E | 5.96009.06

BAUMÜLLER

WINBASS

OPERATION SOFTWARE
FOR WINDOWS

Operating Instructions

BAUMÜLLER

WinBASS
Operation Software for Windows
Version V 2.08

Operating Instructions

Edition: 9 March 1998

5.96009.06

These operating instructions describe the operator interface for controller parameterization. They are intended to complement the Technical Description and Operation Manuals of the associated V, E or BUM 61x controllers.

BEFORE CARRYING OUT COMMISSIONING, READ AND
OBSERVE THE OPERATING INSTRUCTIONS AND
SAFETY INFORMATION

This document contains the information necessary to correctly use the products it describes. It is intended for specially trained, technically qualified personnel who are well-versed in all warnings and maintenance activities. The equipment is manufactured using state-of-the-art technology and is safe in operation. It can safely be installed and commissioned and functions without problems if you follow the safety information.

You must not carry out commissioning until you have established that the machine into which this component is to be installed complies with EU machine guidelines.

The publishing of this document invalidates all earlier editions of descriptions and operating instructions of the corresponding product. Within the scope of further-development of our products, Baumüller GmbH serve the right to change their technical data and handling.

TABLE OF CONTENTS

1 STARTING THE PROGRAM

1.1 System Requirements

Minimum Requirements:

- PC with i486 CPU

- 8 MB of RAM

- 10 MB of free hard disk space

- Windows 3.1x

Recommended Configuration:

- PC with Pentium CPU

- 16 MB or more of RAM

- 10 MB of free hard disk space

- 1 free COM port

- Windows 3.11 or Windows 95

- A colour monitor

The program works in conjunction with the following controllers:

- E-Controller with firmware X009 to X011

- E-Controller with firmware XA10

- V-Controller with firmware X002

- BUM61x with firmware X009 and X010

1.2 Software Installation

WARNING

- You must only use the program for recommended applications and in conjunction with controllers recommended by BAUMÜLLER Nürnberg GmbH or BAUMÜLLER-approved third-party devices and components.

- Safe and correct operation of the system are dependent on careful transportation, correct storage, setup and assembly and on conscientious operation and maintenance.

- Installation may only be carried out by qualified personnel.

The user interface runs under Windows 3.1x and above and Windows 95.

- Insert disk 1 containing the WinBASS Windows user interface in a floppy disk drive.
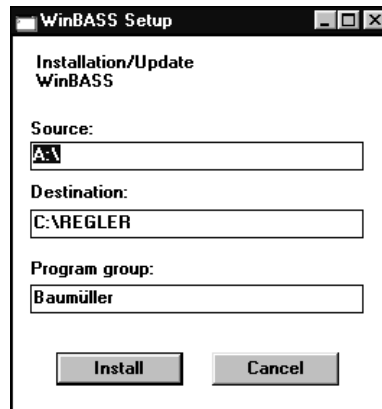- Under Windows, start file SETUP.EXE.

Figure 1: Installation

– In the installation dialog, you can now enter the source and target directories.
– In the third input field, you can enter a program group name; if this name does not exist, the installation routine creates it automatically and adds the WinBASS program icon to the group.
   If you leave the field blank, the routine does not generate a new program icon.

- After this, the WinBASS program files are decompressed and written to the target directory.
- The routine prompts you in a dialog window to change floppy disks.

NOTE

Under Windows 95, you **must** manually close the DOS box after a floppy disk has been decompressed before the routine prompts you to change floppy disks.

- If the target directory already contains a version of the user interface, the routine copies only the *newer* files.

1.3 Starting

WARNING

• Commissioning must be carried out by qualified personnel only.

• During initial commissioning, it is not possible to rule out faulty or uncontrolled motion of the driven machine elements. You must therefore proceed with particular caution.

There are several different ways of starting the Windows user interface for controllers:

• By double-clicking on the program icon

or

• In Program Manager menu File, item Run by entering C:\REGLER\REGLER.EXE

or

• In the File Manager by double-clicking on file REGLER.EXE in directory C:\REGLER.

If you didn't install WinBASS in the default directory, C:\REGLER, enter the appropriate directory in which the executable file is located.

1.4   Configuration

In menu *Settings,* item *Configuration,* you can set the configuration of devices.

It is possible to set the following types:

- Controller
- Motor
- Power unit

You can set or enter the types. Using the Settings switch, you can individually choose the components of the type.

When you leave the configuration dialog by clicking on the OK pushbutton, the system applies the settings and displays the function plan of the new controller type.

The combination of motor and power unit settings are needed for optimizing the PI controller. If data exists for a combination, it is shown.

NOTE

If possible, in online operation the program checks the set values for the controller, motor and power unit. Differences are displayed and can be adapted automatically.
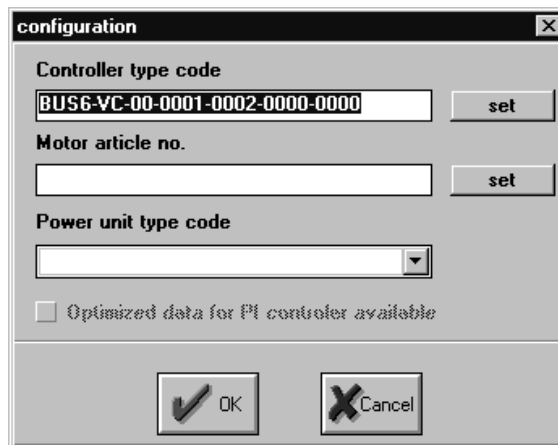
Figure 2: Configuration

1.5   Initialization File

The REGLER.INI configuration file consists of several sections containing a number of entries (in the usual format of Windows .INI files)

Init Section [Init]

Language	The set language (1 = German, 2 = English)
Motor	The selected motor type
Power	The selected power unit
TypKey	The selected type code
Adresse	The set global address

RS232 Section [RS232]

Port	The communications port (1 = COM1, 2 = COM2, 3 = COM3, 4 = COM4)

Error Section [Error]

File	The file for messages
Retry	The number of times to retry before generating a message
TimeOut	The time in ms with no response from the controller
AutoDlg	Automatic display of message dialog (0 = No, 1 = Yes)

You can change all the entries from the user interface.

i   NOTE

If the set COM port is already assigned (e.g. to a mouse) or doesn't exist, it is not possible to communicate with a controller. In this case, it is only possible to run the user interface in offline mode.

