



## SERIAL COMMUNICATION for Delta VFD drives

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# 1 GENERAL

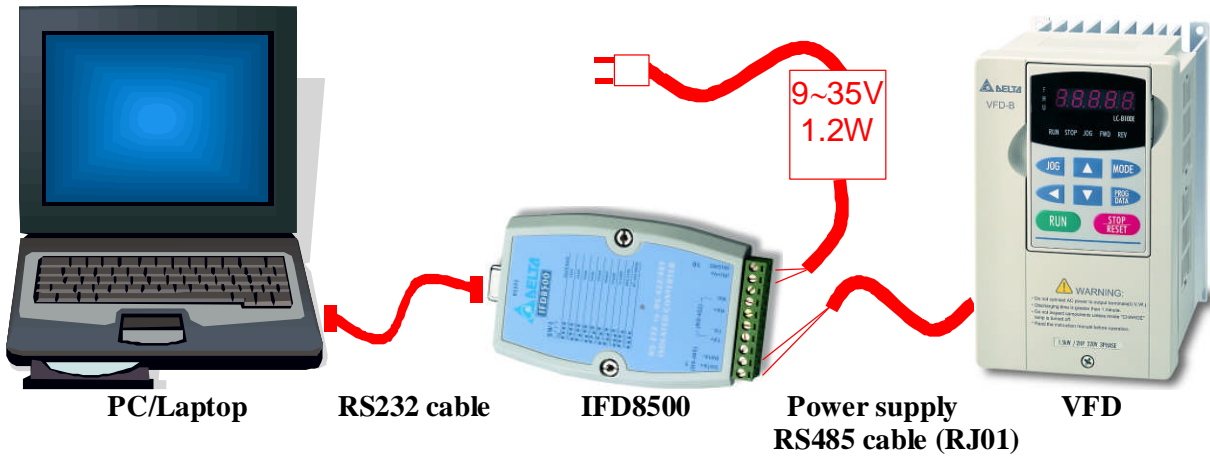
## 1.1 Hardware

Because the PC has RS232 and the drive needs RS485, you need a RS232-RS485 converter. Delta offers the IFD8500 for this purpose.

## 1.2 Software CVFD

To communicate with the drive you can use the Delta communication software, which you can download from [http://www.delta.com.tw/product/em/ac\\_motor/ac\\_motor\\_main.asp](http://www.delta.com.tw/product/em/ac_motor/ac_motor_main.asp). Select [Download communication software] and download the 4 files CVFD4200.exe in a folder. To install, execute the first one and follow the instructions.

## 2 HARDWARE SET-UP



### 2.1 PC/Laptop

Use a PC or laptop with RS232 COM port.

### 2.2 RS232 cable

Use RS232 Sub-d 9-pin 1:1 cable (female-male). This cable is not available from Delta but can be bought in your local computer shop.

### 2.3 IFD8500

RS232-RS485 converter from Delta.

Please refer to manual for dipswitch settings.

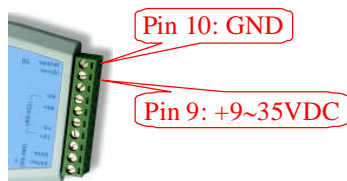
Baud rate	SW1				Baud rate	SW1			
	1	2	3	4		1	2	3	4
1200bps	ON	OFF	OFF	OFF	38400bps	ON	OFF	OFF	OFF
2400bps	ON	OFF	OFF	OFF	57600bps	ON	OFF	OFF	OFF
4800bps	ON	OFF	OFF	OFF	115200bps	ON	OFF	OFF	OFF
**9600bps	ON	OFF	OFF	OFF	RTS Mode	ON	OFF	OFF	OFF
19200bps	ON	OFF	OFF	OFF	RS422 Mode	ON	OFF	OFF	OFF

Length	SW2		Length	SW2	
	1	2		1	2
9bit	ON	OFF	11 bit	ON	OFF
**10 bit	ON	OFF	12 bit	ON	OFF

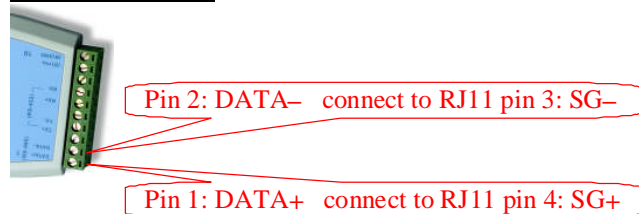
### 2.4 Power supply

The IFD8500 needs an external 9-35V/1.2W power supply. The DVPPS01 (24V/1A) can be used or you can use your own.

Connection Power Supply:



Connection Data:



### 2.5 RS485 cable

- Use Delta **RJ01** cable.
- Cut off the connector at one end, free the individual wires and check which colours connect to the other RJ11 connector pin 3 and pin 4. Strip these two wires.
- Connect RJ11 pin 3 (SG-) to IFD8500 pin 2 (DATA-). See above.
- Connect RJ11 pin 4 (SG+) to IFD8500 pin 1 (DATA+). See above.

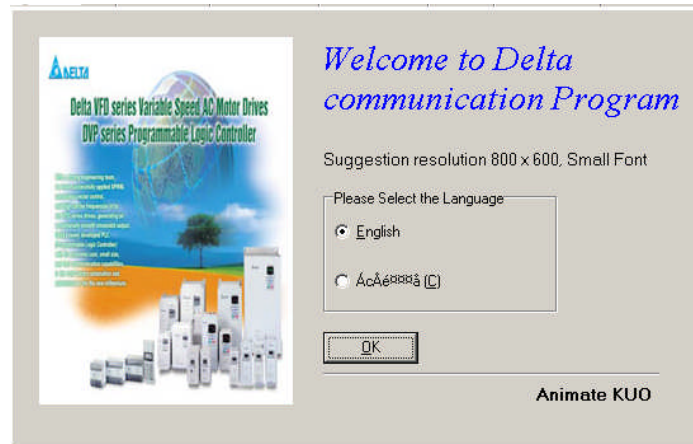
### 3 CVFD SOFTWARE SET-UP

#### 3.1 Installation

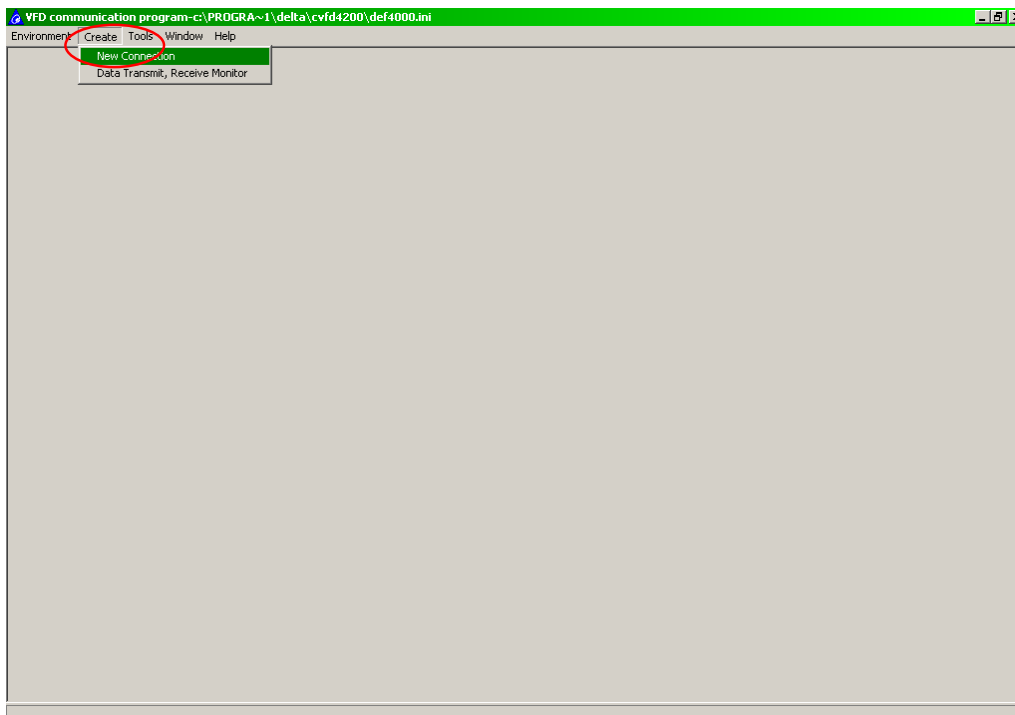
Install the CVFD program acc. to 1.2 and start CVFD.

