

VAMPSET

Setting and configuration tool

Publication version: VVAMPSET/EN M/B006

User manual



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1. Overview

1.1. What is VAMPSET

VAMPSET is a relay configuration tool for VAMP protection relays. The program provides a user-friendly graphical interface for making the configurations. Configurations can also be easily printed out and saved for later use. The user does not need to know anything about the model or hardware of the VAMP relay in being used; VAMPSET reads all information directly from the device.

Since version 1.0 it has also been possible to read and evaluate disturbance recordings made by the VAMP relays. The disturbance records are saved by using a standard COMTRADE file format.

VAMPSET handles the relay settings as documents, **vef**-files. Settings of one physical relay are considered as one document. Documents can be read from the relay and they can be transferred between similar relays. Documents can also be saved to hard drive of the PC, the documents can be loaded back to VAMPSET and to the relay.

1.2. Requirements

VAMPSET only requires a desktop PC with Windows operation system. Different kinds of cables are required for interfacing with VAMP relays; the required cable depends on how the relay is connected to the PC. One of the most commonly used methods is to connect the D9-connector located on the relay's front panel (aka *local port*) to a serial port (COM-port) on the PC. VX003 cable is required for this. Prebuilt can be ordered from VAMP Ltd, but the cable schematics are also available at www.vamp.fi, in **application note ANCOM.EN009 – “How to get communication working between the relay and VAMPSET”**. USB-Serial adapter can also be used if dedicated serial port is not available.

Depending on the relay, an option to use for example *remote port*, USB or Ethernet might also be available. Consult the relay manual, VAMP Ltd website www.vamp.fi or customer support for further information.

1.3. Compatibility

Operating systems

VAMPSET is compatible with Microsoft Windows system versions Windows 7/Vista/XP/2000/NT/98/95 without a need of any additional configuration of the PC.

Products

VAMPSET works with all VAMP protection relays, VAMP monitoring and measuring units and VAMP 321 arc protection system.

1.4. How to get the latest version

The contents of this manual correspond with VAMPSET version 2.2.88 and might be subject to change.

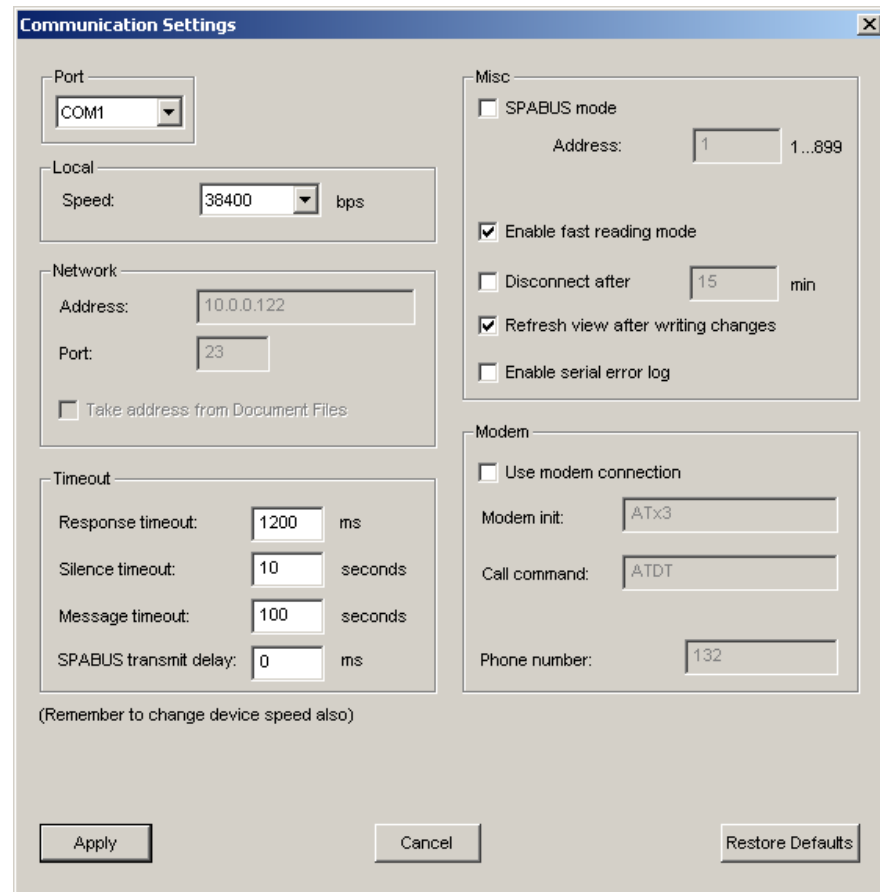
While commissioning new relays, the usage of latest version of VAMPSET is recommended. The latest version can be downloaded from our website. Old versions do not need to be uninstalled.

