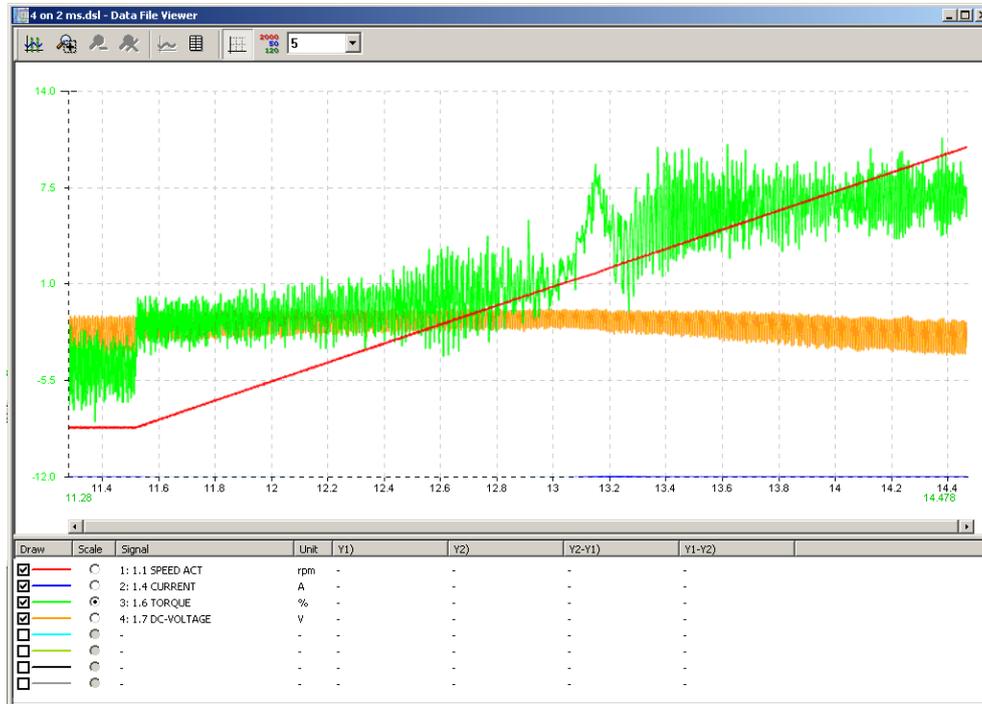
You can set a value for the *X-axis length* in seconds. This determines how much of the axis will be shown at one time.

Time level shows the length of the internal cycle of the drive and how often the signals are updated. The *Sample interval* determines how often the monitor reads samples of the signal values in milliseconds.

You can determine a buffer size in the computer's memory for storing the signal values. Enter the number of samples in the *Monitor RAM buffer*. The *Monitor buffer capacity* panel below shows how much memory it consumes and how long the monitoring can be done according to the number of monitored signals and the sample interval.

Chapter 7 – Data File Viewer window

With this window, you can view signal data files that have been saved in a *Data Logger* view or the *Monitor* window.



This window looks and works almost the same as the *Data Logger* view or the *Monitor* window. The saved file can be opened with the *File / Open...* menu command. The window consists of the following parts:

- Toolbar
- Graph area
- Y-axis
- X-axis
- Legend area
- Status bar

The toolbar has the following buttons:

Button	Description
	<i>Cursor tool</i> button switches on the cursor tool.
	<i>Zoom box tool</i> button switches on the zoom box tool that enlarges a selected area of the graph.
	<i>Zoom out</i> button restores a previous zoom level.
	<i>Reset zoom</i> button restores the original graph scale.
	<i>Show numerically</i> button shows the signal values in text format.
	<i>Show graphically</i> button shows the signal values in graphical format.
	<i>Show/Hide grid</i> button inserts or removes the graph area grid lines. The number of horizontal grid lines can be selected from the selection box.
	<i>Show all scales/Show selected scale</i> button changes how the scales are shown on the Y-axis. In all scales mode, DriveStudio shows the min and max value for all signals. If the scale is shown only for the selected signal, the value on each horizontal grid line is also shown.

Graph area

The graph area shows selected signal values. It offers similar functionality as the *Monitor* window and the *Data Logger* view. The common functionalities are described in Chapter 8 – Other functions / Graph area functions.

Chapter 8 – Other functions

Graph area functions

The *Monitor* window, *Data Logger* view and *Data File Viewer* window all have similar graph area facilities for displaying signal values. Their usage is described here.

Graph axes and legend

The graph area shows the selected signal values with different colors. Time runs on the X-axis. The scales of the signals are shown on the Y-axis.

There are two modes for showing the scales. In the *Show all scales* mode, each signal has its own minimum and maximum values on the Y-axis. In the *Show selected scale* mode, the scale is shown for the signal, which is selected with the radio button in front of the signals in the legend. If the grid lines are visible, the signal's value on each horizontal grid line is also shown.