2 OPERATING THE PROGRAM

2.1 Function Plan

The user interface for controllers is based on windowing. It is assumed that users are familiar with these techniques (refer to your Windows User Manual).

- The controller parameters are displayed in graphic form (refer to the section entitled "Parameter Group").

- Parameters are grouped into modules (refer to the section entitled "Modules").
  If there is a relationship between a module's parameters, the system writes it in graphic form.

- The function plan – that indicates the relationship between individual modules and with this the controller structure – provides an overview.

The program screen is divided from top to bottom into five vertically separate sections (refer to Figure 3 "Function plan of the V-Controller"):

- Title bar
- Menu
- Button bar
- Modules
- State line

Apart from this, there is a parameter display that shows further information of a parameter, a toolbox for connections and a window containing a list of available parameters (parameter list).

After starting the user interface, the system displays the function plan of the set controller.

You make settings in menu *Settings,* item *Configuration* (refer to "Configuration").

Individual modules, e.g. ramp function generators or tachometer-generators, are represented by rectangles highlighted in colour.

When you single-click on a rectangle, you choose the corresponding module and the system displays it.
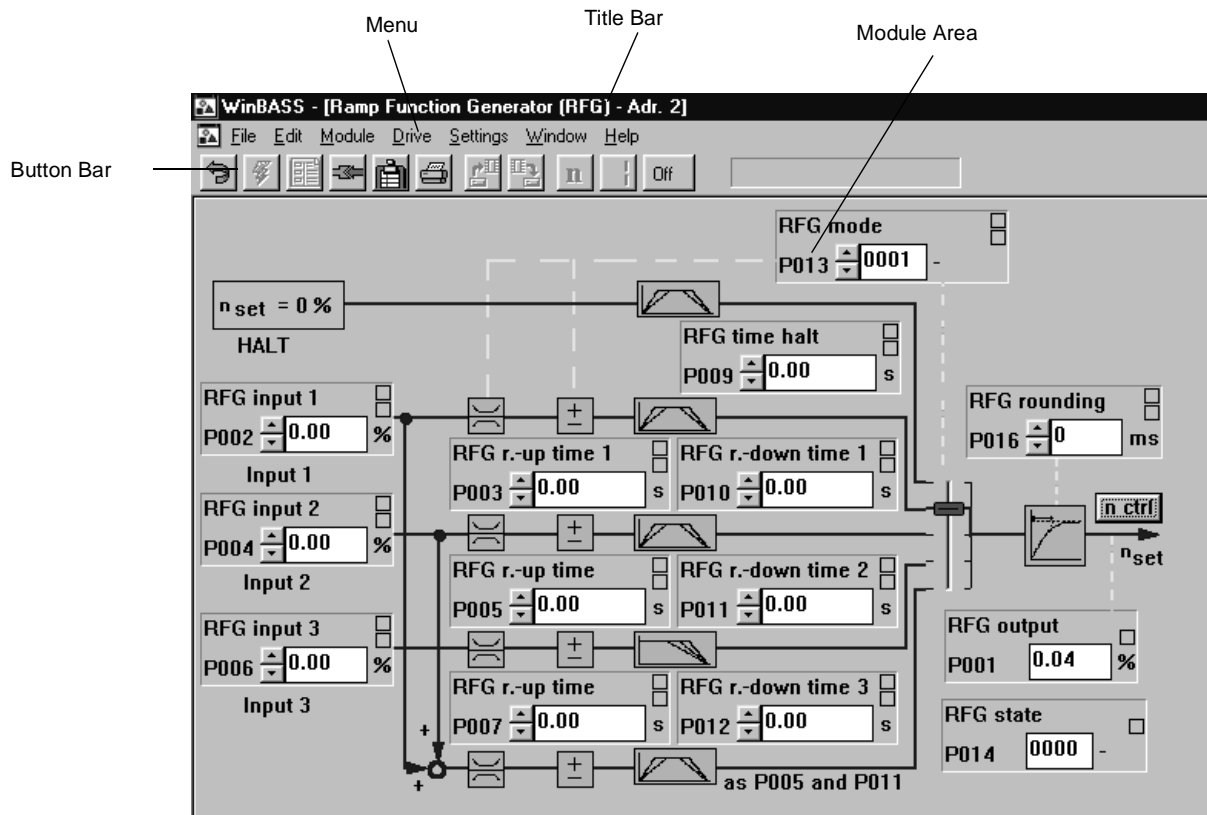

Figure 3: Function plan of the V-Controller

2.2 Modules

The principles of all the modules have the same structure. In the modules, the parameters are represented that belong to the module.