2. Settings -menu

2.1. Communication

Communication settings can be accessed through the menu:

Settings/Communication Settings



The screenshot shows the 'Communication Settings' dialog box with the following fields and options:

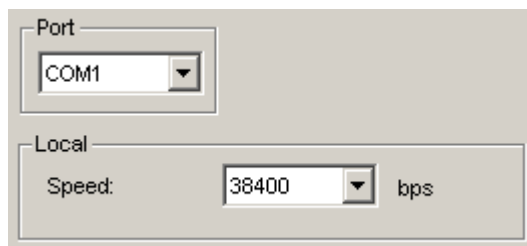
- Port:** A dropdown menu showing 'COM1'.
- Local:**
 - Speed:** A dropdown menu showing '38400' bps.
- Network:**
 - Address:** A text field showing '10.0.0.122'.
 - Port:** A text field showing '23'.
 - ☐ Take address from Document Files
- Timeout:**
 - Response timeout:** A text field showing '1200' ms.
 - Silence timeout:** A text field showing '10' seconds.
 - Message timeout:** A text field showing '100' seconds.
 - SPABUS transmit delay:** A text field showing '0' ms.
- Misc:**
 - ☐ SPABUS mode
 - Address:** A text field showing '1' with a range '1...899'.
 - ☒ Enable fast reading mode
 - ☐ Disconnect after: A text field showing '15' min.
 - ☒ Refresh view after writing changes
 - ☐ Enable serial error log
- Modem:**
 - ☐ Use modem connection
 - Modem init:** A text field showing 'ATx3'.
 - Call command:** A text field showing 'ATDT'.
 - Phone number:** A text field showing '132'.

(Remember to change device speed also)

Buttons at the bottom: Apply, Cancel, Restore Defaults.

Communication settings are used for defining communication timeouts and how the relay is connected to the PC. The following sections of this document describe in more detail the different settings.

2.1.1. Serial Port



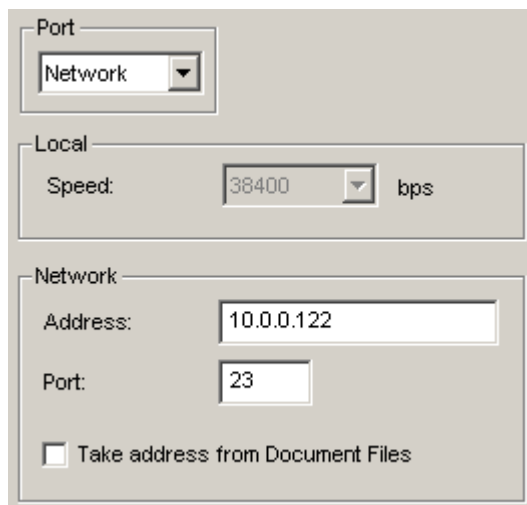
Port: COM1

Local: Speed: 38400 bps

If serial port is used, the **port** and **speed** must be defined. Default **speed** is 38400 bps, but this can be changed. The important thing is that the relay is set to operate at the same speed. Default port is COM1, but this varies between different configurations. Please consult **application note ANCOM.EN009 – “How to get communication working between the relay and VAMPSET”** for further information. This document is available on the VAMP Ltd website www.vamp.fi.

Some of the available speeds might not be supported by all serial ports. Please consult the manual of your serial port for further information.

2.1.2. Ethernet



Port: Network

Local: Speed: 38400 bps

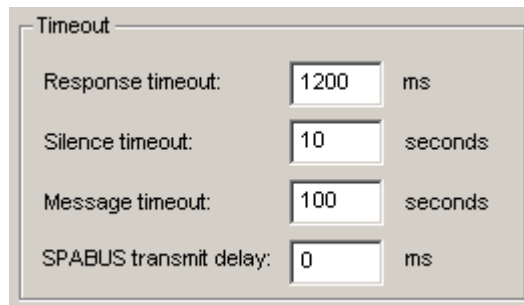
Network: Address: 10.0.0.122

Port: 23

☐ Take address from Document Files

Ethernet settings can be activated by selecting ‘Network’ as a communication port. After the Ethernet settings have been enabled, user can define the IP address and TCP port used for the connection. By ticking the checkbox “**Take address from Document Files**” the user can set the VAMPSET to read the address automatically when a previously saved setting-file is opened.

