



DriveMS

## **User's Manual**

DriveWare®

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### **General Information**

*DriveMS* is a Windows based maintenance tool program for devices that use the SAMI communication protocol. These devices include e.g. *SAMI Star* and *MegaStar*.

*DriveMS* is designed to run under the Microsoft Windows XP, Windows 2000 or Windows NT 4.00 operating environment on IBM-compatible PCs.

The following functions can be performed by using *DriveMS*:

- graphical trending of actual values of user-selected parameters (max 6 items in one window) from one or more drives. Min sample time is from 50 msec (with 1 trend) to 300 msec (with 6 trends).
- horizontal scrolling and scaling of the trend history (in addition to the vertical scrolling and scaling of trends)
- numerical monitoring of actual values of user-selected parameters from one or more drives in different formats
- numerical recording of actual values of user-selected parameters (max 50 items) from one or more drives
- setting of values of parameters of drives
- control of drive's data logger operation and display of the collected sample values in graphical and numeric form
- local control of the selected drive
- creation and execution of macros. A macro is an user-written sequence of macro statements.
- saving/restoring the current *DriveMS* configuration to/from a disk file
- saving/restoring the definitions of the selected window to/from disk files
- saving the data of the selected window to a file
- remote operation

## Chapter 2 – Installation of DriveMS

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### **Installing DriveMS Hardware**

The DriveMS program uses COM ports of your PC (no additional hardware is needed in the PC).

Connect SSPC devices to COM ports *COM1*, *COM2*, *COM3* and/or *COM4* of your PC.

Connect drives to channels *CH1*, *CH2*, ... and/or *CH8* of these SSPC devices.

If there are four COM ports in the PC then the max number of connected drives is  $4*8 = 32$ .

### **Installing DriveMS Software**

Insert the DriveMS CD into the CD drive of your PC.

Your PC may be configured so that the installation starts automatically after the insertion of the CD.

Otherwise, start the installation manually as follows:

- Start the *Control Panel* program and double click on its "Add/Remove Programs" icon.
- Click the **Install** button.

Follow the instructions that appear on the screen.

## Chapter 3 - Use of DriveMS

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### Starting the DriveMS Program

You start the DriveMS program by using the **Start** button in the *Taskbar* (**Start -> Programs -> DriveWare -> DriveMS** if you have used the default settings in the software installation, see Chapter 2, section *Installing DriveMS Software*).

Now you can select the PC COM ports (and their bit rates) you want to use with drives (see Chapter 2, section *Installing DriveMS Hardware*).

The allowable bit rates are 1200, 2400, 4800 and 9600 bits/sec.

When you start DriveMS after the installation then the program:

- asks for the COM port and SSPC channel numbers of the connected drive (Default Target, see below) and the name of the parameter definition file (\*.DEF) that describes the parameters of this drive
- creates a Monitor window (see below) with all parameters of the connected drive (its window title is ALL).

### Screen Layout

When the program starts it displays the main *Frame Window* (usually full screen) and user-defined *child windows* (if any) inside the *Frame Window*. There are six types of *child windows*:

- *Monitor Window* (one or more) for numerical monitoring and recording of actual values of user-selected parameters from one or more drives
- *Trend Window* (one or more) for graphical trending of actual values of user-selected parameters (max 6 items in one Trend Window) from one or more drives. Min sample time is from 50 msec (if 1 trend) to 300 msec (if 6 trends).
- *EEPROM Parameter Window* for upload, compare, change, backup, restore and print of the EEPROM (TEE) parameters.
- *Data Logger Window* (one or more) for control of drive's data logger operation and display of the collected sample values in graphical and numeric form
- *Control Panel Window* for local control of the selected drive
- *Macro Window* (one or more) for creation and execution of macros. A macro is an user-written sequence of macro statements.



Communication status information is shown at the end of the title line of the Frame Window:

- Default Target = c,n (communication is working and the COM port and SSPC channel numbers of the Default Target are c and n) or
- LINK BREAK date time (no response from the Default Target) or
- COMM DISABLED date time (you have disabled the communication)

**Note:** *If there is no response from the Default Target then the whole DriveMS communication stops. Failure in one or more other targets does not prevent the communication with the working targets (if the failed target comes back then DriveMS automatically starts to communicate with it).*

You can change the title of the Frame Window by menu command **Config - Change Title** and the title of the selected child window by **xxxWin - Change Window Title**.

## Targets

Every child window of DriveMS and every item in a Monitor or Trend Window is associated with a drive (or some other device using the SAMI protocol). This drive is called window's or item's *target*. A target is identified by its COM port number and SSPC channel number (see Chapter 2, section *Installing DriveMS Hardware*). *Example:* The target whose identifier is 2, 5 is connected to channel CH5 of the SSPC that is connected to PC's COM2 port.

There are three target levels (listed below from the highest level to the lowest):

- *Default Target* is the Window Target of all child windows without user-specified (or system-specified) Window Target. This target is defined by menu command **Target - Change Default Target**.
- *Window Target* of a child window can be the Default Target (this is the default case) or an user-specified target (defined by menu command **xxxWin - Change Window Target**) or a system-specified target.
- *Item Target* of an item in a Monitor and Trend Window can be either the Window Target of item's window (this is the default case) or an user-specified target (defined by menu command **xxxWin - Change Item Target**).

## Monitoring

When you want to monitor parameter values numerically, you first

- create a new Monitor Window by menu command **MonWin - New Monitor Window** or
- select an existing Monitor Window and the item in this window (if not already selected)

and then add one or more parameter items into the window (after the selected item, if any) by menu command **MonWin - Add Parameter**.

The layout of a monitor item line is as follows:

```
value item ;comment
```

where: *value* = current value of this item  
*item* = parameter number and name  
*comment* = optional user-specified comment (special comments are described in *Appendix 1*)

**Note:** The format of parameter numbers in DriveMS is *nn.nn*

E.g. Parameter number 1 is displayed as 0.01

Parameter number 12 is displayed as 0.12

Parameter number 123 is displayed as 1.23

Parameter number 1234 is displayed as 12.34

You can make some changes to this line layout by menu command **MonWin - Change Line Layout** (this command changes the line layout of *all* items of *all* Monitor and Trend Windows).

The Item Target of the new item is the Window Target of the selected window. You can change item's target by menu command **MonWin - Change Item Target**.

You can change the value display format of the selected item by menu command **MonWin - Change Display Mode**.

If display mode is *Boolean* then numeric value 0 is displayed as text FALSE and any other value is displayed as text TRUE.

You can add, change and/or remove optional line comments by menu command **MonWin - Define Comment** (special comments are described in *Appendix 1*).

You remove the selected item line by menu command **MonWin - Remove Item**.

If you click on an item line while holding down the **Alt** key then DriveMS displays the help text of this item (if the help text exists).

You set the value of the selected item by pressing **F5** (or by starting to write the new value directly or by menu command **MonWin - Set**

**Item Value**) and undo the previous setting by pressing **Ctrl-F5** (or by menu command **MonWin - Undo Item Value Setting**).

You can save the data of the selected Monitor Window to a disk file by menu command **File - Save Current Window As**.