There are different elements in any one module, e.g. parameter groups, switches, text references, normal texts and graphic elements. We will explain below the meanings and functionality of the individual elements using the ramp function generator module as an example.
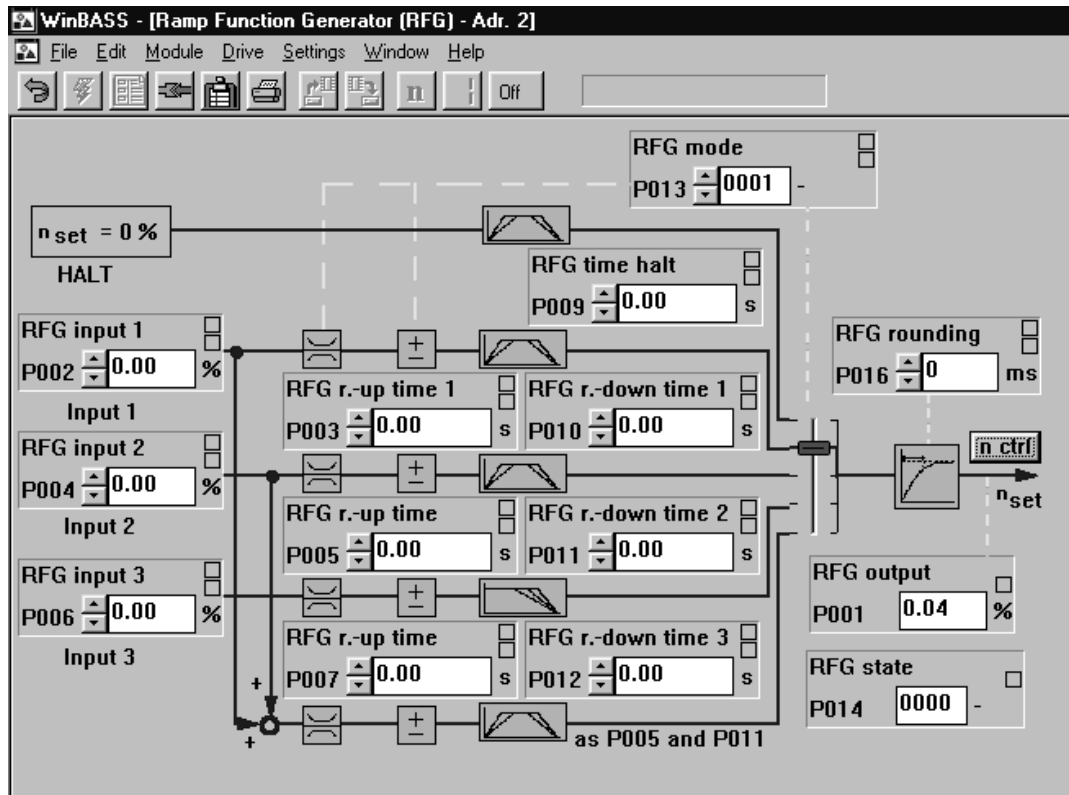

Figure 4: Ramp function generator

In a <u>parameter group,</u> the system represents information on a parameter.

In the case of parameters whose values lead to selections – as in the case of parameter RFG input selection – this selection is implemented by a switch. Changing the switch setting affects the corresponding parameter value.

Texts in a switch are references. Single-clicking on this text takes you to the module that matches the text. This makes possible easy changes between the modules of the function plan.

If present, normal texts and graphical elements represent the context of the displayed parameters. The system shows this context by means of the light-blue symbols and the blue lines (data flow). A yellow dashed line shows a reference from a parameter to the data flow or to a symbol.

Four modules can be open at the same time with the function plan representing a special module that can also be closed. You can change the sizes of all the modules and place them anywhere you like. If the module is not completely visible, you can use the scroll bars to show more of the displayed area.

In the title line beside the module name the valid drive address is displayed. Opening a module the set global address is used as module address.

You close a module using either this button: 🖱 or in menu *Window,* item *Close current* or using the module's system menu.

2.2.1 Parameter Group

Every parameter is represented in a parameter group. An example of this is shown using the parameter below. A parameter group contains the following elements: Name, Unit, Parameter Number and Datum of a parameter, a spin box (scroll), a marking Transmit and a Cyclical marking.
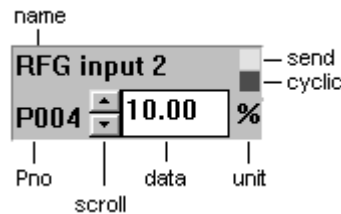

Figure 5: Parameter group

You can change the parameter's datum either by entering characters in the **Data** field or by clicking on the upwards- or downwards-pointing arrow on the **Scroll** spin box. When making keyboard inputs, ensure that the parameter's format is correct (decimal, hexadecimal).

If you *can't see* the upwards- or downwards-pointing arrows, this means that the parameter in question is for display only and you cannot change it.

You should note the special feature with the spin box: clicking on it with the left mouse button changes the value of the datum by the smallest possible value; if you use the *right mouse button,* on the other hand, the value changes by *ten times* the smallest possible value.

Special Functionality

- **Parameter number** field

  – Normally, clicking on this field calls the parameter display.

  – If you chose a switch (with a white background) in the Connect toolbox, clicking on the parameter number establishes the corresponding connection.
    As a result, the system reads this parameter datum from an input or writes it to an output.
    The connection is marked by a coloured highlight. With external inputs/outputs, the parameter number has a *yellow* highlight and with internal inputs (set value generator, motor potentiometer) it has a *magenta* highlight.
    If the parameter is connected with an analog input, you can no longer change the datum manually.

  – In user modules the set drive address for this parameter is displayed additionally in the format "A###P###".

- **Transmit** marking in online operation

  – If the marking is not set (the rectangle is blank), the system transmits a changed datum directly to the controller if the keyboard cursor is no longer in the Datum field. To leave this field, you either press the Return key or click on another datum field. Clicking on the Transmit marking field changes the state of the marking.

  – If the marking is set (the rectangle is yellow), the system does not transmit the changed datum directly to the controller.
    Explicitly carrying out transmission using the corresponding button ⚡ in the button bar, transmits all the changed data to the controller and cancels the markings.

  – If you cancel the marking again by a mouse click, the system displays the old datum (online and offline operation).

–   Due to this functionality, the marking provides two additional options. On the one hand, you can freeze a datum; and on the other, the marking shows that the value of the datum may have been changed.

–   On closing the module, this marking is lost.

•   **Cyclical** marking in online operation

–   If the marking is not set (the rectangle is blank), the controller continually reads the datum. With a marking set, the value is retained that was read last.

–   On closing the module, this marking is lost.

2.2.2 Parameter Display

By clicking on the parameter number in the <u>parameter group,</u> you get to parameter display. In this window, the system shows all the information for one parameter.

There are two types of parameter display:

•   An analog value is additionally displayed above a bar graph
    (refer to "Parameter display with bar graph")

•   The meanings of the bits of a digital value are shown
    (refer to "Parameter display with bit coding").