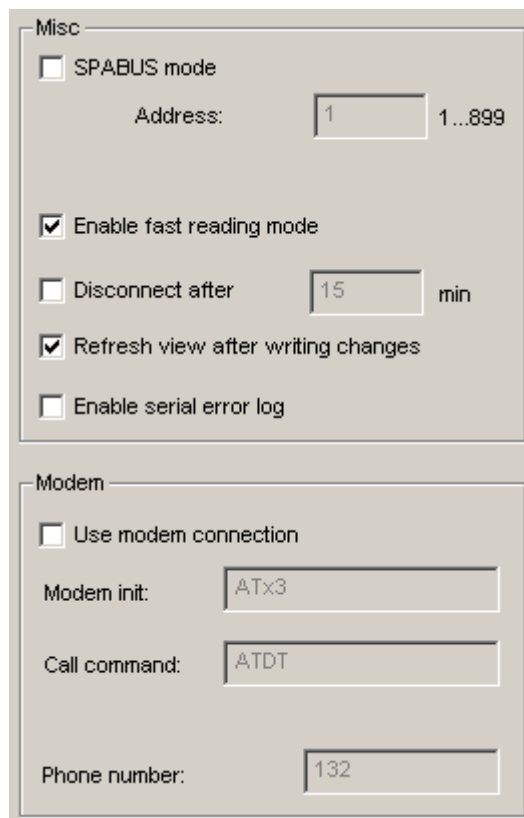
2.1.3. Other communication settings



The screenshot shows a window titled "Timeout" with four input fields for communication timeouts:

Parameter	Value	Unit
Response timeout:	1200	ms
Silence timeout:	10	seconds
Message timeout:	100	seconds
SPABUS transmit delay:	0	ms

Sometimes it might be useful to change the different communication timeouts. The timeouts might for example need to be increased while using a slow and unreliable communications pathway.



The screenshot shows two stacked windows: "Misc" and "Modem".

Misc settings:

- ☐ SPABUS mode
- Address: 1...899
- ☒ Enable fast reading mode
- ☐ Disconnect after min
- ☒ Refresh view after writing changes
- ☐ Enable serial error log

Modem settings:

- ☐ Use modem connection
- Modem init:
- Call command:
- Phone number:

VAMPSET can also be set to use SPABUS or modem-communication, disconnect automatically after certain period of time and log errors. Fast reading mode increases the speed of the communication, but this might need to be disabled if the communications pathway is unreliable.

Changing some of the parameters causes the relay to recalculate some other related parameters. By default VAMPSET refreshes view when changes have been made, but this can be also disabled if required.

2.2. Program Settings

Program settings can be found on the menu:

Settings/Program Settings

The screenshot shows the 'Settings' dialog box with the following sections and options:

- Initial reading:**
 - ☒ Read Fault Logs (Recommend State: Enabled)
 - ☒ Read Event Buffer (Recommend State: Enabled)
 - ☐ Ignore Read Errors (Recommend State: Disabled)
- Group refresh:**
 - ☒ Read Fault Logs (Recommend State: Enabled)
 - ☒ Continuous updating from device (Recommend State: Disabled)
 - ☐ Online measurements
- Log files:**
 - Events log: ☐ [Text field] [Browse...]
 - Changes log: ☐ [Text field] [Browse...]
- Device library:**
 - Root directory: [Text field with 'C:\']
 - Backup directory: [Text field with 'C:\']
- Write settings:**
 - ☐ Write changes automatically after change (Recommend State: Disabled)
- Read settings:**
 - ☐ Upload disturbance recordings automatically (Recommend State: Disabled)
- View:**
 - ☒ Show parameters using boxes (Recommend State: Enabled)
 - PQ-diagram style:**
 - ☒ y-axis=P x-axis=Q
 - ☐ y-axis=Q x-axis=P
 - [Select language button]
 - [Text field]
- Default passwords:**
 - Configurator: [Text field]
 - Operator: [Text field]

Buttons: OK, Cancel

2.2.1. Reading and Group refresh settings

These settings can be used to change how VAMPSET behaves while interacting with relays. It is recommended to keep the default settings.

2.2.2. View Settings

These settings affect the appearance of the program. On default VAMPSET draws borders around parameters which belong together. This can be disabled by unselecting the checkbox “**Show parameters using boxes**”.

Axis on the PQ-diagram can be reversed by changing the selection under the “**PQ-diagram style**” setting group.

2.2.3. Log Files

Different kinds of logging states can be enabled by checking appropriate boxes. The file paths can be typed directly into the text boxes or selected by using “**Browse...**”-buttons. The path must already exist or the log is not created. If the file does not exist, a new file is created automatically. Log files consist of plain ASCII text hence they can be opened using any text editor, e.g. Windows Notepad.

Event logs are appended when events are read from device. Changes logs are updated every time some parameter changed in VAMPSET and send to the relay.

2.2.4. Default Passwords



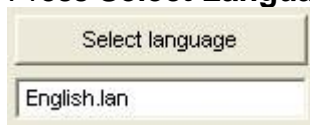
It's possible to define default passwords, which are automatically used in conjunction with the corresponding access level when user does not manually provide a password. This feature can be user to make connecting to devices a bit easier and faster.