You can modify the minimum and maximum values by clicking them and typing a new value on the keyboard. Press *Enter* to enforce the new value or press *Esc* to return the previous value. The X-axis length can be modified in the same way. Only a period is accepted as a decimal separator.

Note! *X-axis length of the monitor window must be changed in the monitor settings*

An orange arrowhead on the X-axis indicates where a triggering has occurred.

The legend area below the graph area shows all signals that have been selected to be monitored, logged or that exist in the data file. Select or clear the checkbox in front of a signal if you want the signal to be drawn or not drawn, respectively.

If you click the name of a signal in the legend area, it is highlighted and drawn on top of the other signals in the graph area. If the Y=0 level of that signal falls between the minimum and maximum values, it is indicated with a dashed line. Clicking the signal again removes the highlight and the zero-level line.

Cursor tool

With the cursor tool, you can see the exact values of the signals at one or two places in time and their differences. Click the *Cursor tool* button to activate it, if it isn't already active, and move the mouse on the graph area. The mouse pointer changes into a free cursor line. You can see the signal values in the legend area in the **Y1**) column. The time stamp of that moment is shown in the header.

If you click the primary mouse button in the graph area, a fixed cursor line is placed at that timestamp. While the mouse button is pressed down, you can move the cursor line left and right. The signal values at the fixed cursor line can be seen in the **Y2**) column of the legend area. The timestamp of that moment is shown in the header.

The time and signal value differences between the free and fixed cursor lines are shown in legend area columns **Y2-Y1**) and **Y1-Y2**).

You can change the format in which the signal's value is shown by clicking the signal in the legend or in the numerical view with the secondary mouse button. The selection is used in both graphical and numerical views.

Zoom box tool

With the zoom box tool, you can enlarge the graph and take a closer look at interesting details. Click the *Zoom box* tool button to activate it, if it isn't already active. Place the mouse cursor in the graph area and press down the primary mouse button. This is one of the desired corners. Drag to the opposite desired corner, and release the button. Upon release, the part of the graph that was inside the selection rectangle is enlarged to fill the graph area.

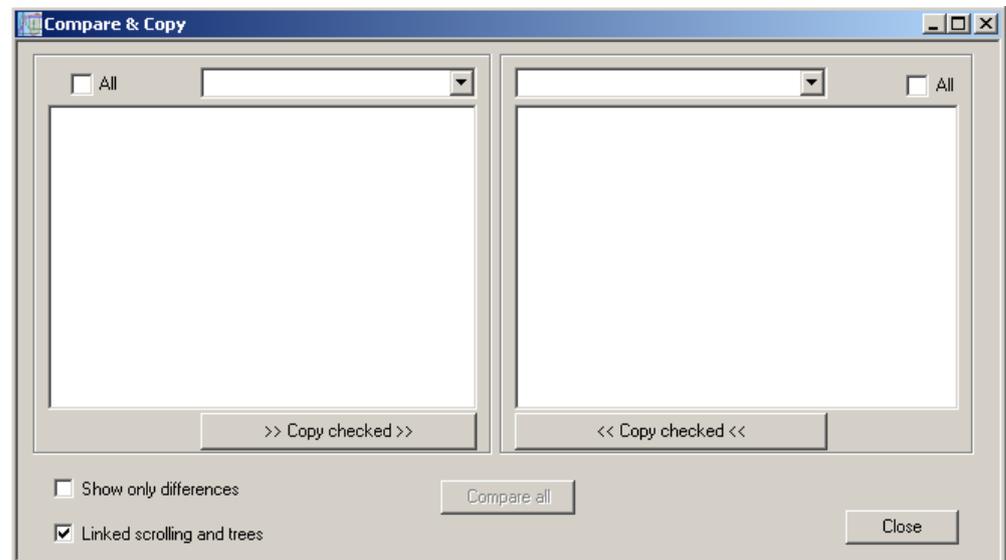
If you click the graph area without dragging, the graph is zoomed in by 50% and the view will be centered on the clicked coordinates.

You can return to a previous zoom level by clicking the *Zoom out* button. You can restore the initial scaling values by clicking the *Reset zoom* button.

Comparing and copying parameters

Using compare function you can find differences between two sets of parameters. With the copy function, you can transfer parameter values between drives and files.

These functions are initiated from the *Parameter Browser / Compare & copy parameters...* menu command. This opens the following window:



First select *Drive* or *Parameter File* for the left and right sides of the dialog box. The selection list includes all active drives as well as all opened parameter files. A new file can be opened from the same selection list. You can also select *Compare to default*. In this case, the drive or file in the other pane is compared to its default values, and you can also copy the default values to the drive or file.