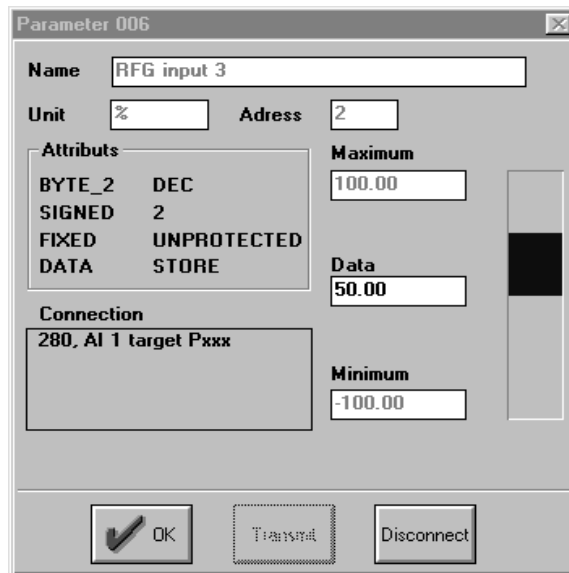The left-hand side of the window is the same with both types of display.

Figure 6: Parameter display with bar graph

In the same way as in the parameter group, you can change the value of the datum either using the spin box or by directly entering the value on the keyboard. In online mode, only this parameter is updated cyclically.

Here too, you can influence downloading of a changed datum to the controller using the Transmit checkbox and pushbutton.

In the Connections group, the system displays the connected parameters with their parameter numbers and names. If the <u>Connect</u> toolbox is open, you can make a connection by clicking on Connections. To cancel a connection, choose one of the entries in the connection list and then click on the *Cancel* pushbutton.

The address is either taken out of the module's drive address or the address of the displayed parameter can be set.

Clicking on the *OK* pushbutton closes the parameter display.

The display from "Parameter display with bar" graph has, in addition, a bar graph that shows the value of the datum relative to the minimum and maximum values.
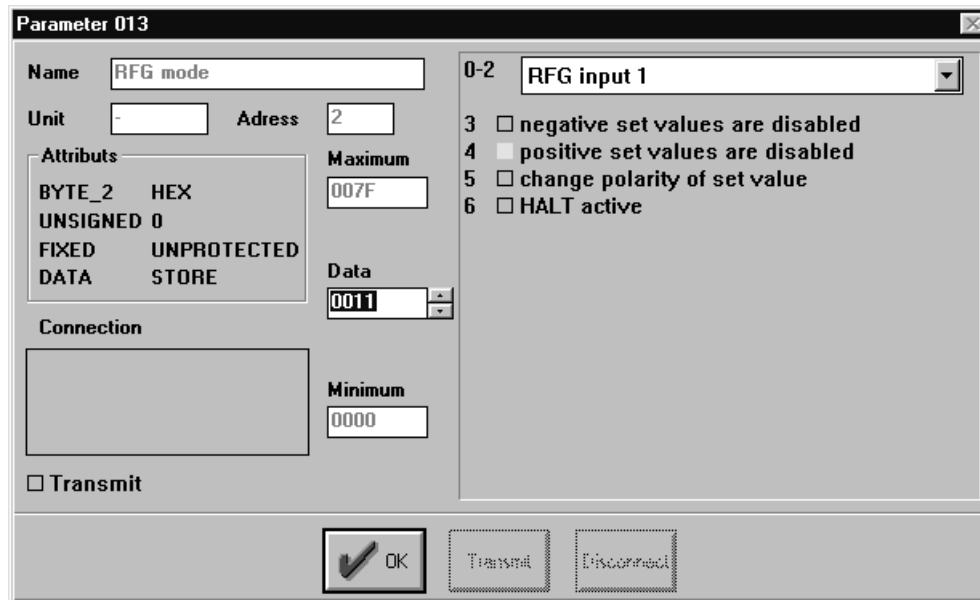

Figure 7: Parameter display with bit coding

In Parameter display with bit coding, the right-hand side of the screen shows the meaning of the datum's individual bits or bit groups.

With individual bits, the symbols have the following meanings:
– a blank rectangle represents the bit value 0
– a yellow rectangle represents the bit value 1.

In bit groups, the system displays the meaning of the set bit group value. If the parameter in question is an editable datum (this is shown by the scroll bars), you can change the value of a bit or of a bit group either by highlighting the value or choosing the appropriate one by scrolling through the list in the spin box. This also changes the value of the datum.

Additional funcitonality is available when connecting bit-coded parameters to a digital input/output. Clicking on the bit text (0, 1, 2, ...) leads, on the one hand, to connecting together of the parameters and, on the other hand, to the setting of the appropriate bits of the digital input/output's bit selection and bit pattern.

For example: connecting bit 4 to a digital input sets the bit selection to 10_{hex}, the LOW pattern to 0, and the HIGH pattern to 10_{hex}.

2.3   Button Bar

Figure 8: Button bar

The button bar below the menu bar contains a number of buttons that correspond to various menu items and allow you to make selections more quickly. Apart from this, the bar contains three display fields, i.e. one for the drive state, a second for online mode and a third for the valid .UDL file. Reading from left to right, the switches and display fields have the following meanings:

	Close	Closes the current module (Window | Close current)
	Transmit	Transmits the changed parameters to the drive in on-line mode (Drive | Transmit)
	Messages	Displays the messages (Drive | Messages)
	Connections	Opens the connection toolbox (Drive | Connect)
	Parameter list	Opens the parameter list (Drive | Parameter list)
	Print	Prints the current module (File | Print)
	Load dataset	Loads the dataset to the controller's memory from EEPROM or RAM (For means of functioning, refer to Drive | Load dataset)
	Save dataset	Saves the dataset from the controller's memory to EEPROM or RAM (For means of functioning, refer to Drive | Save dataset)

n m L GI **L_P L_T L_R R_L** **V**	Operating mode	Displays the operating mode:
		n Speed control
		m Current control
		L Position control
		GI Synchronous operation
		LP Target position specification
		LT Manual mode
		LR Reference run mode
		RI Locating position reference point setting
		V Velocity specification 1 (For means of functioning, refer to Drive | Mode)
0 1 2 3 **4 5 6 7** **E F**	Drive manager state	Displays the drive state and opens the state list (For means of functioning, refer to Drive | Drive manager state)
On●	Online/Offline	Green LED indicates online state
4-operation enabled ↕	State list	List of state conditions for change of state, list of sources/destinations for load/write dataset, list of operating modes
MUKO.UDL	File	File that was loaded last

2.4 State Line

| RFG output | 0.04 | N set value | 0.00 | | | Mot phi mechanical | 0.1 |

Figure 9: State line

The system can display up to four parameter values in the state line.

