

ABB Sace

ABB AC Brushless Servodrives
DGV Converters

Firmware Manual
ABB AC Brushless Servodrives Browser
Application Program



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Application Program

MANIU20.0410 E

EFFECTIVE: 15.10.2004
SUPERSEDES: 30.09.2004

Safety Instructions

Introduction

This chapter states the safety instructions that must be followed when configuring the DGV converter. The material in this chapter must be studied before attempting any work on, or with, the device.

Complete safety instructions can be found in the *Installation Guide*.

Warnings and Notes

This manual distinguishes two sorts of safety instructions. Warnings are used to inform of conditions which can, if proper steps are not taken, lead to a serious fault condition, physical injury and death. Notes are used when the reader is required to pay special attention or when there is additional information available on the subject. Notes are less crucial than Warnings, but should not be disregarded.

WARNING

Readers are informed of situations that can result in serious physical injury and/or serious damage to equipment with the following symbols:



WARNING! Dangerous Voltage: warns of situations in which a high voltage can cause physical injury and/or damage equipment. The text next to this symbol describes ways to avoid the danger.



WARNING! General Warning: warns of situations which can cause physical injury and/or damage equipment by means other than electrical. The text next to this symbol describes ways to avoid the danger.



Electrostatic Discharge Warning: warns of situations in which an electrostatic discharge can damage equipment. The text next to this symbol describes ways to avoid the danger.

Notes

Readers are notified of the need for special attention or additional information available on the subject with the following symbol:

CAUTION!

Caution aims to draw special attention to a particular issue.

Note:

Note gives additional information or points out more information available on the subject.

**General Safety
Instructions**

Neglecting these instructions can cause physical injury and death.



WARNING! The contents of this manual refer to DGV converters correctly installed as described in the *Installation Guide*.

Only properly qualified personnel who are familiar with operation on converters are allowed to perform the commissioning and operation activities on DGV.



WARNING! For no reason should any person access the internal part of the converter or the terminals of the servomotor, before at least four minutes from the power outage.

Potentially lethal voltages are present on a DC intermediate circuit and on the associated circuits.



WARNING! The machine manufacturer who commissions the converter, must install proper additional protection functions to avoid damages to health or equipment when the machine is operating.

More Warnings and Notes are printed at appropriate instances along the text.

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Chapter 1 - Introduction to this Manual

Introduction

This document *Firmware Manual* is part of the DGV Converters manual, code MANIU20.0410 E, provided by ABB Sace S.p.a. The material in this manual must be studied before attempting any work on, or with, the device.

Before You Start

This Manual contains the firmware specifications of DGV. It also provides the reader with the necessary information to use the ABB AC Brushless Servodrives Browser, which is the converter local application program.

The reader is expected to have an appropriate knowledge of electrical fundamentals, electrical wiring practices, electrical drives and control theories.

What This Manual Contains

The purpose of this manual is to provide the reader with the information necessary to program and control the drive with DGV.

It is assumed that the drive is installed and ready for the configuring procedures. For more information please refer to the *Installation Manual*.

Safety Instructions are featured in the first few pages of this Manual. Safety Instructions describe the formats for various warnings and notations used within this Manual. This chapter also states the safety instructions that apply to the operation of the DGV Converters.

Chapter 1 - Introduction to this Manual, contains a short description of this Manual.

Chapter 2 - Overview, contains general information about the application program ABB AC Brushless Servodrives Browser.

Chapter 3 - Installation, shows how to install and start the application program, and the computer system requirements.

Chapter 4 - User Interface, describes the user interface of the application program, that is the ABB AC Brushless Servodrives Browser.

Chapter 5 - Start a Project, explains how to project an application on the drive, once you know its characteristics.

Chapter 6 - Parameters, shows how to open online/offline lists of Browser parameters.

Appendix A - Faults and Messages introduces you to fault causes and removal advice, and general messages for the diagnosis of the drive system.

Appendix B - Troubleshooting describes the troubleshooting of the most common system malfunctions.

Related Publications

In addition to this *Firmware Manual*, please consult the DGV complete user documentation, including:

- the *Installation Manual* of DGV Converters
- the *CANopen Guide* of DGV Converters.

Conventions used in this Manual

Listed below are the terms and conventions which have special meaning throughout this Manual.

Application Program

It is a user interface Windows based program for configuring the drive. ABB AC Brushless Servodrive Browser is the application program which allows you to configure servodrives with DGV Converters. See *Chapter 4 - User Interface*.

ServoDrive

A servodrive is a system made of a converter coupled with a servomotor.

Application File

Application file is a backup file created by the Browser program for saving the servodrive configuration settings. See Chapter 5.

Chapter 2 - Overview

Introduction

This chapter provides a quick summary of the functions and operation of the ABB AC Brushless Servodrives Browser.

Program Structure

ABB AC Brushless Servodrives Browser is an application program for local control of DGV Converters. It follows the common user interface guidelines as defined for Windows, this is why it is easy to learn and use.

User Interface

The Browser consists of an interactive user interface where the motor and converter, project and drive field information are online / offline displayed.

The main feature of this program is the Application Configuration Wizard. The user is required to provide the application data and the servomotor technical data, while the program itself makes the internal computation of the parameters settings and automatically sets the drive to be ready for operation. This reduces the commissioning time and costs.

Databases

The converter is provided with a Motors database directory, which contains the technical data of the 8C SERIES Brushless Servomotors, manufactured by ABB Sace S.p.a. The program allows the user to:

- extend the database, or create a new one, with the technical data of motors from various manufacturers;
- create custom databases with application and backup information (see also *Chapter 5 - Start a Project*).

Main Functions

Here is a brief overview of the main functions available with the ABB AC Brushless Servodrives Browser:

- Drive commissioning
- Parameters settings
- System diagnostic and fault tracing
- Drive local control via RS 232 interface
- Drive reset
- Saving drive configuration information

Distribution Terms

ABB AC Brushless Servodrives Browser is a freeware application program distributed together with BIVECTOR Converters. No registration is needed.

The program may be distributed freely in its original unmodified and unregistered form. Distributors may not charge any money for it, while they may charge money for the medium (online-time, CD-ROM, etc.).

ABB Sace operates on a policy of continuous improvement. Therefore we reserve the right to make changes and improvements to any of the products described in this guide without prior notice.

Warranty

This software is distributed "as is" and without warranties whether expressed or implied. Because of the various software and hardware environments into which this program may be put, no warranty of fitness for a particular purpose is offered.

MS-DOS is a trademark of Microsoft Corporation.

Windows 95, Windows 98, Windows NT and Windows 2000 are registered trademarks of Microsoft Corporation.

Other products may be trademarks or registered trademarks of their respective manufacturers.

Chapter 3 - Installation

Introduction

This chapter provides the user with the necessary information to install and start the ABB AC Brushless Servodrives Browser.

Hardware and System Requirements

To operate Browser, your computer must meet the following requirements and have the following hardware and software installed to the minimum

- Processor Intel MMX or superior (or equivalent)
- Operating system Windows 95/98/NT/2000
- Windows compatible graphical adapter
- 2 MB free HD and CD-rom drive unit
- Minimum 32 MB
- Serial interface (COM1 or COM2) free
- PC-converter connecting cable made as the diagram available in *Chapter 6 – Installation Guidelines* of the *Installation Manual*.

How To ...

In order to perform the software installation and then start the program, it is necessary to:

Install ABB AC Brushless Servodrives Browser

1. Start Windows.
2. Insert the CD into the appropriate drive and copy the folder **Browser v...** to your local hard disk, preferably to the directory **C:\Program Files**.

Running Set-up

3. Make a shortcut of file **div.exe** on the Desktop of your PC.
4. Double click on the shortcut any time you want to start the application program.
5. Follow the instructions of the configuration wizard to work on the drive.

Browser Folders

The **Browser v...** folder contains three more folders:

- **Motors**, database folder of the motor models of the ABB 8C SERIES Brushless Servomotors
- **Files**, this folder is empty at first, it will contain the application parameter files (*.dgv).
- **Firmware**, for service support only.

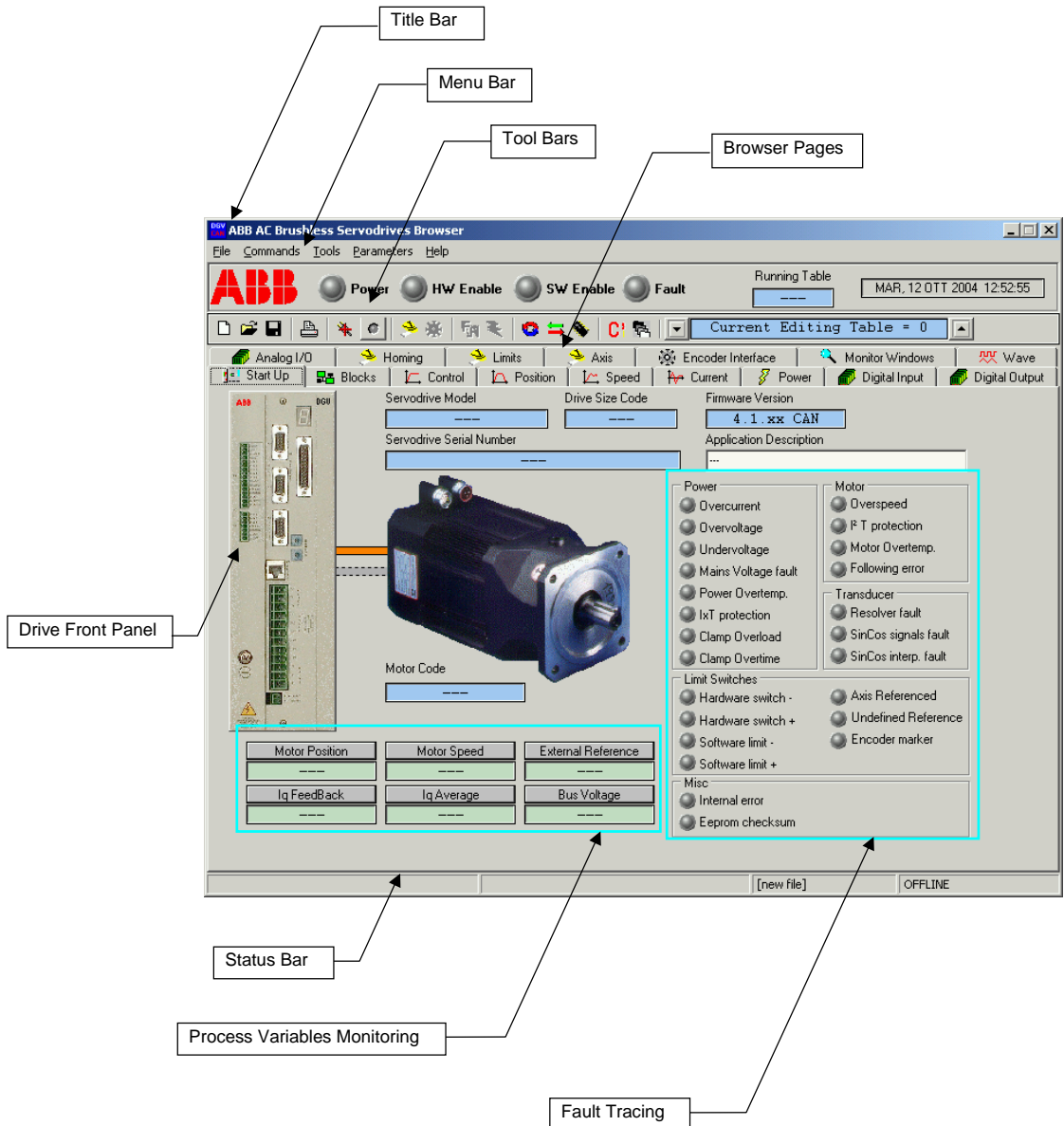
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Chapter 4 - User Interface

Introduction

The ABB AC Brushless Servodrives Browser provides a flexible standard viewing area.

The program runs within one single window, where the user can select several pages and functions. The figure below shows the main page of the program window. This page provides an overview of the drive system and type designation, and the name of the application.



The Program Window

The Browser program window contains five regions: a Title Bar, a Menu Bar, Tool Bars, a Status Bar and a working environment.

The Title Bar displays the name and icon of the application program.

The Menu Bar contains the ABB AC Brushless Servodrives Browser menus. Each menu contains a group of selections that performs specific functions.

The Tool Bar provides a quick access to commonly used commands in the Browser environment. Direct the mouse on the Tool Bar to view the description label of each button.

The Status Bar displays additional information, as for example explanation of the selected command, interactive messages, name of the application file running, etc.

Title Bar



The title bar is located along the top of a window. It consists of the following parts:

1. System menu button
2. Application name (ABB AC Brushless Servodrives Browser)
3. Minimize button, same as Minimize in the System menu. Reduces the window to an icon.
4. Close button, same as Close in the System menu

To move the window, drag the title bar. You can also move dialog boxes by dragging their title bars.

Clicking close button ends your application session. The Browser prompts you to save documents with unsaved changes.

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

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

Menus

File Commands Tools Parameters Help

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

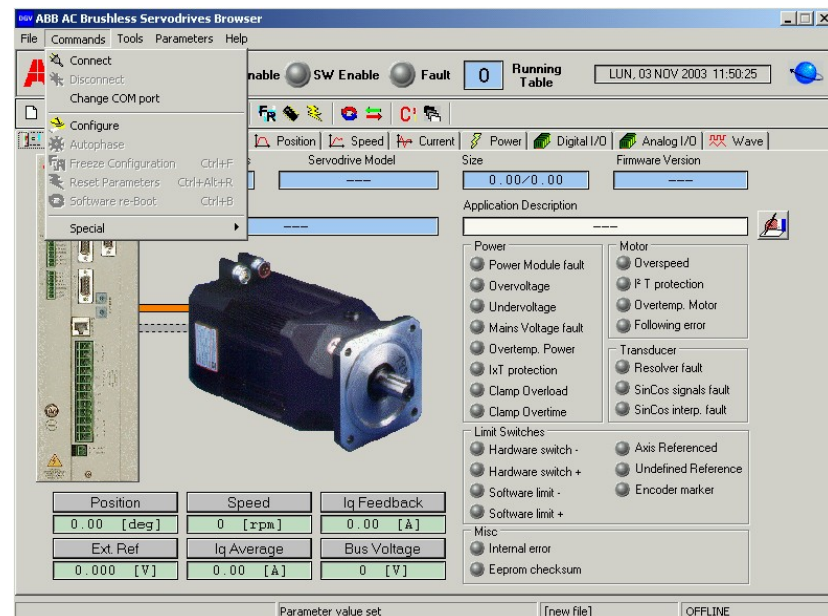
- File
- Commands
- Tools
- Parameters
- Help

To open (drop-down) a menu, click its name on the menu bar. You can also use a key, which is the key underlined in the menu name, with Alt key down, to open a menu. For example, Alt+F opens the File menu.

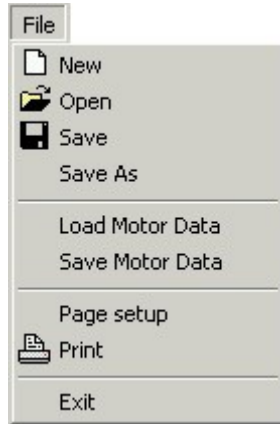
To execute a command or drop-down a submenu from a dropped-down menu (or submenu), click its name on the dropped-down menu. You can also use the arrow keys to navigate within the menu bar, menus, and submenus. Pressing Enter drops submenu down or executes the highlighted command. Pressing Esc key closes the menu or submenu. You can also use a key, which is the key underlined in the command or submenu name, to execute a command or drop-down a submenu.

For example, pressing X, while the File menu is dropped-down, executes Exit.

Note the status bar shows a short description of any command highlighted in the menu. This feature is available for all the menus as well.



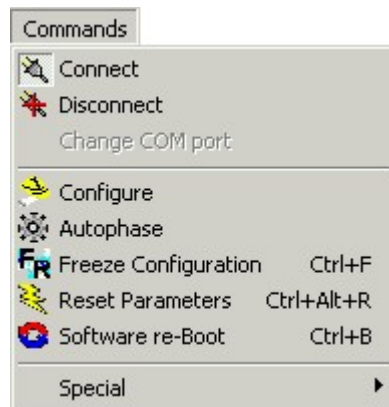
File Menu The File menu is located in the menu bar.