#### 3.2 Setting up

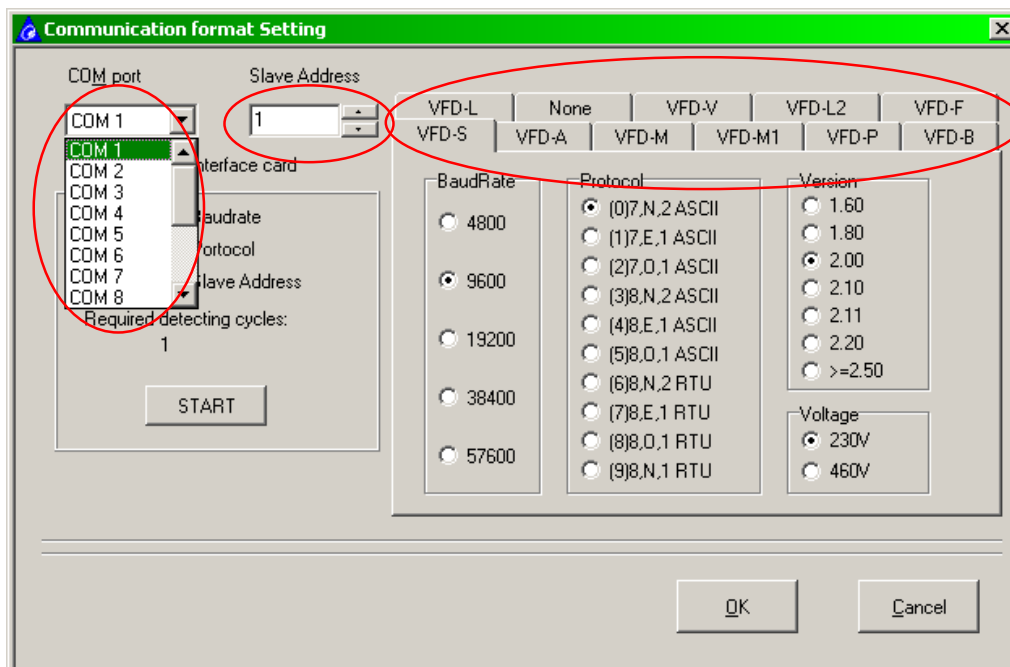
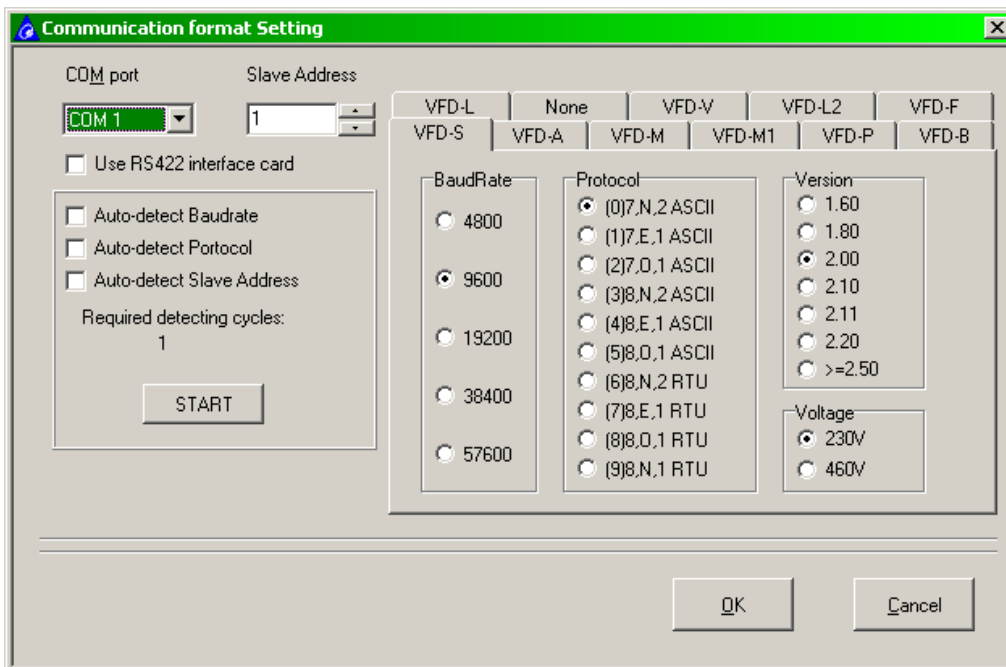
After starting CVFD the following screen appears.



- Select [English] and press [OK].

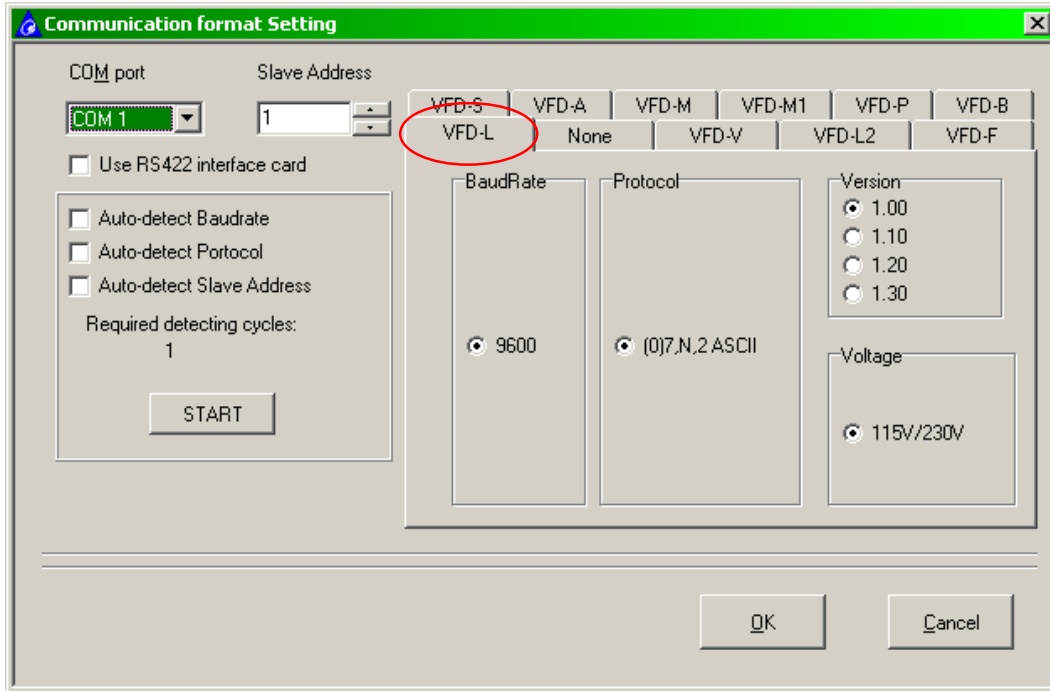


- Select [Create] and [New connection].



- Select the right COM port. This depends on your computer.
- Select the slave address. This needs to be the same as the drive you want to control.
- Select the tab for the drive you want to control. Use [none] if you want to use CVFD to communicate with any other Modbus device.