The state line is divided into four pairs of fields with the left-hand one showing the parameter name and the right-hand one indicating the datum. These parameters are displayed continuously and, in this way, make it possible in online operation to monitor important parameters.

You connect a parameter to the fields as follows:

After opening the parameter list, you must choose a parameter. Left-clicking on the left-hand field of the pair of fields connects this parameter to the field. Choosing the first entry in the list – Remove parameter – allows you to cancel this connection.

The drive address of a parameter is taken from the global address.

2.5 Menu

File

– **Open**
This opens a file: normally, a .UDL file is loaded in the parameter list of the user program. The system stores the paramters that the file contains in the list and this means that they are displayed when you call a module. In the case of the special modules (cam disk available in the V-controller only), the system loads a corresponding file.

– **Save**
Normally, the parameters are saved in the .UDL file that is currently displayed in the state line. If no filename is displayed, the system calls the Save As function. In the case of the special modules, the system saves corresponding data.

– **Save as**
Normally, this saves the parameters in a .UDL file of a different name.

– **Print preview**
Previews the list of parameters of the current module.

– **Print**
Prints the parameters of the current module. The parameters are printed in the form of a listing.

– **Printer setup**
Sets up the printer

– **Exit**
Ends the program

Edit (cam disk only)

– **Change**
Changes the curve value and the markings

– **Copy**
Copies interpolation points of the curve table to the clipboard

– **Paste**
Pastes interpolation points from the clipboard to the curve table

– **Delete marking**
Delete all markings

– **Delete all**
Delete all values and markings

Modules

– **Call a module**
Modules are grouped together. For the meanings of the modules and descriptions of the parameters, refer to the Technical Description of the controller that is set in the configuration .

– **Function plan**
The function plan offers an overview of the controller structure and allows you to choose individual modules

– **Cam disk (available in V-controller only)**
This module allows you to enter cam disk data and download it to the controller.

– **User modules**
Selection list of generated user modules

Drive

– **Online**
Switches between online and offline operation. A checkmark (tick) to the left of the Online label indicates this operating mode. The online LED on the button bar changes appropriately.

– **Download**
Loads parameters from a .UDL file and sends the values that can be saved to the drive. Initially, the values are copied to the controller's memory. You can first specify the destination on the controller (EEPROM, RAM or main memory).

– **Upload**
Reads all the parameters from the drive and saves the values in a .UDL file. You can first specify the source on the controller (EEPROM, RAM or main memory). It is possible to set the first and last parameters using the Start ID and the End ID.

– **Dataset compare**
Compares two UDL datasets. The first dataset can originate from a file or from the controller; the second one can **only** originate from a file.

– **Commissioning guide**
Guides you through commissioning for speed-controlled operation

– **Transmit**
You use this menu item to transmit the changed parameters to the drive.

– **Messages**
Displays the list of most recent messages. To output the error from the controller, the system reads out the error index and code parameters and acknowledges the error. Messages are

saved in the set file (by default regler.err). You can delete the displayed messages from the list without having eliminated the error. The system automatically calls display of the messages when a new message is added.

– **Connections**
The system opens the toolbox containing possible <u>Connections</u> (see below)

– **Parameter list**
Opens the <u>parameter list</u> (see below)

– **Load dataset**
Loads a dataset from the EEPROM or RAM to the controller's main memory. Choosing this item opens a list containing the sources. Once you have selected a source and chosen the menu itme again, the system loads the dataset. If you choose main memory or leave the field blank, nothing is loaded.

– **Save dataset**
Writes the dataset from the controller's main memory to the EEPROM or RAM. For the means of functioning, refer to Load dataset.

– **Drive manager state**
Choosing the drive manager state and closing the list switches to the selected state.

– **Operating mode**
Choosing and closing the list switches to the current operating mode.

– **Comm. source**
Chooses the communications source

Settings

– **Language**
Switches the language from German to English and vice versa. The system displays the text and menus in the selected language.

– **Interface**
Sets the COM port. You can choose between no port (offline mode only), COM1, COM2, COM3 or COM4.

– **Address**
Sets the global drive address. Except for user modules the global address is used while access to drive parameters.

– **Messages**
Changes the settings for messages

– **User modules**
Using this menu item, you can generate and change user modules

– **Configuration**
In the *Configuration* dialog, you specify the available devices.
The types below can be set:

Controller	the controller being used
Motor	the connected motor
Power unit	the power unit being used

For type settings, refer to the devices' rating plates.

2.6   Connections

As soon as a module with parameters is open, you can open the <u>Connect</u> toolbox using the [icon] push-button in the button bar, or by choosing menu *Drive* item *Connect.*

Figure 10: Connections

This toolbox lists all the internal and external inputs and outputs that can be connected to parameters.

You carry out connecting to an input or an output as follows:

- First, use the mouse to choose the input or output that you want to be connected. The mouse cursor changes to the following shape: ◄── .

- Clicking on the parameter number of the <u>parameter group</u> establishes the connection. The system indicates this by giving the parameter number a coloured highlight. In this connection, *yellow* indicates external inputs/outputs, with *magenta* showing internal ones.
  This cancels the connect mode; you can also leave this mode by pressing the *Escape key* or by closing the toolbox.
  The drive address for the connection parameter is taken from the global address.

Inputs/outputs that have already been connected are displayed in the toolbox in reverse video. If you establish another connection with an input or output that is already connected, the existing connection is cancelled.

There are two special features with analog inputs:

- You can never connect *two* analog inputs using the same parameter.