Later you can e.g. import this file into the document you are working with or you can download these saved values by a Macro Window (see section *Macros* later in this chapter).

**Note:** The *definitions* of the selected Monitor Window are saved/restored by the **Save/Open** commands in the **MonWin** menu.

You can select a Monitor Window by pressing (while holding down the **Alt** key) the **number** key that corresponds to the parenthesized window number of the desired window.

## **Recording**

You can record the numeric values of the parameters of a Monitor Window to a file.

First, select the desired parameters (max 50) to the desired Monitor Window as described in section *Monitoring* above in this chapter.

**Note:** Use only one target / one COM port if you record values from several Item Targets (i.e. max number of different Item Targets is 4 if you have 4 COM ports).

Then, define the name of the recorder file, record interval and the number of lines in the recorder file by menu command **MonWin – Start/Stop Recorder**.

The minimum value of the record interval (in milliseconds) is the same as the number of parameters in the Monitor Window multiplied by 50.

One line in the recorder file contains the values of one record interval. The maximum allowable number of lines depends on the amount of free disk space. If the recorder file becomes full during recording then the oldest line is replaced by the new line.

Finally, start the record operation by the **Start** button.

You can set the values of the items in the recorder window (= Monitor Window) when the recording is on.

**Note:** The values of other windows are not updated during recording.

You stop the recording by the **F4** key (or by menu command **MonWin – Start/Stop Recorder**).

You can display the content of the recorder file e.g. by menu command **File - Display Recorder File**.

## Trending

**Note:** The word "Trend" means in DriveMS "graphical display of parameter values" and the word "Trend" that is used in the DMS program is in DriveMS replaced with the word "DataLogger".

When you want to start the graphical trending of one or more parameter values, you first

- create a new Trend Window by menu command **TrendWin - New Trend Window** or
- select an existing Trend Window (if not already selected)

There can be max 6 items defined in one Trend Window. These items are listed in the box at the top of the window (initially all items are marked with question marks). You click on the item line which you want to replace with a new parameter item and then make the item definition by clicking the **Param** button (or by menu command **TrendWin - Parameter**).

The layout of a trend item line is as follows:

value item

where: *value* = current value of this item  
*item* = parameter number and name

**Note:** The format of parameter numbers in DriveMS is *nn.nn*

E.g. Parameter number 1 is displayed as 0.01

Parameter number 12 is displayed as 0.12

Parameter number 123 is displayed as 1.23

Parameter number 1234 is displayed as 12.34

You can make some changes to this line layout by menu command **MonWin - Change Line Layout** (this command changes the line layout of *all* items of *all* Monitor and Trend Windows).

The Item Target of the new item is the Window Target of the selected window. You can change item's target by clicking the **Target** button (or by menu command **TrendWin - Change Item Target**).

**Note:** Use only one target / one COM port if you display values from several Item Targets (i.e. max number of different Item Targets is 4 if you have 4 COM ports).

You can change the numeric value display format of the selected item by menu command **TrendWin - Change Num Display Mode**.

If display mode is *Boolean* then numeric value 0 is displayed as text `FALSE` and any other value is displayed as text `TRUE` (the value `FALSE` is displayed as graph value 0 and `TRUE` as graph value 1).

If you click on an item line of a Trend Window while holding down the **Alt** key then DriveMS displays the help text of this item (if the help text exists).

After you have defined one or more items, select the item(s) you want to display during trending by checking the desired check box(es) in front of the item definition lines.

After you have checked an item then you can set the Y values of the selected graph by clicking on the top, middle and/or bottom white **Y value text area**. You can change these values at any time later on by selecting first the desired item and then clicking on the desired Y value text area (this also enables the vertical scrolling and scaling of existing trend graphs when the trending has been stopped).

You set the sampling interval (in milliseconds) by clicking the **Interval** button (or by menu command **TrendWin - Change Sample Interval**). The minimum value is the same as the number of selected graphs multiplied by 50.

You can define a triggering condition by menu command **TrendWin - Set Trig Condition**. "Black value" means a value of the first (black) graph and "Red value" means a value of the second (red) graph.

If you want to save the trend history during trending then you must define the size of the trend buffer before you start trending (see section *Trend Buffer* later in this chapter).

You start (and stop) the trending by pressing the **F4** key (or by menu command **TrendWin - Start/Stop Trending**). You can change item definitions and selections, sample interval and Y values during trending.

If you have defined a triggering condition and this condition is met during trending then the trending stops automatically after the "Sample Count after Trig".

**Note:** *When trending has been started the Trend Window can update only the numeric actual values of the items selected for trending. Therefore, the unselected items are dimmed when the trending is on. The values of other windows are not updated during trending.*

You set the value of the selected item by pressing **F5** (or by starting to write the new value directly or by menu command **TrendWin - Set**

**Item Value**) and undo the previous setting by pressing **Ctrl-F5** (or by menu command **TrendWin - Undo Item Value Setting**).

**Note:** *If you want to set (during trending) the value of an item that is not in the Trend Window then you can display the Helper List box by the **F7** key (or by the **List** button), select an item from Helper's item list and press the **F5** key (or click Helper's **Set Value** button). The Helper List box lists the items that are in the Monitor Window with title TrendWinHelper. You can put the desired items into this Monitor Window before you start trending.*

With the trending stopped, you can press the mouse button while the cursor is on the graph area and the numeric values of the samples at the cursor location are displayed in the list box at the top of the window on the gray background (the cursor time is displayed above the graph area). You can move the mouse while holding down the mouse button. When you release the mouse button then the current (real-time) values are again displayed in the list box.

You can save the sample values of the selected Trend Window to a file (in bitmap or text format) by menu command **File - Save Current Window As** (with the trending stopped). See section *Trend Save* later in this chapter.

You can clear the trend graph area by menu command **TrendWin - Clear Graph Area** (when the trending is stopped).

## **Trend Buffer**

The trend graph area of a Trend Window can horizontally display 500 *sample batches* (sample intervals). One *sample batch* contains the sample values of the user-specified trending items (1...6 items) that are collected during the time span of the user-specified sampling interval.

If you want to save and display more *sample batches* than the last 500 collected ones then you have to set the trend buffer size by menu command **TrendWin - Change Buffer Size**. The buffer size defines how many *sample batches* can be saved to the buffer. The maximum allowable size of the buffer depends on the free PC disk space.

**Note:** *If you change the buffer size at a later time, and there are samples in the buffer, then these samples are lost!*

When you start trending, all *sample batches* are now always saved to the buffer. If the buffer becomes full during trending then the oldest *sample batch* is replaced by the new one.

After you stop trending, you can scroll the collected samples horizontally to the right (or left) by the **right** (or **left**) **arrow** key while

holding down the **Alt** key (the size of the scroll move is the half of the trend graph area width).

You can compress the trend graph horizontally to 1/10 from its previous width using the **right arrow** key while holding down the **Shift** key. The compressing means that every 10<sup>th</sup> trend sample is displayed in the Trend Window.

Using the **left arrow** key (while holding down the **Shift** key) you can expand the compressed trend graph.

If you use the **Ctrl** key instead of the **Shift** key then the compress/expand ratio is 2 instead of 10.