2.2.5. Changing VAMPSET language

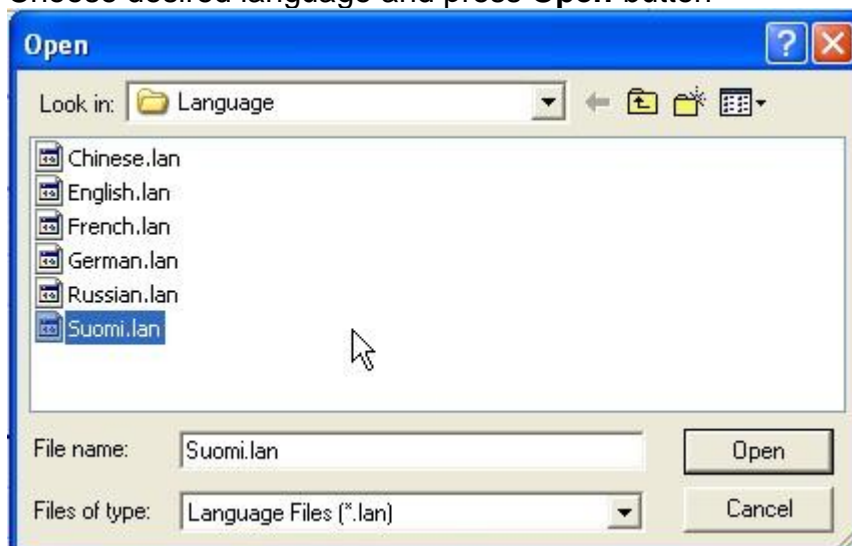
1. Open **VAMPSET**
2. Go to **Settings**-menu and select **Program Settings**



3. Press **Select Language**-button



4. Choose desired language and press **Open**-button



5. Press **OK**-button



6. Restart **VAMPSET**

3. Communication-menu

The **Communication**-menu provides different kinds of features which are used for interacting with the relay. The menu has for example selections for connecting/disconnecting the device, searching for new devices, reading parameters from relay, writing changes to relay, synchronizing time and rebooting the relay.

Communication	Device Library	Disturbance Record
Connect Device...		F5
Disconnect Device		Ctrl + F5
Search and Select Devices		
Quick connect...		F11
Write All Settings To Device		
Write Changed Settings To Device		F10
Write current view to device		
Sync time and date from computer		
Boot Device		F9
Run script-file		
Read all settings from Device		
Refresh Current Group From Device		F8
Refresh Menu From Device		
Update Firmware		
Update Language		
Update Boot-code		
Read all DB texts from device		
Restore Device DB		
Device diagnostics		
Terminal		Ctrl + T
TCP/IP connection tester		
Detect External IO		
Get ICD File...		
Create ICD File...		
Get IID File...		
Configure with SCD file...		
Get DeviceNet EDS...		
Get EtherNetIP EDS...		

Some of these commands are also available in the VAMPSET toolbar. Buttons on the toolbar (and their obvious counterparts in the **Communication**-menu) are explained in more detail later in the Chapter 4.1.2.



3.1. Communication special commands

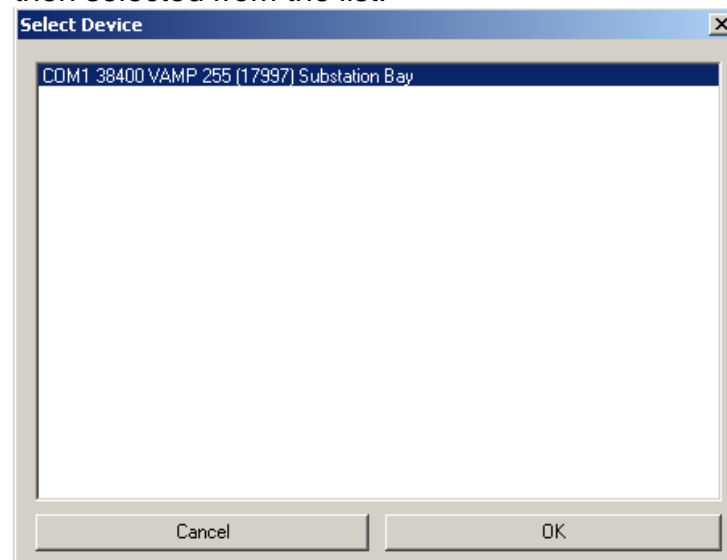
3.1.1. Connect, Disconnect and Quick connect

The normal “**Connect/Disconnect Device...**”-buttons are available both in the **Communication**-menu and in the toolbar. The menu however has one additional command which can be used for making connection to the relay; “**Quick connect...**”.

Using the normal **Connect**-selection causes VAMPSET to immediately read all the available menus and parameters from the relay reads. Reading the full menu structure might take for awhile and thus the **Quick connect**-selection is available. **Quick connect** reads initially only a small basic menu structure and the rest are read from the relay on demand.

3.1.2. Search and Select Devices

The “Search and Select Device”-command can be used to search for VAMP protection relays attached to the PC via serial-port. Using this command causes VAMPSET to open a new window, which goes through all available COM-ports and searches for relays. The found relays are displayed to the user and they can be then selected from the list.



