MotoWare
User's Manual

Copyrigt 1995, JVL Industri Elektronik A/S, Blokken 42 DK-3460 Birkerød, Denmark

Version 2.x

JVL Industri Elektronik A/S

Table of Contents

1   Introduction

MotoWare is a Windows program for controlling your Motor Controller. You can create, edit and save controller programs. It is possible to open and edit several programs at a time. Each program is saved in a document (file) together with the controller type, address and checksum selection. Thus you can simply select the send button and the required program is transferred to the specified controller in the correct format.

MotoWare also gives you the opportunity for on-line communication with the Motor Controller. Select the on-line button and the on-line editor appears. Simply key-in your command string and press <Enter> and the program will send the information in the right format. The editor collects all information sent back via the serial interface.

If you have a DMC10 DC-servo or a AMC1x AC-servo Controller, MotoWare helps you to set-up the controller. You can make a collection of parameter sets, and send the selected set to the Controller. It is also easy to retrieve the current set-up of the controller; simply select a command button.

Through out this Manual the word "Motor Controller" is used as common word for the different types of Controllers, by which you can communicate with using Moto-Ware. Following types of controllers can be selected:

• Step Motor Controllers like SMC1x and SMC2x series
• DMC10 DC-Servo Controller
• AMC1xx AC-Servo Controllers serie
• Trimatic Controllers CSDU2100 and CSDU200 series
• SMI30 Servo/step Motor Indexer.

If you have a AMC1x AC-servo Controller it is possible to obtain a Velocity profile and display it graphically. Together with the Velocity profile you can select to display position error, Torque or Power consumption.

1.1   Installing MotoWare

1.1.1   System Requirements
MotoWare requires the following minimum configuration:

- A PC running Windows 3.11 or Windows95
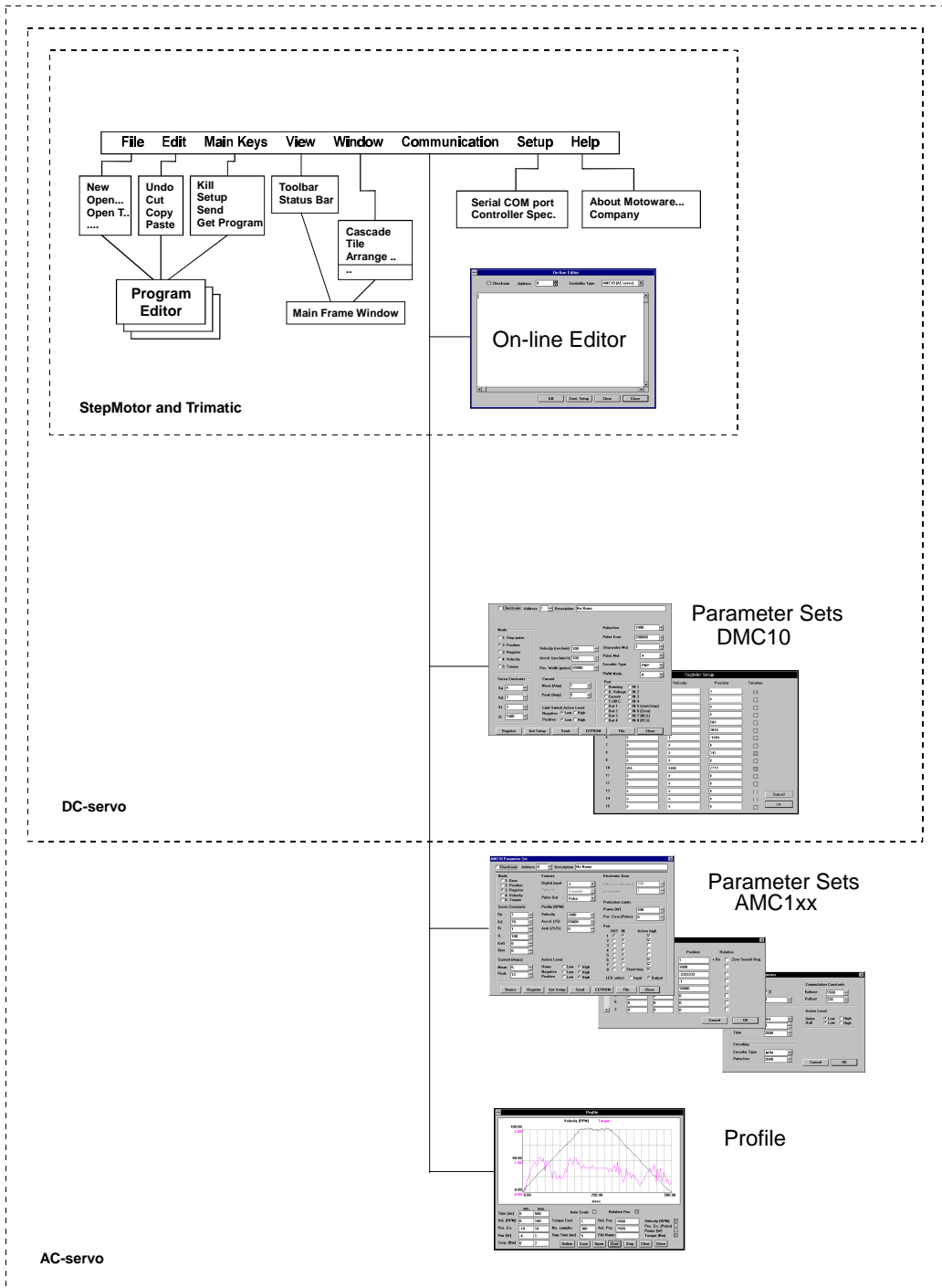- One free serial COM port
- A hard disk with 2 Mbytes free space