If the *Linked scrolling and trees* checkbox is checked, the parameter trees act as one. That is, as you open or close a group in one pane, the group in the other pane is also opened or closed, and the scrolling of a pane affects the other pane so that the parameter trees stay aligned.

The comparison of parameters is done group by group as the groups are browsed. You can also use the *Compare all* button to compare the complete parameter lists at once. If the *Show only differences* checkbox is checked, only those parameters or groups that differ are shown. These also include those parameters and groups that only exist in the other drive or file.

Once you have selected the source or target for both sides of the dialog box, you have the possibility to select needed parameters to be copied from the drive or file on the left to the file or drive on the right, or vice versa. You can check the *All* checkbox to select all parameters from the source, or you can select only needed parameters or parameter groups. Note that only writeable parameters have a checkbox. The checkbox is also missing, if the parameter is missing from the other document.



All groups have a special checkbox in their row with three states:

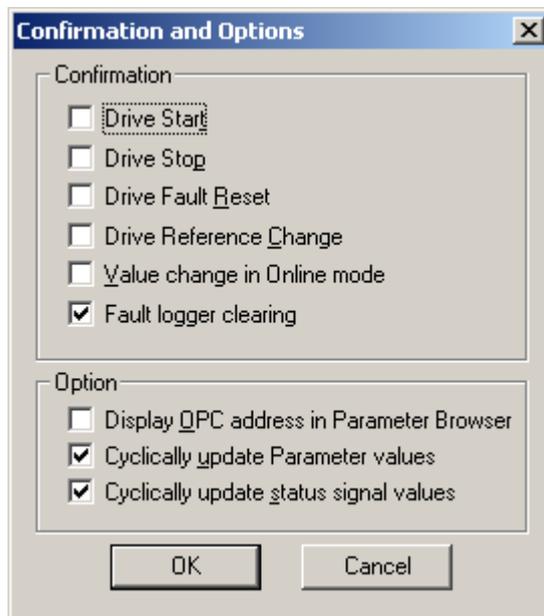
empty means that no parameters of this group are checked

triangle means that one or more but not all parameters of this group are checked

square means that all parameters of this group are selected

Confirmation and Options

You can open this dialog with the *Edit / Confirmation and Options* menu command. Here you can set the DriveStudio behavior.



By default, a confirmation is requested only before the fault logger is cleared. The parameter and status signal values are updated cyclically.

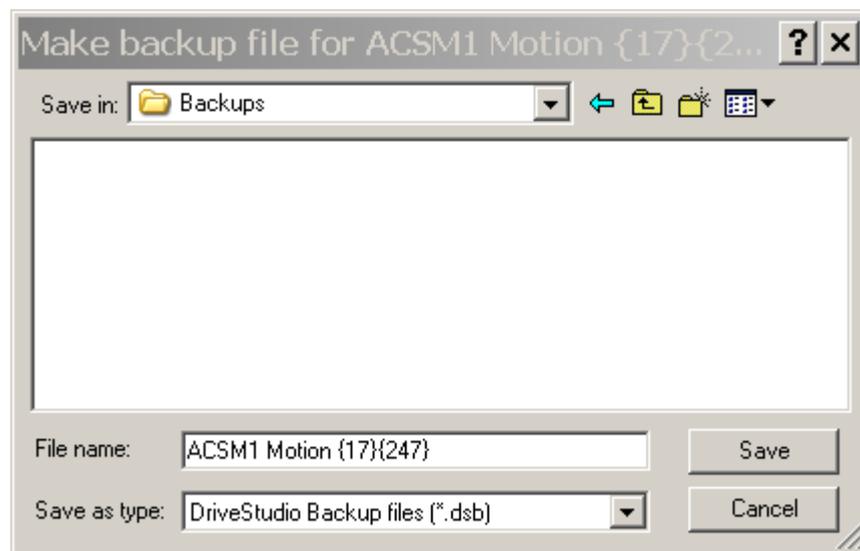
Solution programming

You can start the DriveSPC (Solution Program Composer) with the *View / DriveSPC* menu command. DriveSPC opens in a new window as a separate application. With DriveSPC, you can create and modify solution programs that are executed in the drives.

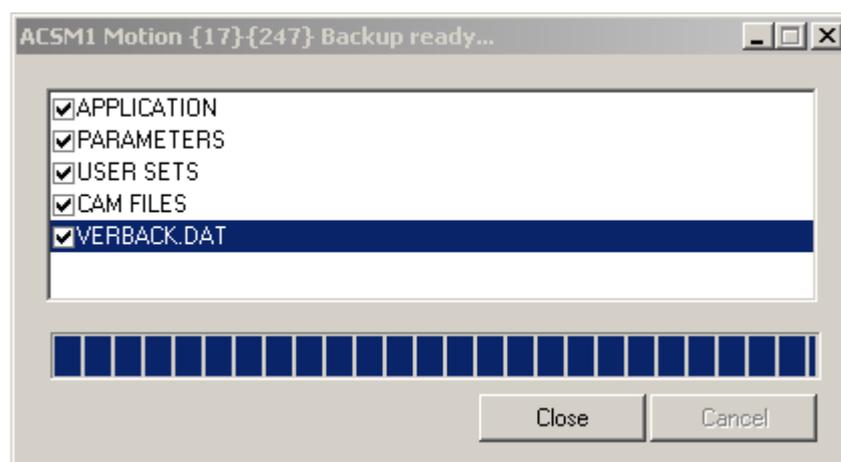
For information about solution programming, please see the DriveSPC user manual and the firmware manual of the drive.

