IMD PRO

VVVF for elevators

RST Elektronik GmbH

INTELLIGENT MULTI DRIVE

CANopen CiA 417

Sinus Encoder

A

B

Drive Control

Software Manual

Version 9.697.21-1

USB PC

CE

RS485 B	RS485 A	GND	+24V	B Out	A Out	(n.c.)
68	67	83	82	64	29	81
66	31	30	63	62	28	27
GND	+15V	+5V	(n.c.)	(n.c.)	Enc. B	Enc. A

GND	GND	GND	Out.59	Out.58	Out.56
65	61	60	59	58	56
36	35	25	24	22	21
TMS-	TMS+	In.25	In.24	In.22	AnaIn.21

GND	In.54	In.53 (RFG)	In.52 (RO)	In.51 (RU)	In.50 (VN)
55	54	53	52	51	50
20	19	18	17	16	15
+24V	In.19 (V4)	In.18 (V3)	In.17 (V2)	In.16 (V1)	In.15 (V0)

GND	RxD RS232	TxD RS232	+5V
77	76	75	74
73	72	71	70
Out.73 (EÜ)	Out.72 (ZB)	Out.71 (ZS)	GND

USB Stick

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Date: 08/21

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1 General

The ***DriveControl*** software is a sophisticated, user-friendly PC programme for commissioning and optimization of our ***PRO*** VVVF controller series.

The PC and VVVF controller are connected to each other via a standard mini USB cable.

For your free copy of the programme, visit our website at:

https://www.rst-elektronik.de/download/frequenzumrichter-software/

2 Functions

- User-friendly parameter menu
- Remote control of VVVF controller via virtual front view
- Driving of individual outputs for testing
- Real-time driving cycle display with many analysis options
- Analysis of recorded drive curves
- Configurable display values
- Automatic saving of parameters in database
- User-friendly plain text programming of inputs/outputs
- Reading of error memory
- Reading of statistic data with graphical representation of VVVF controller load
- Uploading firmware updates to VVVF controller

3 Starting the programme

When the programme is started, the following window will be opened.
Here, two modes are available, i.e. **Direct Connection** and ***Offlinemode***.

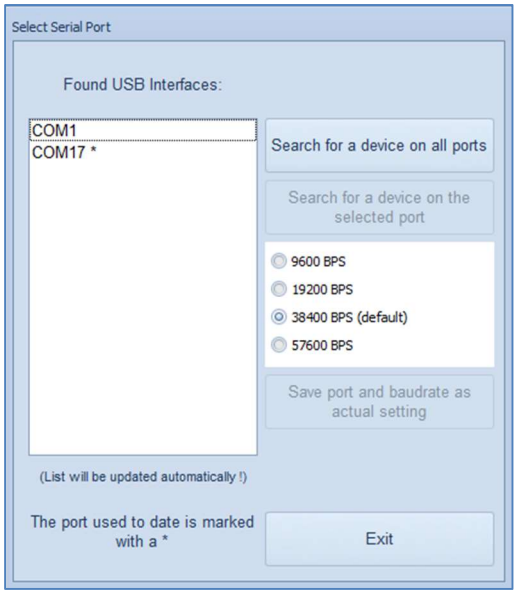
Another button is available for selecting and configuring the serial interface for direct connection to the VVVF controller.

4 Direct connection - with VVVF controller

4.1 Establishing connection

Once you have connected your PC to the VVVF controller via a **Mini-USB cable**, you will have to set / identify the correct COM port. In the middle button, ***Current port***, the last connected serial port is shown. If this port is still up to date, you can establish the connection by clicking the ***Direct Connection*** button.

If you are unsure which port is active, click the middle button ***Change current Port…*** to open the following window:



In the left area you will see a list of all ports found. The currently selected COM is marked with *.

Click button "***Search for a device on all ports***" to check all ports one after the other. This will take a while depending on the number of ports available.

A quicker method is to unplug and reconnect the USB cable and checking the ports found. The new port is the correct one. Select it by clicking on it and click button "***Search for a device on all ports***" to check it.

Now, the message ***"Device found at Port COMno.!"*** should be displayed.

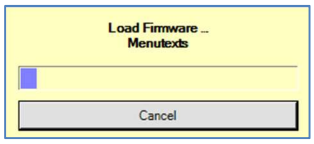
Save the setting by clicking button ***"Save port and baudrate as actual setting"*** and leave the menu by clicking the ***"Exit"*** button.

Establish the connection by clicking the ***Direct Connection*** button.

Notice:
The default baud rate is 38400 Baud; this value should only be changed after consultation with RST (other values will require modifications in the VVVF controller).

When the VVVF controller is connected to the PC for the very first time, all relevant information such as menu texts and structure, parameter information, error memory and the input/output terminal configuration of the VVVF controller is read and saved, together with the firmware version, in a **Database** in the installation folder of the DriveControl software.

This local database on the PC can be synchronized with a central database installed on a server, for example. In this way, all units can be managed at a central location when several laptops are used (e.g. different service technicians).



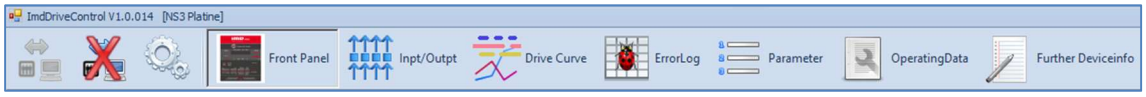
When this VVVF controller is connected the next time, you won't have to download this information again, provided that the firmware of the VVVF controller is still the same as before.

5 Direct connection - Functionality

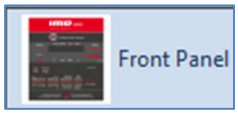
5.1 General

The software is divided in various user-friendly **functional areas**.

The functional areas can be accessed via the buttons in the upper symbol bar.