1.1.2   Installing MotoWare
Installing MotoWare in a directory

1. Select the File Manager Icon
2 Insert the MotoWare diskette in drive A: (or B:)
3. Select the install.exe program from the A: (or B:) drive
4. Double click the mouse button or press [Enter].
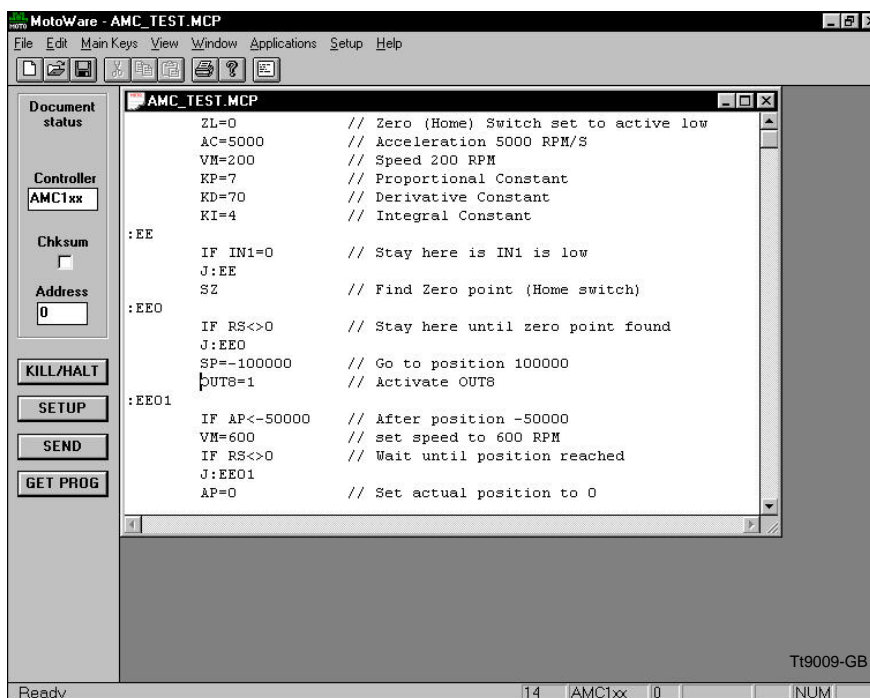
MotoWare will be installed.

2   Overview

2.1　　　Main Frame window

When MotoWare runs, the Main Frame window displays a menu bar, a toolbar and a status bar, as illustrated below. The Main Frame window also contains document views if any documents are open. At the left side of the Main Frame window some buttons are located. These buttons are linked directly to the document view and will only be enabled when a document is open. The following sections describe the items of the Main Frame window.

```
MotoWare - AMC_TEST.MCP                                    _ B X
File  Edit  Main Keys  View  Window  Applications  Setup  Help

AMC_TEST.MCP                                          _ D X
            ZL=0              // Zero (Home) Switch set to active low
            AC=5000           // Acceleration 5000 RPM/S
            VM=200            // Speed 200 RPM
            KP=7              // Proportional Constant
            KD=70             // Derivative Constant
            KI=4              // Integral Constant
:EE
            IF IN1=0          // Stay here is IN1 is low
            J:EE
            SZ                // Find Zero point (Home switch)
:EE0
            IF RS<>0          // Stay here until zero point found
            J:EE0
            SP=-100000        // Go to position 100000
            OUT8=1            // Activate OUT8
:EE01
            IF AP<-50000      // After position -50000
            VM=600            // set speed to 600 RPM
            IF RS<>0          // Wait until position reached
            J:EE01
            AP=0              // Set actual position to 0
```