### 3.3 VFD-L



#### 3.3.1 Settings VFD-L

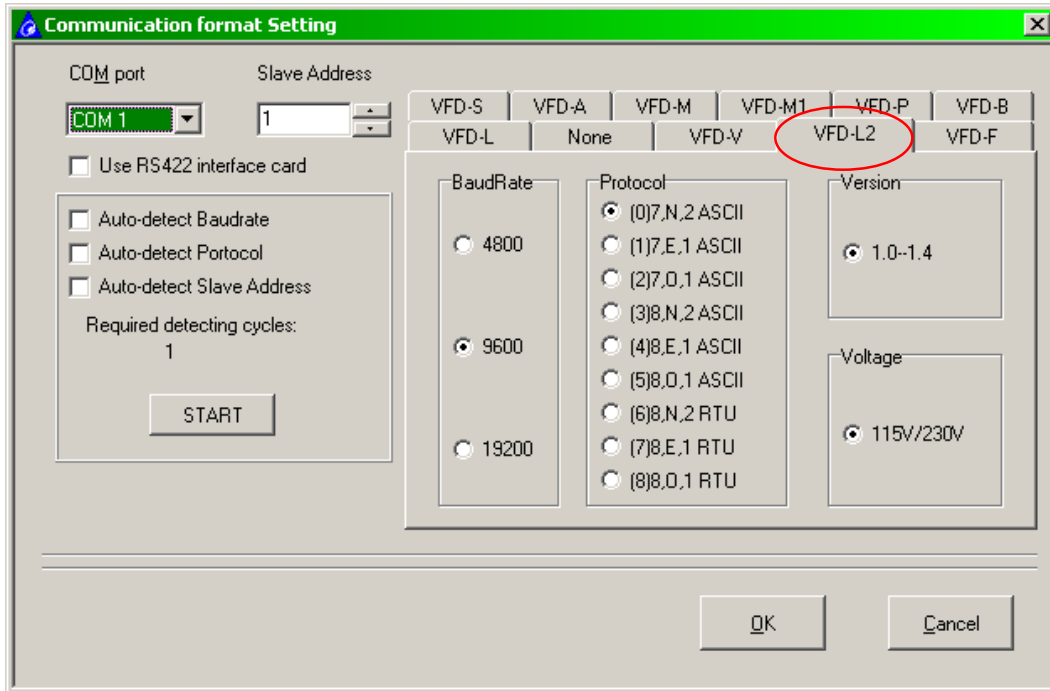
- Slave address: Must be the same as the dipswitch settings.

Communication Inhibits	Communication address is 01	Communication Address is 01	Communication Address is 02	Communication Address is 63

- Baudrate: In VFD-L this is fixed to 9600 Baud.
- Protocol: In VFD-L this is fixed to ASCII 7,N,2 (7 data bits, no parity, 2 stop bits).
- Firmware: Select the firmware acc. to info on product label in lower left-hand corner.
- Voltage: The voltage is set to 115/230V for all VFD-L.
- Press [OK].

See 4. Operation.

### 3.4 VFD-L2

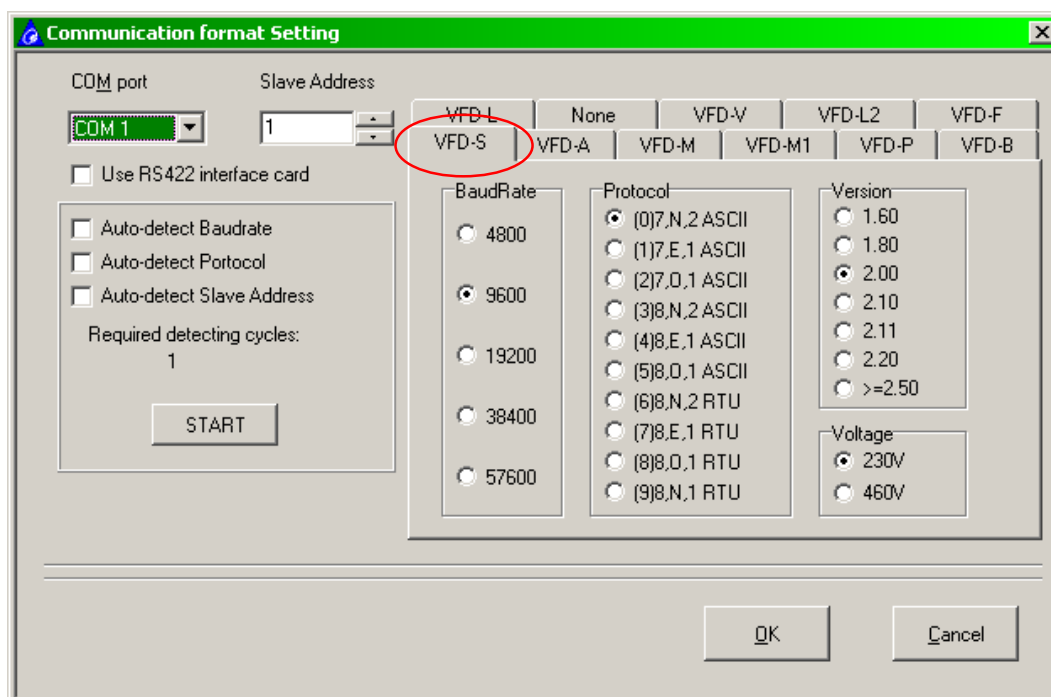


#### 3.4.1 Settings VFD-L2

- Slave address: Must be the same as Pr9-00.
- Baudrate: Must be the same as Pr9-01.
- Protocol: Must be the same as Pr9-04.
- Firmware: Select the firmware acc. to Pr0-06 or in lower left-hand corner of product label.
- Voltage: The voltage is set to 115/230V for all VFD-L2.
- Set Pr2-00=4 (Frequency command by RS485) and Pr2-01=3 or 4 (Control by RS485).
- Press [OK].

See 4. Operation.

## 3.5 VFD-S



### 3.5.1 Settings VFD-S

- Slave address: Must be the same as Pr9-00.
- Baudrate: Must be the same as Pr9-01.
- Protocol: Must be the same as Pr9-04.
- Firmware: Select the firmware acc. to Pr0-06 or in lower left-hand corner of product label.
- Voltage: The voltage is set acc. to the type: 230V for ....S21.... or ....S23.... and 460V for ....S43....
- Set Pr2-00=4 or 5 (Frequency command by RS485) and Pr2-01=3 or 4 (Control by RS485).
- Press [OK].

See 4. Operation.