If you restart trending after the compress then the collected samples are displayed on the screen according to the current compress ratio but all collected samples are always saved to the trend buffer and it is possible to see the undisplayed intermediate sample values when you stop trending and expand the trend.

## **Trend Save**

You can save the sample values of the selected Trend Window to a file by menu command **File - Save Current Window As** (when the trending is stopped).

The save format can be either graph (bitmap filename extension is `BMP`) or text (filename extension is `TEXT`). It is not necessary to write the filename extension because DriveMS appends it automatically to the filename you specify.

If you select the *graph* format then you can select Black-and-White or Color mode. In Black-and-White mode, the widths of the graph lines are different so it is possible to differentiate the graphs in a BW picture.

If you select the *text* format and you have compressed the graph (see section *Trend Buffer* above in this chapter), then there are two save mode alternatives:

- The *Time-scaled values in the time range* mode saves the **compressed** samples of the graph area (this means that there are max 500 sample lines in the output file).
- The *All values in the time range* mode saves **all** samples of the trend buffer that are between the start and end time instances of the graph area (this mode enables e.g. the save of all samples of the trend buffer to one file).

You can read the saved *text* file e.g. by:

- Menu command **File - Display Trend Text File** or

- The *Excel* program.

## **Control Panel**

The Control Panel is opened by menu command **Target - Open Control Panel**. Control Panel works by setting bits in STATUS\_CMD and therefore, it needs the CMD file that corresponds to the DEF file (parameter definition file) that is currently in use (DriveMS uses the CMD files of the *DMS* program).

The buttons of the Control Panel are:

- The **Start** button (or function key **F2**) starts the target. The target will use the SPEEDREF value as its reference value.
- The **Stop** button (or function key **F3**) brings the target down.
- The **CoastStop** button (or function key **F6**) stops the target immediately.
- The **Reset** button (or function key **F9**) resets STATUS\_CMD to zero.
- By the **RefValue** button you can set target's new SPEEDREF value. In addition to this button the SPEEDREF value can be changed by function keys as follows:  
Function key **F7** increases the reference value. **Shift + F7** is a ten-fold increase.  
Function key **F8** decreases the reference value. **Shift + F8** is a ten-fold decrease.

**Note:** *Control Panel writes the reference value always to SPEEDREF 27T. If you use scalar control then you have to write the reference value to FREQREF 29T by using an user-created Monitor Window (with a FREQREF line).*

By the **Ref Value** scroll bar you can change target's SPEEDREF value.

The reference value is changed by clicking scroll bar's left or right-hand arrow button. The speed of change increases the longer the mouse button is held down.

You can click between the arrow buttons, too. The reference change is now ten-fold. The speed of change increases the longer the mouse button is held down.

It is also possible to change the reference value by dragging the thumb with the mouse. The thumb value is sent to the target when you release the mouse button.



## **EEPROM Parameter Window**

The EEPROM Parameter window is opened by menu command **Target - Open EEPROM Parameter Window**. In this window you can work with the TEE parameters (i.e. parameters that can be saved to target's EEPROM memory).

You can upload the TEE parameter values from the RAM memory of the Default Target by the **Upload from RAM** button.

***Note:** The uploaded parameter values in this window are not updated automatically if these values change in the Default Target after the upload. If you want to monitor values of the TEE parameters in the Default Target then you can create a new Monitor window (select window title EEPROM from the title list). This Monitor window will contain all TEE parameters of the Default Target.*

You can read the TEE parameter values from a previously saved (see below) parameter file by the **Read from File** button.  
You can read parameter files created by the DMS program, too.

By double clicking on a parameter line you can change parameter's value. An asterisk is displayed at the end of the changed parameter line.

The TEE parameter values in the window can be downloaded to the RAM memory of the Default Target by the **Download to RAM** button (download is possible only if the parameter definition file in the window is the same as the current parameter definition file).

The TEE parameter values in the RAM memory of the Default Target can be copied to its EEPROM memory by the **Copy from RAM to EEPROM** button.

The TEE parameter values in the window can be saved to a disk file by the **Save to File** button.

By the **Compare with File** button you can compare the parameter values in the window with the values in a previously saved parameter file.

You can compare parameter files created by the DMS program, too.

By the **Print File** button you can print the content of a previously saved parameter file.

You can print parameter files created by the DMS program, too.

## **Data Logger Window**

***Note:** The word "DataLogger" means here the same as the word "Trend" in the DMS program.*

**Note:** You can use only data logger channels TREND1 ... TREND6 with a Data Logger Window.

If needed, you can read the values of TREND7 (or TREND8) by macro RDTREND7.MAC (or RDTREND8.MAC) to disk file TREND7.TXT (or TREND8.TXT). These macros are in the DriveMS directory.

You open a new Data Logger Window by menu command **DLogWin – New Data Logger Window**.

The current value of the Default Target is set to the Window Target of the new window.

You can read and display the values of TREND\_IVAL, TREND1, TREND2, TREND3, TREND4, TREND5, TREND6, TREND\_TRIG and TRIGCOUNT with menu command **DLogWin – Read Data Logger Info**.

**Note:** The format of parameter numbers in DriveMS is *nn.nn*

*E.g. Parameter number 1 is displayed as 0.01*

*Parameter number 12 is displayed as 0.12*

*Parameter number 123 is displayed as 1.23*

*Parameter number 1234 is displayed as 12.34*

You can set the values of TREND\_IVAL, TREND1, TREND2, TREND3, TREND4, TREND5, TREND6 and TREND\_TRIG with menu command **DLogWin – Initialize Data Logger**.

By means of the **Change** button you can change the selected parameter item in the item list box.

By menu command **DLogWin – Data Logger Control** you can manually trigger the data logger (this sets the value of TREND\_SAV to 1).

You can upload the collected samples (100 values from TREND1BUFFER, TREND2BUFFER, TREND3BUFFER, TREND4BUFFER, TREND5BUFFER and TREND6BUFFER) by menu command **DLogWin – Upload Data Logger Samples**.

The numeric values of the samples at the cursor location are displayed in the list box at the top of the window together with names of the data logger channel variables (the cursor time is displayed above the graph area).

You can move the cursor either with the mouse while holding down the mouse button, or with the **right** and **left arrow** keys.

You can vertically scroll and scale the sample graphs in the same way as in a Trend Window (see section *Trending* above in this chapter).

You can display the uploaded sample values in numeric form using menu command **DLogWin – Numeric Display of Samples**.

You can save the sample values to a disk file using menu command **File - Save Current Window As**.

The save format can be either graph (bitmap filename extension is `BMP`) or text (filename extension is `TEXT`). It is not necessary to write the filename extension because DriveMS appends it automatically to the filename you type.

If you select the *graph format* then you can select Black-and-White or Color mode. In Black-and-White mode the widths of the graph lines are different so it is possible to differentiate the graphs in a BW picture.

Later you can e.g. import this saved file into the document you are working with or read the saved *text* file by the *Excel* program.

## **Macros**

A *macro* is an user-written sequence of macro statements in a Macro Window. The syntax of macro statements is defined in the DriveMS *Macro Language* (see *Appendix 2*).