Document status
Controller
AMC1xx
Chksum
Address
0
KILL/HALT
SETUP
SEND
GET PROG

Tt9009-GB

Ready　　　　　　　　　　　　　　14　AMC1xx　0　　　NUM

2.1.1　　Document Status

The Document field on the left of the Main Frame Window will at all time display the set-up for the active document. Changes in the set-up can be done by selecting the [SETUP] button and at set-up dialog appears.

The [KILL/HALL] button is used to stop an ongoing motion and a running program. Works for AMC12 and Step Motor Controllers only. For the Step Motor Controllers the caret will be placed at the program line where the program was stopped.

The [SEND] button is used when you want to send the Program to the controller. Remember to select the right controller type, address and checksum status.
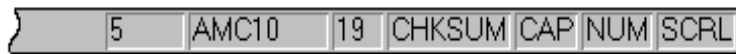
The [GET PROG] button will read the program saved in the controller. Remember to open a new empty document first. Will for all controllers execpt AMC10, AMC11 and DMC10.

2.1   Main Frame window

2.1.2   Status Bar

The Status Bar is located at the bottom of the Mainframe Window. The Status Bar gives information on the status of the window, or command information will be displayed. At the right side of the bar, seven indicators are located.

5	Indicates the caret is located in line 5 of the active document.
AMC10	Indicates that a Controller of the type AMC10 is selected. This selection is made in the **Setup - Controller Spec.** menu. This selection is used as default when opening new documents and when you open the On-line editor. Before the On-line editor is opened MotoWare automatically checks that the selected controller, address and use of checksum are correct.
19	Indicates that the default address is 19. This selection is made together with the controller type, see AMC10 above.
CHKSUM	Indicates that checksum checking are used on the command strings. This selection is made together with the controller type, see AMC10 above.CAPIndicates that the Caps Lock key has been activated.
NUM	Indicates that the numeric keypad is locked for entering of numbers.
SCRL	Indicates that the Scroll Lock key has been activated.

2.1.3   Menu Bar

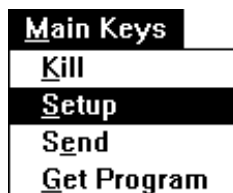|	
File	Menu for opening, closing files etc.
Edit	This menu contains menu items to help you edit your document (such as copy, cut, etc.)

2.1   Main Frame window

Main Keys This menu lists all of the same command buttons located at the left side of the Main Frame window. This menu is provided to enable MotoWare to be used without a mouse.

```
Main Keys
  Kill
  Setup
  Send
  Get Program
```

View   This menu is used to display or hide the toolbar or the status bar.

```
View
 √Toolbar
 √Status Bar
```

Window   Document views can appear on top of each other, side by side, or they can be iconised. This menu contains these features.

```
Window
  Cascade
  Tile
  Arrange Icons
 √1 TRIMATIC.MCP
```
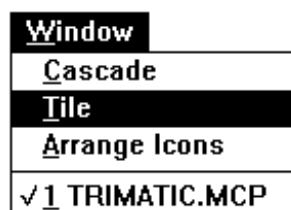
Applications This menu contain three menu items. *On-line editor* is a dialog for communicating on-line with the Motor Controller. *Parameter Sets* gives you the opportunity to create, copy, send etc. a number of parameter sets for the DMC10 DC-servo or the AMC1x AC-servo Controllers. And last the *Profile* menu item. When you have a AMC1x AC-servo select this menu item to generate Velocity profiles graphically.

```
Applications
  On-line Editor
  Parameter Sets
  Profile
```
Tt9016-GB

2.1 Main Frame window

Set-up   Communication between the Motor Controller and MotoWare is achieved via one of the PC's serial COM ports. The Serial COM port dialog can be used to select the COM port used. Note ! baudrate etc. cannot be changed via the dialog. If more than one controller is connected to the interface, the controllers must have different addresses. Communication can also be verified by the use of a checksum. Also, you must specify the correct controller. Open the Controller Spec. dialog to select address, checksum and controller type.