## 3.6 VFD-M



OLD

**Communication format Setting**

COM port: COM 1    Slave Address: 1

Use RS422 interface card

Auto-detect Baudrate  
 Auto-detect Portocol  
 Auto-detect Slave Address

Required detecting cycles: 1

START

VFD-L	None	VFD-V	VFD-L2	VFD-F
VFD-S	VFD-A	VFD-M	VFD-M1	VFD-P
VFD-B				

BaudRate: 4800, 9600, 19200, 38400

Protocol: (0)7,N,2 ASCII, (1)7,E,1 ASCII, (2)7,0,1 ASCII, (3)8,N,2 ASCII, (4)8,E,1 ASCII, (5)8,0,1 ASCII

Version: 1.06

Voltage: 230V, 460V

OK    Cancel

NEW

**Communication format Setting**

COM port: COM 1    Slave Address: 1

Use RS422 interface card

Auto-detect Baudrate  
 Auto-detect Portocol  
 Auto-detect Slave Address

Required detecting cycles: 1

START

VFD-L	None	VFD-V	VFD-L2	VFD-F
VFD-S	VFD-A	VFD-M	VFD-M1	VFD-P
VFD-B				

BaudRate: 4800, 9600, 19200, 38400

Protocol: (0)7,N,2 ASCII, (1)7,E,1 ASCII, (2)7,0,1 ASCII, (3)8,N,2 RTU, (4)8,E,1 RTU, (5)8,0,1 RTU

Version: 2.00, >=3.00

Voltage: 230V, 460V

OK    Cancel

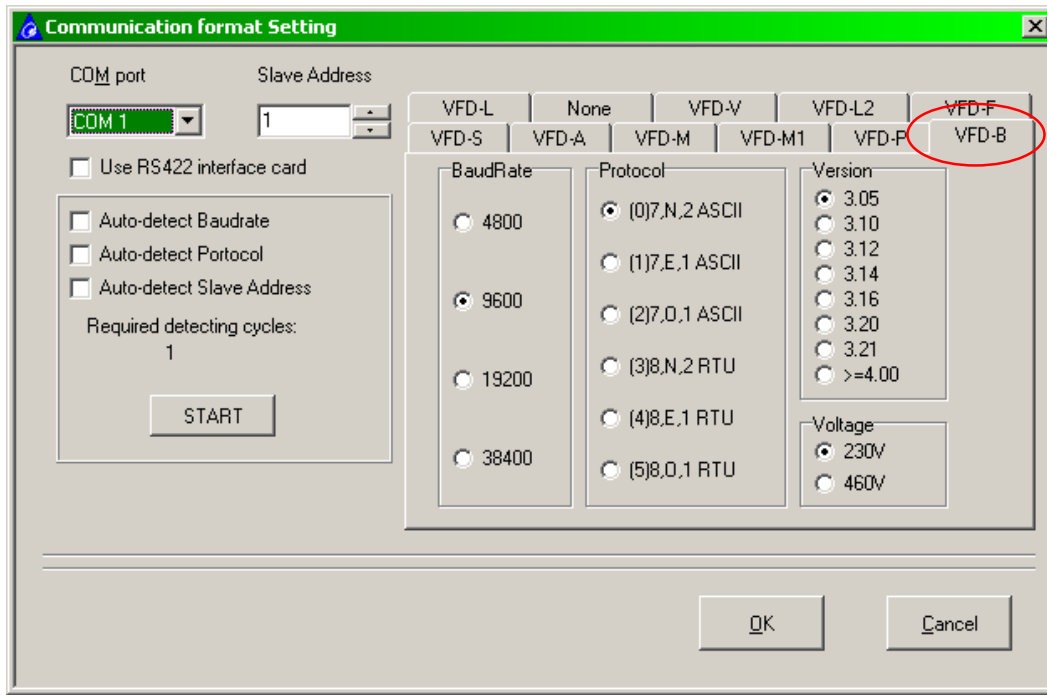
### 3.6.1 Settings VFD-M

- Slave address: Must be the same as Pr88.
- Baudrate: Must be the same as Pr89.
- Protocol: Must be the same as Pr92.
- Firmware: Select the firmware acc. to Pr100 or in lower left-hand corner of product label.  
If the screen doesn't show the right firmware version to select please change from M to M1 or from M1 to M.
- Voltage: The voltage is set acc. to the type: 230V for ....M21.... or ....M23.... and 460V for ....M43....
- Set Pr00=3<sup>1</sup> (Frequency command by RS485) and Pr01=3 or 4 (Control by RS485).
- Press [OK].

See 4. Operation.

<sup>1</sup> Refer to manual. Can be different in older versions.

### 3.7 VFD-B

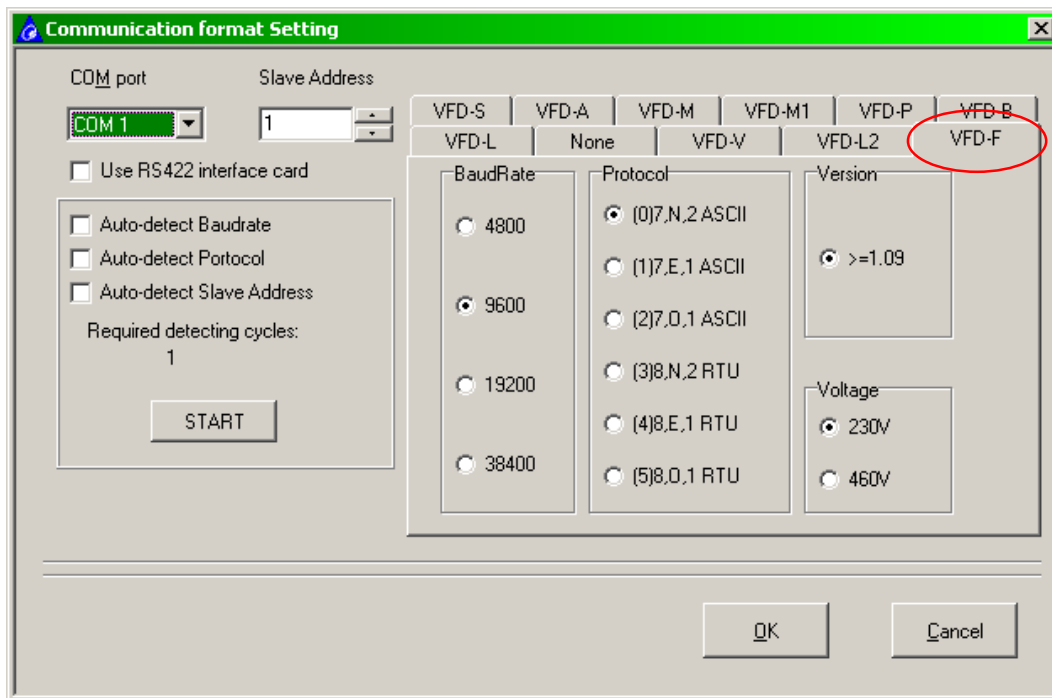


#### 3.7.1 Settings VFD-B

- Slave address: Must be the same as Pr09-00.
- Baudrate: Must be the same as Pr09-01.
- Protocol: Must be the same as Pr09-04.
- Firmware: Select the firmware acc. to Pr00-06 or in lower left-hand corner of product label.
- Voltage: The voltage is set acc. to the type: 230V for ....B21.... or ....B23.... and 460V for ....B43.....
- Set Pr2-00=4 or 5 (Frequency command by RS485) and Pr2-01=3 or 4 (Control by RS485).
- Press [OK].

See 4. Operation.

### 3.8 VFD-F

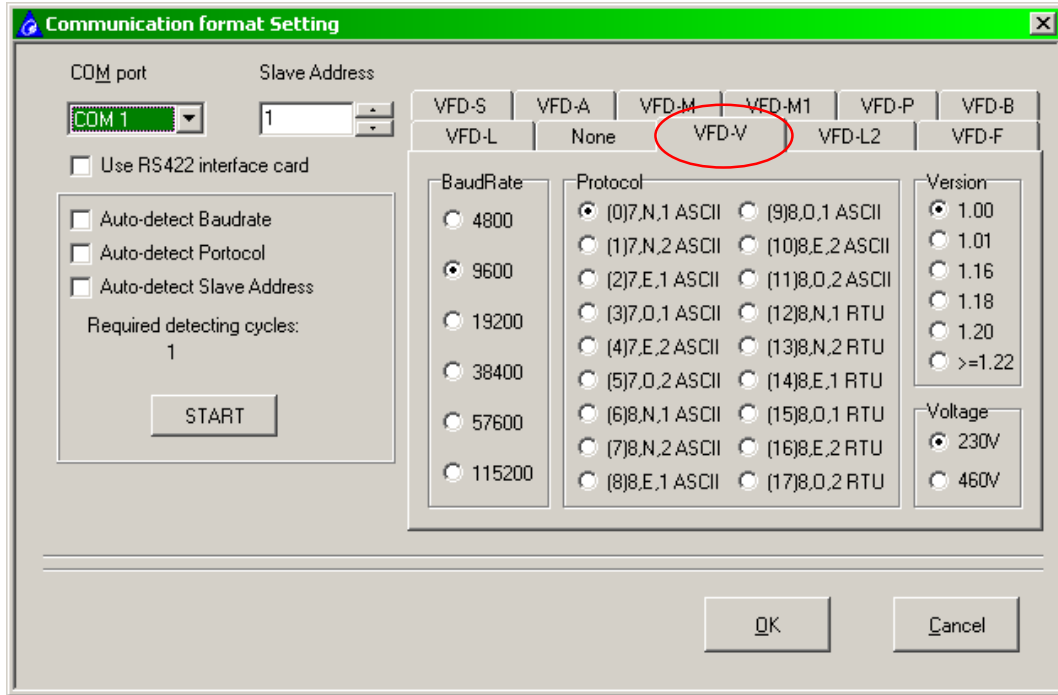


#### 3.8.1 Settings VFD-F

- Slave address: Must be the same as Pr09-00.
- Baudrate: Must be the same as Pr09-01.
- Protocol: Must be the same as Pr09-04 and Pr09-05.
- Firmware: Select the firmware acc. to Pr00-00 or in lower left-hand corner of product label.  
**Note:** For firmware  $\leq 1.08$  this CVFD program cannot be used to communicate with VFD-F!
- Voltage: The voltage is set acc. to the type: 230V for ...F23... and 460V for ...F43....
- Set Pr02-00=4 (Frequency command by RS485) and Pr02-01=3 or 4 (Control by RS485).
- Press [OK].