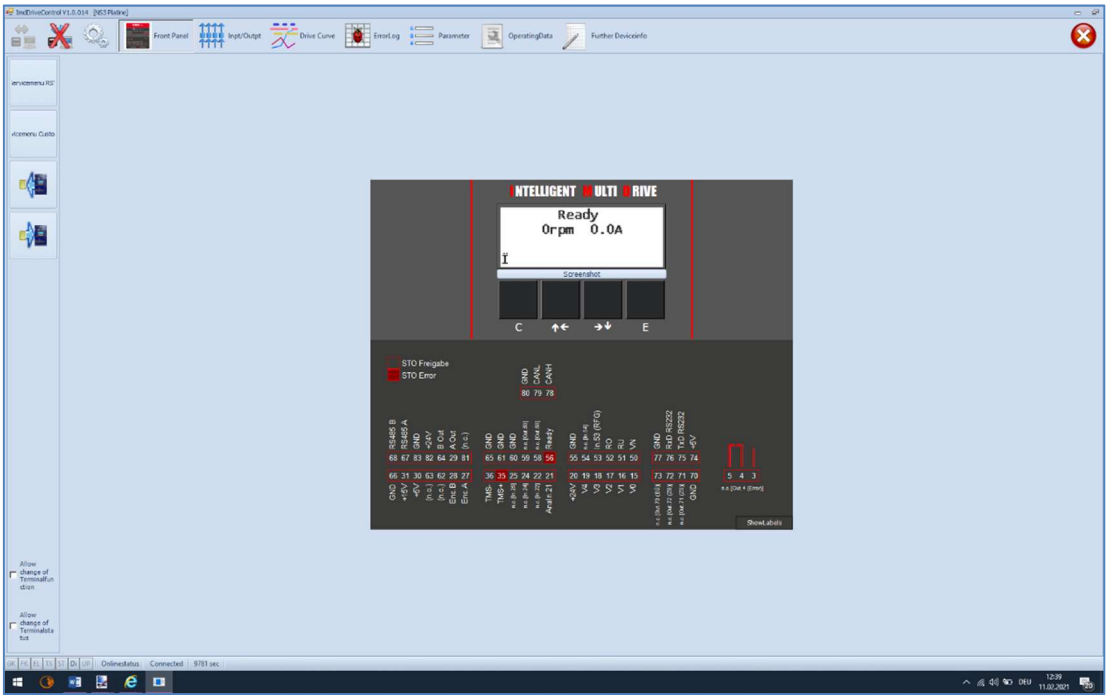
5.2 Functional area: "Front Panel"



Once connection has been established, the Front Panel view of the VVVF controller will open automatically.

Here, you have the same control/operating options as at the physical unit directly.

Active input signals will appear in red.



On the top left of the screen, you will find the following buttons:

Enable extended (RST) menu level.
Once enabled, you have access to all VVVF-controller parameters.
Notice:
The parameters enabled in Service menu may only be changed in consultation with RST. Incorrect settings may damage the VVVF controller.

Enable extended (Customer) menu level.
Once enabled, you have access to additional VVVF controller parameters which may be required for Service.

Save current configuration as a file.
The configuration of the currently connected VVVF controller can be saved as a file (outside of database).

Upload current configuration from a file to the unit.
The currently connected VVVF controller can be configured using the information saved in a file.

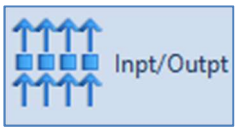
You will find the selection options at the bottom left of the screen.

Allow change of Terminalfunction

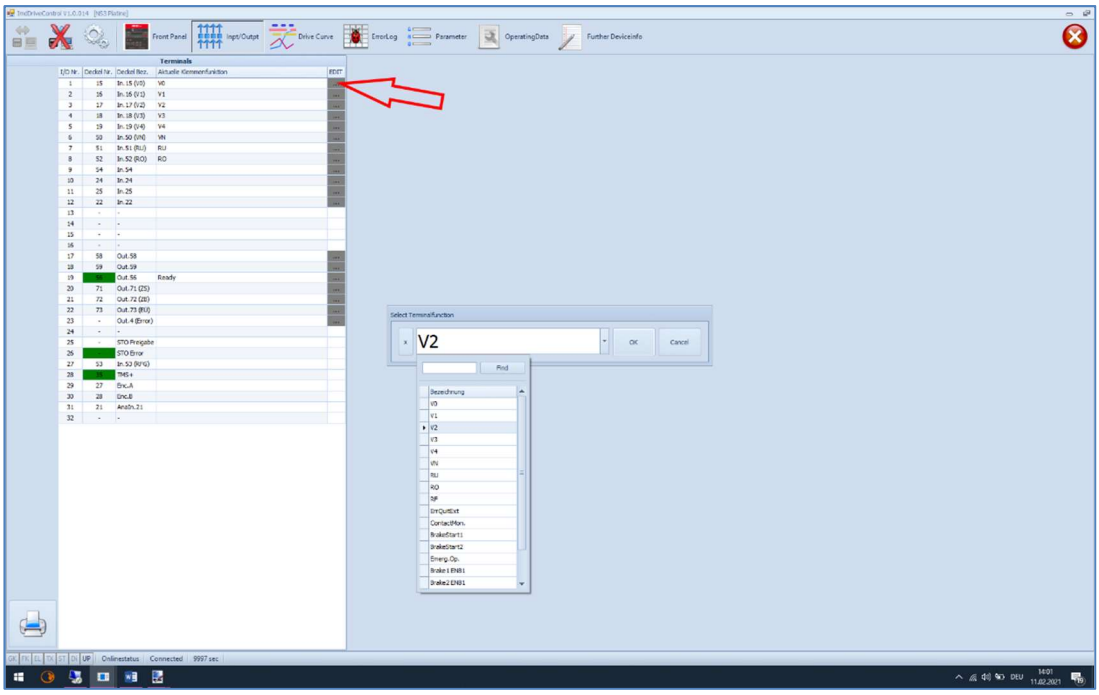
Allow change of Terminalstatus

This will be detailed in Chapter 5.3.1.

5.3 Functional area: “Input/Output”



In this functional area, you can configure the inputs/outputs.