3.1.3. Update firmware

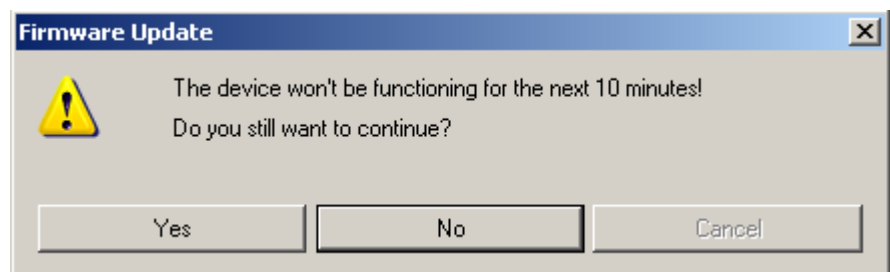
This command is used for updating relay firmware. New firmware can only be obtained by connecting VAMP Ltd customer support. The need for a new firmware is evaluated by the support-staff.

Firmware should only be updated when the device is not functioning correctly! Fully functional device, even one with an old firmware, should not be updated if the device is already working properly!

When a firmware update is deemed necessary, the new firmware will be provided by VAMP Ltd in a format "**VAMPx_Vy.yy.vef**", where x is the model of the relay and y.yy is the version of the new firmware.

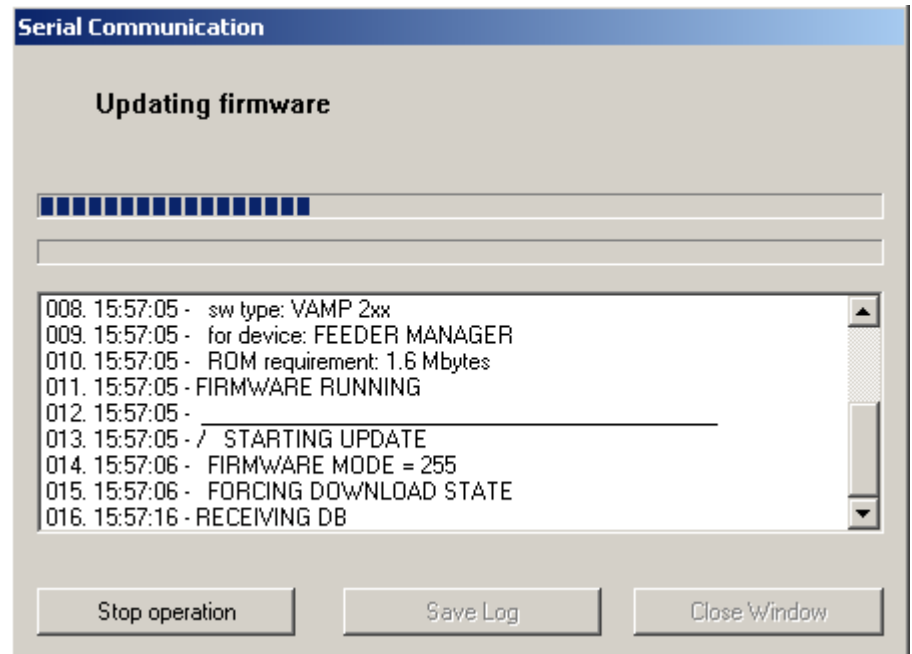
The procedure for updating the firmware is the following:


1. Make sure that you are using the latest VAMPSET program from the VAMP Ltd website: <http://www.vamp.fi/>
2. Copy all the provided files to your hard drive in to a safe place.
3. Connect the VX003 cable between the PC and relay. **USE ONLY DIRECT SERIAL CONNECT, NO MEDIA CONVERSIONS OR ETHERNET!** USB Serial can be used if required.
4. Start VAMPSET, select a communication port and speed from the "**Settings/Communication Settings**"-menu.
5. Connect to the relay normally (shortcut key **F5**), do not use **Quick Connect**. Use Configurator access level (default password **2**). This causes VAMPSET to read the existing configurations and settings.
6. Save the existing configurations and settings by selecting "**File/Save**" from the menu.
7. Select menu "**Communication/Update Firmware**". The following warning will be shown:



Choose "**Yes**" from the warning dialog. Select the provided firmware file *i.e.* **vef**-file. Before pressing "**Open**"-button from the following dialog, make sure that the type of the relay in question matches with the type in the name of the

vef-file. After the “Open”-button is pressed VAMPSET will automatically start the update and following dialog is displayed:



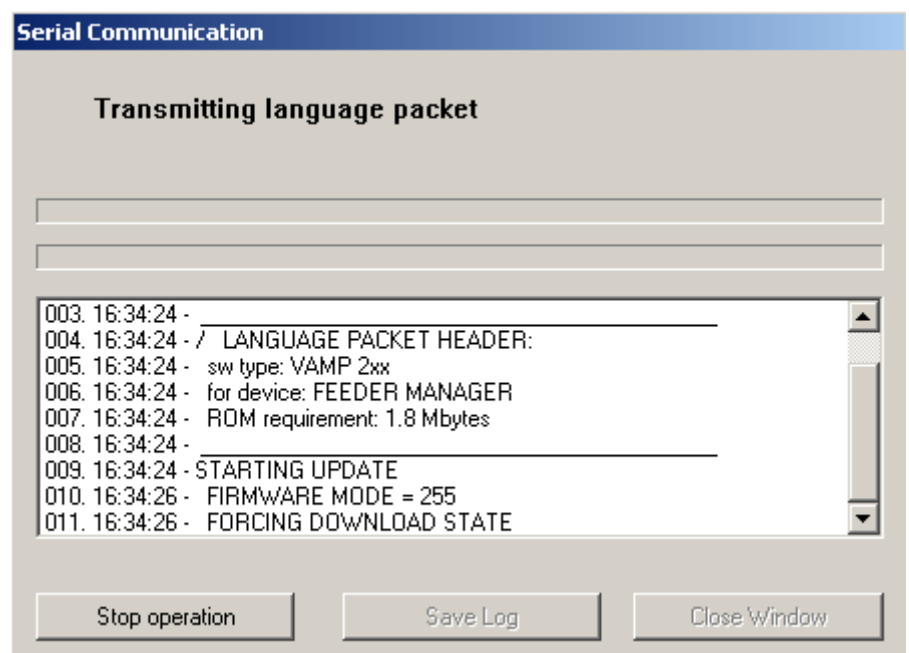
8. Updating the firmware takes about 5-10 minutes and the relay can not be used during this time. Also ensure an uninterrupted supply of power to both the PC and relay during the update process. The relay will restart automatically when the update has been completed successfully.
9. The next step is to open the settings-file, which was created in the beginning of the update.
10. Press “**Compare settings**”  button. This takes about 2-5 minutes. The firmware update was successful if there are no differences. Please note that time, date and some thermal values may have been changed and this is normal.
11. Close the currently active file by selecting “File/Close” from the menu. Now you can resume using the relay normally. New features may be available so it is recommended to do a full connect by using the “**Communication/Connect device...**”-menu (Shortcut key = F5) and then save the new configuration for archiving purposes. Older configuration files, made before the firmware update, should not be used at all.

3.1.4. Update language

This feature can be used to change the relay's language. English is the default, but some other currently available languages include Finnish, French, German, Italian and Swedish. The language files are available from VAMP Ltd. upon request and they are delivered in a file format "**language_x.vlf**", where **x** identifies the relay firmware version for which the language file is intended for.

The procedure for changing the firmware is the following:

1. Make sure that you are using the latest VAMPSET program from the VAMP Ltd website: <http://www.vamp.fi/>
2. Copy all the provided files to your hard drive in to a safe place.
3. Connect the VX003 cable between the PC and relay. **USE ONLY DIRECT SERIAL CONNECT, NO MEDIA CONVERSIONS OR ETHERNET!** USB Serial can be used if required.
4. Start VAMPSET, select a communication port and speed from the "**Settings/Communication Settings**"-menu.
5. Select menu "**Communication/Update Language**".
Warning window will be displayed, choose "**Yes**". Select the provided language file *i.e.* **vlf**-file. Before pressing "**Open**"-button, make sure that the firmware version of the relay matches with the one in the **vlf**-file name. (For example if the firmware of the relay is 5.75 the **vlf** file should be "**language_575.vlf**") After the "**Open**"-button is pressed VAMPSET will automatically start to send the language file and the following dialog is displayed:



6. Sending of the language file takes about 5-10 minutes and the relay can not be used during this time. Also ensure an uninterrupted supply of power to both the PC and relay during the update process. When the language update has been completed, the user will be informed about this in the final row of the update dialog. The dialog window and VAMPSET can then be closed.
7. Use the HMI on the relay and go downwards main menu until you reach the DEVICE SETUP menu.

```

▲▼▶ DEVICE SETUP
AR  | bit/s   38400bps
OBJ |
Lgic| Acc     CONF
CONF|
Bus |
Diag|




```

8. Now go to the left until you reach LANGUAGE menu. In this menu you should now see the default language and the language which was just transferred in to the relay.

```

▲▼◀▶ LANGUAGE
AR  | ●English  v5.46
OBJ | ○Suomi    v5.21
Lgic|
CONF|
Bus |
Diag|



```

9. Press the INFO  button in the HMI, after that press ENTER , input give the Configurator password (default 2), and finally press the ENTER  again.
10. The active language is displayed on a black background.

```

LANGUAGE
●English v5.46
○Suomi   v5.21
CONF

```

11. Select the desired language and press ENTER . Processing of the language-change will take about 10-20 seconds. Press CANCEL  to go back to the main display of the relay.