See 4. Operation.

### 3.9 VFD-V



#### 3.9.1 Settings VFD-V

- Slave address: Must be the same as Pr09-00.
- Baudrate: Must be the same as Pr09-01.
- Protocol: Must be the same as Pr09-04.
- Firmware: Select the firmware acc. to Pr00-06 or in lower left-hand corner of product label.
- Voltage: The voltage is set acc. to the type: 230V for ....V23.... and 460V for ....V43....
- Set Pr00-20=1 (Frequency command by RS485) and Pr00-21=0 (Control by RS485).
- Press [OK].

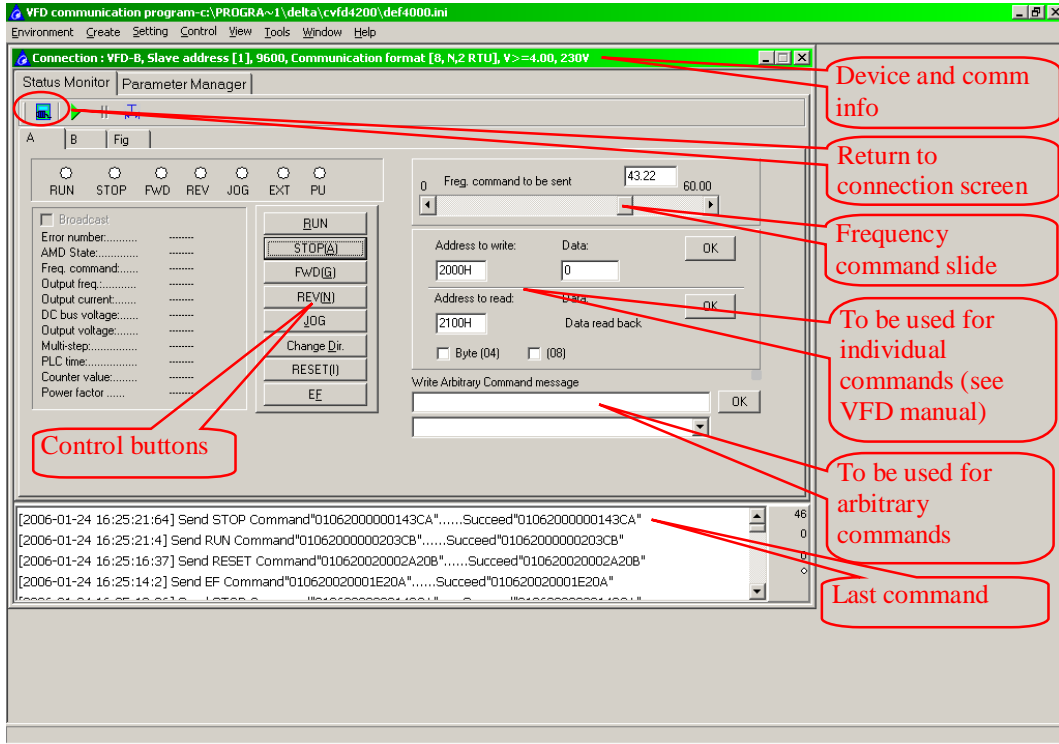
See 4. Operation.

## 4 OPERATION

### 4.1 Basic operation

After setting up CVFD and the VFD drive and you have pressed OK, you'll see the following screen:


Example for VFD007B21A with firmware 4.05 and settings Pr09-00=1 (Slave address), Pr09-01=01 (Baudrate 9600), Pr09-04=03 (Protocol Modbus RTU 8,N,2), Pr02-00=04, Pr02-01=03.




If everything is working correctly the drive should start running upon pressing RUN button.

- Buttons:
- [RUN]=Run command
  - [STOP]=Stop command
  - [FWD]=Forward direction
  - [REV]=Reverse direction
  - [JOG]=Run at Jog speed. To stop press [STOP].
  - [Change Dir]=Change direction from Fwd to Rev or from Rev to Fwd.
  - [RESET]=Reset command
  - [EF]=External fault. When pressed the VFD-B display shows “EF” error message.  
Reset via [RESET] button.

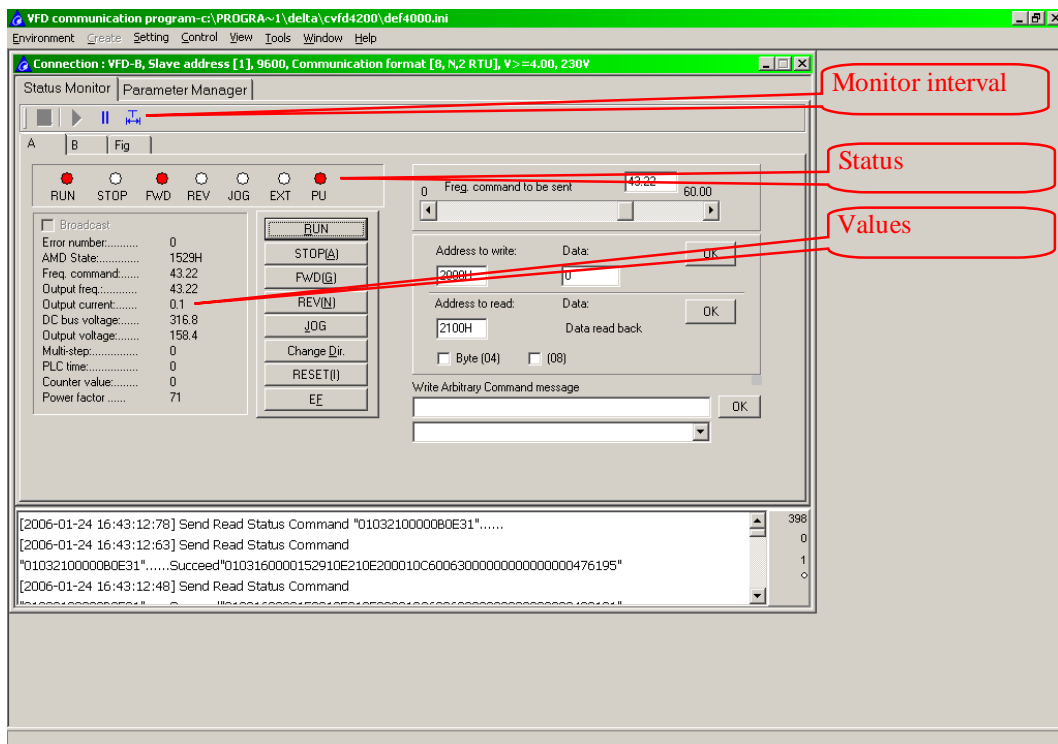
### 4.2 Continuous monitoring

For continuous monitoring, press .

Press  to stop continuous monitoring.