Help   The About MotoWare menu item gives you information on the MotoWare program. Select the Company item to get JVL Industri Elektronik's address.
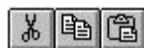

The five first menus (File, Edit, Main Keys, View and Window) are related to the document editor in the Main Frame window. See the following document sections.

2.1.4   Toolbar

   File (document) buttons to create a new file, open or save a file.

   Edit buttons to cut, copy and paste text.

   Print and help button

   By choosing this button, the on-line editor dialog will appear.

3   Programs

3.1 Creating Controller Programs

3.1.1 Program Editor

The Main Frame contains the program editor. You can make your own programs for the motor controllers. Each program is saved in a separate document file. To edit a program you must open a document view, either by selecting new or open from the file menu. Text in a document view can be edited just like in an ordinary text editor. It is possible to have more than one document open at a time. Each document is displayed in a separate view. Text can easily be copied from one view to another via the clipboard (copy, cut, paste).

To send a program from an active document view to the Motor Controller, proceed as follows:

Select the Set-up button and a set-up dialog appears. Select the required Controller type, address and checksum.
Choose the Send button.

The program will now be sent.

3.1.2 Step Motor Controller Programs

If the selected controller is a Step Motor controller, the command **PO** (program) is inserted automatically at the beginning of the program and the command **E** appended to the end of the command stream. Instead of line numbers in jump commands, labels can be used. MotoWare converts labels into line numbers when the program is sent to the controller.

Example:
```
            R40        // acceleration 40 steps
            T2000      // top speed 2000 steps
     :test1
            C1         // clear output 1
            A1         // activate output 1
            J:test1
```

Choose the Send button and the following will be sent

```
            PO
            R40
            T2000

            C1
            A1
            J2
            E
```

3.1.3 DMC10 DC-servo

If the selected controller is a DMC10 DC-servo, the text is sent as it appears.

3.1 Creating Controller Programs

3.1.4 AMC1O/11 AC-servo Controller Programs

AMC10x and AMC11x are not programmable. If you try to send a program to one of these controllers you will get an *E4: Instruction does not exist* error.

3.1.5 AMC12 AC-servo Controller Programs

If the selected controller is a Step Motor controller, the command **PROGRAM** is inserted automatically at the beginning of the program and the command **EXIT** appended to the end of the command stream. Instead of line numbers in jump commands, labels can be used. MotoWare converts labels into line numbers when the program is sent to the controller.

Example:

```
        AC=1000          // acceleration 1000 RMP/S
        VM=500           // velocity 500 RPM
:test1

        IF AP>20000      // if actual position is higher than 20000
        OUT5=1           // set OUT 5 high
        J:test1          // jump to :test1
```

Choose the Send button and the following will be sent

```
        PROGRAM
        AC=1000
        VM=500

        IF AP>20000
        OUT5=1
        J2
        EXIT
```

For more details about programming consult the AMC12x User Manual LB0039-xx.

3.1.6 Trimatic Controller Programs

If the selected controller is a controller of the Trimatic type, the command **E!** (Erase program and set to default) is inserted automatically at the beginning of the command stream. After the program have been sent, open the on-line editor to execute the program in the controller.