Backup and restore

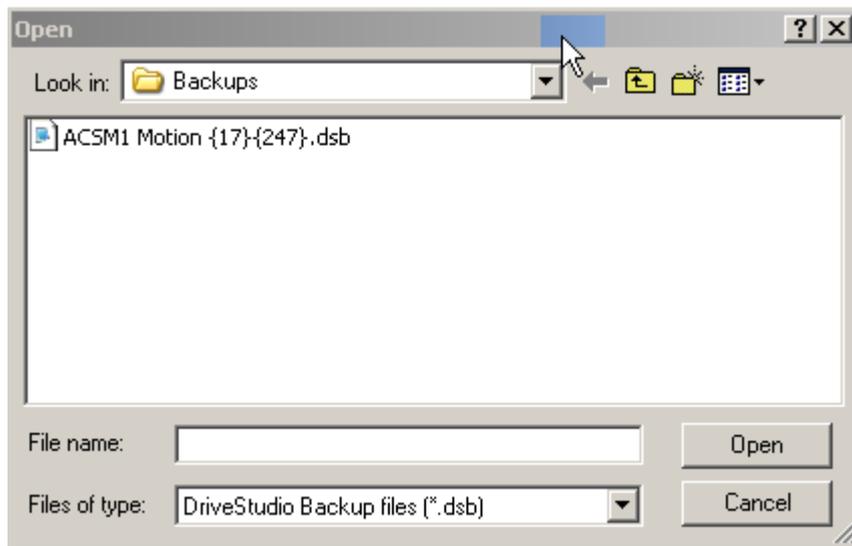
You can create a backup of a selected drive with the *Drive / Backup* menu command.



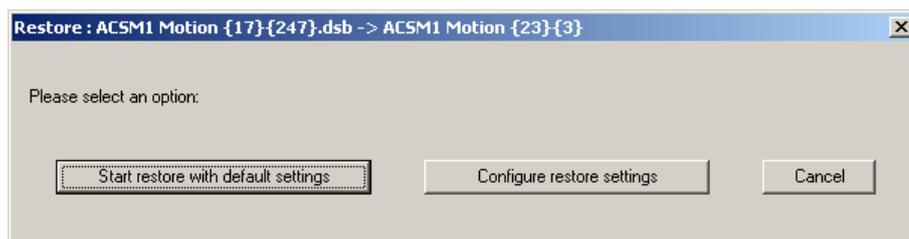
By default, the filename of the backup is the name of the drive. You can select the folder for backup. Clicking Save will display the following dialog. A typical backup procedure takes about 30 seconds and ends with the following screen.



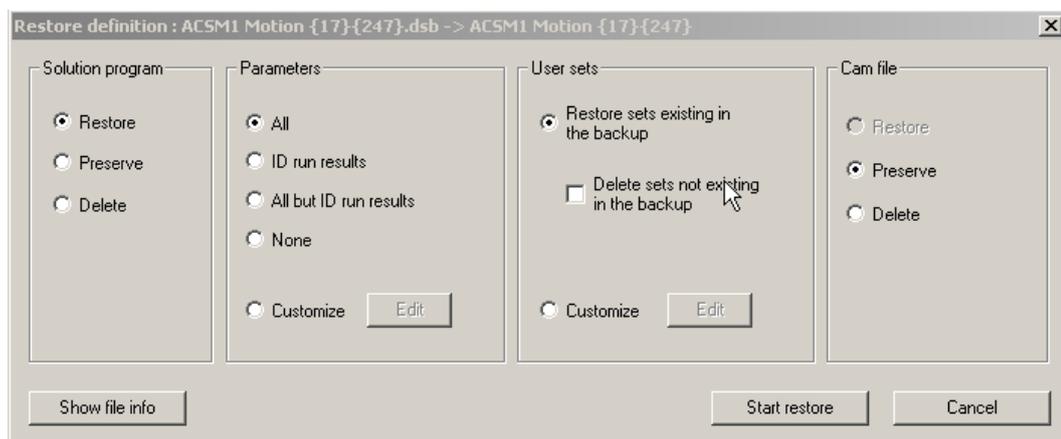
You can restore a selected drive with the *Drive / Restore* menu command. The following screen appears.