By macros it is possible e.g. to set the values of parameters in target(s) or to write a simple PC-based application program for the control of target(s).

There are two basic methods to create a *new macro*:

- Write the required macro statements into an empty Macro Window (see below for details)
- Convert a saved Monitor Window data file into a macro (see below for details)

A previously *saved macro file* is opened by menu command **MacroWin - Open Macro**.

Now you can modify the macro in the created (or opened) Macro Window and/or you can start the execution of the macro by pressing the **F9** key (or by menu command **MacroWin - Execute Macro**). The selected macro statement lines only are executed by menu command **MacroWin - Execute Selected Lines**.

The Macro Execution Window (see below for details) is displayed on the screen during the execution of the macro and you can create a simple user interface by using this window.

It is possible to read from one file and to write to one file during the execution of a macro by macro statements `#FILENAMEIN =`

```
"filename", #FILENAMEOUT = "filename", V = #FILEIN,
#FILEINRESET and #FILEOUT = ....
```

You can create a chain of macros by using macro statement  
**#GOTOMACRO = "macrofilename".**

During the execution of some macro statements (e.g. wait statements) DriveMS can update numeric values of items in Monitor and Trend Windows.

You can stop the execution of the macro by pressing the **Esc** key.

You can save your macro to the macro file shown at the title of the Macro Window by menu command **MacroWin - Save Macro** (or to a new macro file by menu command **MacroWin - Save Macro As**).

### ***Write the Macro into an Empty Macro Window***

A new Macro Window is opened by menu command **MacroWin - New Macro Window**.

You can add and edit text in a Macro Window in the same way as you edit text e.g. in the *Notepad* program. The following "standard" keyboard key combinations are available:

Ctrl - C	copies the selected macro text to the clipboard
Ctrl - V	pastes the text in the clipboard to the insertion point
Ctrl - X	cuts the selected macro text
Del	deletes the selected macro text

You can use menu commands **Edit - Copy**, **Edit - Paste**, **Edit - Cut** and **Edit - Delete** instead of the above-mentioned keys.

**Note:** *The format of parameter numbers in DriveMS is nn.nn*

*E.g. Parameter number 1 must be written as 0.01  
 Parameter number 12 must be written as 0.12  
 Parameter number 123 must be written as 1.23  
 Parameter number 1234 must be written as 12.34*

*Example:* Write the following *assignment statements* into your new Macro Window:

```
0.51 = 10000
0.52 = -10000
0.71 = 4
```

By pressing the **F9** key the parameters listed in the macro are set to their defined values in the current Default Target. By changing the Default Target and pressing the **F9** key again the same value settings can be done for other targets too.

With a *target statement* you can define that the following statements will use the target of the target statement instead of the Default

Target. This target specification is in effect until the next target statement (or to the end of the macro if no more target statements exist).

*Example:* If you want to set the values of the first two parameters (see the example above) in the target 1, 5 and the value of parameter 0.71 in the target 1, 2 then the macro example above must be edited into the following form:

```
#TARGET = 1,5  
0.51 = 10000  
0.52 = -10000  
#TARGET = 1,2  
0.71 = 4
```

By pressing the **F9** key the parameters listed in the macro are set to their defined values in the defined targets.

When you have finished the macro you should save it by menu command **MacroWin – Save Macro As**. The filename extension of a macro file is always `MAC`.

### ***Convert a Saved Monitor Window Data into a Macro***

First, select the desired parameters to a Monitor Window.

Then, save the content of this Monitor Window (it contains now the current values of the selected parameters) to a disk file (filename extension is `TXT`) by menu command **File - Save Current Window As**.

Finally, change (e.g. by the *File Manager* program) the filename extension from `TXT` to `MAC`.

*Example:* Insert the `SPEED REF` parameters (assume 0.27) of all targets (assume targets 1, 2 ... 1, 5) into an empty Monitor Window:

```
1,2:0.27  
1,3:0.27  
1,4:0.27  
1,5:0.27
```

Save the content of this Monitor Window to a disk file `SPEEDS.TXT`.

Rename `SPEEDS.TXT` to `SPEEDS.MAC`.

At a later time, the `SPEED REF` values saved above can be sent back to the same targets in the following way:

- open the file `SPEEDS.MAC` (created above) with menu command **MacroWin – Open Macro**
- press the **F9** key

Of course, you can change the content of the `SPEEDS.MAC` macro (as any other macro) before or after the macro execution. Remember

## Macro Execution Window

to save the changed macro with menu command **MacroWin – Save Macro** if you want to use the changed macro afterwards.

The Macro Execution Window is displayed on the screen during the execution of a macro. This window can be divided into three areas:

- The top area (the *String area*) is used to display text strings (e.g. help texts) to the user.
- The middle area (the *Value area*) contains the Value input field and the **Enter** button (the **Enter** key can be used instead of this button)
- The bottom area (the *Variable area*) contains the Variable input field and the **Set Variable** button.

It is possible to create a simple user interface by user interface statements. Here is an example:

- You can e.g. display help information to the user by macro statement **#PUTSTR = "character string"** and read user's input by macro statement **v = #GETVAL**.
- You can write e.g. the default input value by macro statement **#PUTVAL = "character string"** (before the **v = #GETVAL** statement) and if the user accepts this default value (s)he can continue by pressing only the **Enter** key.
- If the user wrote an invalid value then you can display an error message e.g. by macro statement **#MSGBOX = "character string"**.

The Value input field and the **Enter** button can be removed by macro statement **#SHOWGETVAL = 0**.

The **v = #GETVAL** statement above halts the execution of the macro until the user presses the **Enter** key.

You can set values of macro variables (**%c** and **%Rc**) "on the fly" (i.e. without halting the macro execution) by writing the value setting command (e.g. **%k=123**) to the Variable input field and clicking the **Set Variable** button.

Note that it is a good practice to read the value of this variable only in one statement in the macro (e.g. by statement **%p = %k**) because it is not possible to know where the execution of the macro is when the user clicks the **Set Variable** button.

The Variable input field and the **Set Variable** button can be removed by macro statement **#SHOWSETVAR = 0**.

## **Definition Files**

You can save the current DriveMS configuration (the definitions of all current Monitor, Trend and Macro Windows) with menu command **Config - Save Configuration**. The Frame Window title is used as file name (the length of this title can be up to 80 characters).

A previously saved DriveMS configuration can be restored by menu command **Config - Open Configuration**.

You can save the definitions of the selected Monitor Window with menu command **MonWin - Save Monitor Window** and the definitions of the selected Trend Window with menu command **TrendWin - Save Trend Window**. The window title is used for the file name (the length of this title can be up to 80 characters).

**Note:** *The data of the selected window is saved with menu command **File - Save Current Window As**.*

A previously saved Monitor Window can be added to the current configuration with menu command **MonWin - Open Monitor Window** and a Trend Window with menu command **TrendWin - Open Trend Window**.

## **Help**

Menu command **Help – Contents** displays the main index of the DriveMS Help.

Another help method is context-sensitive help, i.e. you can press the **F1** key in order to get information about the selected menu command, child window etc.