3.1.7 Comments

It is possible to insert comments in your program. Insert // and the rest of the line is regarded as a comment and will therefore not be sent to the controller. For Step Motor controllers it is also possible to use a semi-colon ; as a separator for comments. This enables programs written in EDITOR2 to be imported directly via the **Open Text File...** Menu item in the **File** Menu.
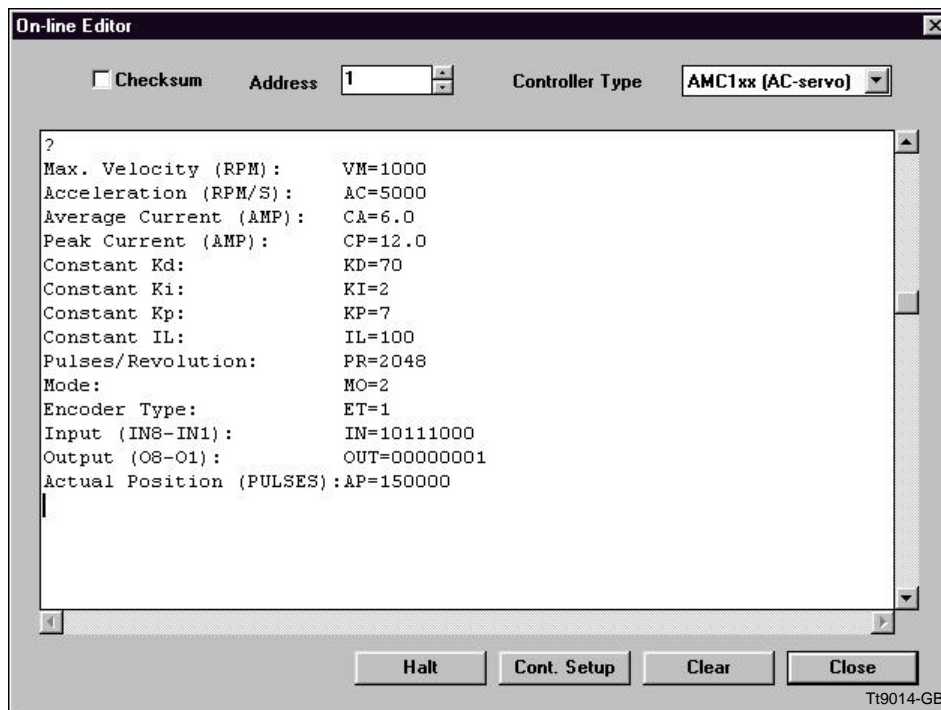
4   Applications

4.1 On-line Editor

4.1.1 Using the On-line Editor

The on-line editor works like a terminal program. Enter your command line and press <Enter>, and the command string is sent to the controller. If addressing is used, the address is inserted at the beginning of the string, and if selected the checksum is appended. If the on-line editor is communicating with a DMC10 DC-servo or AMC1x AC-servo controller, checksum selection is changed automatically when checksum field are changed.

The on-line editor buttons:

Cont. Set-up: If a DMC10 DC-servo controller is selected and this button is chosen, a set-up dialog appears. The set-up dialog will help you to change the set-up of the controller. The set-up dialog is the same as the DMC10 Parameter Set Dialog dialog. If a AMC1x AC-servo controller is selected the AMC1x Parameter Set Dialog will appear instead.

Clear: Clear the editor window.

OK: Close the editor.

Halt: Appears when a Trimatic controller is selected. This button stops a running program in the controller.

Kill: Appears when a Step Motor controller is selected. This button stops a running program in the controller.

On-line Editor

```
?
Max. Velocity (RPM):      VM=1000
Acceleration (RPM/S):     AC=5000
Average Current (AMP):    CA=6.0
Peak Current (AMP):       CP=12.0
Constant Kd:              KD=70
Constant Ki:              KI=2
Constant Kp:              KP=7
Constant IL:              IL=100
Pulses/Revolution:        PR=2048
Mode:                     MO=2
Encoder Type:             ET=1
Input (IN8-IN1):          IN=10111000
Output (O8-O1):           OUT=00000001
Actual Position (PULSES): AP=150000
```

Checksum Address 1 Controller Type AMC1xx (AC-servo)

Halt | Cont. Setup | Clear | Close

Tt9014-GB

4.2   Parameter Sets

4.2.1   Parameter Sets File Menu

Select the [File] button in the Parameter Set dialog, and the Parameter Set File Menu dialog appears. This dialog lists all the parameter sets previously created. When you first open is the list box will be empty.

Buttons in this dialog:

Delete: You can delete any entry in the list by selecting it and clicking the [Delete] button

Copy: You can duplicate a parameter set by selecting it in the list and clicking the [Copy] button. Copying is useful when you want to create a new parameter set that is only slightly different from one that already exists.

Save: To create a new parameter set, type in a file name and click the [Save] button. This produces a new parameter set with the values displayed in the parameter set dialog window.

Open: If you want to open an existing parameter set, select it in the list and then click the [Open] button. Then this dialog will be closed and the DMC10 or AMC1x Parameter Set Dialog dialog appears displaying the new values.