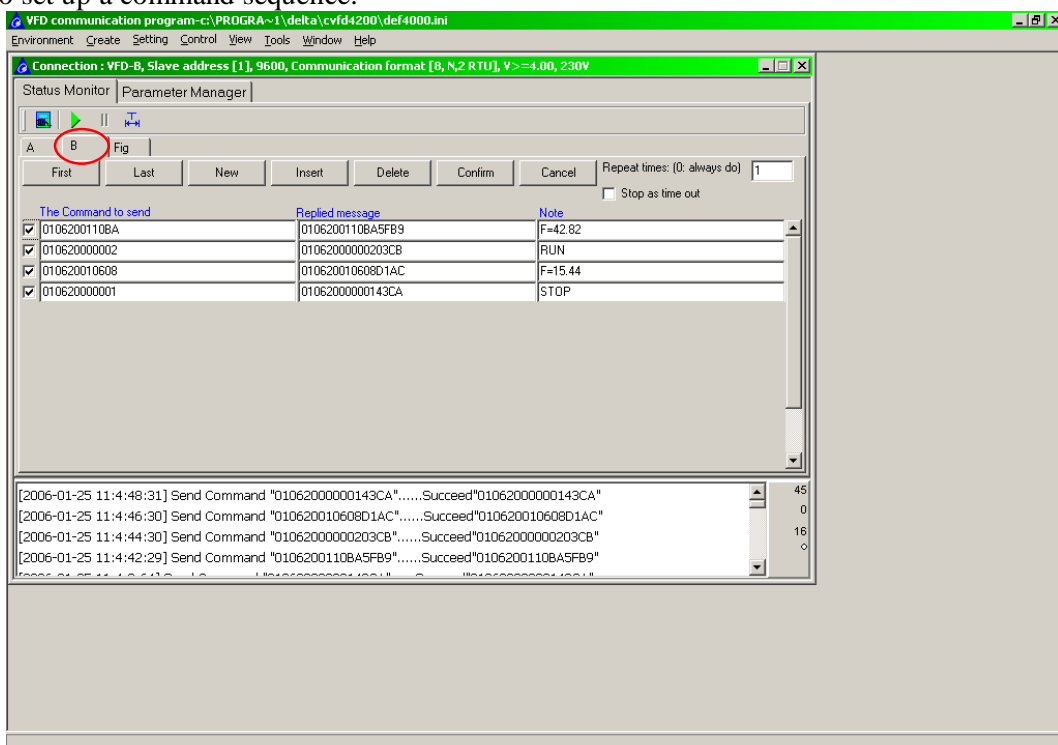
Press  to set the monitoring interval between 0.1~9000.0s

During continuous monitoring, CVFD constantly reads the drive's status and some values.



### 4.3 Command sequence

Select B to set up a command sequence.



With aid of the buttons you can make a [New] command line, [Insert] a command line, [Delete] a command line, go to the [First] or [Last] command line.

#### 4.3.1 The command to send

The command you want to send without the LRC or CRC check. Refer to the manual on how to build commands.

#### 4.3.2 Replied message

The response with LRC or CRC check.

#### 4.3.3 Note

Your comment text.

### 4.3.4 Repeat times




The number of times you want to repeat the sequence. 0 means infinitely.


### 4.3.5 Time out

Tick the Stop as Time Out if you want the drive to stop in case of time out error due to lost communication.

### 4.3.6 Operation

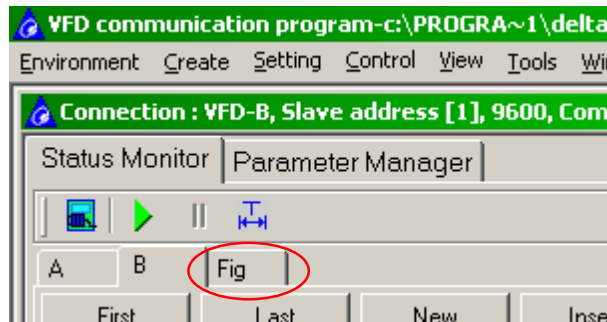
To start the sequence, press .

To stop the sequence, press . If Repeat times is 0, it will run infinitely until  is pressed. If repeat times is  $\neq 0$ , then it will run the sequence as many times as set and then stop. It still can be interrupted by pressing .

Press  to set the interval between commands in the range of 0.1~9000.0s

## 4.4 Scope function

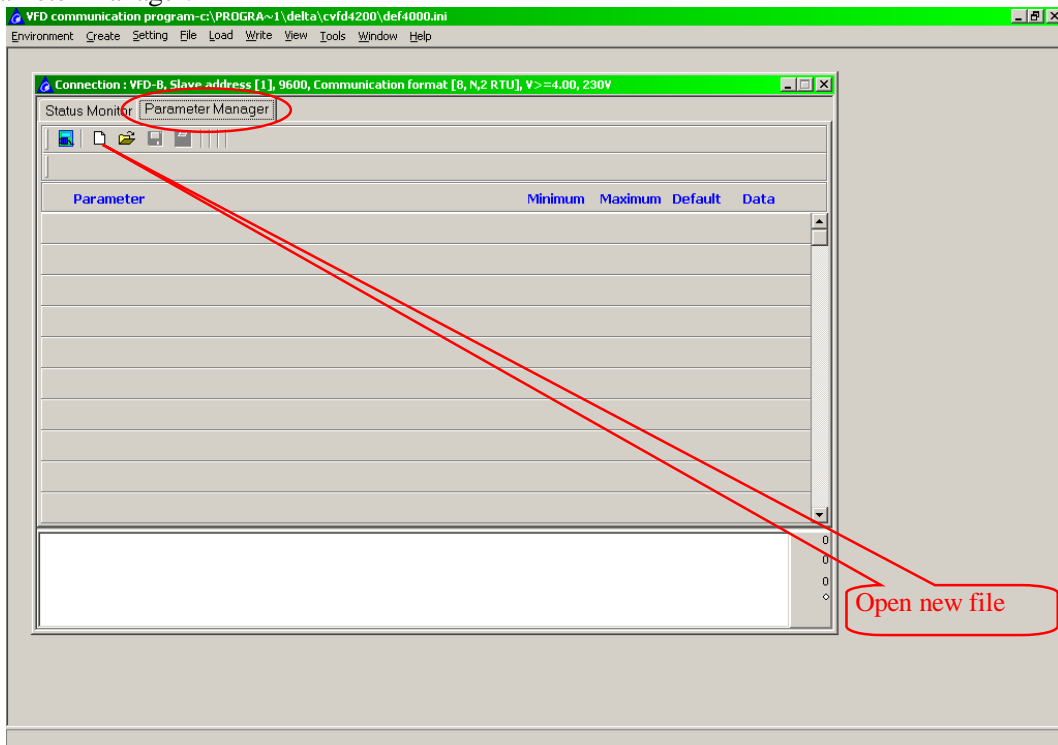
Select the Fig. tab.



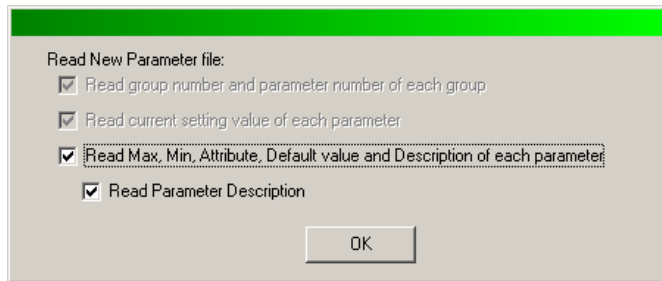
This part is still under development.

## 4.5 Parameter manager

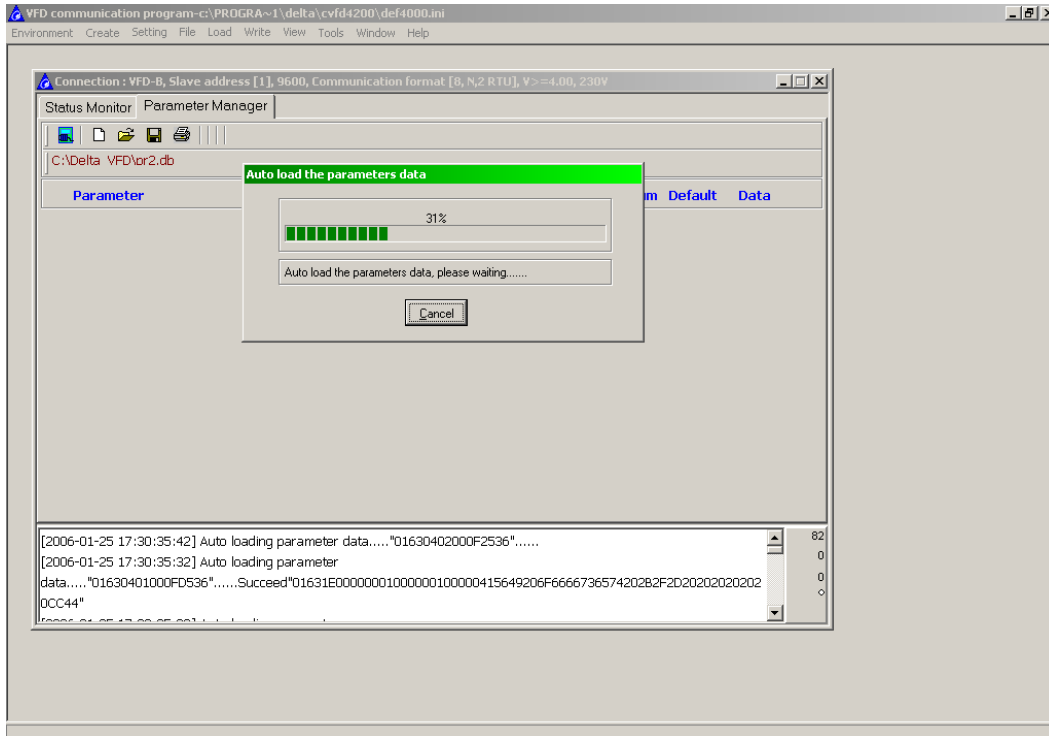
Go to Parameter manager.