## **Exit**

When you exit DriveMS (e.g. with menu command **File - Exit**), all current configuration settings of all current Monitor, Trend and Macro Windows are always saved into the `AMCTOOL.ATC` file in the DriveMS directory (if this file already exists it is overwritten).

During the next startup the settings of this file are automatically copied to the initial configuration settings of the DriveMS program.

### **Save Current Window As**

Using this command you can save the data of the selected window to a file.

You can later e.g. import this file into the document you are working with.

**Note:** The definitions of the selected window are saved/restored using the **Save/Open** commands in the **MonWin** and **TrendWin** menus.

### **Print Current Window**

Using this command you can print the graphs of the selected **Trend Window**.

### **Display Trend Text File**

Using this command you can display the content of a previously saved trend file (the trends must have been saved in the **text** format, not in the graph format).

This command creates a new Trend Window based on the information in the saved trend text file. You can scroll and scale the trends in this new Trend Window (and even start a new trending, if needed).

### **Display Recorder File**

Using this command you can display the content of a previously saved recorder file.

When you have selected the recorder file then you can select the recorder items (1...6 items) for display.

This command creates a new Trend Window based on the information in the saved recorder file. You can scroll and scale the trends in this new Trend Window (and even start a new trending, if needed).

### **Current Par DEF File**

This command displays the name and date of the parameter definition file that is currently in use.

This command is grayed out if no parameter definition file is selected.

### **Select Par DEF File**

By this command you can select the parameter definition file (\*.DEF) that corresponds to the type of the connected drive(s).

DriveMS uses the parameter definition files of the *DMS* program. The name of the selected parameter definition file is saved to the configuration file when you save configuration using **Config - Save Configuration**.



**Configuration File  
Operations**

**Monitor Window**

**File Operations**

**Trend Window File  
Operations**

The current DriveMS configuration and/or the definitions of the selected Monitor or Trend Window are saved/restored using the **Save/Open** commands in the **Config**, **MonWin** and **TrendWin** menus. These commands use window titles as file names (max length 80 characters).

The **File Operations** commands show the relationship between the above mentioned long "virtual" file names of **Save/Open** and the short (normally invisible) "real" DOS filenames (8+3 characters, generated automatically by DriveMS). You can delete, rename and/or copy these DOS files.

**Exit**

When you exit DriveMS, all configuration settings of all current Monitor, Trend and Macro Windows are always saved into the `AMCTOOL.ATC` file in the DriveMS directory (if this file already exists it is overwritten).

During the next startup the settings of this file are automatically copied to the initial configuration settings of the DriveMS program.

- Cut*** This command copies the selected Macro Window text to the clipboard and removes the text from the screen. You can now paste it into another location of the macro you are working with (or into another Macro Window).
- Copy*** This command copies the selected Macro Window text to the clipboard. You can now paste it into another location of the macro you are working with (or into another Macro Window).
- Paste*** This command inserts the previously copied (or cut) text into the selected location of the macro you are working with.
- Delete*** This command removes the selected Macro Window text from the screen (or the next character of the window if no text selected).

### **Change Default Target**

You can change the Default Target with this command. The COM port and SSPC channel numbers of the Default Target are shown at the end of the title line of the Frame Window when the communication is working.

**Note:** *If the Default Target goes down then the whole DriveMS communication stops. Failure in one or more other targets does not prevent the communication with the working targets (if the failed target comes back then DriveMS automatically starts to communicate with it).*

### **Open Control Panel**

This command opens the Control Panel Window (see Chapter 3, section *Control Panel*).

### **Open EEPROM Parameter Window**

This command opens the EEPROM Parameter Window (see Chapter 3, section *EEPROM Parameter Window*).

### **Enable Communication**

This command enables the communication with the target(s).

### **Disable Communication**

This command disables the communication with the target(s).

**Note:** *The communication is always disabled when DriveMS is minimized (iconic).*

### **Comm Statistics**

This command displays communication statistics (cumulative values since the startup of the DriveMS and since the opening of this statistics box).

## Chapter 7 - Config Menu

---

### **New Configuration**

Using this command, you can create a new configuration.

**Note:** *All Monitor, Trend and Macro Windows of the current configuration will be closed!*

### **Change Title**

Using this command you can change the Frame Window title of the current configuration (max 80 characters at the top line). If you save the definitions of this configuration (see the **Save Configuration** command below) then this title is used as the file name of the saved file.

### **Open Configuration**

Using this command you can restore a previously saved DriveMS configuration (see the **Save Configuration** command below).

### **Save Configuration**

Using this command you can save the current DriveMS configuration (all definitions of all Monitor, Trend and Macro Windows) to a file. The Frame Window title is used as the file name.

**Note:** *You can delete configuration files using menu command **File - Configuration File Operations**.*

## Chapter 8 - MonWin Menu

---

### **New Monitor Window**

Using this command you can create a new Monitor window.

You can either write a window title text of your own or select a pre-defined window title from the title list (this list has been created based on the information in the current parameter definition file; title ALL means all parameters; title EEPROM means all `TEE` parameters). If you select a window title from the title list then DriveMS fills the new Monitor window automatically with the parameters that are related to this title (if needed, you can modify the content of the new window after its creation). If you write some other window title then the new Monitor window is empty.

### **Change Window Title**

Using this command you can change the window title of the selected Monitor Window (max 80 characters). If you save the definitions of this Monitor Window (see the **Save Monitor Window** command below) then this title is used as the file name of the saved file.

### **Change Window Target**

Using this command you can change the target of the selected Monitor Window. If the Window Target is not specified as the Default Target, the COM port and SSPC channel numbers of the Window Target are shown in front of the title of the window.

### **Enable Monitoring**

This command enables the update of the item values of the selected Monitor Window.

### **Disable Monitoring**

This command disables the update of the item values of the selected Monitor Window. The text of the disabled window is grayed out. By pressing the **space bar** you can update the value of the selected item in the disabled window.

### **Open Monitor Window**

Using this command you can add a previously saved Monitor Window (see the **Save Monitor Window** command below) to the current configuration.

### **Save Monitor Window**

Using this command you can save all definitions of the selected Monitor Window to a file. The window title is used as the file name.

**Note:** You can delete window definition files using menu command **File - Monitor Window File Operations**.

### **Add Parameter**

Using this command you can add a parameter after the selected line in the active Monitor Window (or to the end of the list if no line is

selected).

The **Apply** (= **Alt + A**) button works as the **OK** button but the dialog box does not disappear and you can immediately select a new parameter.

If you want to add several parameters to the Monitor Window, first select one parameter by clicking on it in the parameter list and then

- select the other parameters by clicking on them while holding down the **Ctrl** key (if you want to select individual parameters) or
- click on the last parameter of the range while holding down the **Shift** key (if you want to select a range of parameters)

Finally click **OK** or **Apply** (= **Alt + A**).

### ***Remove Item***

This command deletes the selected line from the active Monitor Window.

### ***Change Display Mode***

Using this command you can change the display mode of the actual value of the selected item in the active Monitor Window. If display mode is *Boolean* then numeric value 0 is displayed as text `FALSE` and any other value is displayed as text `TRUE`.