Cancel: If the [Cancel] button is chosen, this dialog will be closed and the DMC10 or AMC1xx Parameter Set Dialog dialog appears displaying the old values.
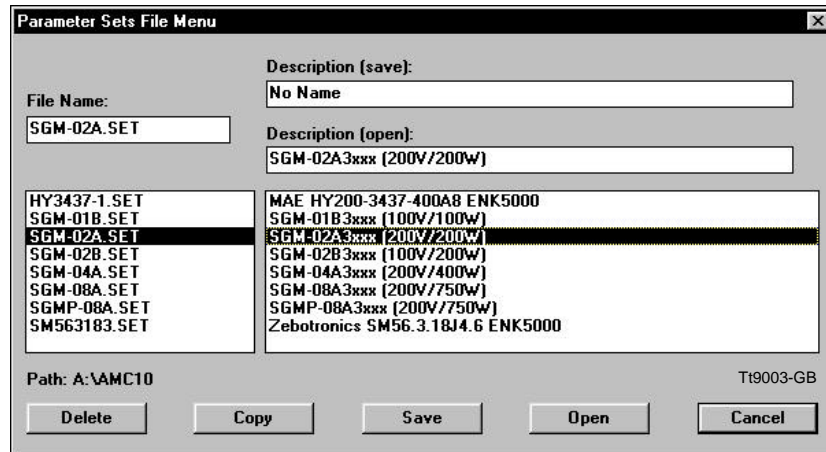
4.2 Parameter Sets

4.2.2 DMC10 Parameter Set Dialog

Select the **Communication menu** and the **Parameter Sets** item, and the DMC10 Parameter Set dialog appears if the DMC10 controller type is selected in the Main Setup dialog. The DMC10 Parameter Set Dialog dialog provides you with a very easy way to set-up your DC-servo controller. Read the DMC10 User's Manual for more information on the parameters. It is possible to send or retrieve a complete parameter set. The Port section of this dialog will automatically be updated. If no DMC10 DC-servo controller is connected, the fields will be greyed.

Buttons in this dialog:

Register: Choose this button and the register set-up dialog window appears.

Get Set-up: Get the current DMC10 DC-servo controller set-up.

Send: Send the parameter set to the DMC10 DC-servo controller.

EEPROM: Send the save in memory command to the DMC10 DC-servo controller.

File: Choose this button to open Parameter Set File Menu dialog.

Close: Closes the dialog.

4.2 Parameter Sets

4.2.3 DMC10 Register Set-up Dialog

The DMC10 DC-servo has 16 registers. Each register can be modified via this dialog window. Choose the Cancel button to close the dialog without saving any changes. Choose the OK button to save the register set-up.

Register	Acceleration	Velocity	Position	Relative
0	0	0	1	☐
1	1000	100	1000000	☐
2	0	0	2000000	☐
3	50000	333	5550000	☐
4	0	0	0	☐
5	0	1000	3000000	☐
6	0	0	0	☐
7	0	0	0	☐
8	0	0	0	☐
9	0	0	0	☐
10	0	0	0	☐
11	0	0	0	☐
12	0	0	0	☐
13	0	0	0	☐
14	0	0	0	☐
15	0	0	0	☐

Cancel   OK

Tt9015-GB

4.2   Parameter Sets

4.2.4   AMC1x Parameter Set Dialog

Select the **Communication menu** and the **Parameter Sets** item, and the AMC1x Parameter Set dialog appears if the AMC1x controller type is selected in the Main Setup dialog. The AMC1x Parameter Set Dialog provides you with a very easy way to set-up your AC-servo controller. Read the AMC1x User's Manual for more information on the parameters. It is possible to send or retrieve a complete parameter set. The Port section of this dialog will automatically be updated. If no AMC1x AC-servo controller is connected, the fields will be greyed.

Buttons in this dialog:

Basics: Vital Motor Set-up parameters are listed in a separate dialog. Click the Basics button to change Motor Parameters.

Register: Choose this button and the register set-up dialog window appears.

Get Set-up: Get the current AMC1x AC-servo controller set-up. When this button is clicked a dialog will appears and you will be asked to collect the register parameters or not. Collecting the register parameters will take about 20 seconds extra. So choose only the YES button if you using register mode (mode 3).

Send: Send the parameter set to the AMC1x AC-servo controller. When this button is clicked a dialog will appears and you will be asked to send the register parameters or not. Sending the register parameters will take about 20 seconds extra. So choose only the YES button if you using register mode (mode 3).

EEPROM: Send the save in memory command to the AMC1x AC-servo controller.

File: Choose this button to open Parameter Set File Menu dialog.

Close: Closes the dialog.

4.2 Parameter Sets

4.2.5 AMC1x Register Set-up Dialog

The AMC1x AC-servo has 64 registers. Each register can be modified via this dialog window. Choose the Cancel button to close the dialog without saving any changes. Choose the OK button to save the register set-up. Use the scrollbar on the left to view the register set-ups eight at the time.