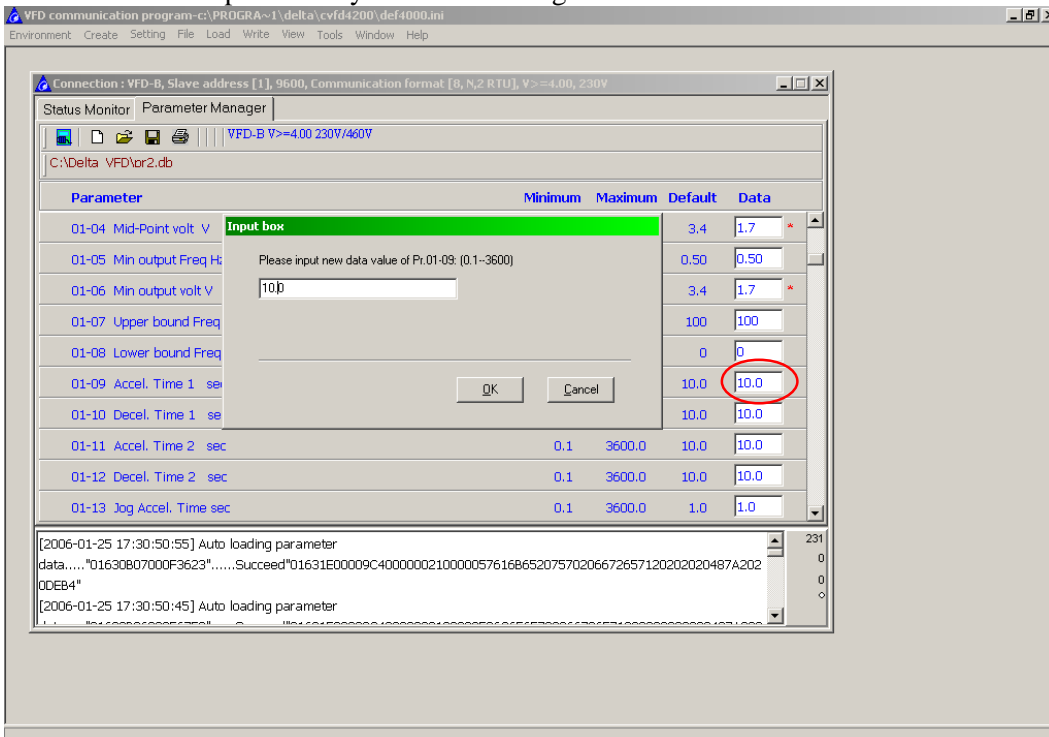
Open new file



Press [OK]

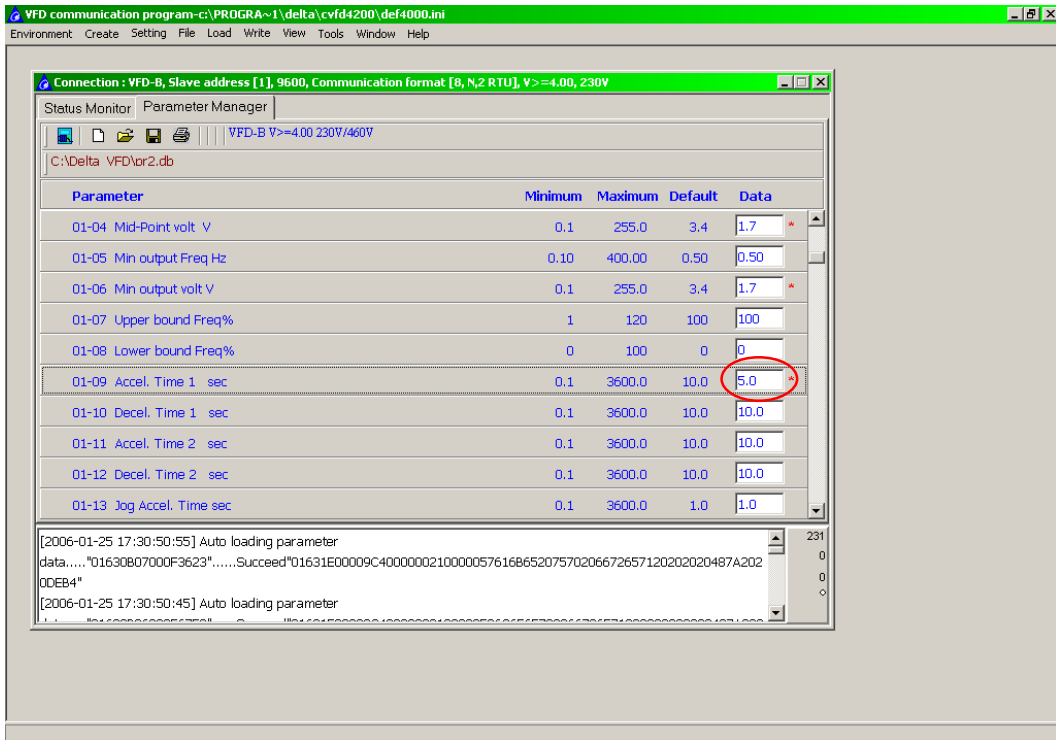


Click on the data field of the parameter you want to change.

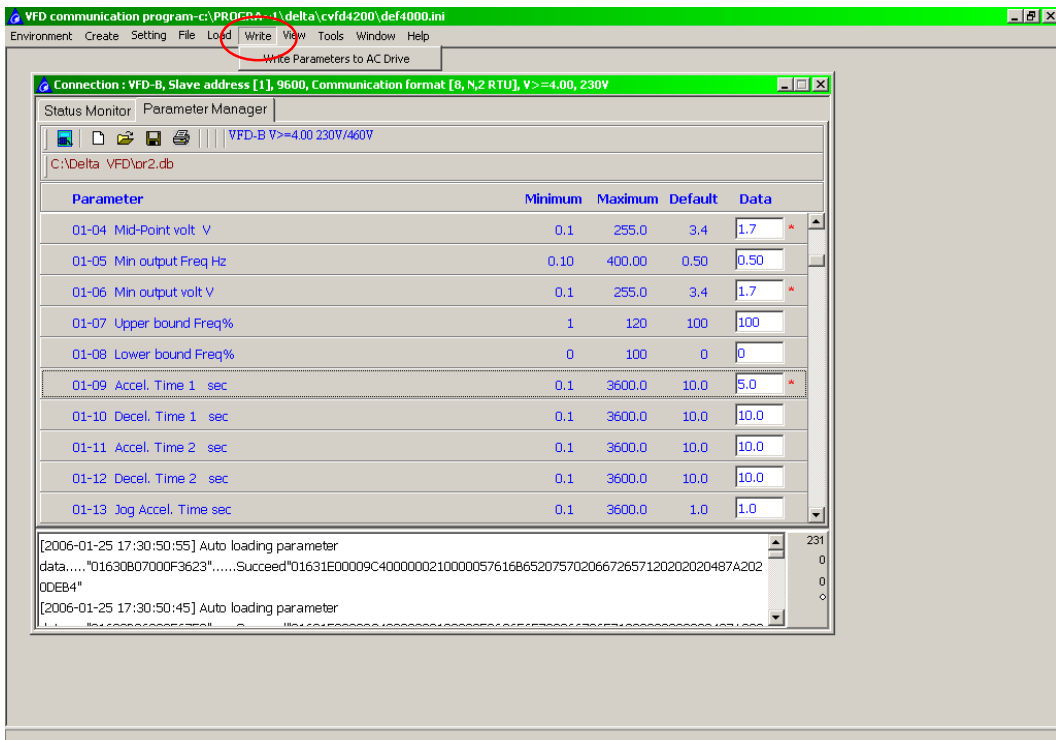


The change is shown in the data field.