The menu contains the following commands:

- *New* Opens a new application
- *Open* Opens a previously saved application.
- *Save* Saves the application.
- *Save As* Saves the application with a new name.
- *Load Motor Data* Loads the motor data from a motor data file.
- *Save Motor Data* Saves a new motor data file.
- *Page setup* Sets printing set-up
- *Print* Shows the Print dialog
- *Exit* Exits the application program (shortcut key is Alt+F4), same as Close command in the System menu, close button in the title bar, or double-clicking the system menu button in the title bar. The Browser prompts you to save documents with unsaved changes.

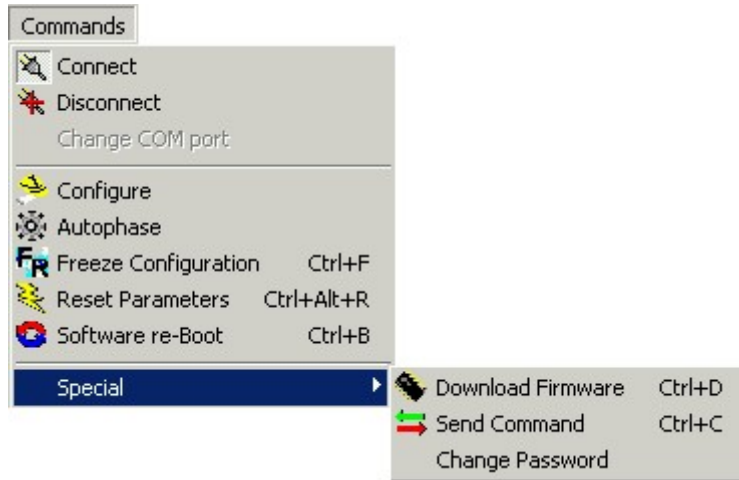
Commands Menu The Commands menu is located in the menu bar.



The menu contains the following commands and submenus:

- *Connect* Connects the Browser online to the drive
- *Disconnect* Disconnects from the drive
- *Change COM port* Changes serial COM port
- *Configure* Starts the Application Configuration Wizard
- *Autophase* Starts the autophasing procedure
- *Freeze Configuration* Stores configuration into the non-volatile memory
- *Reset Parameters* Set default drive parameters
- *Software re-Boot* Perform software reset
- *Special* Submenu with special functions

Special Special is submenu of the Commands menu and contains commands for experts.



The following commands and submenu are available:

- *Download Firmware* is used for firmware upgrade and reset of the drive parameters. For service support only.
- *Send Command* For service support only.
- *Change Password* Changes access password to database.

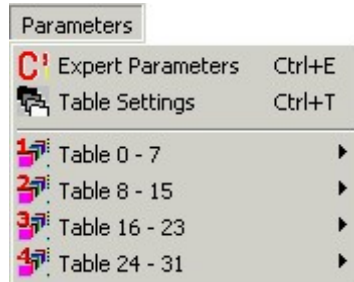
Tools Menu The Tools menu is located in the menu bar and contains commands for selecting the *Browser Pages*.



- *Startup Assistant* Displays the general condition of the drive
- *Block Analyzer* Represents the functional blocks
- *Control* Contains control parameters
- *Position Regulator* Contains parameters of position control loop
- *Speed Regulator* Contains parameters of speed control loop
- *Current Regulator* Contains parameters of current control loop
- *Power Drive* Shows the condition of the power supply stage
- *Digital Input* Contains parameters for configuring digital inputs
- *Digital Output* Contains parameters for configuring digital outputs
- *Analog I/O* Contains parameters for configuring analog input and output
- *Homing* Contains parameters for homing methods
- *Limits* Contains parameters for configuring hardware and software limit switches
- *Axis* Contains parameters of axis configuration
- *Encoder Interface* Contains parameters for configuring the emulated encoder interface
- *Monitor Windows* Contains parameters of the monitoring functions
- *Waveform Generator* Contains functions of the digital oscilloscope

You can browse the pages also by clicking the page tabs located immediately below the tool bar.

Parameters Menu This menu is located in the menu bar and contains commands for experts.

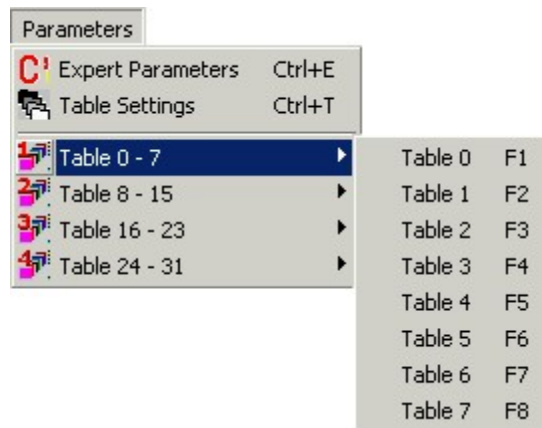


The Parameters menu contains the following commands and submenus:

- *Expert Parameters* opens a window which contains the overall parameters list of the drive system. You can also use the shortcut key Ctrl+E. See *Expert Parameters* for details.
- *Table Settings* opens a window which is to be used for configuring motion tasks by using tables. Shortcut key is Ctrl+F. See *Table Parameters* for details.
- *Table 0 – 7* is submenu of Parameters menu. It contains commands for retrieving table parameters.
- *Table 8 – 15* is submenu of Parameters menu. It contains commands for retrieving table parameters.
- *Table 16 – 23* is submenu of Parameters menu. It contains commands for retrieving table parameters.
- *Table 24 – 31* is submenu of Parameters menu. It contains commands for retrieving table parameters.

Every command in the submenu has a different shortcut key so that table can be retrieved instantly during operation.

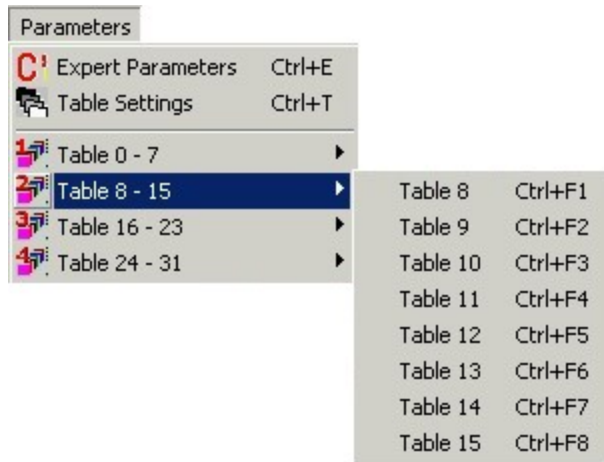
Table 0 – 7 Submenu This is submenu of Parameters menu.



This submenu contains commands for retrieving parameters of the first table subset:

- Table 0 (shortcut key F1)
- Table 1 (shortcut key F2)
- Table 2 (shortcut key F3)
- Table 3 (shortcut key F4)
- Table 4 (shortcut key F5)
- Table 5 (shortcut key F6)
- Table 6 (shortcut key F7)
- Table 7 (shortcut key F8)

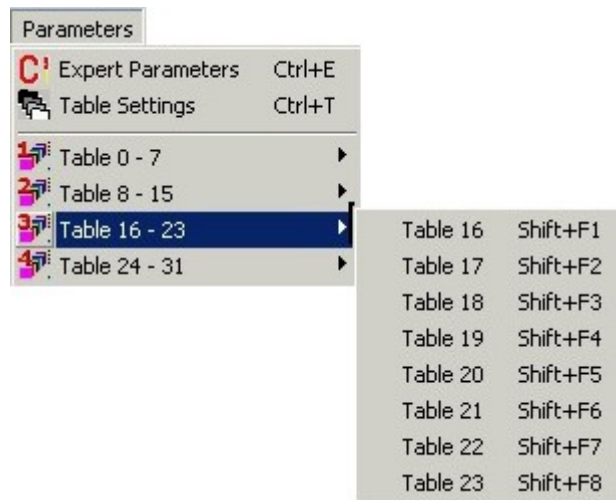
Table 8 – 15 Submenu This is submenu of Parameters menu.



This submenu contains commands for retrieving parameters of the subset of table 8 to 15:

- Table 8 (shortcut key Ctrl+F1)
- Table 9 (shortcut key Ctrl+F2)
- Table 10 (shortcut key Ctrl+F3)
- Table 11 (shortcut key Ctrl+F4)
- Table 12 (shortcut key Ctrl+F5)
- Table 13 (shortcut key Ctrl+F6)
- Table 14 (shortcut key Ctrl+F7)
- Table 15 (shortcut key Ctrl+F8)

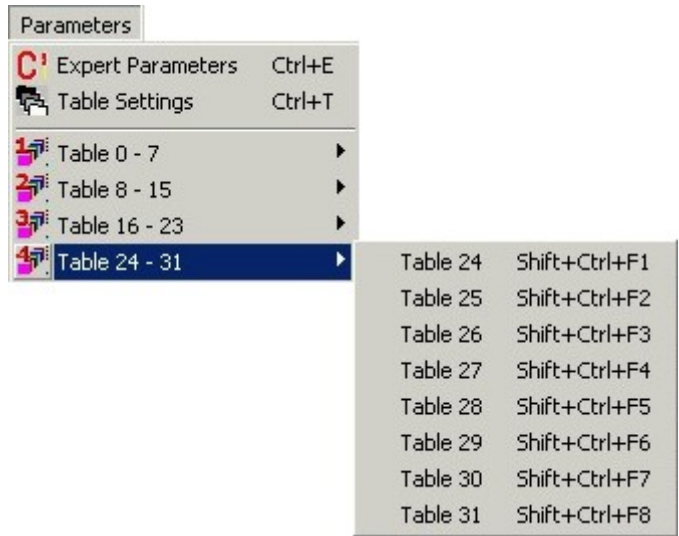
Table 16 – 23 Submenu This is submenu of Parameters menu.



This submenu contains commands for retrieving parameters of the subset of table 16 to 23:

- Table 16 (shortcut key Shift+F1)
- Table 17 (shortcut key Shift+F2)
- Table 18 (shortcut key Shift+F3)
- Table 19 (shortcut key Shift+F4)
- Table 20 (shortcut key Shift+F5)
- Table 21 (shortcut key Shift+F6)
- Table 22 (shortcut key Shift+F7)
- Table 23 (shortcut key Shift+F8)

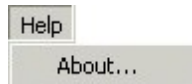
Table 24 – 31 Submenu This is submenu of Parameters menu.



This submenu contains commands for retrieving parameters of the subset of table 24 to 31:

- Table 24 (shortcut key Shift+Ctrl+F1)
- Table 25 (shortcut key Shift+Ctrl+F2)
- Table 26 (shortcut key Shift+Ctrl+F3)
- Table 27 (shortcut key Shift+Ctrl+F4)
- Table 28 (shortcut key Shift+Ctrl+F5)
- Table 29 (shortcut key Shift+Ctrl+F6)
- Table 30 (shortcut key Shift+Ctrl+F7)
- Table 31 (shortcut key Shift+Ctrl+F8)

Menu Help This menu provides information about the Browser release version.



Tool Bars



Tool bars provide a quick access to commonly used tools and commands available in the menus. The Browser has the following tool bars:

1. Drive status monitoring bar
2. Buttons tool bar

Drive status monitoring bar

The drive status monitoring bar displays the most significant information about the drive status, that is:

- Power
- HW Enable
- SW Enable
- Fault

plus

- Running Table
- date and time
- Current Editing Table.

Buttons Tool Bar



This tool bar provides buttons of the commonly used tools and commands available within the menus:

- *New* Opens a new application file. This is the same command in the menu *File – New*.
- *Open* Opens an application file, same command of menu *File – Open*.
- *Save* Saves parameters in a data application file. This button performs the same command of menu *File – Save* when saving the first time, *File – Save as* when an application file was saved and you want to updated.
- *Print* Prints the oscilloscope graph, same as command menu *File – Print*.
- *Connect* Activates serial communication with drive, same as menu *Commands – Connect*.
- *Enable* On/off button for SW enable. When HW Enable is provided, this tool changes the drive status: drive is operating if the button is pushed on, drive is disabled if button off.
- *Configure* Configures a new application on drive, same command of menu *Commands – Configure*.
- *Autophase* Starts the utophasing procedure, same command of menu *Commands – Autophase*.
- *Freeze Configuration* Stores the configuration settings into the drive non-volatile memory., same command of menu *Commands – Freeze Configuration* (shortcut key Ctrl+F).
- *Software Download* DGV custom firmware update for service support only. Same command of menu *Commands – Special – Download Firmware* (shortcut key Ctrl+D).
- *Software Reset* Reset drive parameters to default manufacturing values. This is useful when configuration problems occur. This command is mandatory after firmware upgrading. Same command of menu *Commands – Reset Parameters* (shortcut key Ctrl+Alt+R).

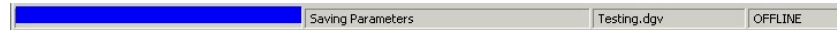
- *Software re-Boot* Restarts the drive intelligence as it was switched off and turned on again. This tool allows you to reset serious permanent error and faults due to wrong usage of the application program and the drive itself. Same command of menu *Commands – Software re-Boot* (shortcut key Ctrl+B).
- *Send Command* For service support only, same command of menu *Commands – Special – Send Command* (shortcut key Ctrl+C).
- *Expert Parameters* Display the window Expert Parameter containing the list of parameters for fine-tuning of the drive performances, same command of menu *Parameters – Expert Parameters*.
- *Table Settings* Display in a new window the motion tables, same command of menu *Parameters – Table Settings*.

Status Bar



The status bar is located along the bottom of the Browser window. It contains the following four areas:

1. The left area describes actions of menu items and of the toolbar button. It also shows a progressive blue bar when saving or retrieving parameters.



2. The second middle area shows messages explaining the result of the last action performed. It can also display an explanation of a lengthy operation while it is executed.
3. This area shows the name of the data file when saved.
4. This area informs you about the application working ONLINE or OFFLINE.

Indicators, Buttons and Dialog Windows

The Browser is provided with green, yellow and red led indicators, push buttons, and dialog windows.

The led indicators and the buttons virtually reproduce pilot lights and, on/off switches or common commands. The dialog windows are used for parameter settings and drive configuration procedure.

Indicators Leds indicate drive status conditions (Hardware Enable, Software Enable, Power, Fault).



Led indicator (off)



Led indicator (on)

Buttons Buttons may reproduce command functions (see *Buttons Tool Bar*) or on/off switches. This is the case of the *Software Enable* command button, always visible on the Tool Bar together with other common commands (*Autophase, Connect, Configure, ecc.*).



Bright push on/off button of the *Software Enable* command.

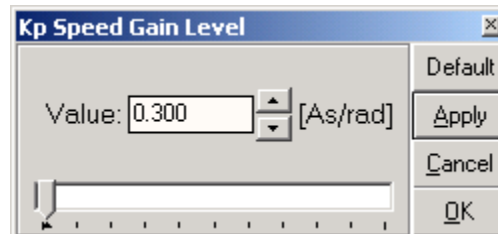
There is one more button:



The Trimmer button, which is used for setting parameter values.

Any time the user click a trimmer button a dialog window is opened.

Dialog Windows A dialog window is a new window that the application itself opens for updating parameter settings. For example, we click the trimmer button of the *Speed Proportional Gain* in the Waveform Generator page and the following window appears:



This dialog window displays:

- name of the parameter
- parameter value into its units
- an active cell to modify the parameter value manually or through up-down arrows
- slider box to modify the parameter value instantaneously by moving the cursor
- buttons to accept changes

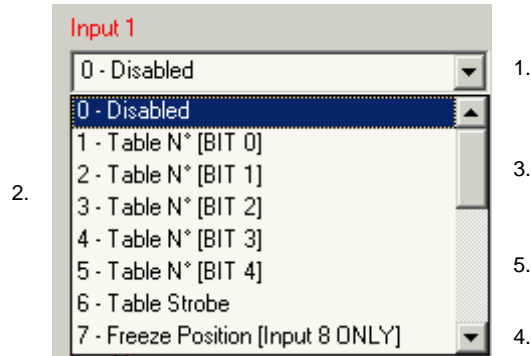
There are four buttons:

- *Default* sets the parameter default value
- *Apply* sets a new parameter value
- *Cancel* closes the window without changing the parameter value
- *Ok* closes the window

The Browser may provide other types of common dialog or popup windows to inform you of not-allowed operations or error acknowledgement. If this happens consult the *Appendix B – Troubleshooting*.

Scroll Bars

Scrollbars are displayed at the bottom and right edges of a document window. The Browser application uses scrollbar for drop-down list opened within the working environment.



1. Drop-down arrow
2. Drop-down list. A drop-down list is opened when pressing a drop-down arrow.
3. Scroll box. Drag the scroll box inside the scrollbar to view all the command selections given in the list.
4. Scroll arrow. Click the scroll –up or –down arrow to scroll one command up or down.
5. Scroll shaft. You can also click the scroll shaft to scroll one page down in the list.