12. Check that the language is actually changed in the relay, by browsing the menus in the relay's HMI.
13. Read a new VAMPSET setting-file from the relay with PC and save the new settings for archiving. It is not recommended to use the old setting-files which had been made by using different language.

3.1.5. ICD-, IID-, SCD- and EDS-files

VAMPSET can be used for exporting a number of files, which in turn may be required for interfacing the relay with other systems. These functionalities can be found from the **Communication-**menu:

Get IDC File...	Read IEC 61850 IED Capability Description file from the connected relay (unconfigured IEC 61850 server device description)
Create IDC File...	Build IEC 61850 IED Capability Description file from VAMPSET configuration data (off-line, without connecting to the relay)
Get IID File...	Read IEC 61850 Instantiated IED Description file / Configured IED Description file from the connected relay (configured IEC 61850 server device description)
Configure with SCD file...	Set up the IEC 61850 interface of the relay with provided System Configuration Description file
Get DeviceNet EDS...	Read DeviceNet slave Electronic Data Sheet file from the connected relay
Get EtherNet/IP EDS...	Read EtherNet/IP slave Electronic Data Sheet file from the connected relay

3.1.6. Additional relay configuration commands

Usually these commands are not required by a normal user, for every-day relay usage. These commands are only needed on special occasions and their usage is instructed by VAMP Ltd customer support when required.

Run Vamp-script, Update boot code and Restore Device DB

These commands are needed only in special cases. The procedure of using these is quite similar to the firmware and language updates and the usage is advised by VAMP Ltd customer support when necessary.

Read all DB texts from device

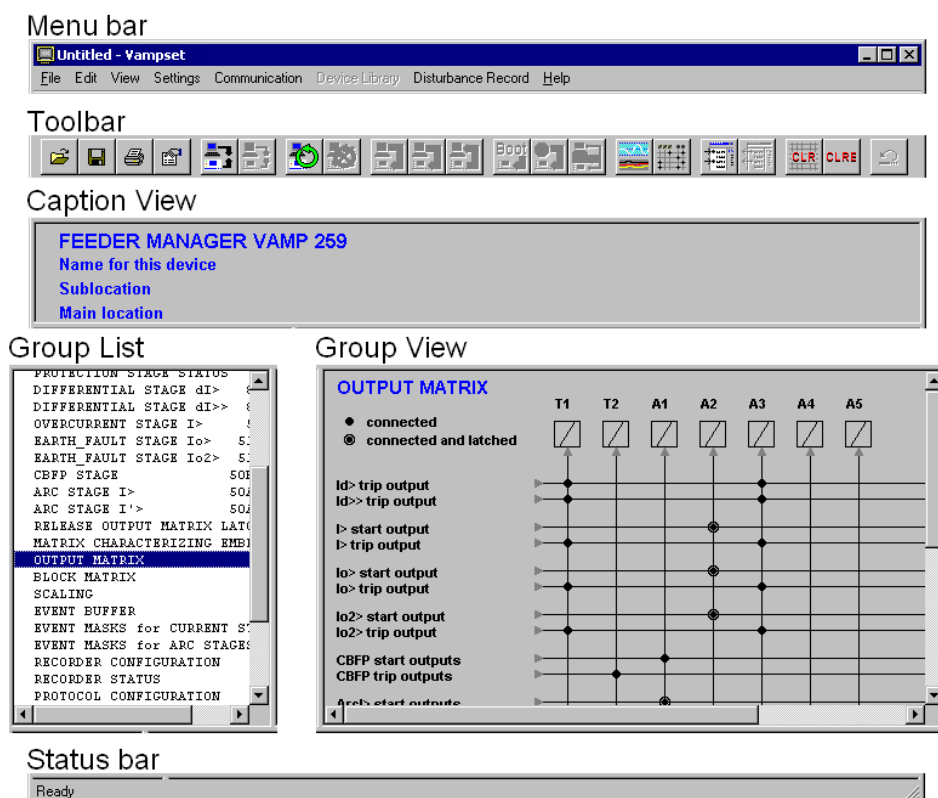
With this command VAMPSET reads the database of the relay in to a text file. Customer needs to provide this file when requesting language files from the customer support.

Terminal

This command opens a terminal window, which can be used to interface with the relay by using Get/Set-protocol. The usage of the terminal is advised by VAMP Ltd customer support when necessary.

4. Relay Configuration Window

4.1. Main Window



The main window of VAMPSET is divided to the following six parts:

Menu bar

Contains various menus, **Settings**- and **Communication**-menus were described on previous chapters, other menus will be described later in this manual.

Toolbar

Provides shortcuts to various tools used for interfacing with the relay. Toolbar buttons are described later in this chapter.

Caption View

Shows information about the relay which is being configured. The contents of these fields can be defined by the user.

Group List

List of available setting parameter groups. The desired setting group must be selected in order to access the setting parameters.