Register	Acceleration	Velocity	Position	Relative
0	0	0	1	+ Dir ☑ Auto Search Reg.
1	3000	500	100000	☐
2	0	0	200000	☐
3	300	3000	3100000	☐
4	0	0	4100000	☐
5	1000	456	5100000	☐
6	0	0	-100000	☐
7	0	0	0	☐

AMC10 Register Setup

Cancel   OK

Tt9000-GB

Buttons in this dialog:

Cancel: Choose the Cancel button to close the dialog without saving any changes.

OK: Choose the OK button to save changes made in the register set-up.

4.2 Parameter Sets

4.2.6 AMC1x Basic Motor Parameters

Some parameters for the motor and the encoder or hall element must be set up correctly, otherwise the system will not work at all. These parameters are all collected in the Basic Motor Parameters Dialog.
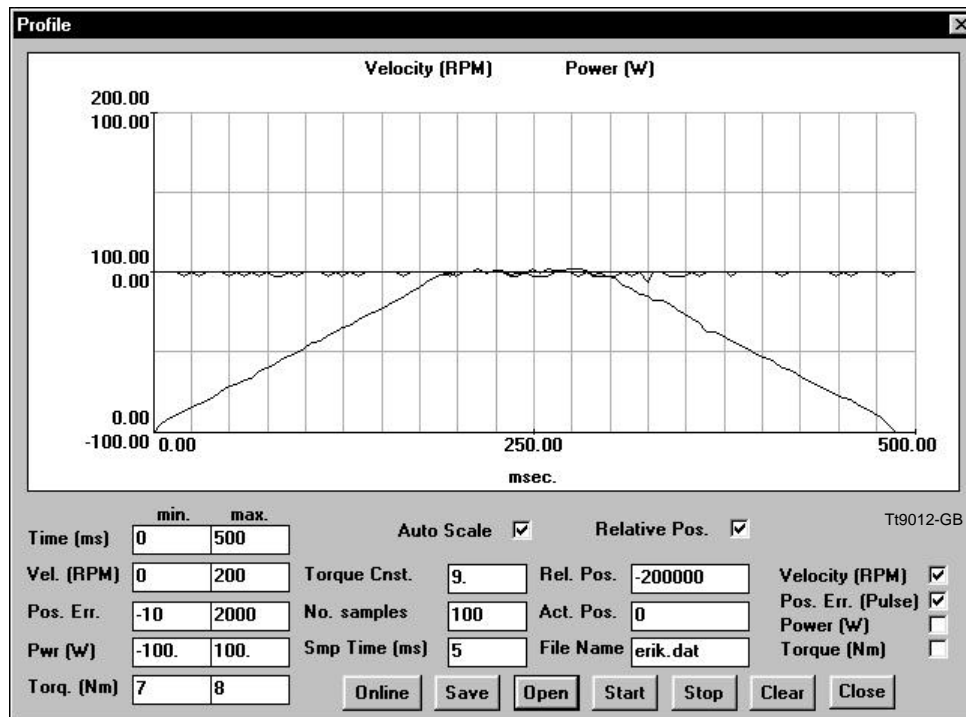
4.3   Profile Dialog

4.3.1   Profile Dialog

Select the **Communication** menu and the **Profile** menu item, and the Profile dialog will appear. If you have a AMC1x AC-servo Controller this dialog make it possible to collect and display Velocity, position error, Torque or Power consumption profiles graphically. You must select two and only two parameters to be displayed. You can set-up limits for the data to be displayed or simply check the Auto Scale check box. When you select the [Start] button motor is set to move to a absolute or a relative position depending on the status of the Relative Pos. check box.

Note that the profile can only be obtained when the Controller is in Position Mode (Mode 2), address is 0 and checksum check is not used.

Buttons in this dialog:

Online: Select this button to open the online editor. In the online editor it is easy to change the set-up of the controller. Via the online editor it is also possible to open the Controller Set-up dialog which will give you an overview on the entire set-up.

Save: It is possible to save the displayed profile in a file. Select the save button and the Save As Dialog. The just select a directory then type in the file name and click the [OK] button. The data will be saved for later use.

4.3　　　　　　Profile Dialog

Open:　　When you want to display a previously saved profile select the [Open] button. The Open File Display will appears. Select the wanted profile, click the [OK] and the profile will be displayed.