Working Environment

ABB AC Brushless Servodrive Browser is a standard Windows graphical user interface for servodrives with DGV Converters. The working environment of this Browser is arranged within pages that show the basics of the drive control strategy and behavior.

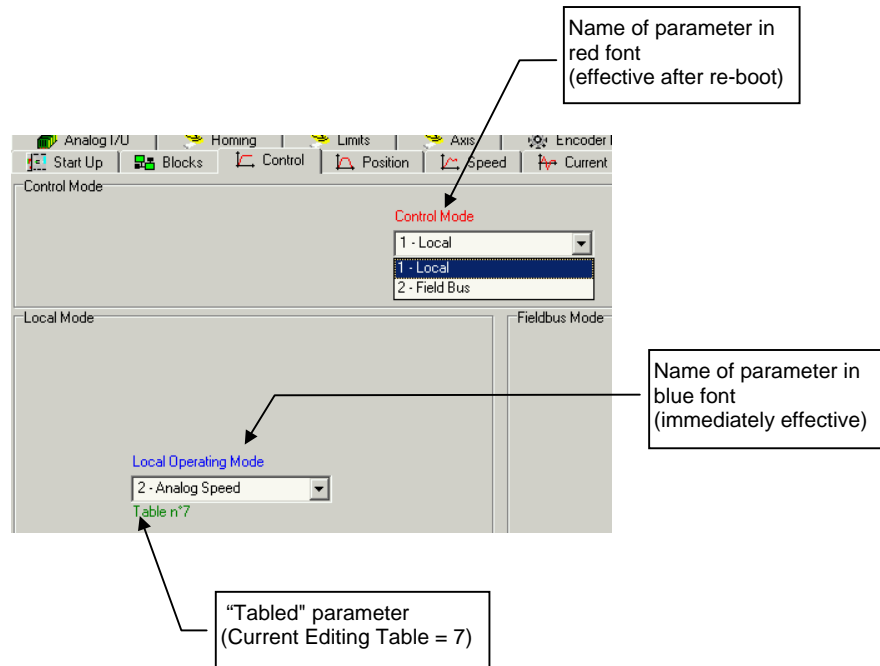
The tabs located immediately below the tool bar are:

- Start Up *Startup Assistant page*
- Blocks. *Block Analyzer page*
- Commands *Command Generator page*
- Position *Position Regulator page*
- Speed *Speed Regulator page*
- Current *Current Regulator page*
- Power *Power Driver page*
- Digital Input *Digital Input page*
- Digital Output *Digital Output page*
- Analog I/O *Analog I/O page*
- Homing *Homing page*
- Limits *Limits page*
- Axis *Axis page*
- Encoder Interface *Encoder Interface page*
- Monitor Windows *Monitor Windows page*
- Wave *Waveform Generator page*

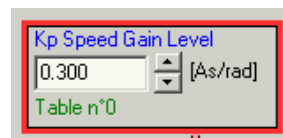
Within the Browser pages there are multiple-selection parameters with drop-down menu and parameters identified by boxes. For each parameter it is provided

1. the name
 - in red font, which indicates that modification of this parameter are effective only after *Software re-Boot*,
 - or in blue font, which indicates that modification of this parameter are immediately effective;
2. a drop-down menu or a box for altering the parameter manually or by up-down arrows;
3. the number of the motion table that is being modified, if the parameter is “tabled” into the *Table Settings* listing.

Example of parameters with drop-down menu:



Example of parameter within a box:

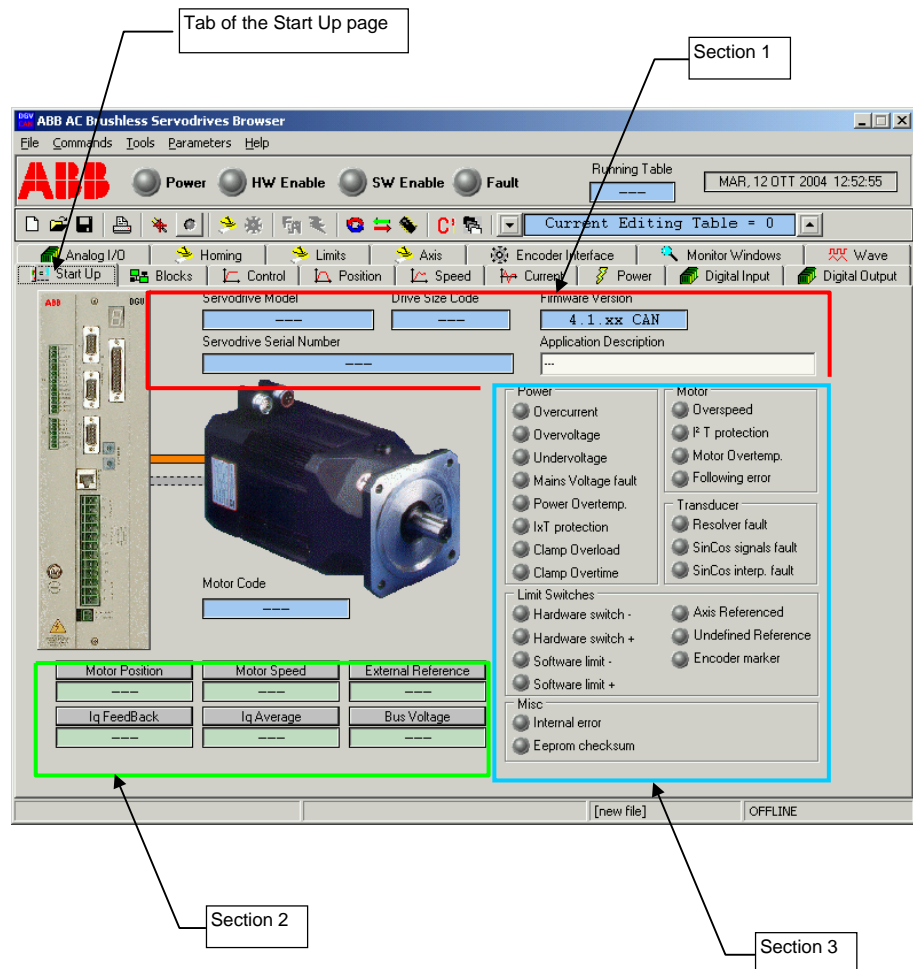


Browser Pages

In the following a short description of each Browser page is provided.

Startup Assistant

This is the main page of the ABB AC Brushless Servodrives Browser. It provides an overview of the drive system as well as of the drive status.



There are three sections much important when online connected.

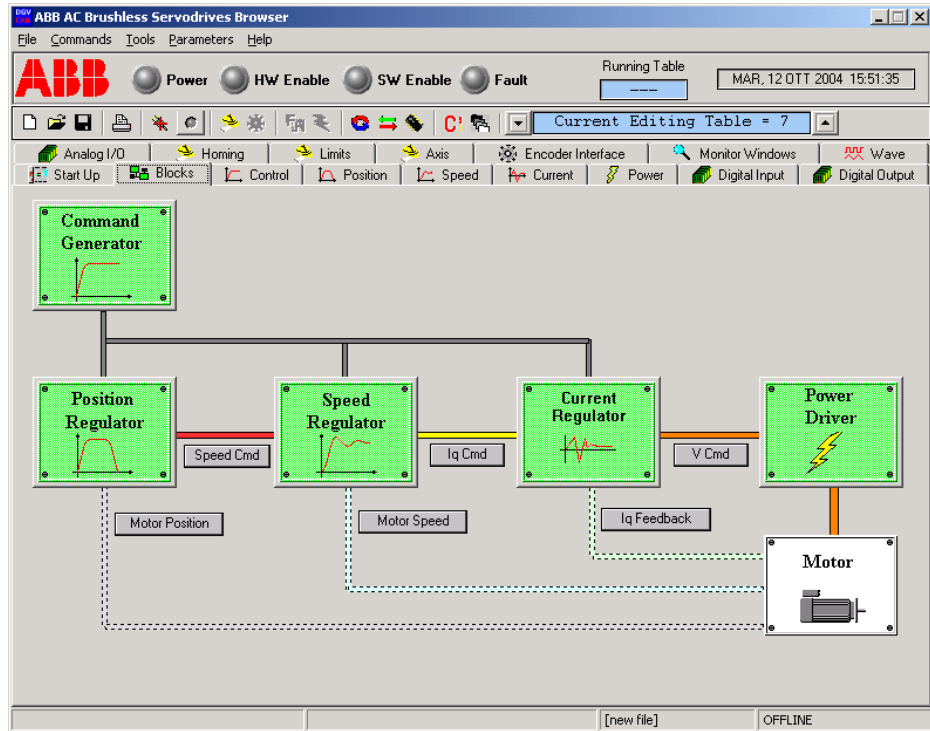
One section automatically detects and displays the servodrive model, size and serial number, and the application symbolic name too.

A second section displays the drive local variables (position, speed, etc.).

A third section displays general messages, protection functions and faults that may occur during operation.

Block Analyzer

The Block Analyzer page shows the basic block diagram of the drive internal control loop.



This page represents the block for conditioning of analog commands that may supply the position, speed or current control loop, represented with green boxes as well.

Pressing the green boxes will open the Browser page of the Position Regulator, the Speed Regulator, the Current Regulator or the Power Stage monitoring page, respectively. You can also view the same pages clicking the page tabs located immediately below the tool bar.

Control The Control page prompts you to select the control mode

- 1 - Local
- 2 - Field bus

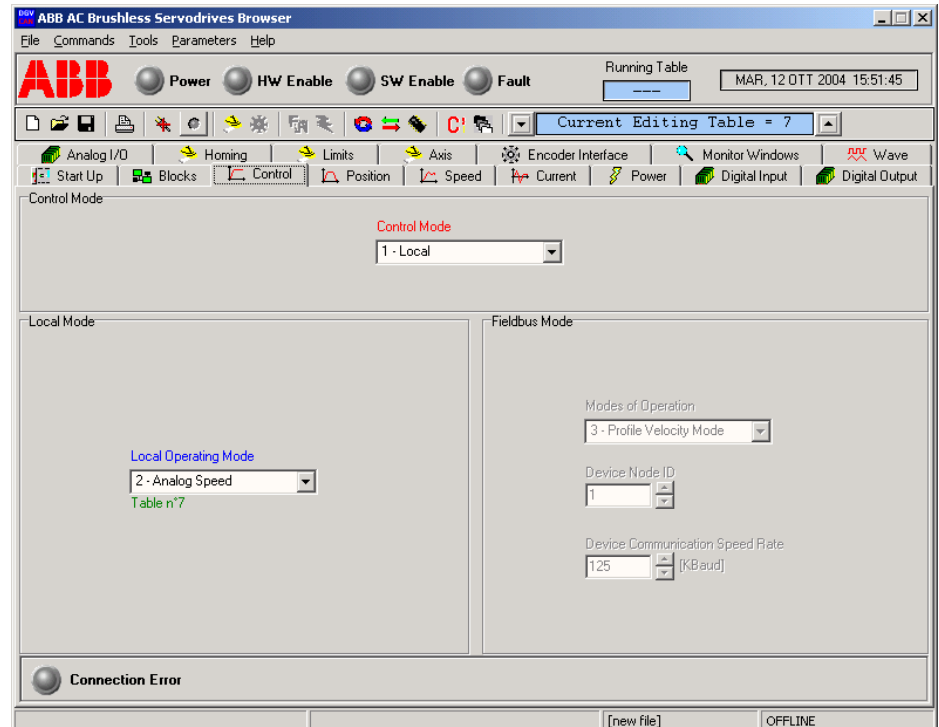
and the operating mode.

The local operating modes “Local Operating Mode” are:

- 1 - Analog Torque
- 2 - Analog Speed
- 3 - Digital Torque
- 4 - Digital Speed
- 5 - Digital Position

the field bus operating modes “Modes of Operation” are, CANopen and Profibus version respectively:

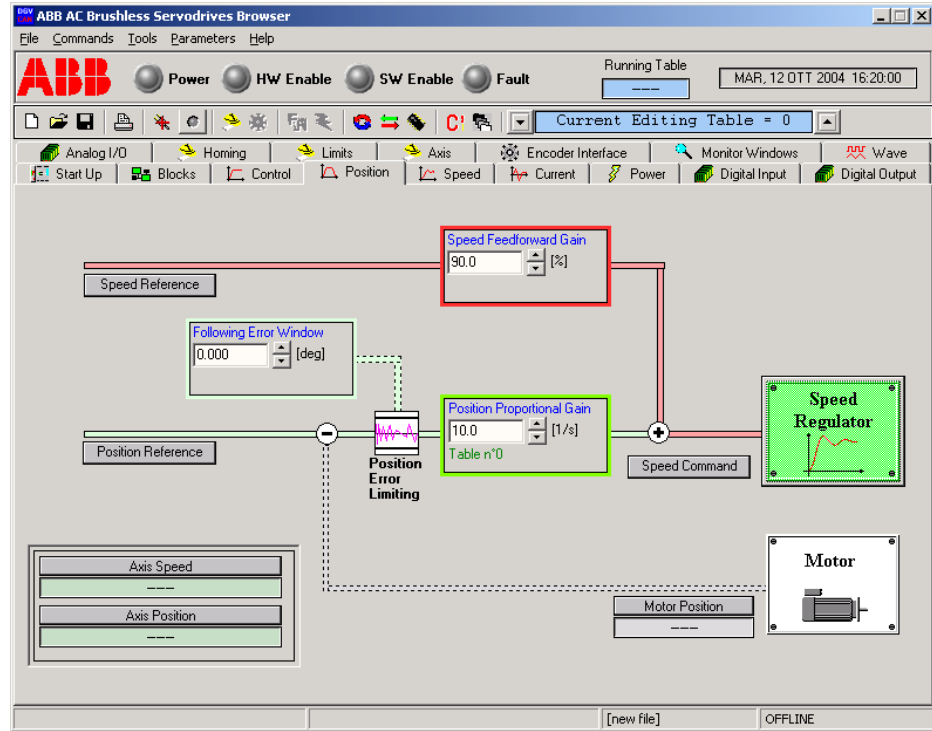
- | | |
|--------------------------------|-------------------------|
| -4 - Synchronization Mode | -3 - Torque Mode |
| -3 - Jogging Mode | -2 - Analog Torque Mode |
| -2 - Analog Torque Mode | -1 - Analog Speed Mode |
| -1 - Analog Torque Mode | 1 - Speed Mode |
| 1 - Profile Position Mode | 2 - Positioning Mode |
| 3 - Profile Velocity Mode | |
| 4 - Profile Torque Mode | |
| 6 - Homing | |
| 7 - Interpolated Position Mode | |



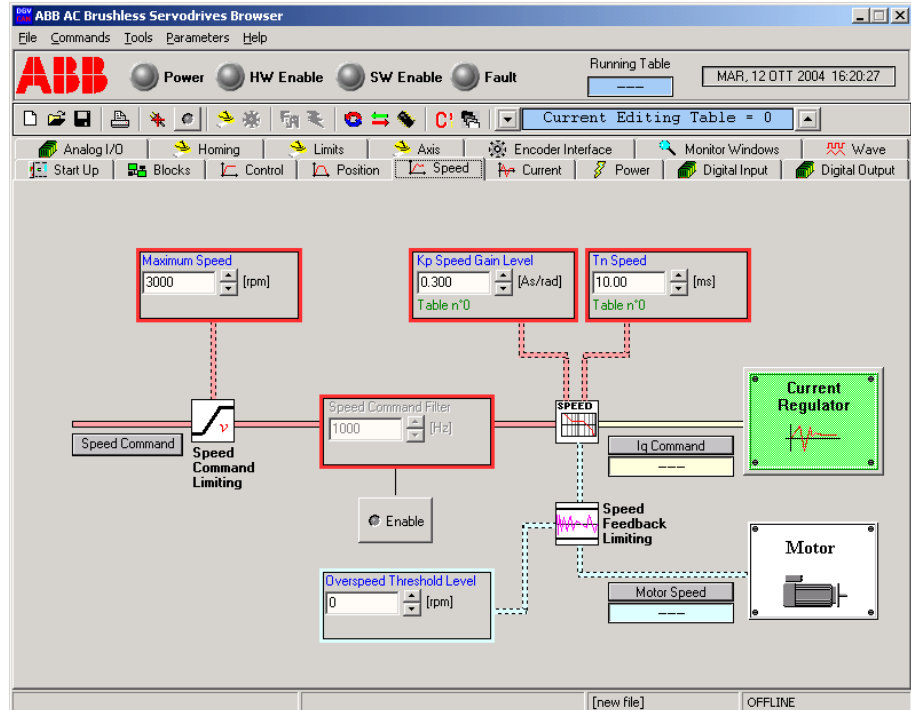
See the *CANopen Manual* or *Profibus Manual*, depending on the field bus to be used.