To edit the current configuration at a VVVF controller terminal, click the 3 dots in the ***Edit*** column.

A menu with various options will open. Select the required function by clicking on it and confirm your selection by pressing the ***Enter*** button.

The terminal is now configured with the new function.

5.3.1 Configuring and testing a terminal via functional area “Front panel”

In **Front panel** view, there is another way of configuring the inputs/outputs.

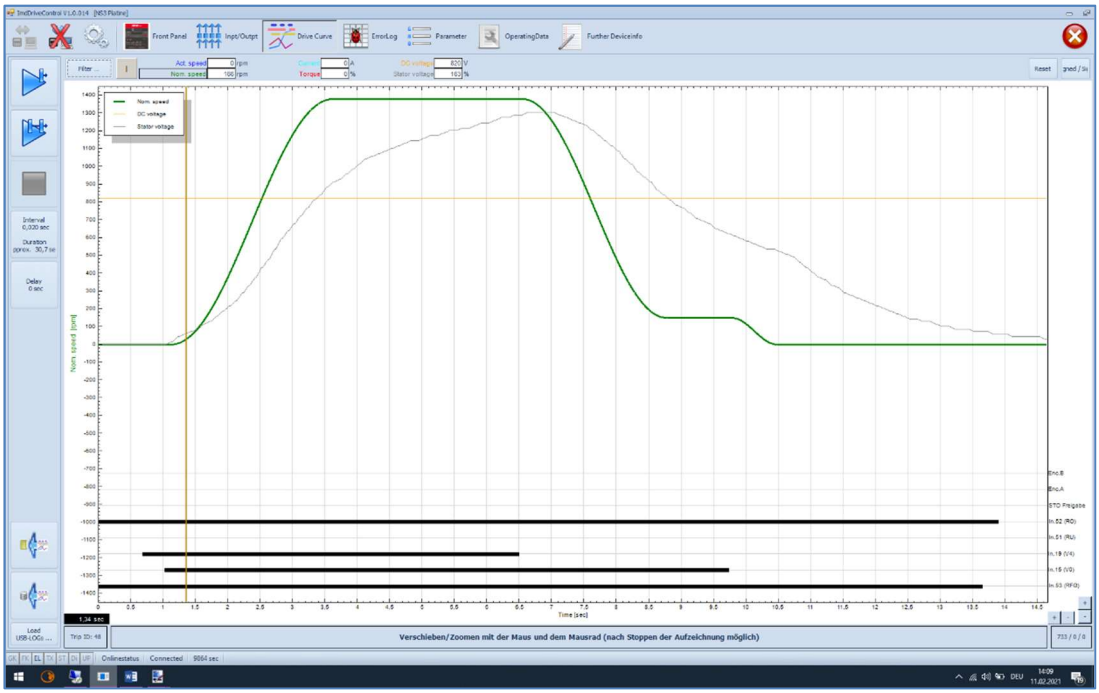
Once the ***Allow change of Terminalfunction*** option is enabled, terminals can be selected and configured directly.

To test an output terminal and the connected periphery, the level can be switched manually. To that end, option ***Allow change of Terminalstatus*** must be enabled. After that, just click on the terminal to switch the level.

Notice:
When a terminal has already been assigned a function, its functionality must be configured as “Not assigned” for testing.

5.4 Functional area “Drive curve”

In this functional area, you can analyse the drive curve in detail and save it.



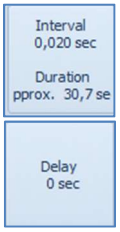
5.4.1 Starting and stopping drive curve recording

Recording individual drive curves.
Once you click the button, recording will begin once the travel operation starts and end once the operation is stopped.
The curve will not be overwritten by the next operation. You can save it if necessary.

Permanent recording
Click this button to start permanent recording. The last travel operation (if applicable) is shown.
Recording will only stop once you click the STOP button.

STOP button cancels recording of drive curves.

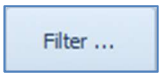
5.4.2 Resolution and duration of recording



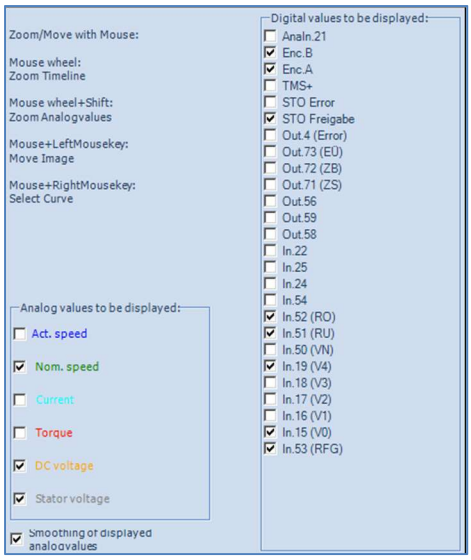
With the default recording interval of 20 ms, the total recording time is approx. 30 s. For longer travel operations, the recording interval must be increased accordingly.

Click this button to delay the start of the recording routine. This may be useful, for example, if you want to record parts of the drive curve at a high resolution.

5.4.3 Selection of variables to the displayed



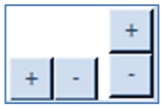
Click the ***Filter*** button to show all signals recorded in the background. Once you click the button, the following window will be opened.



In this window, you can select the listed analogue and digital variables for graphical representation.

When you click the ***Filter*** button again, the window will be closed.

5.4.4 Zoom



Use the **+-** buttons at the bottom right of the screen to zoom the recorded curve in x/y-direction.

If you use a mouse with a wheel, you have the following options:

- Zoom x-axis using the mouse wheel
- Zoom y-axis by pressing the Shift key and using the mouse wheel
- Move the analogue curves using the left mouse button
- Select a curve using the right mouse button

Click the ***Reset*** button to return to the original representation.

5.4.5 Selecting a curve

Right-click a curve to select it. The selected curve will be highlighted.

In addition, the y-axis will now have a scale for the selected variable.

5.4.6 Activation of data cursor for display of current values

Click this button to display a cursor and additional window with all “analogue data” recorded.