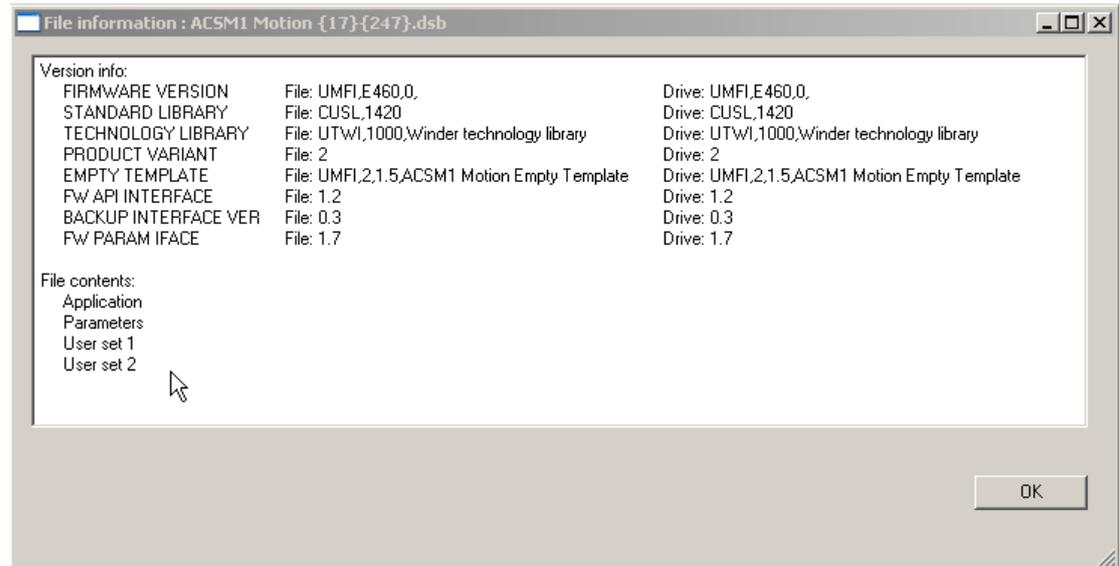
Select the backup that you want to restore, and click *Open*. From the next dialog, you can either start the restore using the default settings or configure a custom restore. In a default restore, all available components are restored from the backup file. Unavailable components are preserved as they are in the drive.



If you select to configure the restore operation, a dialog for doing that is opened.



Select *Show file info* to check information about the backup file. Here you can see version information from the backup file and from the drive. Click *OK* to continue.



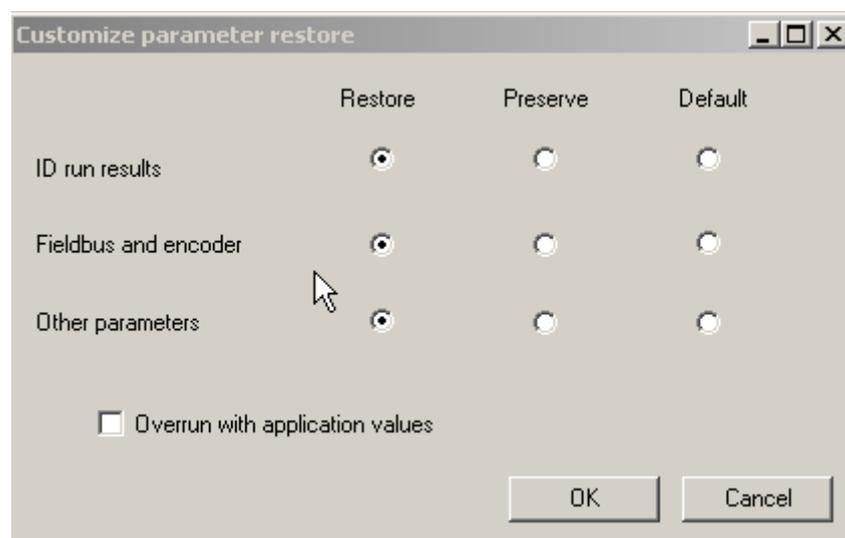
Restore is divided into four different sections, and choices for each section can be changed (if a cam file exists).

For **Solution program** selecting,

- *Restore*, will restore the solution program from the backup file to the drive
- *Preserve*, will preserve the existing solution program if it exists in the drive
- *Delete*, will delete the solution program if it exists in the drive

For **Parameters** selecting,

- *All*, will restore all parameters from the backup file (will also overwrite parameters that are written by the solution program)
- *ID run results*, will restore only ID run parameters
- *All but ID run results*, will restore all except ID run results (will also overwrite parameters that are written by the solution program)
- *None*, will not restore any parameters
- *Customize*, selecting *Customize* and *Edit*. Here parameters are divided into three different groups.