### ***Define Comment***

Using this command you can add, change and/or remove one or more optional item comments in the active Monitor Window. Special comments are described in *Appendix 1*.

### ***Change Item Target***

Using this command you can change the target of the selected item. If the Item Target is not specified to be the Window Target then the COM port and SSPC channel numbers of the Item Target are shown before the name of the item.

### ***Set Item Value***

By this command (or by pressing **F5**) you can set the value of the selected item in the active Monitor Window (the current value is displayed in the value dialog box for editing).

**Note:** *You can start typing value characters without selecting this command (or pressing the **F5** key) because the value dialog box appears automatically when you have entered the first value character.*

### ***Undo Item Value Setting***

This command (or **Ctrl-F5**) undoes the previous value setting.

**Note:** *It is not possible to undo if you have changed the active child window after the value setting.*

### ***Start/Stop Recorder***

This command either displays the Value Recorder dialog box or stops the recording (see Chapter 3, section *Recording* for details).

## ***Change Line Layout***

Using this command you can specify the number of spaces (1...9) between the value text and the item name text.

**Note:** *This command changes the line layout of all items of all Monitor and Trend Windows.*

## Chapter 9 - TrendWin Menu

---

- New Trend Window** Using this command you can create a new Trend Window.
- Change Window Title** Using this command you can change the window title of the selected Trend Window (max 80 characters).  
If you save the definitions of this Trend Window (see the **Save Trend Window** command below) then this title is used as the file name of the saved file.
- Change Window Target** Using this command you can change the target of the selected Trend Window. If the Window Target is not specified to be the Default Target then the COM port and SSPC channel numbers of the Window Target are shown before the title of the window.
- Open Trend Window** Using this command you can add a previously saved Trend Window (see the **Save Trend Window** command below) to the current configuration.
- Save Trend Window** Using this command you can save all definitions of the selected Trend Window to a file. The window title is used as the file name.
- Note:** *You can delete window definition files by menu command **File - Trend Window File Operations**.*
- Parameter** Using this command (or by clicking the **Param** button) you can replace the selected item in the selected Trend Window with a parameter.
- Display Helper List** This command (or the **F7** key) displays a dialog box that contains the items of the Monitor Window with title *TrendWinHelper*.  
You create this Monitor Window and put the desired items into this Monitor Window before you start trending.
- By this dialog box you can set values of the items in the dialog box and/or copy items from the dialog box to Trend Window.
- Change Num Display Mode** Using this command you can change the numeric display mode of the actual value of the selected item in the selected Trend Window.  
If display mode is *Boolean* then numeric value 0 is displayed as text `FALSE` and any other value is displayed as text `TRUE` (the value `FALSE` is displayed as graph value 0 and `TRUE` as graph value 1).
- Change Item Target** Using this command (or by clicking the **Target** button) you can change the target of the selected item. If the Item Target is not specified as the Window Target then the COM port and SSPC



channel numbers of the Item Target are shown before the name of the item.

### **Set Item Value**

Using this command (or by pressing **F5**) you can set the value of the selected item in the selected Trend Window (the current value is displayed in the value dialog box for editing).

**Note:** *You can start typing value characters without selecting this command (or pressing the **F5** key) because the value dialog box appears automatically when you have entered the first value character.*

**Note:** *If you want to set (during trending) the value of an item that is not in the Trend Window then you can display the Helper List box by the **F7** key (or by the **List** button), select an item from Helper's item list and press the **F5** key (or click Helper's **Set Value** button). The Helper List box lists the items that are in the Monitor Window with title TrendWinHelper. You can put the desired items into this Monitor Window before you start trending.*

### **Undo Item Value Setting**

This command (or the pressing of the **Ctrl-F5** keys) undoes the previous value setting.

**Note:** *It is not possible to undo if you have changed the active child window after the value setting.*

### **Change Sample Interval**

Using this command (or by clicking the **Interval** button) you can set the sampling interval (in milliseconds). The minimum value is the same as the number of selected graphs multiplied by 50.

### **Change Buffer Size**

Using this command you can change the size of the trend buffer (see Chapter 3, section *Trend Buffer* for details).

### **Start/Stop Trending**

This command (or the **F4** key) starts (or stops) the trending. You can change item definitions and selections, sample interval and Y values during the trending.

### **Set Trig Condition**

Using this command you can define a triggering condition. "Black value" means a value of the first (black) graph and "Red value" means a value of the second (red) graph. If you have defined a triggering condition and this condition is met during trending then the trending stops automatically after the "Sample Count after Trig".

### **Clear Graph Area**

This command clears the trend graph area (trending must be stopped).

## **Mouse and Keyboard Operations**

You can select an item in the item list box using the **up** and **down keys** or by clicking on an **item name text**.

By clicking on the **top graph Y value text** you can set a new maximum Y value.

By clicking on the **middle graph Y value text** you can set a new offset Y value.

By clicking on the **bottom graph Y value text** you can set a new minimum Y value.

## **Vertical Scrolling and Scaling**

**Note:** *The increment in the following operations is half of current area height.*

By holding down the **Alt** key and pressing the **up** or **down key** you can move the selected graph up or down.

By holding down the **Shift** key and pressing the **up** or **down key** you can change the value of the top graph Y value text.

By holding down the **Ctrl** key and pressing the **up** or **down key** you can change the value of the bottom graph Y value text.

## **Horizontal Scrolling and Scaling**

**Note:** *Trending must be stopped and the trend buffer defined.*

By holding down the **Alt** key and pressing the **right** or **left key** you can move the graphs to the right or to the left (the move length is half of graph area width).

By holding down the **Shift** key and pressing the **right** or **left key** you can compress or expand the graphs (compress/expand ratio is 10).

By holding down the **Ctrl** key and pressing the **right** or **left key** you can compress or expand the graphs (compress/expand ratio is 2).

## Chapter 10 - MacroWin Menu

---

See also the commands in the **Edit Menu** (Chapter 5).

### **New Macro Window**

This command creates a new (empty) Macro Window.

### **Open Macro**

This command restores a previously saved macro. The name of the opened file is displayed as the title of the Macro Window.

**Note:** *You can also open a previously saved Monitor Window data file (see Chapter 3, section Macros).*

### **Save Macro**

This command saves the macro text of the selected Macro Window to a file whose name is the title of the Macro Window.

### **Save Macro As**

This command saves the macro text of the selected Macro Window to an user-specified file. The name of the file is displayed as the title of the Macro Window.

### **Execute Macro**

This command (or the **F9** key) starts the execution of the macro of the selected Macro Window.

The Macro Execution Window is displayed on the screen during the execution of the macro and you can create a simple user interface by using this window.

It is possible to read from one file and to write to one file during the execution of a macro by macro statements `#FILENAMEIN = "filename", #FILENAMEOUT = "filename", V = #FILEIN, #FILEINRESET` and `#FILEOUT = ....`

You can create a chain of macros by using macro statement `#GOTOMACRO = "macrofilename"`.

During the execution of some macro statements (e.g. wait statements) DriveMS can update numeric values of items in Monitor and Trend Windows.

You can stop the execution of the macro by pressing the **Esc** key.