This will show you the current values at the current cursor position.

The variable in the box is the currently selected one. In this case, **Nom. speed** is selected.

The cursor can be moved by moving the mouse to the left/right.

When you click the button again, the information will be closed.

5.4.7 Saving a drive curve

5.4.7.1 Saving in database

Click this button to save the logged curve and valid parameter settings as well as the I/O configuration in the database. You can access and analyse it later at any time (in offline mode).
In this way, the curves and settings can be allocated to the right VVVF controller via the database management.
You can save as many drive curves as you wish.

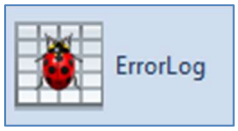
5.4.7.2 Saving as separate file

Click this button to save a drive curve as a file outside of the database. The saved curve is not linked to the VVVF controller database on your PC and can be sent to RST for further analysis, for example.

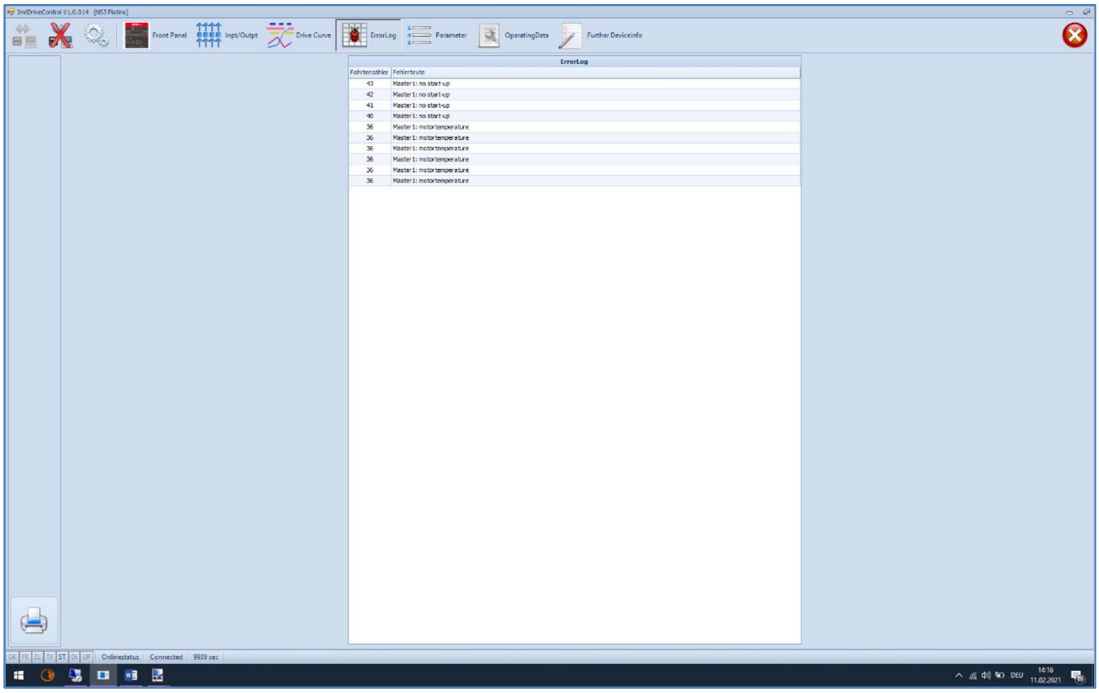
5.4.8 Uploading drive curves saved on USB stick

Click this button (at bottom left of screen) to upload drive curves from the USB stick. Once you click this button, you will be prompted to enter the relevant drive curve number. Starting with this number, the next 5 consecutive travel operations are uploaded to your PC so you can analyse a certain range around the operation of interest. This is particularly useful if the error memory of the VVVF controller contains older error messages the cause of which is to be identified.

5.5 Functional area: “ErrorLog”

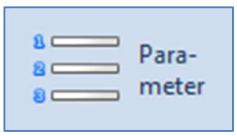


This functional area shows the contents of the error memory.

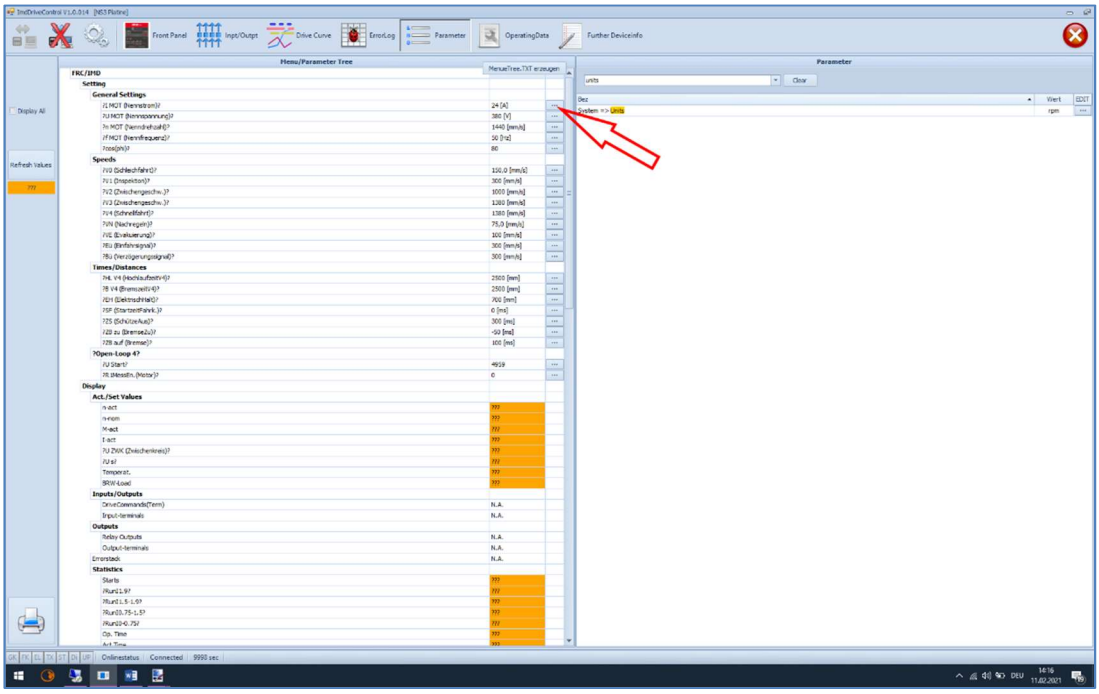


Click this button to print the displayed contents.