Start:　　This button starts the motor motion and the data collection. The Controller collects data while it is running. The transmission of data to the computer will be carried out after the wanted number of data has been collected. The data will be displayed automatically.

Stop:　　This button enables the user to stop the motor abruptly.

Clear:　　Select this button to clear the graph window.

Close:　　Close the dialog.
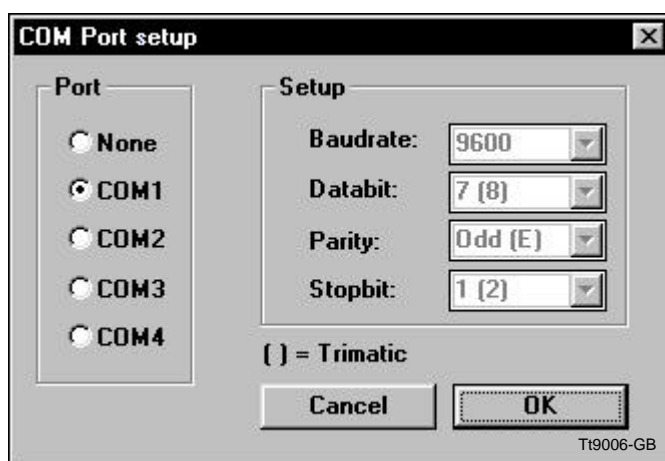
5   Set-up Menu

5.1 Serial COM port

5.1.1 Serial COM port Set-up Dialog

Select the **Setup** menu and the **Serial COM port** menu item, and the COM Port Set-up dialog will appear. The Motor Controller can be connected to one of the serial communication (COM) ports of the computer. This dialog enables a COM port to be selected for serial communication with the controller. When a selection has been made and the [OK] button is clicked, the connection will be made. The selection will be saved in the init file on the harddisk and will be used everytime you run Moto-Ware.

If the selection is not possible, e.g. another device is using the port, an error message will be displayed. Select None and then switch to the Program Manager to find out which program is occupying the port. Deselect the port within the other program.

Note that the Baudrate etc. cannot be changed; this is displayed for information only.

```
┌─ COM Port setup ──────────────────────────────[X]─┐
│ ┌─ Port ──────┐  ┌─ Setup ──────────────────────┐ │
│ │             │  │                               │ │
│ │  ○ None     │  │  Baudrate:  [9600      ▼]    │ │
│ │  ● COM1     │  │  Databit:   [7 (8)     ▼]    │ │
│ │  ○ COM2     │  │  Parity:    [Odd (E)   ▼]    │ │
│ │  ○ COM3     │  │  Stopbit:   [1 (2)     ▼]    │ │
│ │  ○ COM4     │  │                               │ │
│ │             │  │  ( ) = Trimatic               │ │
│ └─────────────┘  │  [  Cancel  ]  [    OK    ]   │ │
│                  └───────────────────────────────┘ │
│                                         Tt9006-GB  │
└────────────────────────────────────────────────────┘
```

Click the [Cancel] if you regret the change in connection.

NOTE: Remember connecting the Motor Controller to the computer !

5.2   Main Set-up

5.2.1   Main Set-up Dialog

Select the Set-up menu and the Controller Spec menu item, and the Main Set-up dialog will appear. The controller type, address and checksum status can be selected via this dialog window. When an appropriate selection has been made click the [OK] button and the selection is displayed in the Status Bar. The selection will be used when checking the controller while the on-line editor is loaded and as default when creation a new document.

Tt9010-GB
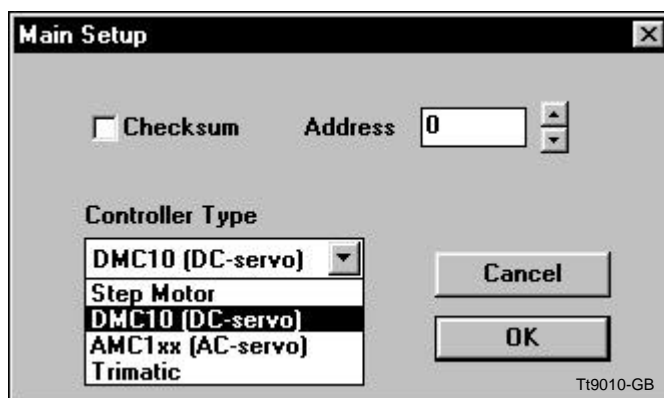
Click the [Cancel] if you regret the change in selection.