Position Regulator This page shows the position control loop. By this page you can:

- Update the position control loop main parameters (*Speed Feedforward Gain* and *Position Proportional Gain*)
- Monitor the drive local variable *Axis Position* and *Axis Speed*.

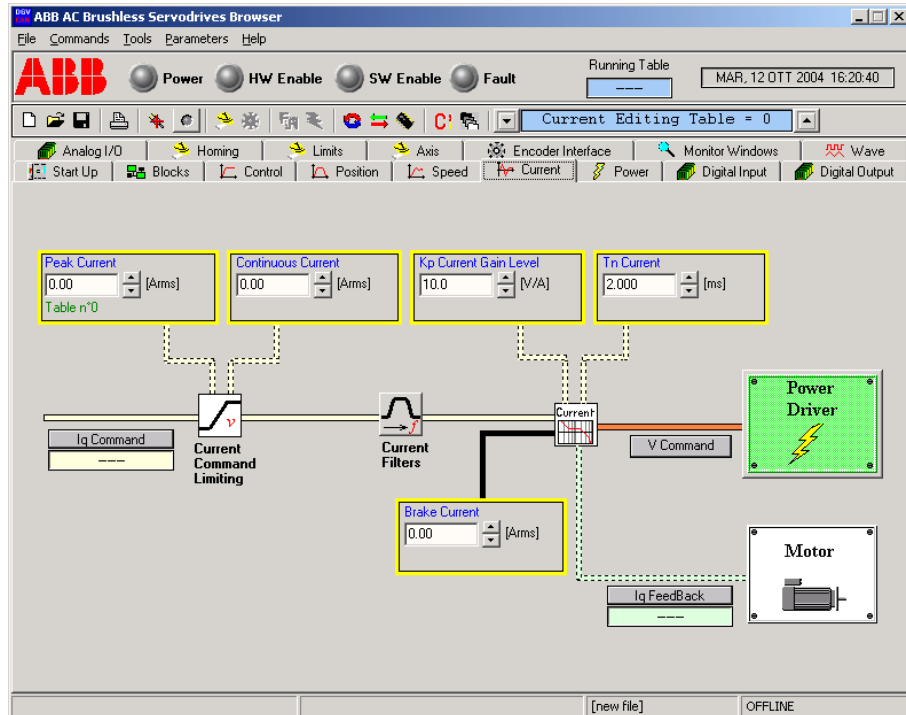


Speed Regulator As for the previous page, through the Speed Regulator page show below you can access the main parameters of the drive internal speed control loop.

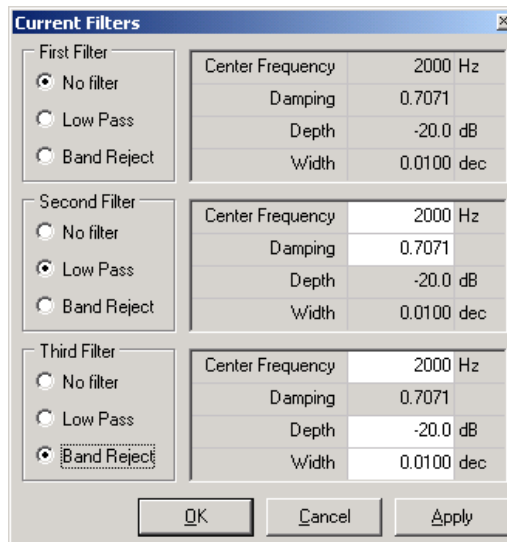


Current Regulator

The Current Regulator page is hereby presented. For safety reasons the current loop parameters are password protected during drive operations.

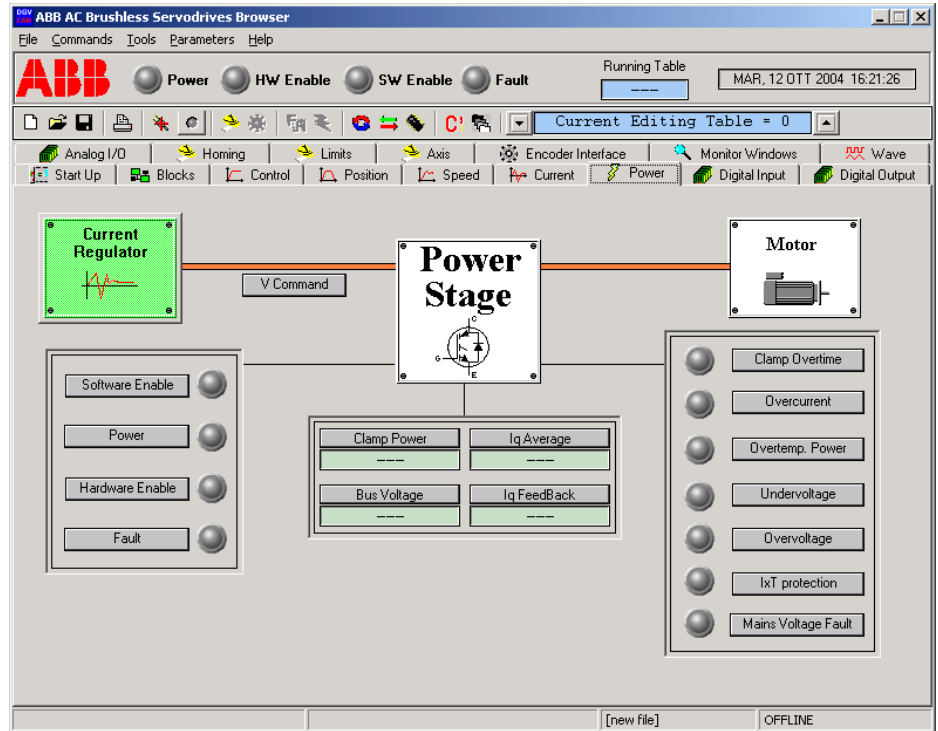


Pushing the button “Current Filters”, it is possible to configure up to three filters on the current reference signal.



These filters may be configured as Low Pass or Band Rejection filter.

Power Driver This page shows the block diagram of the drive power stage. The power local variables and power faults are also displayed.



Digital Input

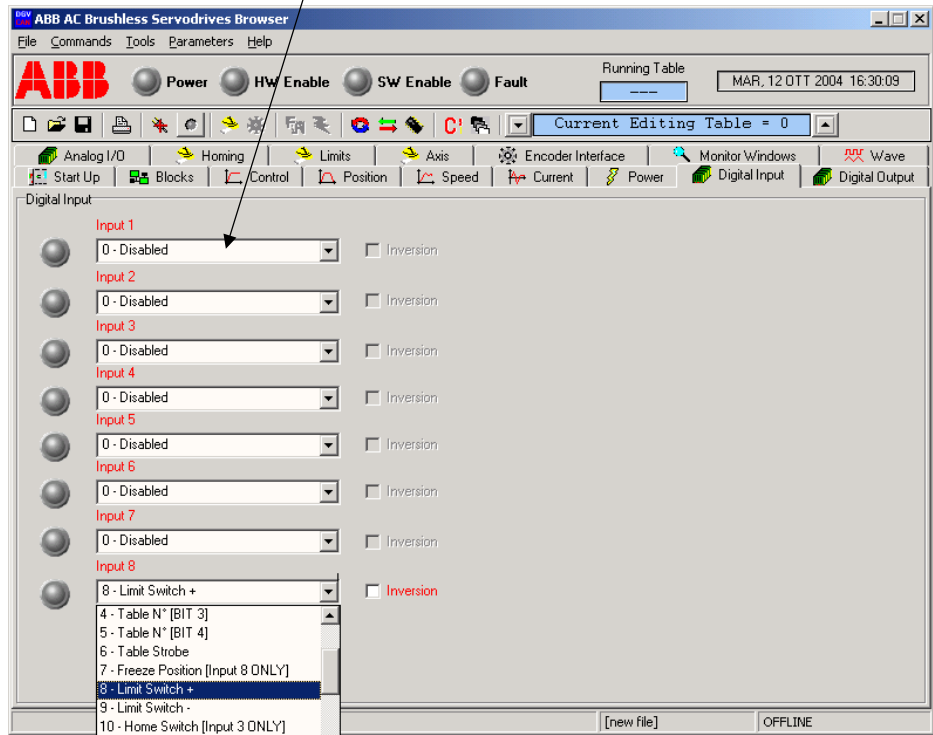
This page allows you to configure digital inputs located within terminal X5 and X6 of DGV front panel. The configuration of digital inputs can be stored into the servodrive non-volatile memory.

Drop-down menus display available functions.

The condition of each digital input can be inverted by setting check-box "Inversion".

Configurable digital inputs located on DGV front panel.

Terminal X5:	Terminal X6:
- D-IN 1	- D-IN 6
- D-IN 2	- D-IN 7
- D-IN 3	- D-IN 8
- D-IN 4	
- D-IN 5	



Note. it is not allowed to use the same function over two different inputs.

Digital Configurable Inputs

All digital inputs have the same drop-down menu.

Push the down-arrow and move the scroll box to view and select one of the following functions:

1 - Table N° (BIT 0)	Allow on-the-fly switching of 2 motion tables.
2 - Table N° (BIT 1)	Allow on-the-fly switching of up to 4 motion tables.
3 - Table N° (BIT 2)	Allow on-the-fly switching of up to 8 motion tables.
4 - Table N° (BIT 3)	Allow on-the-fly switching of up to 16 motion tables.
5 - Table N° (BIT 4)	Allow on-the-fly switching up to 32 motion tables. Tables have to be activated and properly programmed. See <i>Chapter 6 – Parameters</i> .
6 - Table Strobe	Strobe on the switching command of the motion tables.
7 - Freeze Position (input 8 ONLY)	Freeze drive actual position into the servo converter non-volatile memory.
8 - Limit Switch +	Hardware positive limit switch input.
9 - Limit Switch -	Hardware negative limit switch input.
10 - Home Switch (input 3 ONLY)	Home switch input for homing methods 4, 6, 20 and 22. See Chapter 6 of the <i>CANopen Guide</i> or <i>Profibus Guide</i> depending on the field bus to be adopted.
11 - Start Sync (active LOW)	Start speed or position axis synchronization with predefined gear ratio.
12 - Halt (active LOW)	Perform intermediate stop during positioning. This command is available for all digital and analog operating modes except for interpolation and synchronization modes.
13 - Start Homing	Start homing procedure at any positive edge of the input signal. Note. The input signal has to be set to zero again after the drive status word prompts you the homing procedure is over. Input signal set to zero before the homing procedure is over will abort operation.
14 - Start Jog 1	Start jogging mode 1 at any positive edge of input signal and keep on jogging until input signal is positive.
15 - Start Jog 2	Start jogging mode 2 at any positive edge of input signal and keep on jogging until input signal is positive.
16 - Start Motion Task	Start new task at any positive edge of the input signal. This input command has priority over field bus control word. Note. Input signal set to zero before the positioning is over will not abort operation.
17 - Brake Inhibit	Unlock mechanical brake and electrical braking.
18 - Stop Motion Task (active LOW)	Stop last motion task at any positive edge of the input signal.

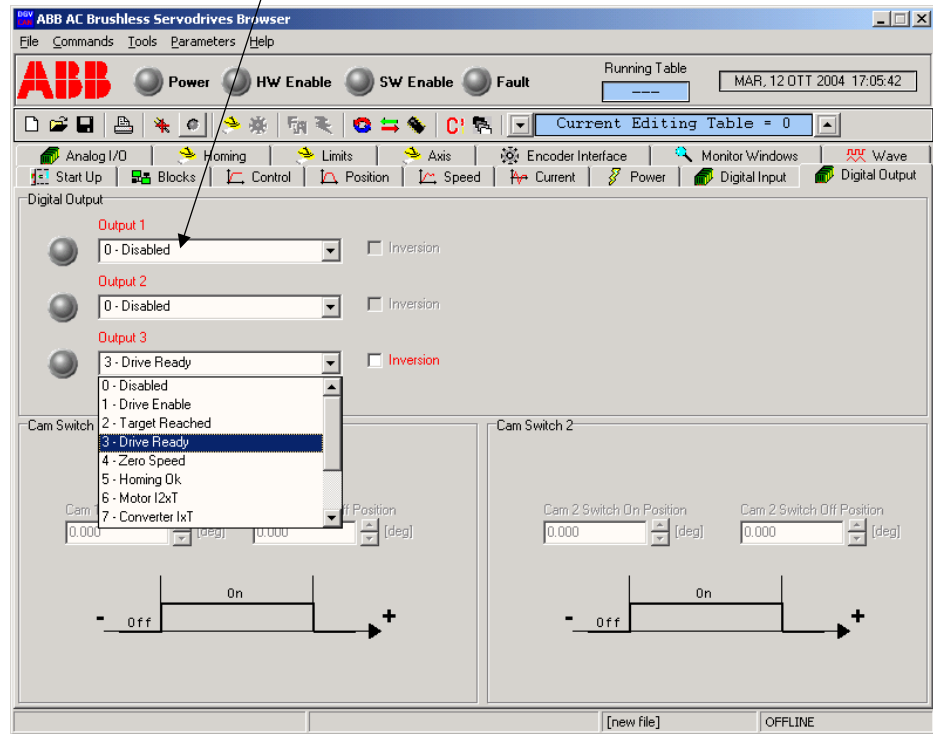
Digital Output This page allows you to configure digital inputs and outputs located within terminal X6 of DGV front panel. The configuration of digital outputs can be stored into the servodrive non-volatile memory.

Drop-down menus display available functions.

The condition of each digital input can be inverted by setting check-box "Inversion".

Configurable digital outputs located on terminal X6 of DGV front panel:

- D-OUT 1
- D-OUT 2
- D-OUT 3



Note. it is not allowed to use the same function over two different ioutputs.

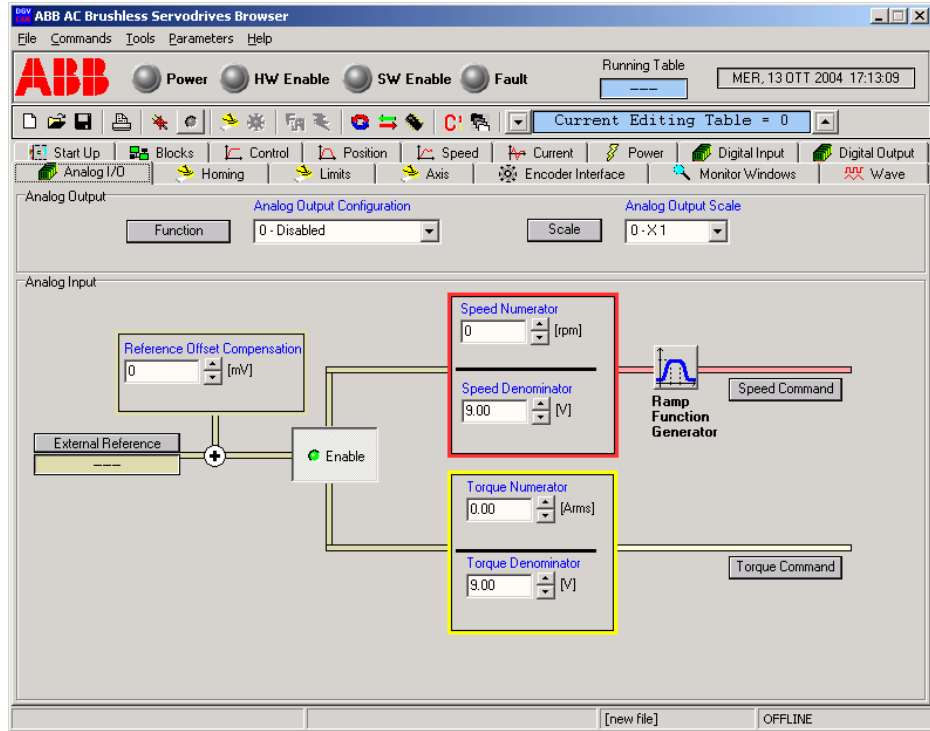
Digital Configurable Outputs

All digital outputs have the same drop-down menu.