5.6 Functional area: “Parameter”



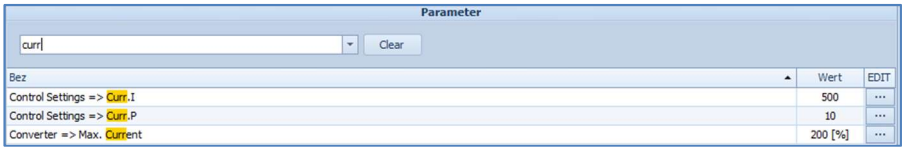
In this functional area, you have access to the VVVF controller parameters.



In the left area of the screen, you will see the menu structure, including parameters.

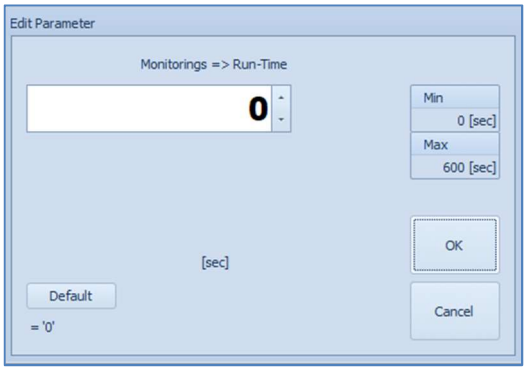
In the right area of the screen you can search for parameters directly without knowing the menu to which they are assigned. Simply enter a search text in the input field. This will open a list of all parameters containing this text.

In the example below, the text “curr” was entered.



To edit a parameter, click the 3 dots in the Edit column.

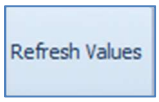
This will open a window where you can enter the required value.



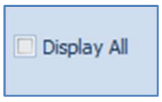
The ***Min.*** and ***Max.*** values indicate the setting range.

Click the ***Default*** to reset the parameter to its default setting.

Click ***OK*** button to save the required value.



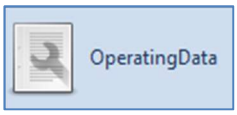
Once you click this button, the actual values in the menu will be updated. The update time is shown directly below, the actual values are now green in the menu.



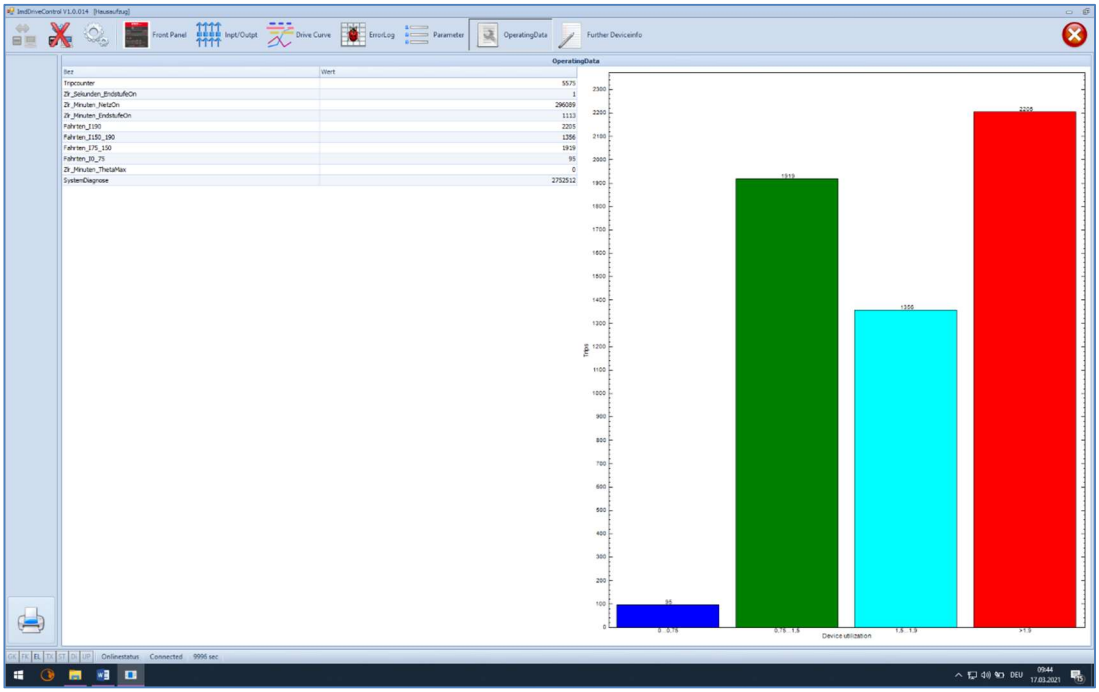
The required menus and parameters depend on the VVVF controller operating mode. For optimum user friendliness, unused menus and parameters will be hidden. With this option, all menus and parameters are displayed.

Click this button to print the a list of all VVVF controller parameters.

5.7 Functional area: “Operating Data”



In this functional area, you will find the VVVF controller operating data, including statistics on utilization.



The statistics will enable you after a short time to assess if the VVVF controller is operating in its optimum range. In this way, incorrect adjustments or permanent overloading are avoided.