- You cannot change a parameter that is connected to an analog input (the scroll bar is not visible).

When connecting digital inputs/outputs from the <u>parameter display,</u> you can mark a bit: this presets the bit selection and the bit pattern (refer to Parameter Display).

There is another option for establishing a connection:

- For this, you must open the <u>parameter list</u>. 📋 .

- After this, choose the parameter that you want to connect to and left-click on the number of the input or output parameter.

- You cancel this connection by choosing the first list entry, Remove parameter.

To be able to have all the existing connections in the toolbox displayed in online mode too, at switchover from offline to online after loading of a dataset to the controller's main memory and after a download, the controller reads out the inputs and outputs. This procedure takes some time but it always supplies you with the current connections.

You cancel a connection by means of the <u>parameter display</u>. As an alternative, it is also possible to carry this out by means of the parameter list, as described above.

2.7 Parameter List

There are three different ways to open the parameter list.

In menu *Drive* item *Parameter list,* using the 📋 pushbutton on the <u>button bar</u> or using the pushbutton in the <u>Connect</u> toolbox.

The list shows all the avalable parameters of the selected controller type (refer tot <u>Configuration</u>).

You can use the parameter list for the following purposes:

- Connecting selected parameters to the <u>state line</u> and

- connecting an input or output to the selected parameter.

This is the opposite to the usual procedure with a normal connection (connecting an input/output to a parameter by means of the <u>Connect</u> toolbox).

Figure 11: Parameter list

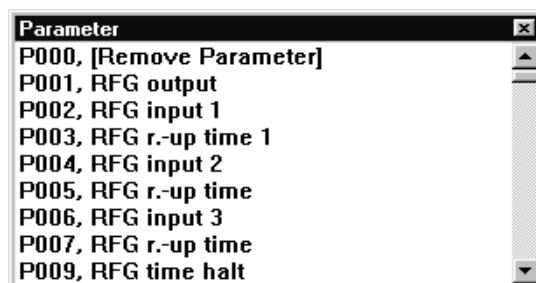With these two connections, the procedure is as follows:

1. Choose a parameter in the list (Remove parameter is the same as cancelling the connection)

2. Left-click on the parameter number of the input or output or on the left-hand field of the two associated fields in the state line

3. → the connection is established.

The global address is used as drive address for the connected parameter.

2.8   File Handling

On loading or saving, the system gives you the option of loading parameter values from a .UDL file or writing them to a .UDL file respectively.

This functionality allows you to save parameter values to a file in offline operation and then to download them to the controller at a later stage.

File handling is based on the following mechanism:

*   All the parameters are recorded in a list. The list is added to when you open modules or load a .UDL file.

*   Saving has the effect of storing all the parameters in this list to a .UDL file. This provides you with a vast number of options for generating .UDL files.

*   The option of being able to save the parameter under another name allows you to change or add to existing files.

2.9   Upload/Download

By contrast with normal data handling, with an upload or a download the parameters that are to be read or written are not stored in the internal parameter list.

Regardless of the modules that are already open, the controller writes parameter values directly to a .UDL file or the system downloads them directly from a .UDL file to the controller. In this connection, it is of no consequence whether the program is in online or offline mode.

If the controller does not respond, appropriate messages are displayed in the message list.

NOTE

It is not possible to carry out uploading or downloading if the controller is in *Drive State 4* (Operation Enabled).

With both operations, you have the option of setting the storage location (main memory, RAM, EEPROM). In addition, uploading allows you to set the start and end parameters and, optionally, to generate a list file.

Apart from uploading and downloading, you can compare two datasets with one another. For the first dataset, you can choose between a .UDL file and a dataset from the controller. The second dataset must always be taken from a .UDL file.

In the comparison, the system only compares the parameters that can be stored in the controller's EEPROM. The result of the comparison can be stored in a text files.

2.10 Messages

At parameterization of a controller, it is always possible that problems arise. They can be due to one of the following causes:

• Communications

• Wrong settings

• The system

If problems do occur, you must eliminate them to be able to continue operation. There can be numerous different reasons and the most common ones are described below:

• In the case of communications, the cause is usually due to the connection between the controller and the PC. The issued message is usually a timeout message or a faulty message frame.

• With wrong settings, these are usually incorrectly set parameter values or a write-protected Comm. source (P126 Bit 0) parameter.

• System messages are usually about hardware problems. In this case, you can usually find the causes in the controller, the motor or the power unit. for a list of error messages, refer to the appropriate controller Technical Description (in the section on error messages).

If a problem has occurred, the user program generates a message that is saved in a list.

The button bar contains a button indicating

– whether the list is empty

– messages have already been issued

If there are messages, you can retrieve them using the button above or in menu *Drive,* item *Messages.*

By setting a flag in menu *Settings,* item *Messages* or in the message display, you can specify whether the system shows this display automatically when a new message is entered in the list.

By choosing the messages, you can delete them from the list. This does not of course get rid of the problem.

NOTE

All the controller's system messages are output automatically and this carries out resetting of the controller.

2.11 User Modules

In offline mode, you can use menu item *Settings | User Modules* to assemble your own modules. In this connection, the system opens a 7 × 3 field module. These fields represent a placeholder for the <u>parameter groups</u>. Apart from this module, the system opens the parameter list and an input list (combo box) in the button bar. You create your own modules as follows:

- First choose an existing module from the input list; or, if you are creating a new module, enter its name in the input line.

- After this, a parameter is chosen in the list.

- Left-clicking on this parameter places it on any field. In this connection, it is of no consequence whether a parameter group is already in this location. You can also carry out placement for further parameters. It is not absolutely necessary to assign all the locations with a parameter. This allows you to custom-design your modules.

- Once you have place all the necessary parameters, the module you have created is automatically saved when you switch to another user module or close the placement module.

You can choose the generated modules using menu item *Modules | User Modules |...*

2.12 Commissioning Guide (V 2.07 and Above)

At commissioning, the system methodically guides you through the individual areas. The entries you make within these areas initialize the controller such that all the parameters are set that are relevant to a specific operating mode.