Push the down-arrow and move the scroll box to view and select one of the following functions:

1 - Drive Enable	Signals when servodrive is enabled, that is the drive power stage is supplied and HW enable input is on. The servodrive usually changes from the state "Drive Ready" to the state "Drive Enable".
2 - Target Reached	States position, speed or current target reached. Especially: <ul style="list-style-type: none"> • Speed target – whether analog or digital – is reached when the drive speed is lower than threshold Min Speed and consistent with parameters Speed Window and Speed Monitoring Time (see <i>Chapter 6 - Monitoring Functions of CANopen Guide or Profibus Guide</i>). • Position target – whether analog or digital – is reached when the drive position is consistent with parameters Position Window and Position Monitoring Time (see <i>Chapter 6 - Monitoring Functions of CANopen Guide or Profibus Guide</i>). • When a speed- or position-controlled servodrive is halted by "Halt" command, this output prompts that the target was reached using the same parameters of <i>Monitoring Functions</i>.
3 - Drive Ready	States when mains voltage is applied to the converter but HW Enable input is still off.
4 - Zero Speed	States when drive speed is lower than threshold Min Speed. This function is available for both current and speed operating modes, and it can be matched with outputs function 10 and 11 of virtual cams.
5 - Homing OK	States when homing procedure was successfully completed. Output signal stays positive until a new homing procedure is started.
6 - Motor I2xT	States when the motor protection function is active.
7 - Converter IxT	States when the converter protection function is active.
8 - Positioning Ack	Positioning Acknowledge. Position setpoint was successfully loaded.
9 - Sync Reached	States when the slave axis is fully synchronized with the master.
10 - Cam Switch 1	Output of function "virtual cam 1" (see <i>Chapter 6 – Virtual Cams, Profibus or CANopen Manual</i>).
11 - Cam Switch 2	Output of function "virtual cam 2" (see <i>Chapter 6 – Virtual Cams, Profibus or CANopen Manual</i>).

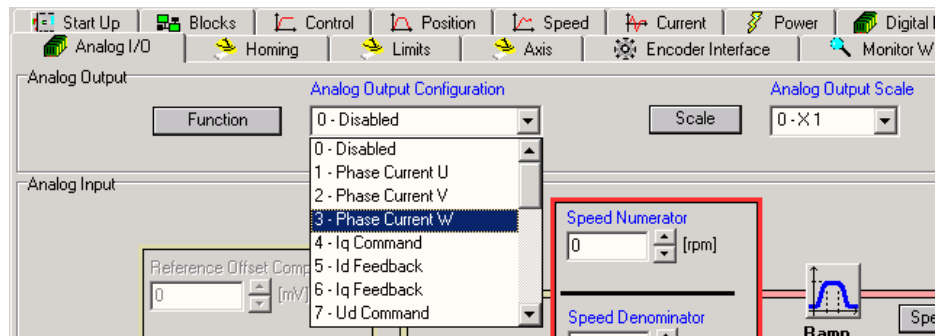
Analog I/O This page allows you to configure the analog input (+/- VREF) and the analog output (A-OUT) placed on the converter front panel. The Analog I/O configuration can be stored into the servodrive non-volatile memory.



The section “Analog Output” is provided for configuring the analog output A-OUT, +/- 10 V , located on the converter front panel.

A drop-down menu displays all functions available for the analog output.

The function “Scale” allows for scaling the signal.



Current and voltage related functions are 16-bit accuracy; position and speed related functions are 32-bit accuracy.

Full scale of current signals is:

$$10 \text{ V} = 1,2 * \text{Drive Peak Current [A]}$$

Full scale of current signals is:

$$10 \text{ V} = \text{Vmains} * 1,41$$

For other signal types, full scale is specific.

Push the down-arrow and move the scroll box to view and select one of the following functions:

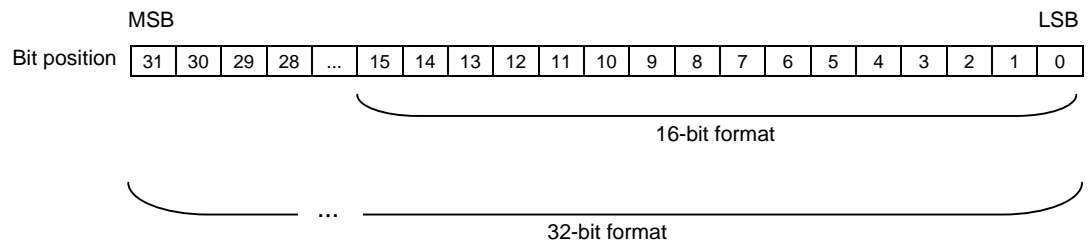
- | | |
|---------------------|---|
| 1 - Phase Current U | Phase-U Current feedback signal from DGV power stage. |
| 2 - Phase Current V | Phase-V Current feedback signal from DGV power stage. |
| 3 - Phase Current W | Phase-W Current feedback signal from DGV power stage. |
| 4 - Iq Command | Internal command of the quadrature-current. |
| 5 - Id Feedback | Feedback of the direct-current obtained by the stator currents. |
| 6 - Iq Feedback | Feedback of the quadrature-current obtained by the stator currents. |
| 7 - Ud Command | Direct-component of the voltage given by the Id control loop. |
| 8 - Uq Command | Quadrature-component of the voltage given by the Iq control loop. |
| 9 - Eq Command | Estimation of the servomotor b.e.m.f. |

10 - Vd Command	Direct-component of the voltage applied to the servomotor.
11 - Vq Command	Quadrature-component of the voltage applied to the servomotor.
12 - Speed Command	Speed command output of the speed internal control loop. Full scale is: 10 V = Motor Maximum Speed (CAN: Indice 2251; Profibus: PNU 337)
13 - Motor Speed	Speed feedback signal of the servomotor position transducer. Full scale is: 10 V = Motor Maximum Speed (CAN: Indice 2251; Profibus: PNU 337)
14 - Position Reference	Position reference input signal of the position control loop. This signal may be generated by the trajectory internal generator or by an external position profile generator. Full scale is: 10 V = 2^{31} number-of-counts
15 - Speed Reference	Speed reference input signal of the speed control loop. Full scale is: 10 V = Motor Maximum Speed (CAN: Indice 2251; Profibus: PNU 337)
16 - Axis Position	Axis Position. Full scale is: 10 V = 2^{31} number-of-counts
17 - Position Error	This the drive following error, that is the difference between the Position Reference, input of the position control loop, and the Position Feedback. Full scale is: 10 V = 2^{31} number-of-counts
18 - Motor Position	Motor Position. Full scale is: 10 V = 360 deg
19 - Resolver Sine	Demodulation of the resolver sine signal. Standard amplitude of sine signal for 8C SERIES servomotors is +/- 9 V.
20 - Resolver Cosine	Demodulation of the resolver cosine signal. Standard amplitude of cosine signal for 8C SERIES servomotors is +/- 9 V.
21 - IxT Current	Converter average current for IxT protection algorithm.
22 - I2xT Current	Motor average current for I2xT protection algorithm.
23 - Bus Voltage	Bus voltage level. Full scale is: 10 V = 1050 V

Function "Scale" of the signal should be used as follows.

All quantities coming out of the drive Analog Output are provided with their binary internal representation.

Position quantities have 32-bit accuracy, current and voltage quantities have 16-bit accuracy.



The drawing hereunder shows how to use function Scale for reading 32-bit quantities and 16-bit quantities, respectively.

X1	x2	x4	x8	...	x2^16	x2^17	x2^18	x2^19	x2^20	x2^21	x2^22	x2^23	x2^24	x2^25	x2^26	x2^27	x2^28	x2^29	x2^30	x2^31
31	30	29	28	...	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

x1	x2	x4	x8	x16	x32	x2^6	x2^7	x2^8	x2^9	x2^10	x2^11	x2^12	x2^13	x2^14	x2^15
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Position Error is a 32-bit format variable. If the position error of your application is expected to be, for example, 9 degrees during drive dynamic operation, then

$$(9 \text{ deg} / 360 \text{ deg}) * 2^{16}$$

produces 1638 number-of-counts. This number can be read in the range of power 2^{11} . This means the signal can be read in bit positions 2 to 11, hence the right scale to be set for reading Position Error in this case is $x2^{20}$.

X1	x2	x4	x8	...	x2^16	x2^17	x2^18	x2^19	x2^20	x2^21	x2^22	x2^23	x2^24	x2^25	x2^26	x2^27	x2^28	x2^29	x2^30	x2^31
31	30	29	28	...	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Note.

- In the last example, 2^{11} is also full scale of the signal, i.e.
 $10 \text{ V} = 2^{11}$ number-of-counts,
 and bit position 12 contains the sign of signal, which will be positive when motor is rotating clockwise and negative when rotating counterclockwise.
- Accuracy of Analog Output is a window of ten bits. Therefore setting Scale x4 of a 32-bit signal implies indeed reading bit positions 29 to 20.

	X1	x2	x4																																				
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	...	4	3	2	1	0																			

When setting Scale x4 of a 16-bit signal implies reading bit positions 13 to 4, that is

			x1	x2	x4																																		
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																								

- Signals full scale is also scaled by the Scale function.
 - For example, when output function is Phase U Current and Scale is set to x1, full scale of Phase U Current is
 $11 \text{ V} = 1,2 * \text{Drive Peak Current}.$
 When Scale is set to x2, full scale of Phase U Current is
 $12 \text{ V} = 1,2 * \text{Drive Peak Current} / 2.$
 When Scale is set to x4, full scale of Phase U Current is
 $13 \text{ V} = 1,2 * \text{Drive Peak Current} / 4.$
 And so forth, when Scale set to x2⁹, full scale of Phase U Current is
 $10 \text{ V} = 1,2 * \text{Drive Peak Current} / 2^9.$

- When output signal is a position quantity scaled x1, signal full scale is

$$14 \quad V = 2^{31} \text{ number-of-counts}$$

i.e. maximum number-of-counts.

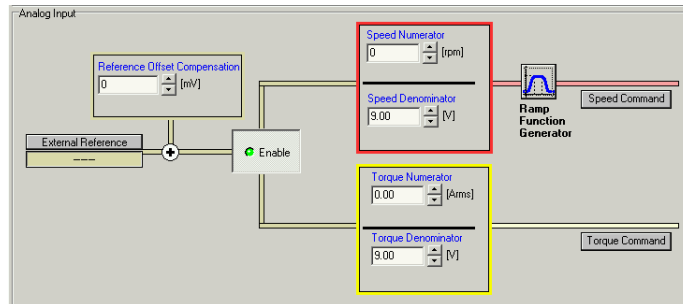
When Scale is set to x2, full scale of the signal is

$$15 \quad V = 2^{31} \text{ number-of-counts} / 2$$

and so on.

Analog Configurable Input

The section “Analog Input” is provided for conditioning of the analog input (+/- VREF) located on the converter front panel.



Parameter “Reference Offset Compensation” compensates offset of the analog input.

Parameters “Speed Numerator“ and “Speed Denominator“ have to be properly set when servodrive is speed controlled. For example, set

- “Speed Numerator” to 3000 rpm
- “Speed Denominator” to 9.00 V

means that an external voltage reference input equal to 9 V will generate a speed command equal to 3000 rpm.

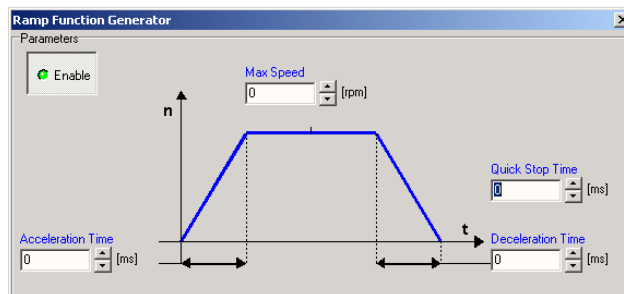
Parameters “Torque Numerator” and “Torque Denominator” have to be properly set when servodrive is current controlled. For example, set

- “Torque Numerator“ to 3 Arms
- “Torque Denominator“to 9.00 V

means that an external voltage reference input equal to 9 V will generate a Iq command equal to 3 Arms.

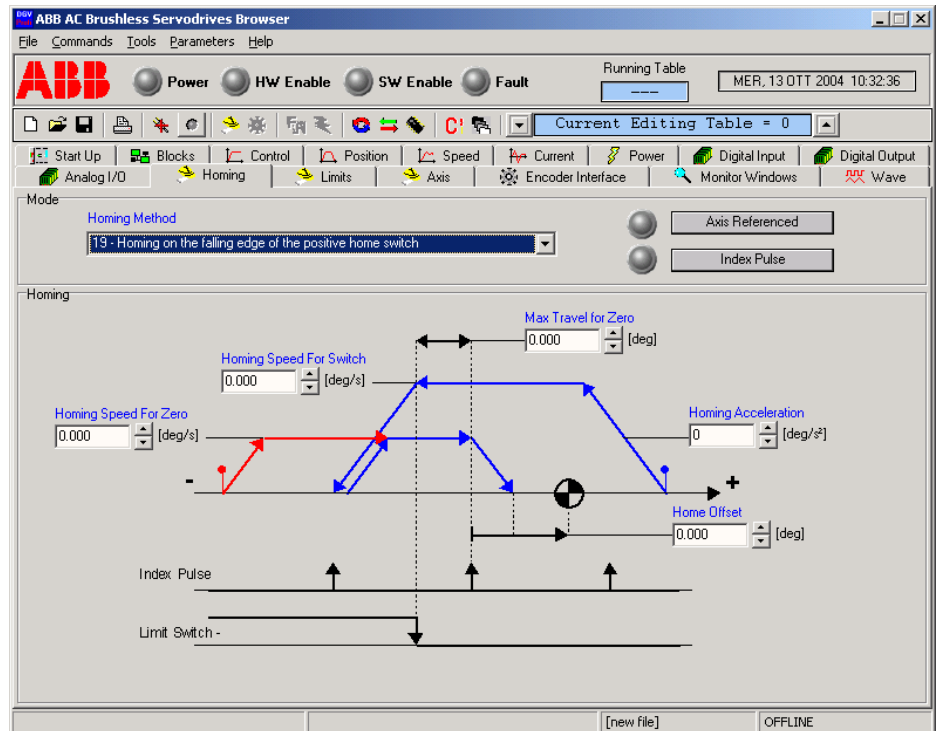
The analog input can be used with local operating modes “Analog Torque” e “Analog Speed”, and the remote operating modes “Analog Torque Mode” e “Analog Speed Mode”.

In addition, pushing the button “Ramp Function Generator” given on the “Speed Command” allows you to configure acceleration, deceleration, emergency ramps and maximum profile speed of the internal ramp generator.



Homing The Homing page contains parameters for configuring the axis referencing procedure.

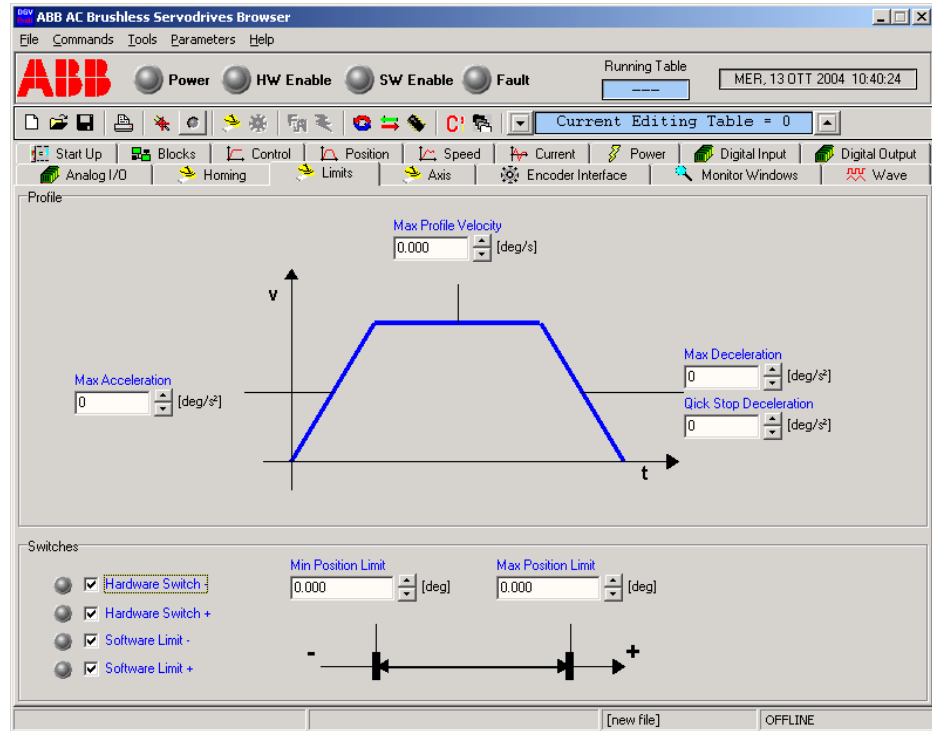
This page shows two led indicators related to axis referencing (Axis Referenced) and acknowledge of the index pulse from the motor position transducer (Index Pulse).