6 Offline mode - without VVVF controller

6.1 General

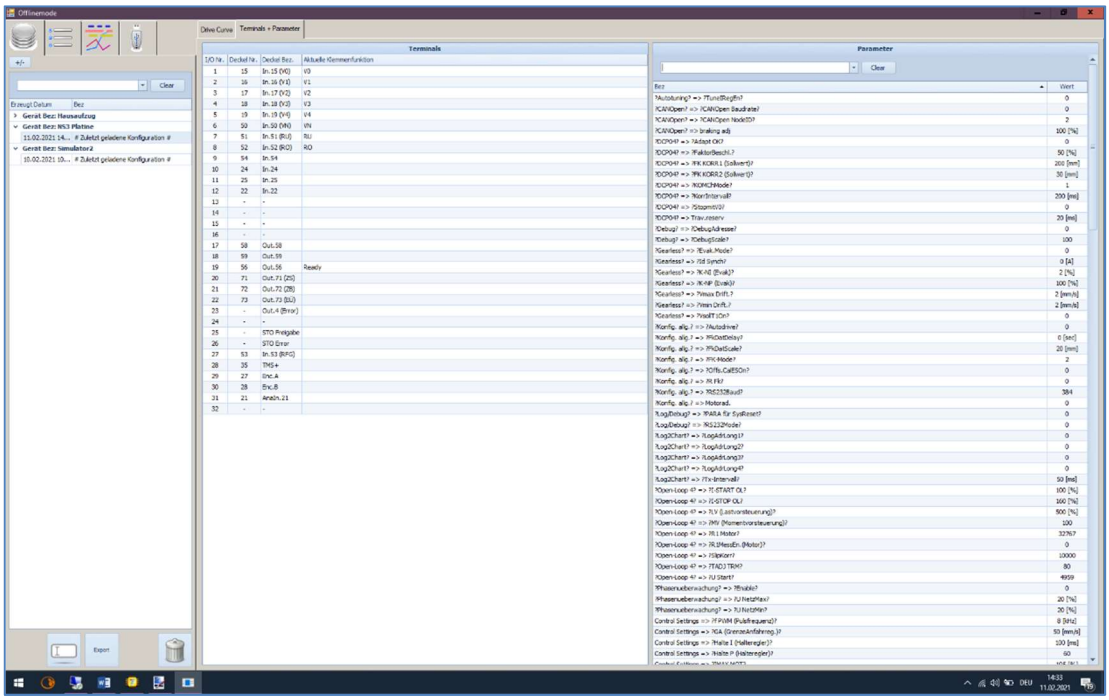
In offline mode, you have many analysis options for tracking curves and their settings.

Once the programme has started, click the ***Offlinemode*** button.

Here, the software is also divided in various user-friendly areas.

6.2 Functional area: “Device database”

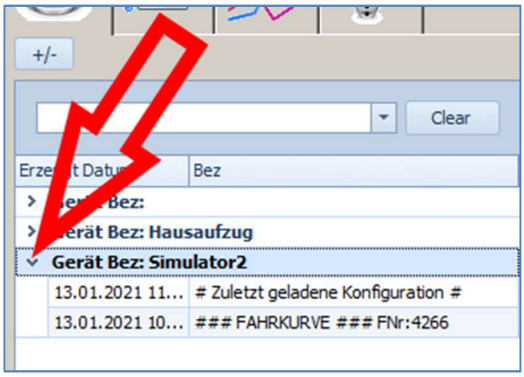
Once you have activated offline mode, the functional area “Device database” will be opened automatically.



In the left area, you will see the VVVF controllers in your local PC database. These are all devices to which this PC has ever been connected.

If you use a central database (on server) synchronizing with different laptops, you will find a list of all devices in the database, including those connected to other service technician’s laptops.

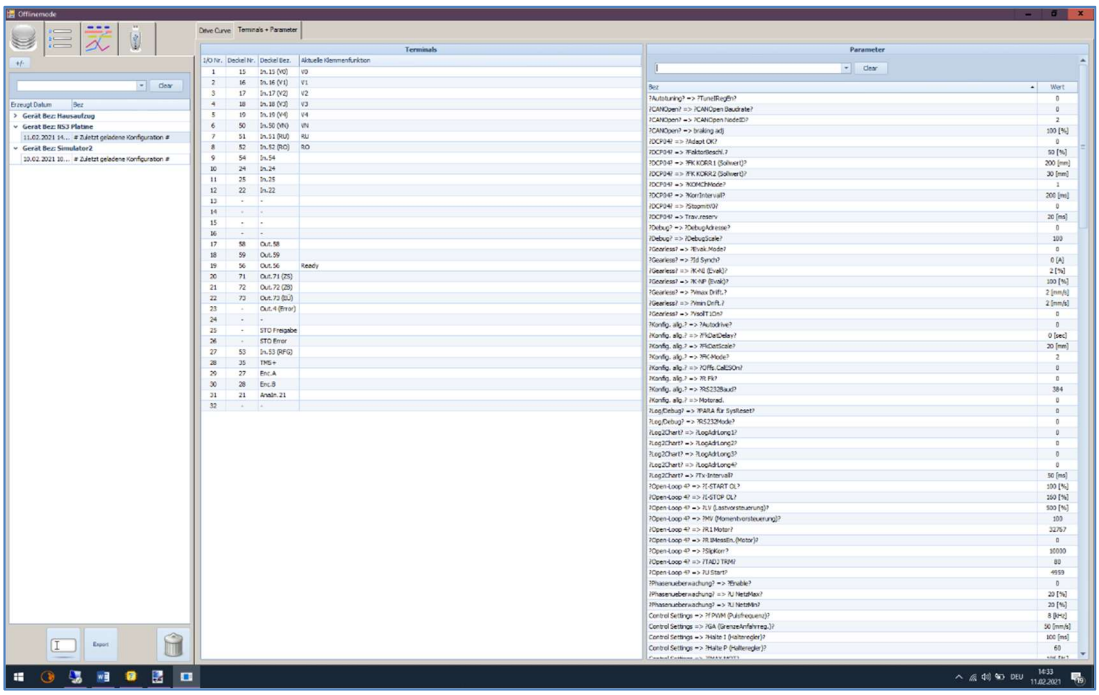
To select a VVVF controller, click the > symbol preceding the device ID.



This will open all configurations and drive curves of this VVVF controller saved in the database.