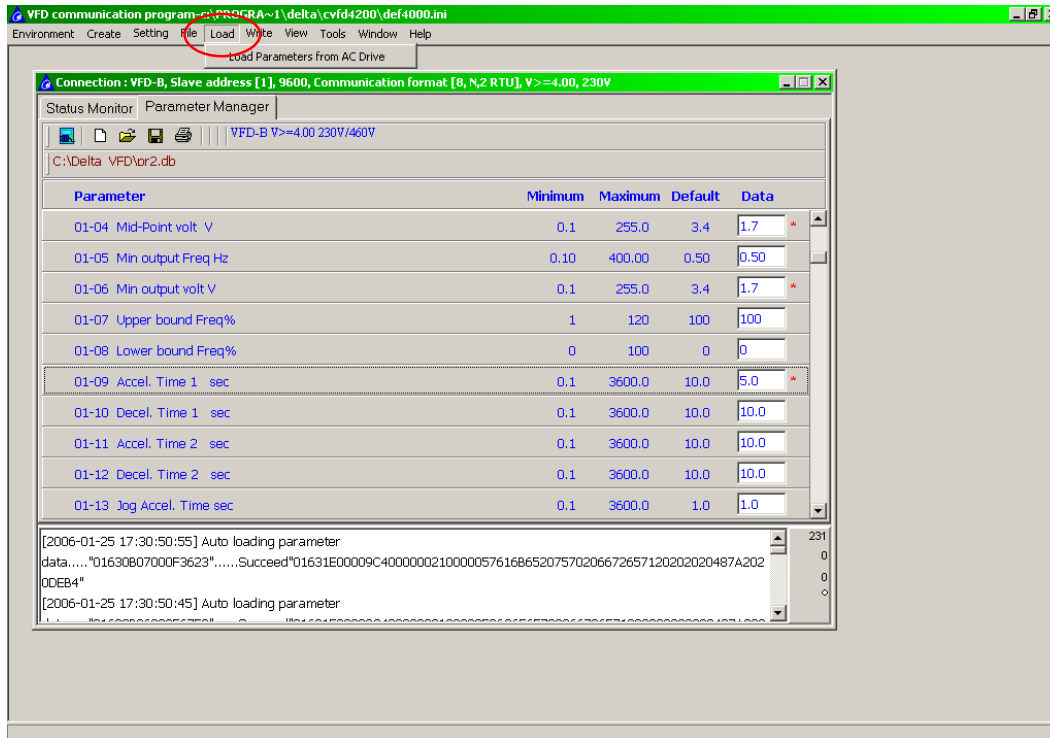




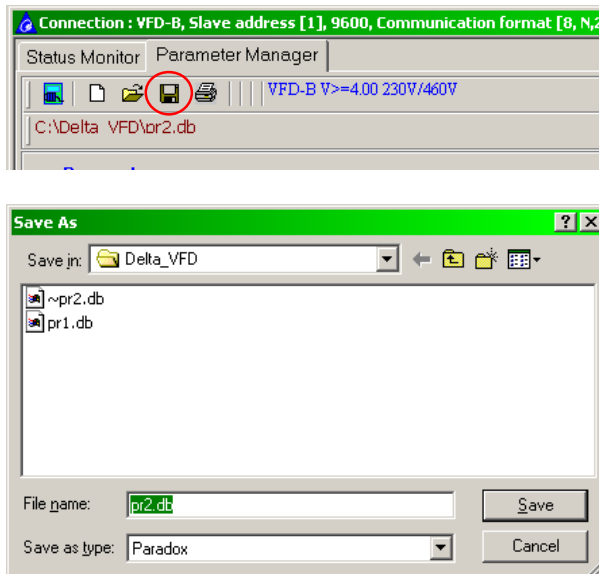
#### 4.5.1 Write parameters to the drive



## 4.5.2 Load (read) parameters from the drive

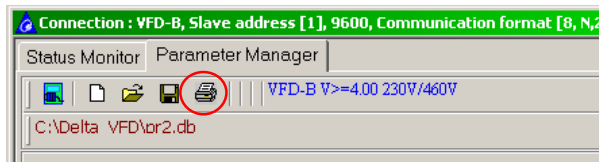


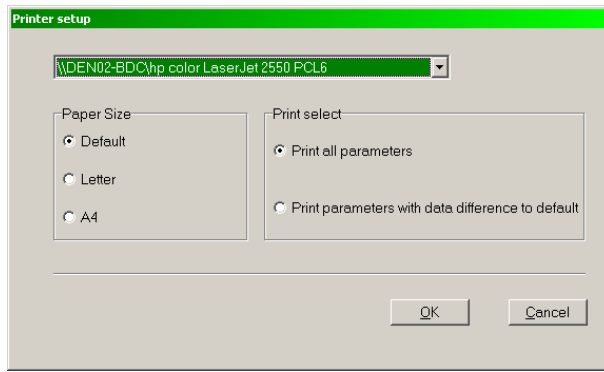
## 4.5.3 Save parameter file




Give the parameter file any name and press [Save].

## 4.5.4 Print parameter file





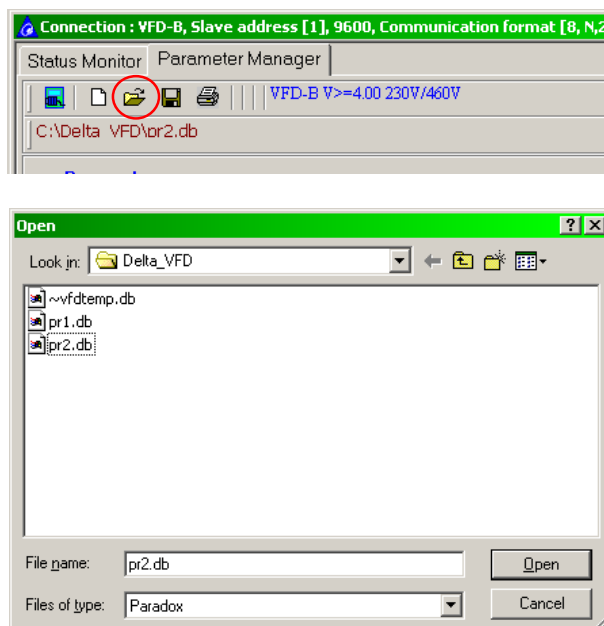
Select paper size, which parameters and printer if needed and press [OK]

In the Print Preview you can still make some adjustments and press  to print.

The result is as follows with header on each page.

Filename: pr2.db      2006-01-25 17:54:42      1				
Connection : VFD-B, Slave address [1], 9600, Communication format [8, N,2 RTU], V>=4.00, 230V				
Parameter	Minimum	Maximum	Default	Data
00-00 Identity Code	0	65535	0	4 *
00-01 Rated Current	0.0	6553.5	0.0	5.0 *
00-02 Parameter Reset	0	10	0	0
00-03 Start-up display	0	4	0	0
00-04 User-defined	0	14	0	0
00-05 User-defined K	0.01	160.00	1.00	1.00
00-06 Software version	0.00	655.35	4.05	4.05
00-07 Password input	0	65535	0	0
00-08 Password setting	0	65535	0	0
00-09 Control Mode	0	3	0	0
00-10 Reserved	0	1	0	0
01-00 Max output freq Hz	50.00	400.00	60.00	60.00
01-01 Motor rated freqHz	0.10	400.00	60.00	60.00
01-02 Motor rated voltV	0.1	255.0	440.0	220.0 *
01-03 Mid-point freq Hz	0.10	400.00	0.50	0.50
01-04 Mid-Point volt V	0.1	255.0	3.4	1.7 *

#### 4.5.5 Open existing parameter file



Select the file and press [Open].