Limits Two sections compose the Limits page.

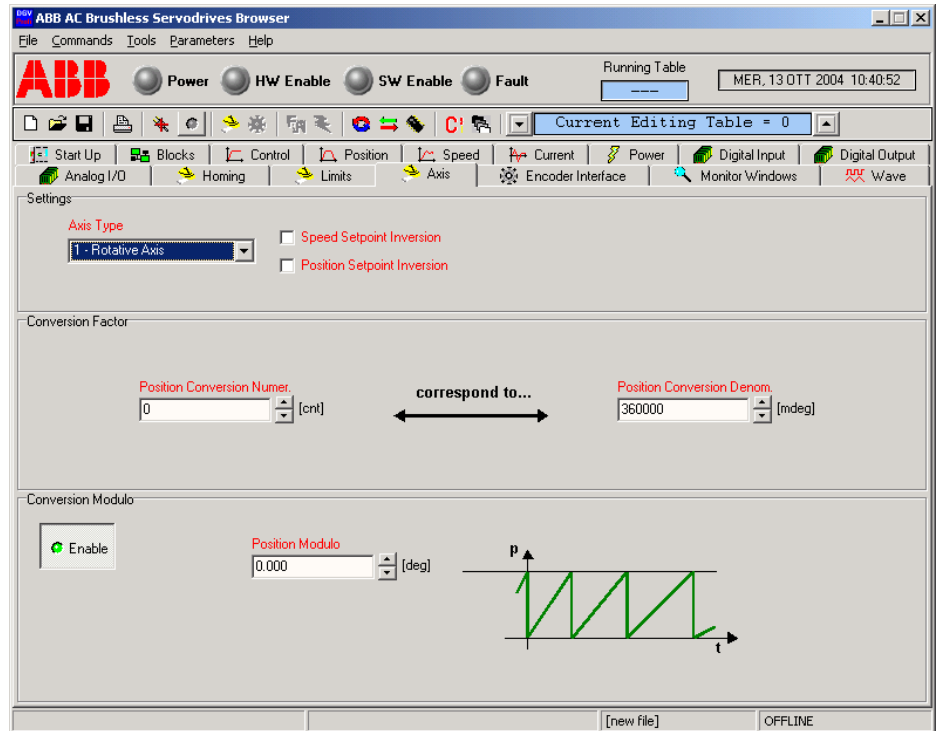
Section “Profile” allows for configuring maximum limits of axis speed and acceleration.

Section “Switches” allows for configuring hardware and software limit switches.



Axis The Axis page presents parameters for configuring the axis type (linear or rotational) and gives the opportunity of inverting the axis direction.

Parameters related to conversion from axis units (deg or mm) into number-of-counts of the position transducer are also presented.

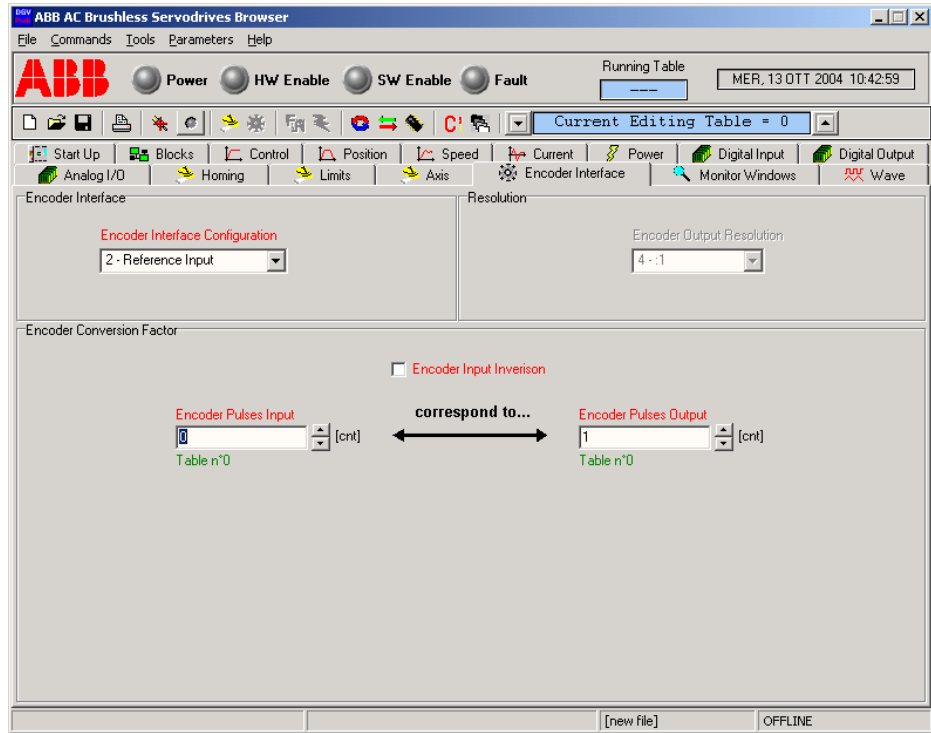


Section “Conversion Modulo” allows for configuring a position modulo for endless rotational axis.

Encoder Interface

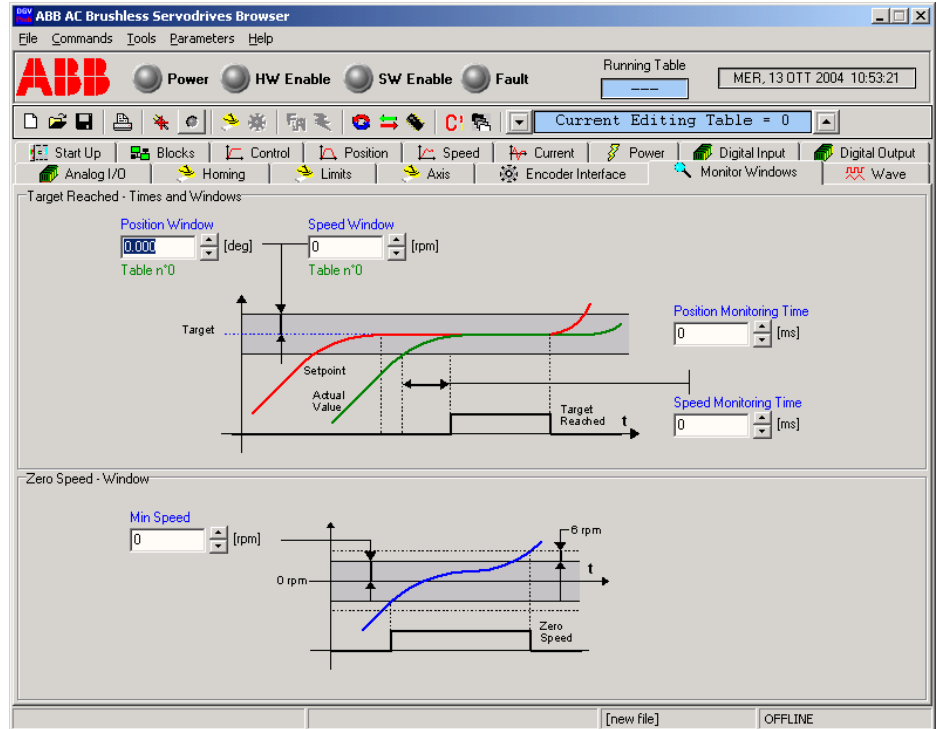
The Encoder Interface page allows for configuring the encoder emulation interface located on terminal X8 of the converter front panel, using one of the following functions:

- 1 - Emulation Output
- 2 - Reference Input
- 3 - Feedback Input
- 4 - Reference Output



See the description of the encoder emulation functions in Chapter 6 of the *CANopen Guide* or *Profibus Guide*.

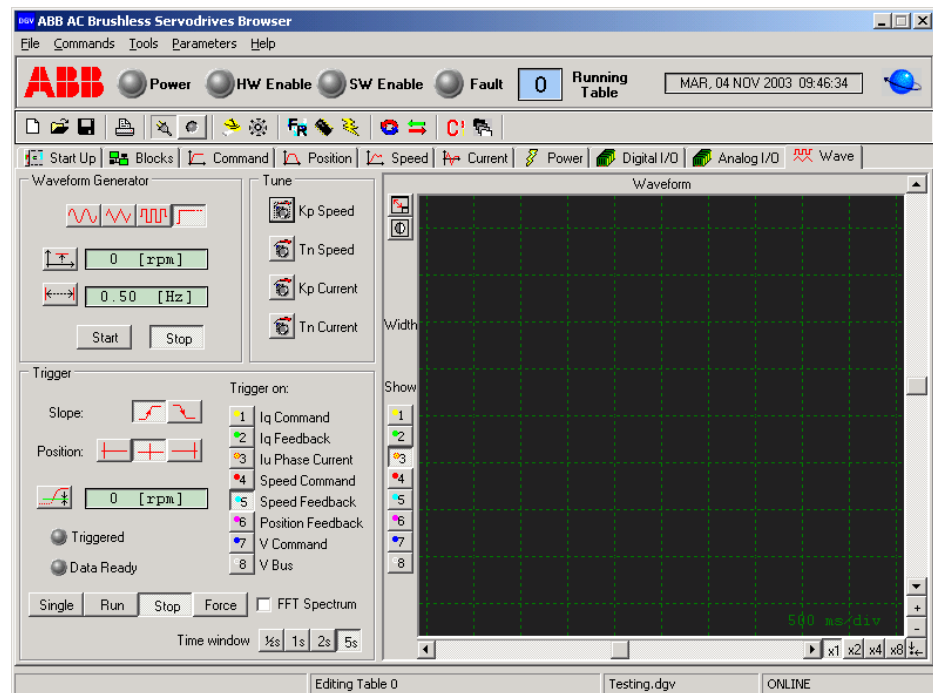
Monitor Windows The Monitor Windows page allows for configuring the speed and position monitoring functions (see *Chapter 6 - Monitoring Functions of the CANopen Guide or Profibus Guide*).



Waveform Generator

Waveform Generator provides utility functions. The waveform generation function allows you to control the drive with a digital waveform generator in accordance with the control mode (current/speed) selected. You can set the amplitude, form and period of the waveform. The drive is disabled with the *Stop* command for safety reasons. Click on the *Software Enable* button to enable it again.

In addition, in the Tune section you have direct access to proportional and integrative gains of current and speed control loops, so that you can easily tune these parameters while observing the drive response on the oscilloscope window.



The oscilloscope function works exactly as a normal digital oscilloscope. Buttons of the Trigger section are provided for selecting front, position and level of the trigger channel.

Press the *Start* button to start acquisition of the signals. The Trigger condition can be forced at any time using the *Force* button. An automatic trigger function on the positive or negative signal front is also available (*Single* button).

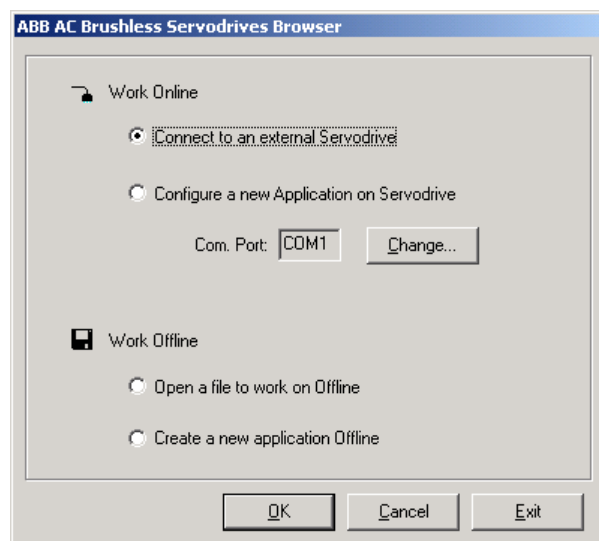
Chapter 5 - Start a Project

Introduction

This chapter describes how to start the project of a new application with DGV or recall a previously saved application.

Opening the Browser

When opening the Browser you get a window which prompts you to select the *Online/Offline* programming mode. Working *Online* you will immediately connect to the drive if the COM port and the cable connection are right. Working *Offline* you can create an application on your PC, save it and test it later on. Working *Online* or *Offline* on both the Browser and the drive depends on your experience.



Work Online

- Select *Connect to an external Servodrive* and then push **OK**. If the drive is supplied and the serial cable is correctly wired, your PC will immediately connect to the drive.
- Select *Configure a new Application on Servodrive* for reconfiguring the drive online.

Work Offline

- Select *Open a file to work on Offline* to open offline an application file previously saved.
- Select *Create a new application Offline* to create a new project offline on your PC. You can save this project and recall it later either online or offline.

How To ...

Start a new Project

Select *Create a new application Offline* to learn how to use this program starting an **offline** project.

Select *Connect to an external Servodrive* to project the application **online**. In this case it is assumed that you have a relevant experience with drives, that you have studied all the documentation related to DGV, and that the drive has been mechanically and electrically installed as prescribed in the *Installation Manual*.

Once you make the selection, push Ok and the *Application Configuration Wizard* starts. This interactive wizard asks the user to provide general and technical information.

Application Configuration Wizard

You are first required to type a descriptive name for your application.

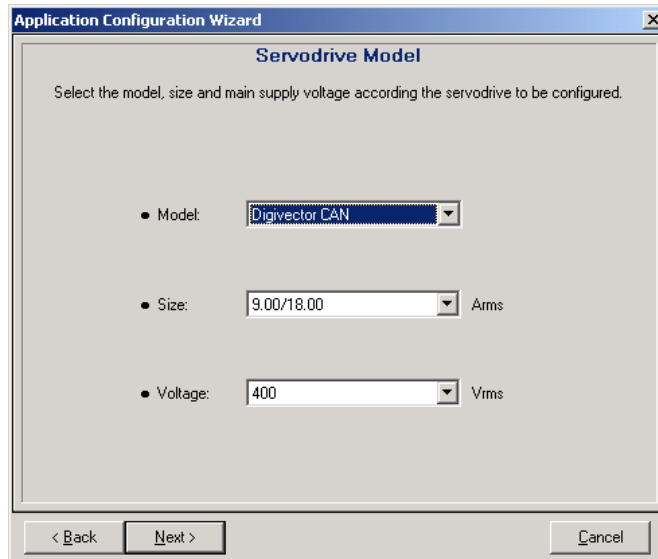


Push Next > to continue the wizard configuration.

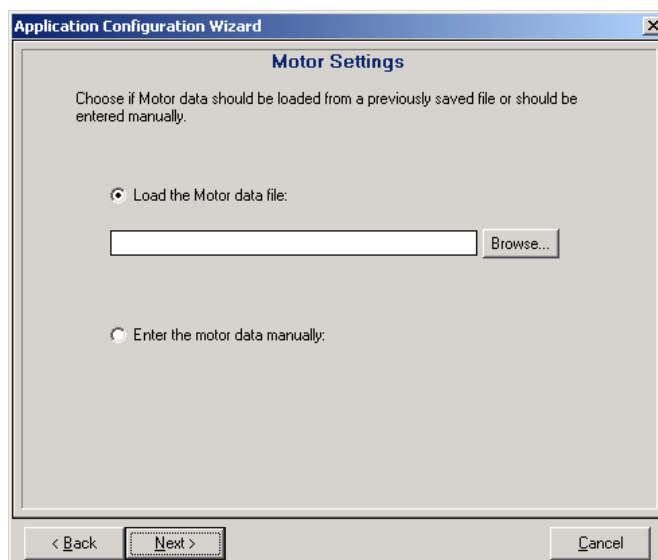
Servodrive Model

Now, if you are working online the program automatically detects the Servodrive Model from the drive connected to the PC.

If you work offline click on the selection boxes to set the drive *Model*, *Size* and supply *Voltage*.

*Motor Configuration*

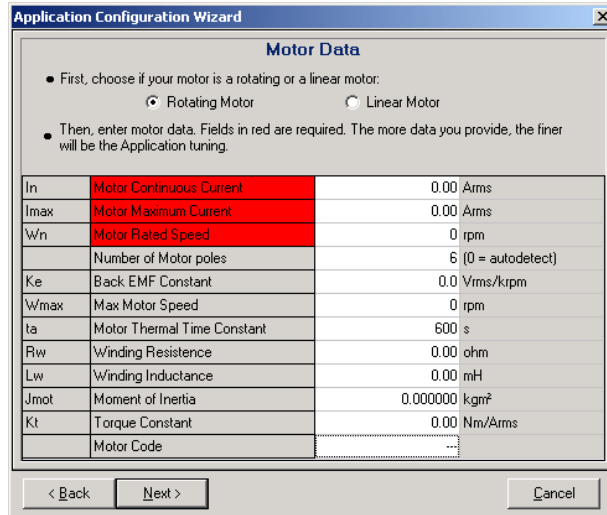
Here you can load the servomotor model. Push *Browse...* and follow the path **C:\Program Files\Browser v...Motors** to open the Motors database directory.