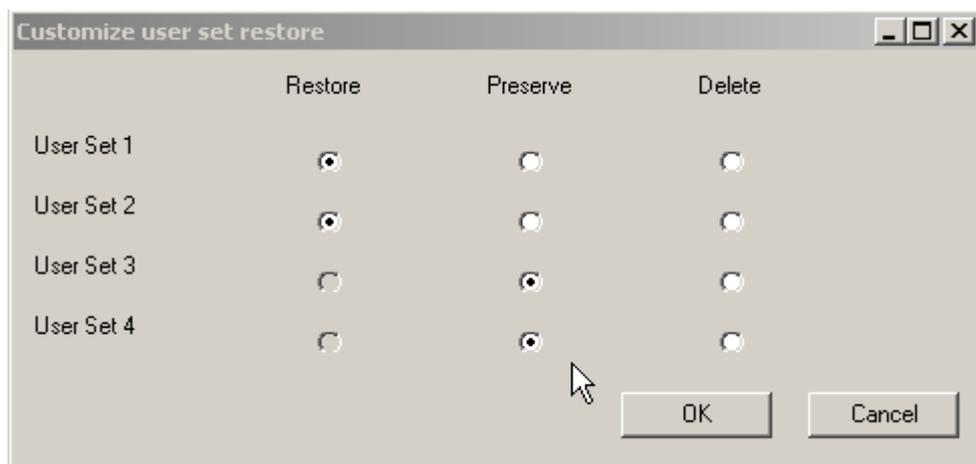
- ID run results
- Fieldbus and encoder
- Other Parameters

For each group, you can select the action taken on the restore from three choices:

- *Restore*: the parameter values are taken from the backup
- *Preserve*: the current values in the drive are not changed
- *Default*: the parameters are set to their default values

Selecting *Overrun with application* values, means that if there are parameters that are used by the solution program, the value given by the solution is not overwritten by other restore actions.

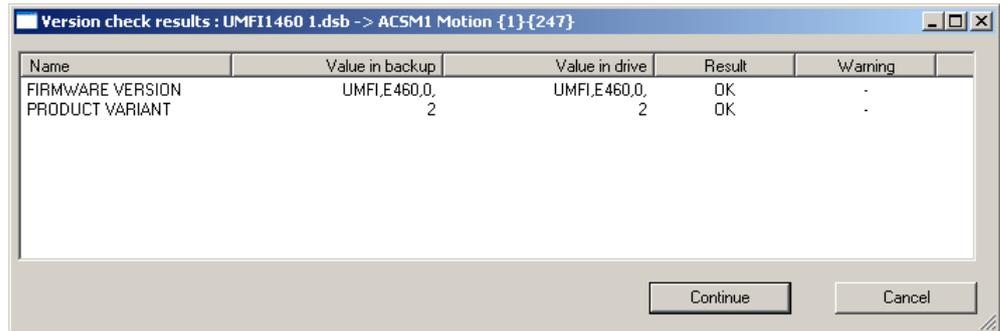
For **User Sets**, the default selection is to restore the sets from the backup. Use the checkbox to delete the other sets (if they exist in the drive). Selecting *Customize* and *Edit*, you can select how each user set should be handled with restore.



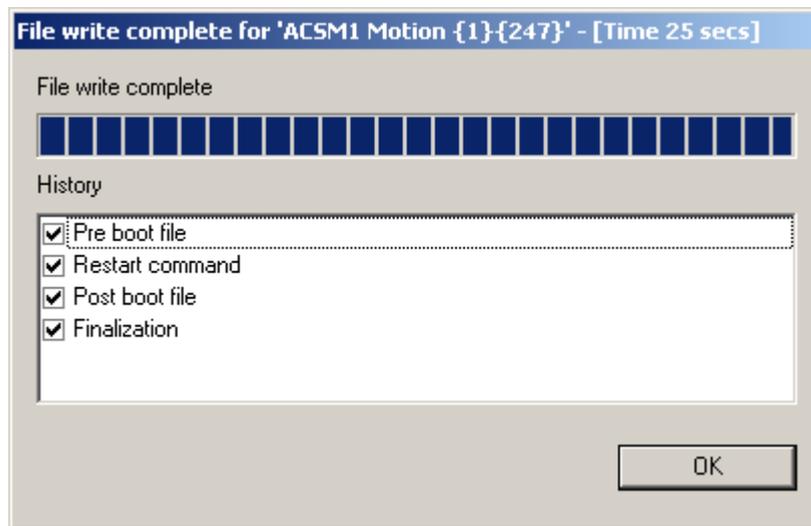
For the **Cam file**, selecting

- *Restore*, will restore the cam file from the backup to the drive
- *Preserve*, will preserve the existing cam file in the drive
- *Delete*, will delete the cam file from the drive