### **Execute Selected Lines**

This command starts the execution of the selected macro statement lines of the selected Macro Window.

The Macro Execution Window is displayed on the screen during the execution of the macro and you can create a simple user interface by using this window.

It is possible to read from one file and to write to one file during the execution of a macro by macro statements `#FILENAMEIN = "filename"`, `#FILENAMEOUT = "filename"`, `V = #FILEIN`, `#FILEINRESET` and `#FILEOUT = ....`

You can create a chain of macros by using macro statement `#GOTOMACRO = "macrofilename"`.

During the execution of some macro statements (e.g. wait statements) DriveMS can update numeric values of items in Monitor and Trend Windows.

You can stop the execution of the macro by pressing the **Esc** key.

## Chapter 11 - DLogWin Menu

---

See also Chapter 3, section *Data Logger Window*.

### ***New Data Logger Window***

This command creates a new (empty) Data Logger Window.

### ***Change Window Title***

Using this command you can change the window title of the selected Data Logger Window (max 80 characters).

### ***Read Data Logger Info***

Using this command you can read and display the the values of TREND\_IVAL, TREND1, TREND2, TREND3, TREND4, TREND5, TREND6, TREND\_TRIG and TRIGCOUNT.

### ***Initialize Data Logger***

Using this command you can set the values of TREND\_IVAL, TREND1, TREND2, TREND3, TREND4, TREND5, TREND6 and TREND\_TRIG.

### ***Data Logger Control***

Using this command you can manually trigger the data logger i.e. set the value of TREND\_SAV to 1.

### ***Upload Data Logger Samples***

Using this command you can upload the collected samples (100 samples from TREND1BUFFER, TREND2BUFFER, TREND3BUFFER, TREND4BUFFER, TREND5BUFFER and TREND6BUFFER).

**Note:** *If needed, you can read the samples of TREND7BUFFER (or TREND8BUFFER) by macro RDTREND7.MAC (or RDTREND8.MAC) to disk file TREND7.TXT (or TREND8.TXT). These macros are in the DriveMS directory.*

### ***Numeric Display of Samples***

Using this command you can display the uploaded sample values in numeric form.

## **Chapter 12 - Windows Menu**

---

<b><i>Tile</i></b>	This command tiles the child windows.
<b><i>Cascade</i></b>	This command cascades the child windows.
<b><i>Arrange Icons</i></b>	This command arranges the iconic child windows (if any).
<b><i>Close All</i></b>	This command closes all child windows.

## Chapter 13 - Help Menu

---

### **Contents**

This command displays the main index of the DriveMS Help.

**Note:** *Instead of this menu command you can press the **F1** key in order to get information about the selected menu command, child window etc.*

### **About DriveMS**

This command displays the DriveMS information box.

# Chapter 14 - Appendices

## Appendix 1

### Special Comments

A special comment is a comment that starts with an user-specified definition string. DriveMS reads and interprets the definition strings of special comments.

The format of a special comment is as follows:

```
[definition]comment
```

where: *definition* = definition string  
*comment* = optional text string

**Note:** No space characters are allowed before the "]" character!

The allowable definition string formats are as follows:

Format	Effect
=nnn	Item line text is red if item's value is equal to <i>nnn</i>
==nnn	Item line text is red if item's value is equal to <i>nnn</i>
!=nnn	Item line text is red if item's value is not equal to <i>nnn</i>
>nnn	Item line text is red if item's value is greater than <i>nnn</i>
>=nnn	Item line text is red if item's value is greater or equal than <i>nnn</i>
<nnn	Item line text is red if item's value is lesser than <i>nnn</i>
<=nnn	Item line text is red if item's value is lesser or equal than <i>nnn</i>
&nnn	Item line text is red if item's value AND <i>nnn</i> is not zero

### Value Type Interpretation

If the value string *nnn* starts with the character "+" (or "-") then it is assumed to be a signed value.

If the value string *nnn* ends with the character "h" then it is assumed to be a hex value.

Otherwise the value string *nnn* is assumed to be an unsigned value.



## Appendix 2

---

### Macro Language

#### Summary of statements:

```
X = C
X = Y
X = Y oper C
X = Y oper Z

#IF (X comp C)
#IF (X comp Y)
#ENDIF

#WHILE (X comp C)
#WHILE (X comp Y)
#ENDWHILE

#TARGET = CV, CV

#WAIT = CV

#GOTOMACRO = "macrofilename"

#FILENAMEIN = "filename"
#FILENAMEOUT = "filename"
V = #FILEIN
#FILEINRESET
#FILEOUT = V
#FILEOUT = "character string"
#FILEOUT = #FILEIN
#FILEOUT = #DATETIME
#FILEOUT = #GETVAL
#PUTSTR = V
#PUTSTR = "character string"
#PUTSTR = #FILEIN
#PUTVAL = V
#PUTVAL = "character string"
#PUTVAL = #FILEIN
V = #GETVAL
#MSGBOX = "character string"
#MSGBOX = #FILEIN
#SHOWGETVAL = C
#SHOWSETVAR = C

#EXIT
```

*Assignment statements:*

```
X = C
X = Y
X = Y oper C
X = Y oper Z
```

*Decision statements:*

```
#IF (X comp C)
#IF (X comp Y)
#ENDIF
```

*Loop statements:*

```
#WHILE (X comp C)
#WHILE (X comp Y)
#ENDWHILE
```

*Target statement:*

```
#TARGET = CV, CV ; COM port, SSPC channel
```

All subsequent statements (up to the next **#TARGET** statement, if any) will use this target.  
Statements before the first **#TARGET** statement (if any) use the Default Target.

*Wait statement:*

```
#WAIT = CV ; wait time (1...60000 msec)
```

During the execution of a **#WAIT** statement DriveMS updates numeric values of items in Monitor and Trend Windows.

*Macro chaining statement:*

**#GOTOMACRO = "macrofilename"**

Stops the execution of the current macro, closes the current Macro Window, opens a new Macro Window with macro `macrofilename` and starts this new macro.

*File and user interface statements:*

```
#FILENAMEIN = "filename"  
#FILENAMEOUT = "filename"
```

These statements specify the names of the input and output files. **No** macro statements are allowed before these statements. The input and output files contain character lines. Max line length in the input file is 100 characters. The input and output files are opened automatically when the execution of the macro is started and closed when the execution of the macro is stopped. If the output file already exists when the execution of the macro is started then it is overwritten by the new output file. If the **#FILENAMEIN** statement is missing then the default name of the input file is `MACRO . IN`. If the **#FILENAMEOUT** statement is missing then the default name of the output file is `MACRO . OUT`.

```
V = #FILEIN
```

Reads a character line from the input file, converts the read characters to a numeric value and puts this value to variable `v`. The conversion stops at the first non-numeric character.

```
#FILEINRESET
```

Moves the read position of the input file back to the beginning of the file.

```
#FILEOUT = V
```

Converts the variable `v` to a character string and writes this string to the output file.

```
#FILEOUT = "character string"
```

Writes the `character string` to the output file. If the string is empty (i.e. `" "`) then a CR/LF character pair is written to the output file.

**#FILEOUT = #FILEIN**

Reads a character line from the input file and writes the read line to the output file.