The Motor directory contains the model database of ABB 8C SERIES Brushless Servomotors. Select the model of the servomotor that you are going to couple with DGV. Remember to match the converter supply voltage (230 V or 400 V) and the servomotor supply voltage (230 V or 380 V). Contact the Customer Service for further support.

Motor Data

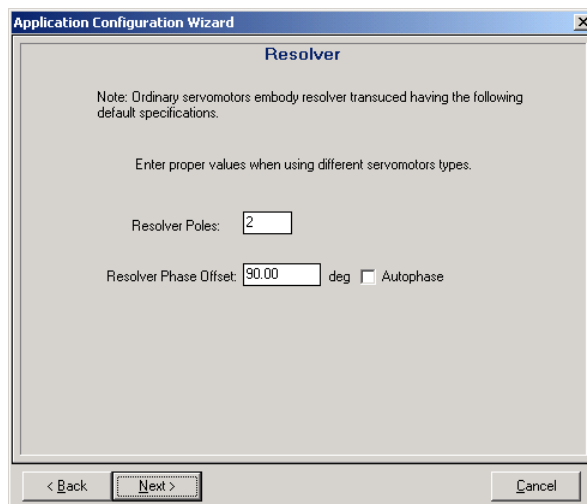
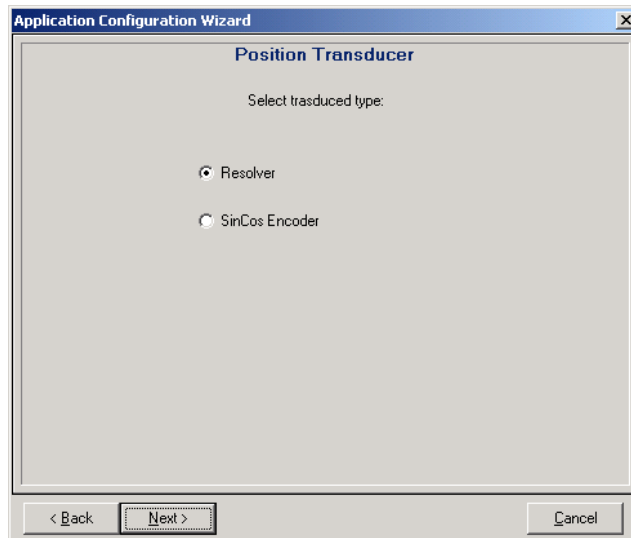
When using an AC brushless servomotor from other manufacturers select *Enter Motor data manually*, push Next > and fill in the required fields of the Motor Data window.



Note. When finished with the wizard, you can save your custom motor model with the data you have inserted. You can save the new motor in the database folder or in another folder from the menu *File – Save Motor Data*.

See the later *Save Motor Data*.

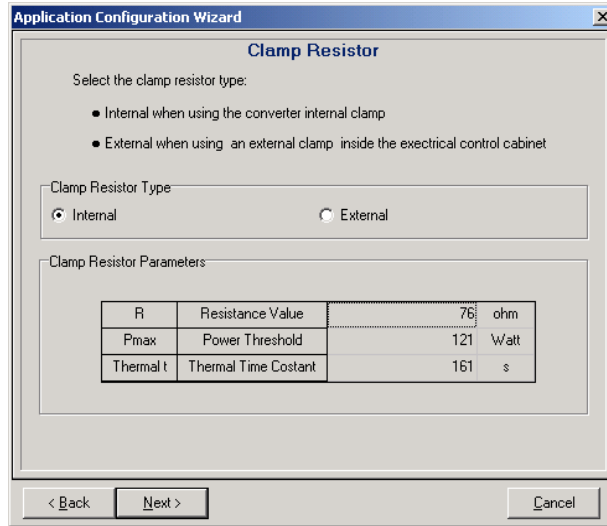
Transducer Select the transducer type. Standard ABB 8C SERIES Brushless Servomotors embody resolvers with 90 degrees phase offset.



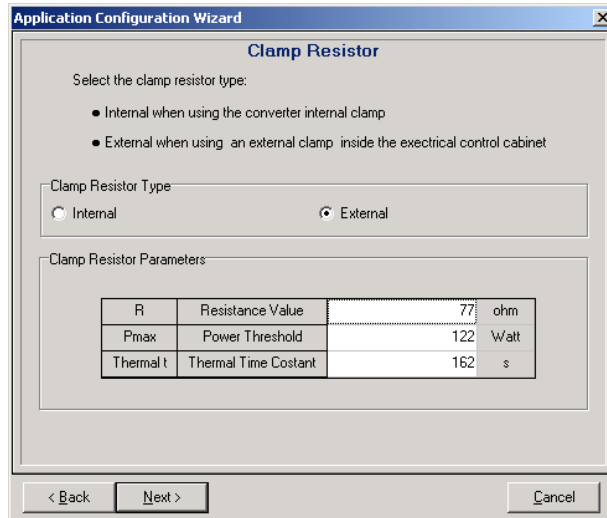
Autophase procedure is mandatory for any brushless servomotor.

Clamp Resistor Select the clamp resistor type. See the *Installation Manual* for the right match of clamp resistor and drive size.

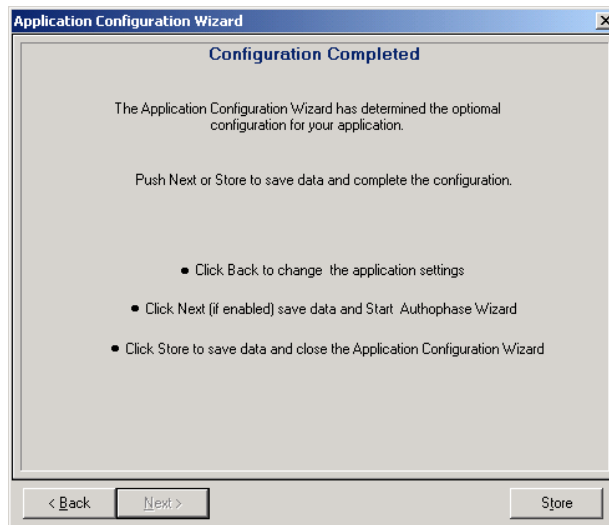
When using the internal clamp resistor, the clamp characteristics are fixed.



When using the external clamp resistor, the clamp characteristics have to be properly set. See the *Installation Manual* for standard *Braking Resistors* to be used with DGV.



Configuration Completed



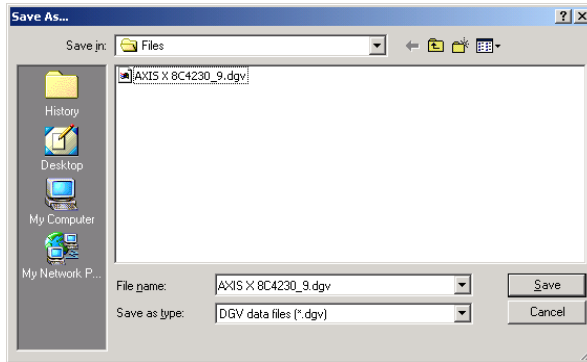
Push **Store** to end the configuration wizard.

Save the New Project

Once the wizard stores the application, the Browser automatically calculates the default values of all application parameters and sets them directly to the drive when online connected.

You can now save the application data into a text file. From the menu *File – Save As...* type the file name, push *Save* and an application file ***.dgv** will be saved.

In this example we type the same symbolic name displayed by the *Application Description* parameter in the Startup Assistant main page.



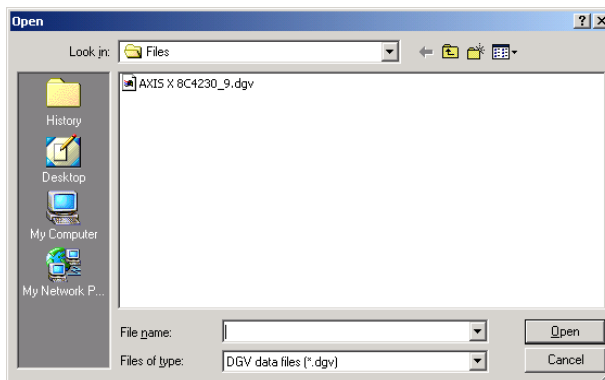
Later you may reload this file either *offline* or *online* for drive quick configuration.

Recall a Project

To recall an application file offline: menu *Commands – Connect...* and select *Open a file to work on Offline*. Open the file, update the application settings as you like, and finally *File – Save...*, or *File – Save As...* to save a new project.

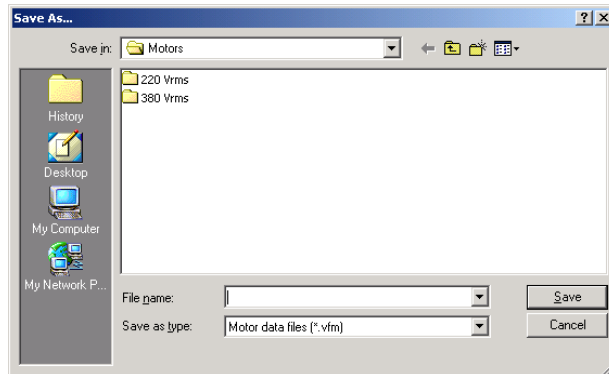
To recall an application file online, i.e. opening it: menu *Commands – Connect...*, select *Configure a new Application on Servodrive* and open the file. This procedure will stop the drive operation and reconfigure the drive itself with the new application settings.

For expert operator, the same command can be executed by the menu command *File – Open* to load and configure an existing application file.



Save Motor Data

If you are using a servomotor from other manufacturers, you can extend database saving new custom models. Enter the motor data manually with the Configuration Wizard, then from the menu *File – Save Motor Data* type the code of your servomotor.

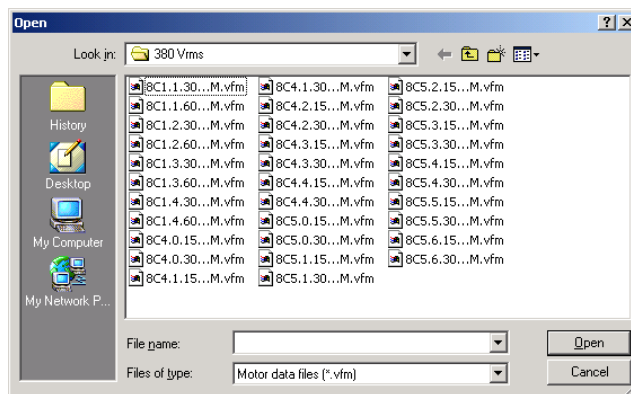


Note. For your convenience:

- the **Files** folder should keep application files only;
- the **Motors** folder should keep motor models only.

Load Motor Data

You may want to reconfigure the drive with a different servomotor model. In this case open menu *File – Load Motor Data* and select the new model into the Motors folder.



Reconfigure the Drive

You may also want to reconfigure a drive which is operating yet. There are two basic steps.

Reconfigure Offline

1. Re-design the application offline

- Menu *Commands – Connect...*
- Select *Open a file to work on Offline* and open the application file previously saved.
- Update your application settings and save the file again, then follow step 2.

Reconfigure Online

2. Reconfigure the drive online

- Menu *Commands – Connect...*
- Select *Configure a new Application on Servodrive* if you have the new application file ready for use.
- Open the application file and the Browser will automatically stop operation and update the drive with the new settings.
- Store the new configuration into the non-volatile memory of the drive: menu *Commands – Freeze Configuration*.

Finally, enable the drive operation and disconnect your PC (menu *Commands – Disconnect...*).

Note. When you get acquainted with the Browser program, you can skip the previous steps and update the settings directly connected to the drive, i.e.

- Menu *Commands – Connect...*
- Select *Connect to an external Servodrive*.
- Update your parameters.
- *Freeze Configuration* to store the new configuration.
- *File – Save...*, or *File – Save As...* to save a new file name.
- *Disconnect...*

Chapter 6 - Parameters

Introduction

This chapter gives a brief overview of the drive parameters that you can view and update by the Browser.

Browser Parameters

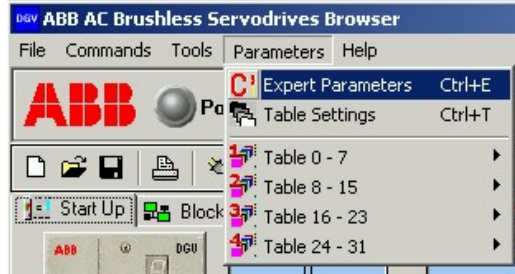
There is a parameter-listing window, *Expert Parameters*, which displays a selective list of drive main parameters, i.e. motor data, converter data, control loop parameters and application specific settings. These are the basic configuration parameters active both in local and remote control.

The *Table Settings* window is available for configuring up to 32 programmable motion tables. Each table provides a standard set of parameters, which are on-the-fly updated when switching from one table to the next.

When saving an application file, a comprehensive parameter list is stored in text format keeping *Expert Parameters* and *Table Settings* together.

How To Display ...

Expert Parameters Select menu *Parameters – Expert Parameters*



or click the Expert Parameters button in the Toolbar (Ctrl + E).

This command opens in a new window the overall list of drive parameters arranged into rows and columns as an Excel table.

Note. The parameters into *Expert Parameters* and *Table Settings* are arranged according to an indexing, which is consistent with the standard numbering of field bus adopted. Therefore parameters of Browser *CANopen Version* and *Profibus Version* are arranged in a different order.

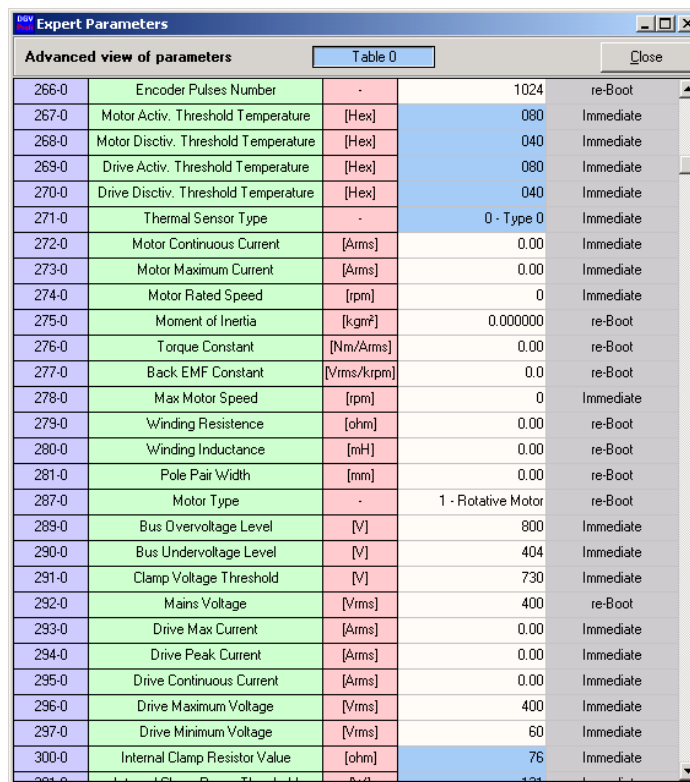
CANopen Version There is one row for each parameter and five different-colored columns giving the following information:

Index/SubIndex	Name	Unit	Value	Effect
2140-00	Max Speed	[rpm]	0	Immediate
2141-00	Acceleration Time	[ms]	0	Immediate
2142-00	Deceleration Time	[ms]	0	Immediate
2143-00	Quick Stop Time	[ms]	0	Immediate
2144-00	Ramp Function Generator Enable	-	0 - Off	Immediate
2200-00	Drive Capabilities	[Hex]	0039	Immediate
2201-00	Actual Selected Table	-	0	Immediate
2202-00	Local Operating Mode	-	2 - Analog Speed	Immediate
2203-00	General Enable	-	1 - On	Immediate
2204-00	Control Mode	-	1 - Local	re-Boot
2205-00	Number of Motor poles	-	6	Immediate
2206-00	Drive Size Code	-	0	Immediate
2207-00	External Reference Enable	-	1 - On	Immediate
2208-00	Sensor Type	-	0 - Resolver	re-Boot
220A-00	Encoder Pulses Number	-	1024	re-Boot
2208-00	Motor Activ. Threshold Temperature	[Hex]	080	Immediate
220C-00	Motor Discriv. Threshold Temperature	[Hex]	040	Immediate
220D-00	Drive Activ. Threshold Temperature	[Hex]	080	Immediate
220E-00	Drive Discriv. Threshold Temperature	[Hex]	040	Immediate
220F-00	Thermal Sensor Type	-	0 - Type 0	Immediate
2210-00	Motor Continuous Current	[Arms]	0.00	Immediate
2211-00	Motor Maximum Current	[Arms]	0.00	Immediate
2212-00	Motor Rated Speed	[rpm]	0	Immediate
2213-00	Moment of Inertia	[kgm ²]	0.000000	re-Boot
2214-00	Torque Constant	[Nm/Arms]	0.00	re-Boot
2215-00	Back EMF Constant	[Vrms/krpm]	0.0	re-Boot
2216-00	Max Motor Speed	[rpm]	0	Immediate

- 1.
- 2.
- 3.
- 4.
- 5.