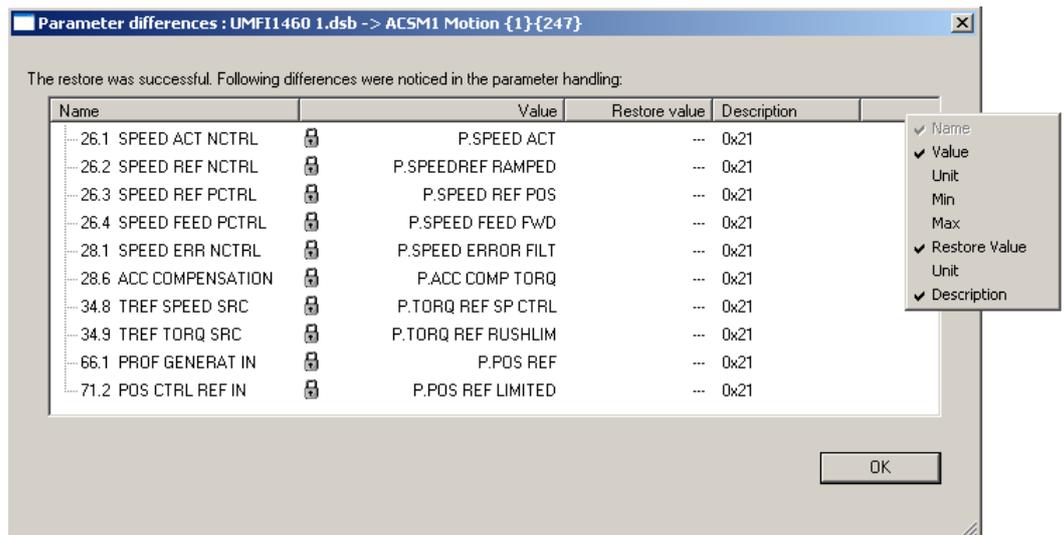
Clicking *Start restore* from the *Restore definition* screen will display the following screen.



Clicking *Continue* opens a dialog indicating the progress of the restore operation. This ends with the following screen.

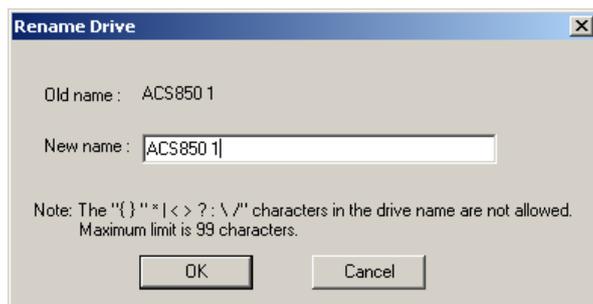
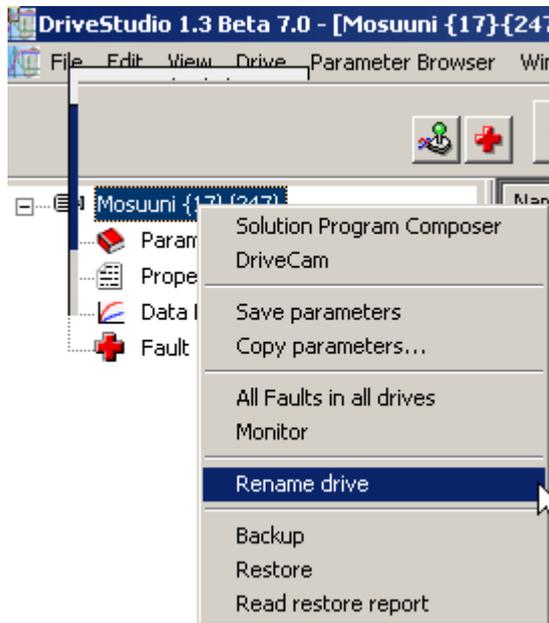


If some parameter values could not be written to the drive in the restore, those are listed after the restore. You can edit their values here.