You can select an entry for analysis. The following options are available.

6.2.1 Displaying device configuration saved in the database

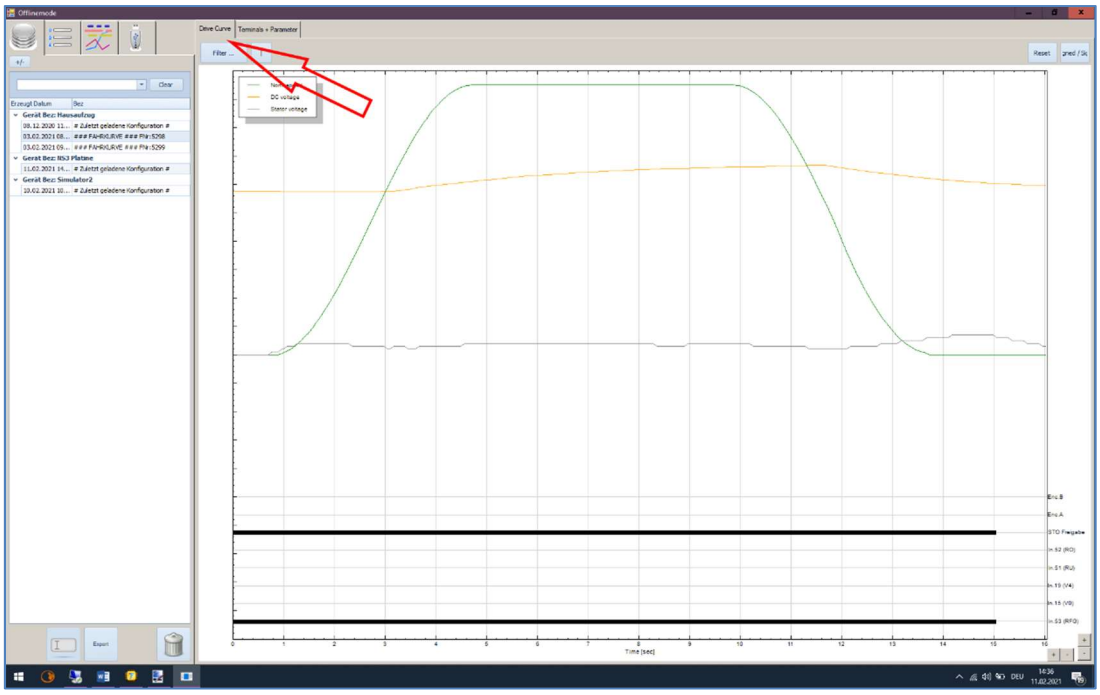


On the left, you will see the parameter configuration of the input/output terminals of the selected VVVF controller.

On the right, you will see a list of all device parameters. You can also search for parameters (like in Online Mode, see Chapter 5.6).

6.2.2 Displaying drive curves saved in the database

If drive curves were saved before for the selected VVVF controller, you can select them for detailed analysis.

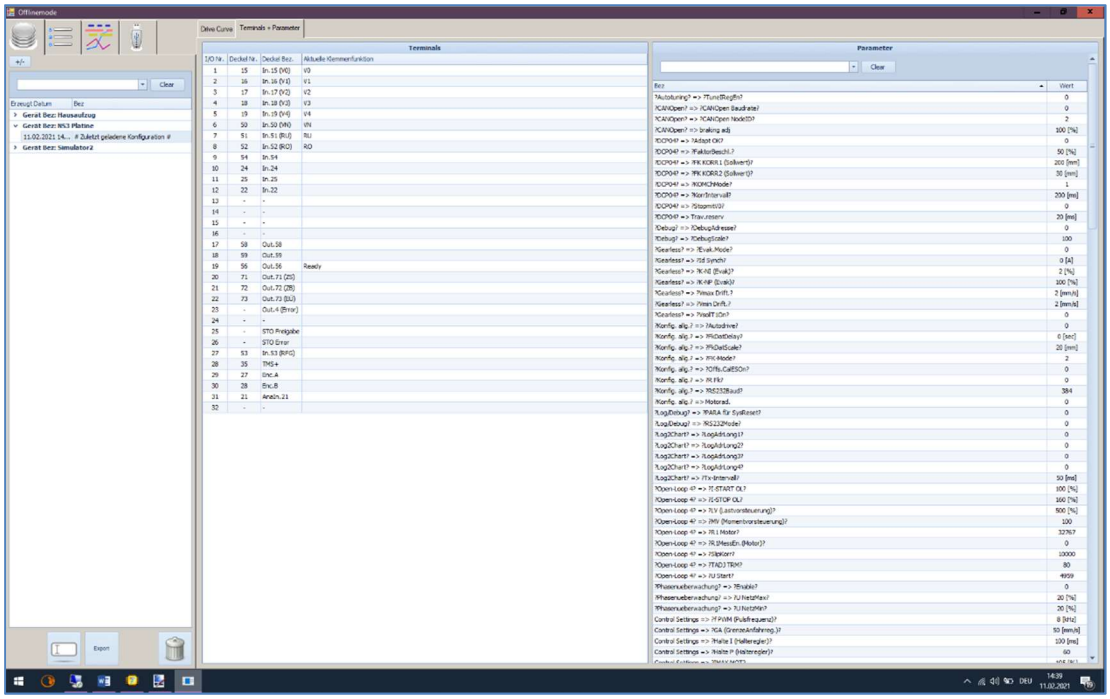


Curve analysis (zooming, cursor, ...) is done as in Direct Connection (see Chapter 5.4.3).

Click the Filter button to switch between drive curve and parameter view for this curve. Parameters are saved for each logged curve to enable tracking the settings resulting in this curve.

6.3 Functional area “Configuration files”

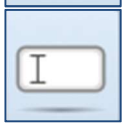
Click this button to open VVVF controller configurations saved in a separate file before (in direct connection, see Chapter 5.4.7.2).



The configuration files contain all VVVF controller parameters and terminal configurations.