1. The first left-hand column displays the parameter Index and SubIndex related to the field bus type adopted (see the *CANopen Guide*).
2. The second column displays the name of the parameter.
3. The third column displays the unit of the parameter.
4. The fourth column displays the value of the parameter within white active cell. Click the white cell and type the new value. Light blue cells are inhibited to changes, because those parameters are related to the Converter hardware layout and should not ever be changed.
5. The fifth column indicates whether online modification of this parameter have immediate effect or it is effective after reinitialization by *Software re-Boot* (Ctrl + B).

Profibus Version In the following the *Expert Parameters* window of the Browser Profibus version is presented.

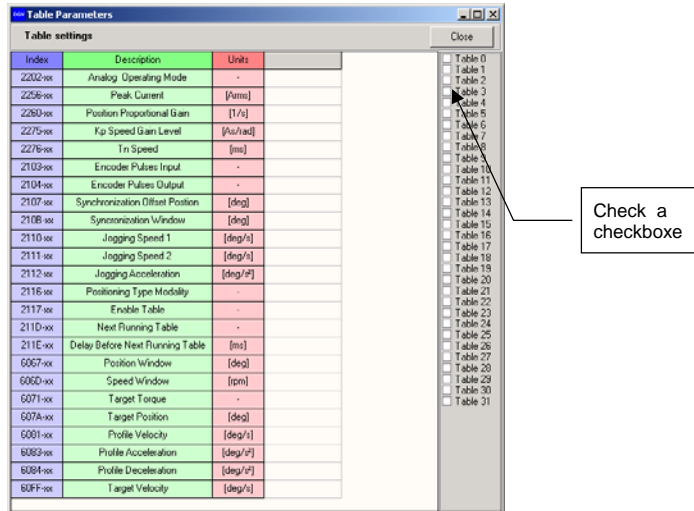


Advanced view of parameters				
Table 0				
266-0	Encoder Pulses Number	-	1024	re-Boot
267-0	Motor Activ. Threshold Temperature	[Hex]	080	Immediate
268-0	Motor Disctiv. Threshold Temperature	[Hex]	040	Immediate
269-0	Drive Activ. Threshold Temperature	[Hex]	080	Immediate
270-0	Drive Disctiv. Threshold Temperature	[Hex]	040	Immediate
271-0	Thermal Sensor Type	-	0 - Type 0	Immediate
272-0	Motor Continuous Current	[Ams]	0.00	Immediate
273-0	Motor Maximum Current	[Ams]	0.00	Immediate
274-0	Motor Rated Speed	[rpm]	0	Immediate
275-0	Moment of Inertia	[kgm²]	0.000000	re-Boot
276-0	Torque Constant	[Nm/Ams]	0.00	re-Boot
277-0	Back EMF Constant	[Vrms/krpm]	0.0	re-Boot
278-0	Max Motor Speed	[rpm]	0	Immediate
279-0	Winding Resistance	[ohm]	0.00	re-Boot
280-0	Winding Inductance	[mH]	0.00	re-Boot
281-0	Pole Pair Width	[mm]	0.00	re-Boot
287-0	Motor Type	-	1 - Rotative Motor	re-Boot
289-0	Bus Overvoltage Level	[V]	800	Immediate
290-0	Bus Undervoltage Level	[V]	404	Immediate
291-0	Clamp Voltage Threshold	[V]	730	Immediate
292-0	Mains Voltage	[Vrms]	400	re-Boot
293-0	Drive Max Current	[Ams]	0.00	Immediate
294-0	Drive Peak Current	[Ams]	0.00	Immediate
295-0	Drive Continuous Current	[Ams]	0.00	Immediate
296-0	Drive Maximum Voltage	[Vrms]	400	Immediate
297-0	Drive Minimum Voltage	[Vrms]	60	Immediate
300-0	Internal Clamp Resistor Value	[ohm]	76	Immediate

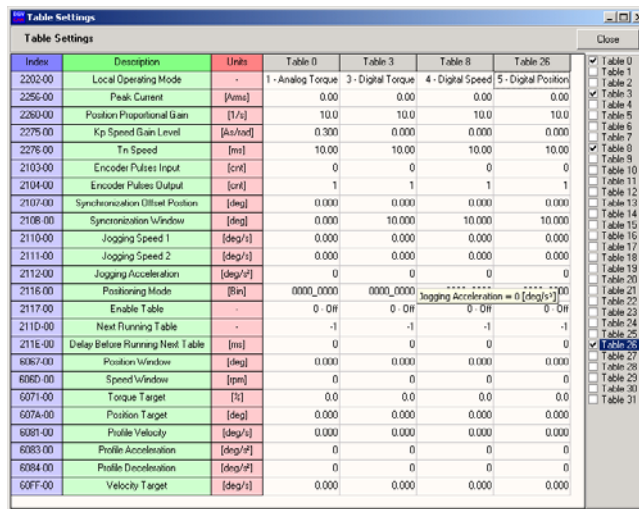
Table Settings Select menu *Parameters – Table Settings* or click the Table Settings button in the Toolbar (Ctrl + T).

This command opens a new window for setting parameters of the motion tables. This window is basically arranged into rows and columns as an Excel table.

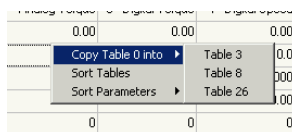
- First step, click the table checkbox in the right hand of the window to view tables.



- Then, parameterize the column related to a table.



Push the mouse right button to perform additional operations with tables.



Appendix A - Faults and Messages

The following table provides:

1. an overview of the faults, alarms and general messages displayed by the led indicators in the Startup Assistant page (see also *Chapter 4 - User Interface*),
2. identification of fault causes and corrective actions to be undertaken.

Note that

- DGV300 display the error code by the status LED (LED Code Legend: G stands for green, R stands for red, Y stands for yellow)
- DGV700 display the error code by the display (first digit of fault codes is F, first digit of alarm codes is A).

Remember that you can reset incidental faults by the fault reset input on the converter frontal panel, whereas serious faults may be reset only by power off.

When permanent faults occur, consult the *Installation Manual* and check your local installation.

Browser Led Indicator	DGV700 Display	DGV300 LED	Cause	Error Removal
IxT Protection	A01	GGGGY	Alarm of the converter thermal model. Current limitation internally activated (yellow led on), drive continues operation.	<ul style="list-style-type: none"> • Check the drive configuration parameters. • Check if the servomotor size matches the converter size.
I ² T Protection	A02	GGGYG	Alarm of the motor thermal model. Current limitation internally activated (yellow led on), drive continues operation.	<ul style="list-style-type: none"> • Check the drive configuration parameters. • Check if the servomotor size matches the converter size.
Software limit -	A03	GGGY	Axis exceeded software negative limit switch.	<ul style="list-style-type: none"> • Move the axis out the limit switch through jogging.
Software limit +	A04	GGYGG	Axis exceeded software positive limit switch.	<ul style="list-style-type: none"> • Move the axis out the limit switch through jogging.

Undefined Reference	A05	GGYGY	Missing homing position	<ul style="list-style-type: none"> Execute referencing before attempting operation.
Positioning Error	A06	GGYYG	Absolute Positioning error. Target position is negative, higher than, or equal to the value of the Position Modulo	<ul style="list-style-type: none"> Check the target position. It must be positive and lower than the Position Modulo.
Invalid Table	A07	GGYYY	Invalid table selection (table disabled)	<ul style="list-style-type: none"> Select a valid (enabled) table
Jog Error	A08	GYGGG	Jog1-Jog2 concurrent activation	<ul style="list-style-type: none"> Disable one Jog
Overcurrent	F01	GGRGG	IGBT module detected Overcurrent.	<ul style="list-style-type: none"> Check the drive configuration parameters. <p>⇒ Resets by <i>Software re-Boot</i>.</p>
Overvoltage	F02	GGGGR	Overvoltage detected on the DC link internal circuit.	<ul style="list-style-type: none"> Check the drive configuration parameters. Stabilize the supply voltage to the nominal level if necessary. <p>⇒ Resets by <i>Software re-Boot</i>.</p>
Mains Voltage fault	F03	GRRGG	Voltage drop on the three-phase supply voltage.	<ul style="list-style-type: none"> Check the converter mains connection and the supply voltage level. Dynamic braking active if DC link voltage level is adequate. <p>⇒ Reset by reset input</p>
Undervoltage	F04	GGGRG	Voltage drop on the DC link internal circuit.	<ul style="list-style-type: none"> Stabilize the supply voltage to the nominal level if necessary. Check the drive configuration parameters. Dynamic braking active if DC link voltage level is adequate. <p>⇒ Reset by reset input</p>
-	F05			
-	F06			
Power Overtemperature	F07	GRGGG	Drive internal temperature exceeds operating limits.	<ul style="list-style-type: none"> Check if ambient conditions and the converter operating conditions are compatible. Check the drive configuration parameters. Check if the servomotor size matches the converter size. Dynamic braking active. <p>⇒ Resets by <i>Software re-Boot</i>.</p>

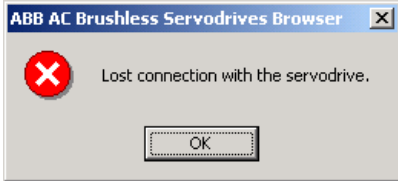

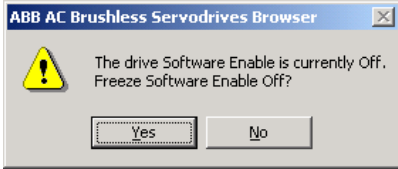

Motor Overtemperature	F08	GRRRR	Motor windings temperature has exceeded the tripping level or temperature sensor signals error.	<ul style="list-style-type: none"> • Check the drive current settings • Check connections of the temperature sensor. • Dynamic braking active. ⇨ Resets by <i>Software re-Boot</i> .
-	F09			
Resolver fault	F10	GGRGR	Resolver position sensor feedback is missing, or transducer out of service.	<ul style="list-style-type: none"> • Check the resolver connections from the converter to the motor. Dynamic braking active. ⇨ Resets by <i>Software re-Boot</i> .
SinCos signals fault	F11	GRRGR	Encoder sincos signals error.	<ul style="list-style-type: none"> • ABB 8C standard Servomotors embody resolver sensors. ⇨ Resets by <i>Software re-Boot</i> . ⇨
SinCos interp. Fault	F12	GRRRG	Encoder sincos signals error.	<ul style="list-style-type: none"> • ABB 8C standard Servomotors embody resolver sensors. ⇨ Resets by <i>Software re-Boot</i> .
-	F13			
-	F14			
Overspeed	F15	GGRRG	Motor speed or speed command exceeded the maximum speed limit.	<ul style="list-style-type: none"> • Check the drive configuration parameters. ⇨ Reset by reset input
-	F16			
-	F17			
-	F18			
Following Error	F19	GRGRG	Following error: the motor position is out of range.	<ul style="list-style-type: none"> • Check the drive configuration parameters. Dynamic braking active. ⇨ Reset by reset input
Hardware switch -	F20	GRRRR	The axis exceeded hardware negative limit switch.	<ul style="list-style-type: none"> • Move the axis out of the limit switch. ⇨ Reset by reset input
Hardware switch +	F21	RGGGG	The axis exceeded hardware positive limit switch.	<ul style="list-style-type: none"> • Move the axis out of the limit switch. ⇨ Resets by reset input.
-	F22			
-	F23			
Clamp Overload	F24	RGGGR	Overload of the braking resistor.	<ul style="list-style-type: none"> • Consider revising the servodrive working cycle. ⇨ Resets by reset input.
Field Bus Fault	F25	GGRRR	Field bus error	<ul style="list-style-type: none"> • Check up cabling and network operation. ⇨ Resets by reset input.

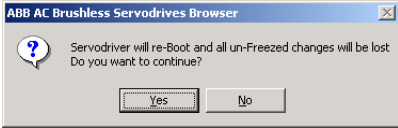
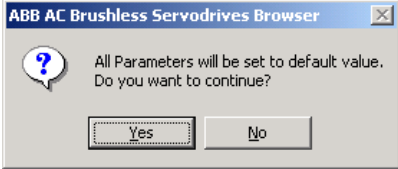

Appendix A - Faults and Messages

Max Travel For Switch	F26	RGRR	Drive exceeded max traversing distance while searching switch.	<ul style="list-style-type: none"> • Check up drive parameterization ⇒ Resets by reset input.
Max Travel For Zero	F27	RGRGG	Drive exceeded max traversing distance while searching zero.	<ul style="list-style-type: none"> • Check up drive parameterization ⇒ Resets by reset input.
Internal Error	F28	GRGGR	Internal error	<ul style="list-style-type: none"> • Switch-off the converter, wait a few seconds for discharging of the power stage and restart. ⇒ Resets by <i>Software re-Boot</i>.
Clamp Overtime	F29	RGRRG	Timeout of the clamp resistor.	<ul style="list-style-type: none"> • Consider revising the servodrive working cycle. ⇒ Resets by <i>Software re-Boot</i>.
Computation Overflow	F30	GRRR	Too many control functions have been activated.	<ul style="list-style-type: none"> • Consider revising the servodrive working cycle. ⇒ Resets by <i>Software re-Boot</i>.
24 V Brake	F31	RRRRG	24 V Brake supply fault (only for DGV300 with optional board for mechanical brake)	<ul style="list-style-type: none"> • Check the brake supply connections. ⇒ Resets by reset input.
Next Table Disabled	F32	RRGGG	Switching to a table currently disabled	<ul style="list-style-type: none"> • Consider revising the servodrive working cycle. ⇒ Resets by reset input.

Appendix B - Troubleshooting

The following table introduces you to the most common messages that Browser can display while using the program. At the same time observe the Browser message kinds (error message, informative message, inquiring message, etc.).

The Browser displays the following message:	Cause	What to do...
 <p>ABB AC Brushless Servodrives Browser Lost connection with the servodrive. OK</p>	<p>The Browser has lost the connection with the servodrive or you switched off the converter while the Browser was online connected.</p>	<ul style="list-style-type: none"> • Push <i>OK</i> and check up connections and wirings of the serial cable from your PC to the drive.
 <p>ABB AC Brushless Servodrives Browser Data has been modified. Do you want to save it? Yes No Cancel</p>	<p>Application data have not been saved on your PC.</p>	<ul style="list-style-type: none"> • Push <i>Yes</i> if you want to update the application file with the last adjustments you made. • Push <i>No</i> if you do not want to update the application file with the last adjustments you made. • Push <i>Cancel</i> to go back to the Browser window.
 <p>ABB AC Brushless Servodrives Browser The drive Software Enable is currently Off. Freeze Software Enable Off? Yes No</p>	<p>You are freezing the drive disabled, i.e. <i>Software Enable</i> is set Off.</p>	<ul style="list-style-type: none"> • Push <i>Yes</i> if you want to freeze the drive disabled. • Push <i>No</i> to go back to the Browser window and set <i>Software Enable</i> On.
 <p>Security check Enter password: OK Cancel</p>	<p>You attempted to use Browser service support functions.</p>	<ul style="list-style-type: none"> • Type the password and push <i>OK</i> otherwise push <i>Cancel</i>.

	<p>You pressed Software re-Boot command. This operation will restart your drive. Remember to Freeze parameters before proceeding.</p>	<ul style="list-style-type: none">• Push Yes to continue Software re-Boot.• Push No to stop it.
	<p>You pressed Reset Parameters command. All parameter settings will be reset to their default value.</p>	<ul style="list-style-type: none">• Push Yes to complete reset.• Push No to stop it.
	<p>Maximum field bus speed rate reached</p>	<ul style="list-style-type: none">• Press OK and set a proper value.



DGV
MANIU20.0410 E

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