You go through the following areas at commissioning:

- Configuration

- Selection of the operating mode, online mode, initialization

- Motor data

- Encoder

- Determination of the locating angle

- Operating mode-dependent area

The commissioning window contains a text that explains the steps that you have to carry out to set the values of an area. Clicking on the Next or Back pushbutton take you one area forwards or backwards respectively. If you click on the Finish pushbutton, you can exit commissioning. In online mode, you have the option of saving the changed parameters in the controller's boot dataset before actually ending commissioning.
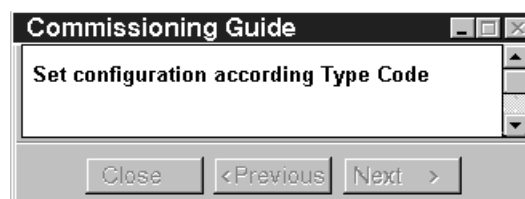

Figure 12: Window for commissioning guidance

In online mode, the system automatically sets mode switchover in the areas in which this is necessary. On leaving these areas, the system then automatically shuts down to drive manager state 1.

2.13 Cam Disk (V 2.04 and Above)

i   NOTE

The cam disk module is available only in conjunction with the V-controller and software version 2.04 and above.

The cam disk module consists of four components:

• A table containing curve data

• A representation of the curve

• A dialog for changing the data of a curve point

• A toolbox for setting markings

Table containing curve data

The window containing the table comprises three areas:

• A table with the curve data

• An area containing special data

• A pushbutton for the functions

The *table with the curve data* has 4097 elements (0 - 4096). On the left-hand side, you are shown the positions in increments on the leading axle (the horizontal axis in the curve). The right-hand side contains the values for the following axle (the vertical axis in the curve). The unit of these values is specified in the area of the special data.

The table has the normal functions of a Windows list:

– Choosing an element shows the corresponding position on the curve

– Movement within the table using the mouse or keyboard

– Double-clicking, pressing the Return key or choosing menu item *Edit | Change,* opens a window in which you can alter the data of the selected entry (see below)

– Application-specific system data is shown by different characters

In the application-specific system data area, you can enter the values listed below, which have a decisive effect on the curve:

- The unit for the values of the following axle in degrees or millimeters. After you have made changes, the system automatically scales the table values.

- The scaling factor that corresponds to the value of one revolution. With degrees as the unit, this is always 360 (automatic scaling is carried out).

- Gearing factor for the following axle: this specifies the maximum value (automatic scaling is carried out).

- Maximum acceleration and speed of the following axle.
  The system highlights acceleration overshoots in red on the curve.

- Production speed of the following axle.

- Stop point on the following axle.
  The position at which the following axle is to come to a standstill after disengaging.

- The mode value specifies the direction in which the following axis is allowed to rotate (counterclockwise and/or clockwise).

The *pushbuttons for the functions* have the following effects:

- Linear
  Linear interpolation of the highlighted area. The system interpolates all the interpolation points in the area; once interpolation has been carried out, the highlight is cancelled.

- Spline
  Cubic spline interpolation of the highlighted area. The procedure is the same as with linear interpolation (at least three interpolation points).

- Zoom/Window
  Displays the curve in its original size (zoom) or stretched to fit the current window size.

- Transmit
  Block-by-block transfer of the curve data to the controller.

- Options
  Hide or display the area of the user-specific system data.

Operating the Program

Representation of the curve

On the curve, the system represents all 4097 points with the corresponding values of the following axle. In this connection the maximum value is defined by the scaling and the gearing factor. Representation of the application-specific system data is illustrated in the table below.

A thick red line shows areas in which the maximum acceleration was exceeded.

At the top left corner of the curve window, the system displays the current coordinates of the cross-hair cursor. This allows you to localize the points more easily.

Representation of markings in the table and on the curve

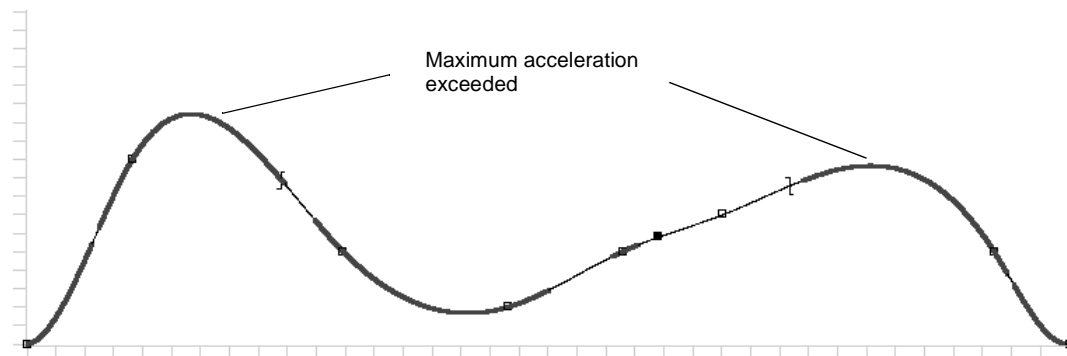| Table	Curve	Designation of Point
*	□	Interpolation point
[	[	Start of area
]	]	End of area
{	⌠	Engagement point
}	⌡	Disengagement point
(	⌐	Start of cam
)	¬	End of cam
	■	Selected point

Example of a curve disk

Figure 13: Curve disk

Dialog for changing the data of a curve point

In this dialog, you can change the value of a curve point and its markings.
The markings are as follows:

- Interpolation point (set automatically at calling)

- Engagement and disengagement points of the leading and following axles

- Cam switching point, start and/or end of a cam

- Area for interpolation, start or end of the area

Toolbox for setting markings

In the toolbox there are pushbuttons for setting markings, with the symbols corresponding to the ones shown in th etable above. We described the individual points in the previous section.