At the bottom left of the screen, you will find the following buttons:

Duplicate selected entry. You can duplicate a dataset and edit it after that. In this way, you can create parameter sets offline and upload them to the VVVF controller on site later.



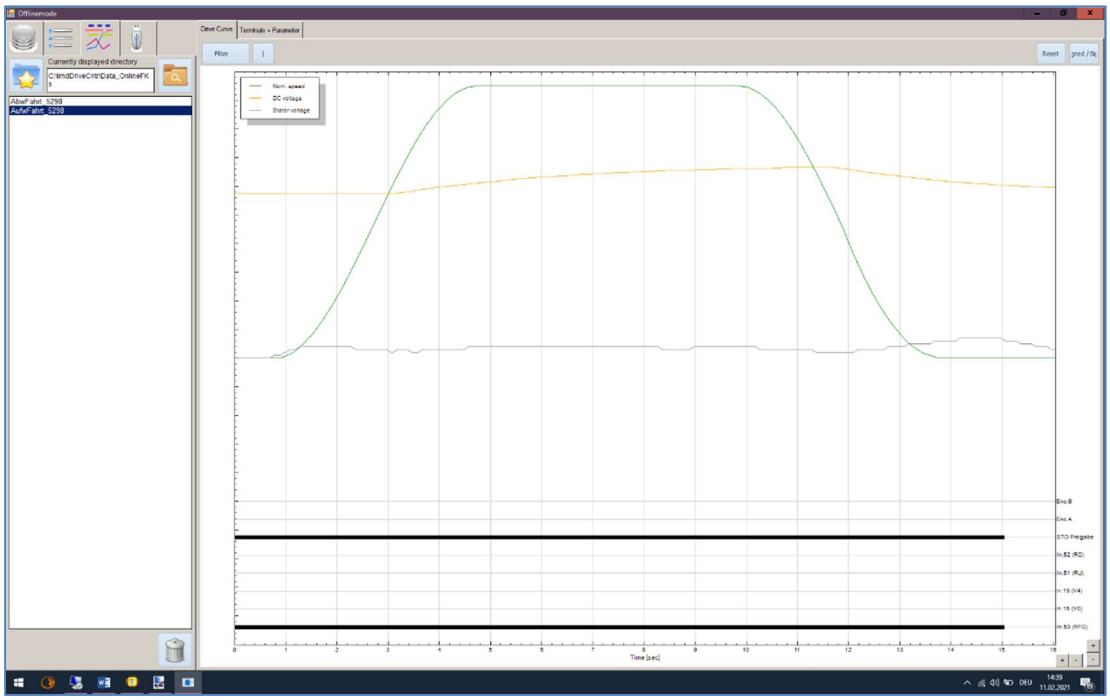
Rename selected entry.

Edit parameter values.

Delete selected entry.

6.4 Functional area: “Drive curve files”

Click this button to open drive curves saved in a separate file before (in direct connection, see Chapter 5.4.7.2).



The drive curve files additionally contain all VVVF controller parameters and terminal configurations.

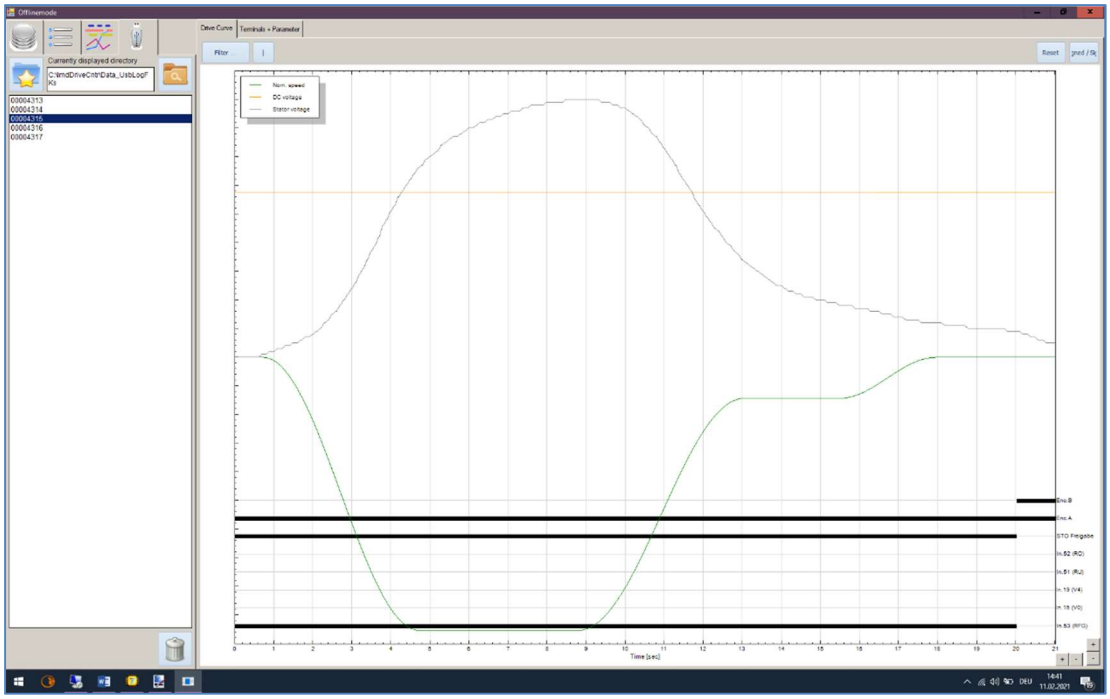
Curve analysis (zooming, cursor, ...) is done as in Direct Connection (see Chapter 5.4.3).

At the bottom left of the screen, you will find the following button:

Delete selected entry.

6.5 Functional area: “USB LOGs”

Click this button to open drive curves logged on the USB before.



The drive curves logged on the USB stick contain the same data as the curves saved on the PC (terminal configuration and parameters).

Curve analysis (zooming, cursor, ...) is done as in Direct Connection.

The functional area features the following buttons:

Select folder (e.g. USB stick or folder on PC hard drive)

Reset to default folder.

Delete selected entry.