If the read line is empty then a CR/LF character pair is written to the output file.

**#FILEOUT = #DATETIME**

Writes the current date and time (e.g. 12/27/01 13:28:57) to the output file.

**#FILEOUT = #GETVAL**

Waits until the user has clicked the **Enter** button of the Macro Execution Window and then this statement reads the character string from the Value input field of the Macro Execution Window and finally, writes the read string to the output file.

If the read string is empty then a CR/LF character pair is written to the output file.

During the execution of this statement DriveMS updates numeric values of items in Monitor and Trend Windows.

**#PUTSTR = v**

Converts the variable *v* to a character string and appends this string to the content of the String area of the Macro Execution Window.

**#PUTSTR = "character string"**

Appends the *character string* to the content of the String area of the Macro Execution Window.

Every vertical bar character (|) in the string (if any) explicitly starts a new line in the String area.

If the string is empty (i.e. " ") then the String area is cleared.

**#PUTSTR = #FILEIN**

Reads a character line from the input file and appends the read line to the content of the String area of the Macro Execution Window. Every vertical bar character (|) in the read line (if any) explicitly starts a new line in the String area. If the read line is empty then the String area is cleared.

**#PUTVAL = v**

Converts the variable *v* to a character string and appends this string to the content of the Value input field of the Macro Execution Window.

**#PUTVAL = "character string"**

Appends the *character string* to the content of the Value input field of the Macro Execution Window. If the string is empty (i.e. " ") then the Value input field is cleared.

**#PUTVAL = #FILEIN**

Reads a character line from the input file and appends the read line to the content of the Value input field of the Macro Execution Window. If the read line is empty then the Value input field is cleared.

**v = #GETVAL**

Waits until the user has clicked the **Enter** button of the Macro Execution Window and then this statement reads the character string from the Value input field of the Macro Execution Window, converts the read characters to a numeric value and puts this value to variable *v*. The conversion stops at the first non-numeric character. During the execution of this statement DriveMS updates numeric values of items in Monitor and Trend Windows.

**#MSGBOX = "character string"**

Displays a message box with the `character string`.  
During the execution of this statement DriveMS updates numeric values of items in Monitor and Trend Windows.  
The execution of the macro continues when the user has clicked the **OK** button of the message box.

**#MSGBOX = #FILEIN**

Reads a character line from the input file and displays a message box with the read line.  
During the execution of this statement DriveMS updates numeric values of items in Monitor and Trend Windows.  
The execution of the macro continues when the user has clicked the **OK** button of the message box.

**#SHOWGETVAL = C**

Hides the Value area components of the Macro Execution Window (if the value of the constant `C` is zero) or shows these components (if the value of the constant `C` is non-zero).  
When a macro is started these components are displayed by default.

**#SHOWSETVAR = C**

Hides the Variable area components of the Macro Execution Window (if the value of the constant `C` is zero) or shows these components (if the value of the constant `C` is non-zero).  
When a macro is started these components are displayed by default.

*Exit statement:*

**#EXIT**

Stops the execution of the macro program.

*Comment statement:*

**; Comment text**

**Notes about the  
Macro  
Statements**

**x, y** and **z** = Variable ID (see below) or Parameter ID (nn.nn)

Variable ID = %**c** (int var, where **c** is char a...z or A...Z)  
 %**Rc** (real var, where **c** is char a...z or A...Z)  
 The initial value of all variables is zero.

**c** = signed or hex constant.  
 Hex constants must be ended with character 'h' (i.e. xxh).

**cv** = unsigned constant or integer variable (%**c**)

**v** = integer or real variable (%**c** or %**Rc**)

**oper** = signed operation: +, -, \* or /  
 integer operation: & (AND) or | (OR)

**comp** = signed comparison: =, ==, !=, <, <=, > or >=

Parameter ID (nn.nn) must be prefixed by character 'P' (i.e. Pnn.nn)  
 in order to avoid ambiguity with a constat value in the following  
 statements:

```
X = Y
X = Y oper Z
#IF (X comp Y)
#WHILE (X comp Y)
```

The case of characters **P** (in Parameter ID) and **R** (in Variable ID) is  
 not significant but the case of character **c** (in Variable ID) is  
 significant.

Spaces and tabs are insignificant.



**Example**

```
; Triangle waveform generator.
; Runs forever (stop e.g. by Esc).
; Parameter 0.27 used in this example.
; If this parameter is in a MonWin then you
; can see its value during the execution.
;
%D = 1      ; Direction (1 = up, -1 = down)
;
0.27 = 0    ; Init value of param 0.27 is zero
;
#WHILE (%z = 0)      ; Loop forever
  %b = %b + %D
  #IF (%b > 100)
    %D = -1          ; Change direction
  #ENDIF
  #IF (%b < -100)
    %D = 1          ; Change direction
  #ENDIF
  %p = %D * 100
  0.27 = 0.27 + %p
  #WAIT = 100       ; Enables MonWin display
#ENDWHILE
```

## Appendix 3

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### Remote Operation

In the remote mode of DriveMS there are actually two separate programs that communicate with each other via a TCP/IP network:

- The DriveMS program (`DRIVEMS.EXE`) that runs in a remote PC. This is called a client program.
- The server program runs in the PC that is connected to the drive(s) via PC's COM ports and SSPC devices. This program (`DMSsrvr.exe`) is included with the DriveMS software package.

**Note:** *A client can use the server only if no other client is using it.*

The remote operation may not work if the network between the server and the client is too slow.

### Installation of the Server Program (`DMSsrvr.exe`)

Install DriveMS into the PC that is connected to the drives (if not yet installed). This PC must be connected to a TCP/IP network, too.

Start the `DMSsrvr.exe` program in the DriveMS directory (e.g. by double-clicking its name).

The DriveMS directory is specified during the installation of DriveMS and the default directory name is

`C:\ProgramFiles\DriveWare\DriveMSx.x`

Write down the IP address of this server PC (e.g. `121.111.1.1`)

**Note:** *`DMSsrvr.exe` and the DriveMS program `DRIVEMS.EXE` do not work at the same time in the same PC.*

### Installation of the DriveMS Program to a Remote PC

Install DriveMS into a PC that connected to a TCP/IP network (if not yet installed).

Create a new directory

Copy all files of the DriveMS directory to this new directory

Create an icon for the `DRIVEMS.EXE` program in the new directory.

Copy the `SAMIprot.dll` file from the Remote DriveMS directory (under the DriveMS directory) to the new directory. This file overwrites the existing file with the same name.

Start the *Notepad* program, write the IP address of the PC where the `DMSserver.exe` is (e.g. `121.111.1.1`) to the screen of the

*Notepad* program and finally save this text line (= IP address) to file `SERV_IP.TXT` (to the new directory)

Start the execution of DriveMS in the remote PC by double-clicking the new icon

**Note:** *With a slow network the execution time of DriveMS operations can be (much) longer than in the local use.*



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**ABB Oy**  
Drives  
P.O.Box 184  
FIN-00381 HELSINKI  
FINLAND  
Telephone + 358 10 22 2000  
Telefax + 358 10 22 22681