You carry out setting as follows:

- Choose a pushbutton by single-clicking on it (the mouse pointer changes its shape accordingly)

- Clicking on an entry in the table gives the point the special marking

Additional functions

Apart from the functionality above, other useful functions are available:

- Loading interpolation points and application-specific system data from and saving them to an ASCII file using menu items *File | Open* and *File | Save.* The information about how the system is to carry out interpolation on the left and right hand sides of the interpolation point is also stored and the system automatically carries out interpolation on loading of the file.

- Copying interpolation points to or pasting them from the clipboard using a combination of keys or the *Edit* menu item (e.g. loading values from an Excel spreadsheet). In this connection, the values in the clipboard must have the following format:

  – The left-hand column contains the leading axle values in increments of 0 to 4096

  – Separated by a tabulator, the right-hand column contains the values of the following axle in degrees or millimeters.

  – The values of the following axle should correspond to the set scaling

  – Lines must be separated by a carriage return.

- Using the transmit pushbutton or menu item *Drive | Transmit,* you transfer the curve data to the V-controller: this is carried out block-by-block. After a block has been transferred, you wait until an option board has retrieved the the transmitted block. You can cancel the transfer by pressing the *Escape- key* or switching to offline mode.

2.14 Troubleshooting

The program starts with the following message:

- Port not available (blocked by driver)
  This error message may be due to one of the following causes:

  – the PC's set communications port is not available

  – the PC's set communications port is being used by another device (e.g. the mouse)

  – the communications driver is set wrong
    In the [boot] section of your Windows SYSTEM.INI file, there is the entry comm.drv.
    This entry should be set to comm.drv (comm.drv = comm.drv).
    If another driver is set here, it can happen that the driver blocks the COM ports for its own reasons and no other programs can access the serial port.

NOTE

The program can only be run in offline mode.

Error messages at data transfer between the controller and the PC

- **Timeout due to communications port**

  If communication cannot be established, the user program reports the timeout error if data is supposed to be transferred between the controller and the PC.

  After this, you should check the following points:

  – The controller is switched on.

  – There is a connection between the PC and the controller.

  – The serial interface of the controller on the PC is the same as the set one

  – Reduce disturbance in the line

- **Datum cannot be changed**

  You tried to change a parameter that either cannot be changed or parameter Comm. source (P126) is set to 0.

3   INSTALLATION

3.1   Serial Connecting Cable for PC

A connecting cable from the controller to the PC is necessary for these devices to be able to communicate.

NOTE

Connect the PC in the switching cabinet or via an isolating transformer.

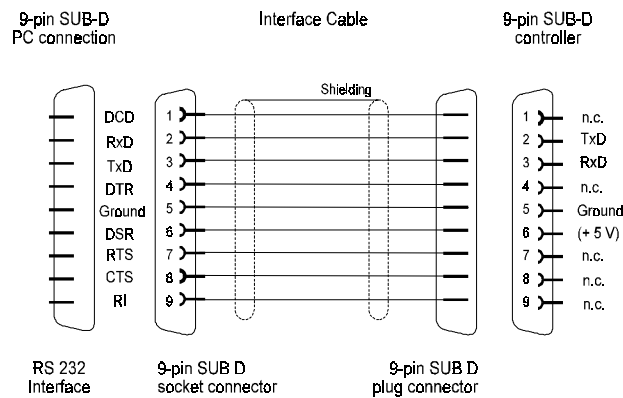• PC connection, 9-pin (interface cable, PC, Internal identifier 1901 8006)

Figure 14: 9-pin connection
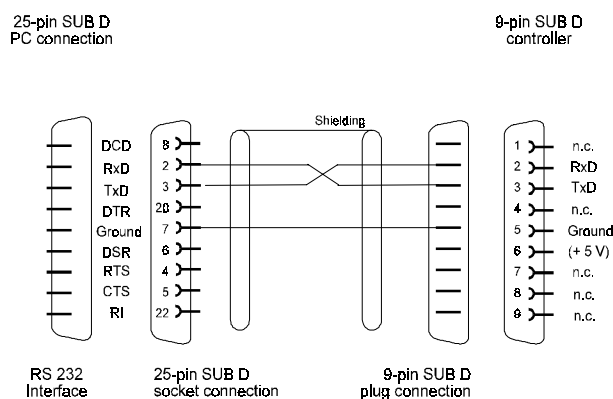
• PC connection, 25-pin (not on offer)

Figure 15: 25-pin connection

3.2   Accessories

	Article Number
• PC interface cable (3 m)	1901 8006
X23 RS232	

4   APPENDIX

4.1   License Agreement

Grant of license

Baumüller Nürnberg (BN) grants you an exclusive license for the supplied software package *Windows User Interface for Controllers* (the SOFTWARE) under the following conditions:

*   simultaneous usage on several computers is allowed;

*   you are allowed to make a backup copy for archival purposes;

*   you are not allowed to transfer the rights in this contract to third parties.

Copyright

You acknowledge that BN is the publisher as well as the owner of the SOFTWARE. BN retains the legal title to the SOFTWARE. You accept that the grant of license above does not represent a sale of the SOFTWARE, and that the license above does not grant you any claim on BN Software with regard to patents, reproduction, trade secrets, trade marks or any other rights.

It is prohibited to alter, translate, disassemble, decompile or reverse-engineer any part or all of the SOFTWARE, the documentation or copies of them.

Warranty

BN stresses that the current state of the art technology does not make it possible to write software that works completely fault-free with all applications and combinations of different hardware components. This means that the subject of this contract is only the software that is basically usable in the sense of the program description.

You must report faults as soon as you are aware of them. If the software is faulty, BN is authorized, at the exclusion of other warranty claims, at its option to make improvements or to supply a replacement. Several improvements are possible.

BN accepts no responsibility for the correct selection, utilization, use and application of the SOFTWARE. In particular, this applies to use with suitable hardware or changes to the SOFTWARE. No responsibility whatsoever is accepted for any and all consequential damages caused by the SOFTWARE, assuming that this is permissible by law.

Summary

You acknowledge and agree that you have read and understood this license agreement and that this is the complete contract between you and BN, which replaces any and all previous agreements whether oral or written or in any other form between you and BN. This license agreement can only be changed by a written document signed by BN.

4.2   Index