Rename the drive

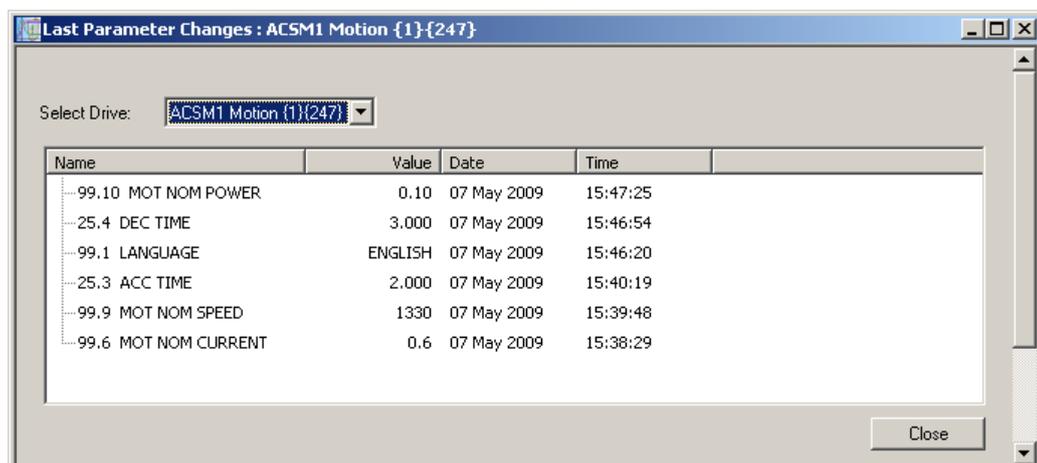
It is possible to rename the drive from the following dialog. You can activate the dialog by right-clicking on the drive list tree.



The drive name cannot contain the following characters: { } * | < > ? : \\/

Last parameter changes

In the *Last parameter changes* dialog, you can view the latest parameter value changes. The maximum number of parameters in the list depends on the drive. The dialog is opened with the *Parameter browser / Last parameter changes...* menu command. Select the drive from the selection list.

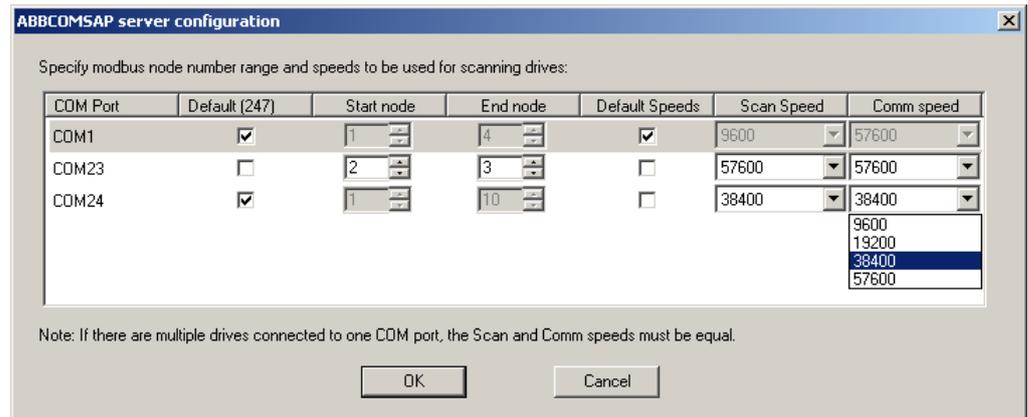


OPC server settings

In the *OPC Server Settings* dialog, you can adjust server-specific settings. These include the modbus node number and the used communication speeds. The settings can be done separately for each available COM port.

Scan speed is the communication speed DriveStudio uses while it searches for available drives connected to the COM port. As the connection to a drive has been established, the communication speed is changed to *Comm speed*. The default speeds are 9600 bps for *Scan speed* and 57600 bps for *Comm speed*.

The dialog can be opened with the *Edit / OPC Server Settings...* menu command.



Wizards

For some drive types, there are wizards to help the commissioning of the drive. There may also be base-solution-specific wizards. If there are wizards available for the drive, they can be launched either from the *Wizard* icon on the drive list or with the *View / Wizard...* menu command. These first launch a dialog from which you can choose which individual wizards to run.

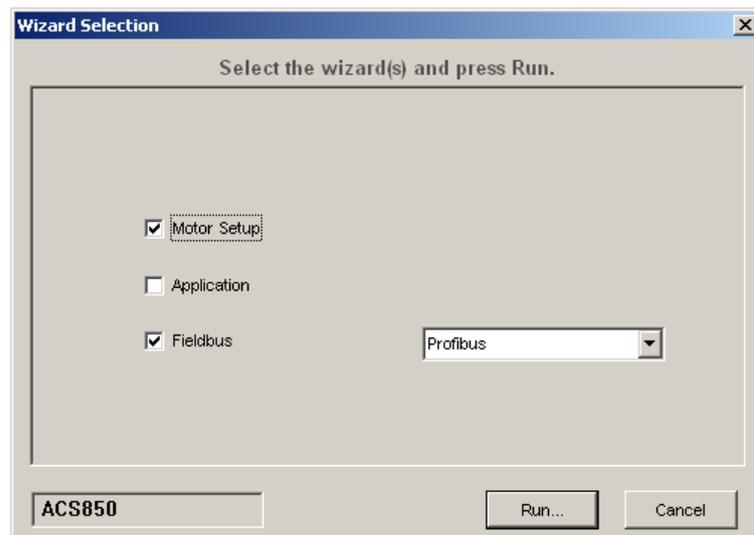




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