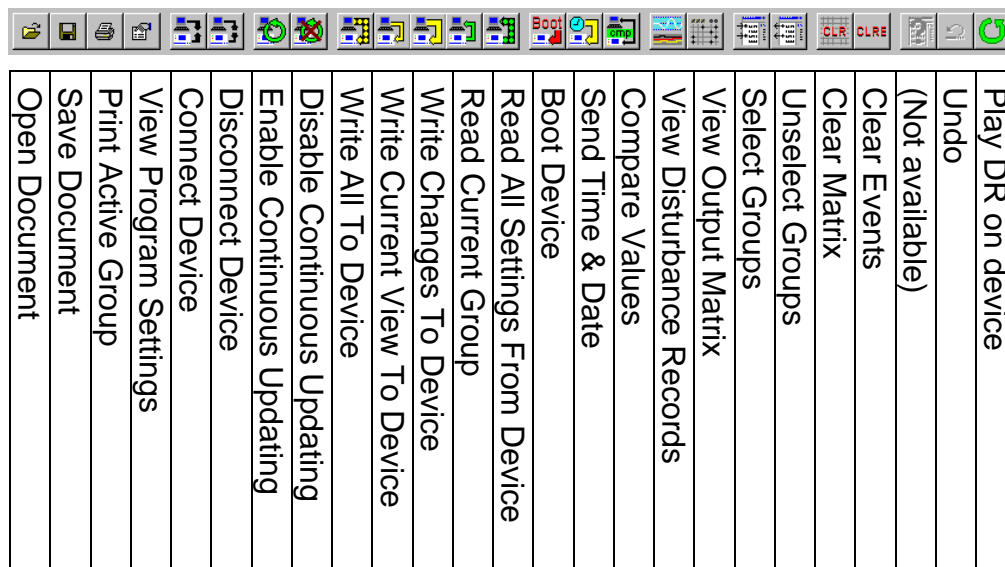
Group View

All of the device configurations are made in this view. The different parameters are available after selecting a group from the **group list**. Right mouse button can be used to scroll this view.

Status Bar

Displays the current state of VAMPSET and valid the valid range when parameters are being modified.

4.1.1. Tools



4.2. Document File (.vf2)

4.2.1. Overview

VAMPSET document file stores information about the device settings, events and fault logs. A new file is created when device is connected and settings are read from the device. Documents can be saved to a disk and the file can later be used for many purposes like

- Making changes to the settings offline. VAMPSET file keeps track of changes which are made offline. Once VAMPSET is connected to the device, all changes can be transmitted to the device at once.
- Copying/transferring settings between devices.
- Archiving purposes; it's a recommended practice to store a copy of the setting files when devices are commissioned and when they are reconfigured.


4.2.2. Passwords

Access to the device parameters is divided into 3 levels: user (no password required), operator (default password **1**) and configurator (default password **2**). VAMPSET document file remembers the access level that is given when the settings are read from the device first time. For example, if the document file has been created with user access level, it cannot be changed later to configurator level document file.

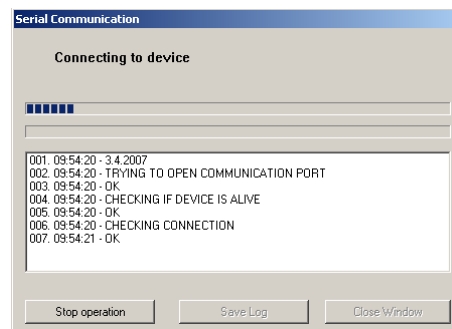
4.2.3. Reading from Device

A new VAMPSET document file is created by reading all settings from the device. Initially VAMPSET screen is empty and only the mechanism to read information from the device is available.

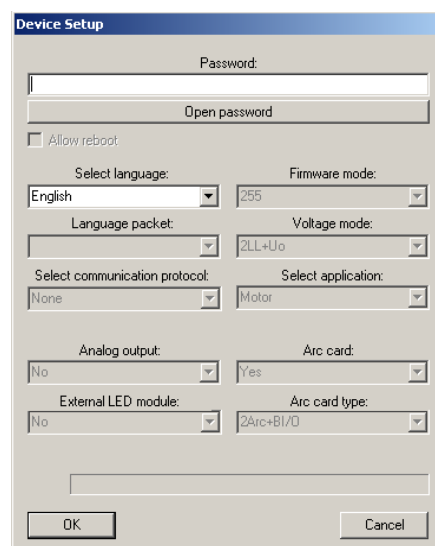
Setting values, protection stages, analogue input information etc. are obtained from the device.

In order to read data from the device, any open document file must first be closed. This can be done by restarting the VAMPSET or selecting **File/Close** from the menu. Reading will start by simply connecting to the device. In order to connect the device press  or **F5** or by using menu command: **Communication/Connect device**

If the communication between VAMPSET and the device is established successfully, VAMPSET starts to read the available menu parameter groups and the following dialog is displayed:



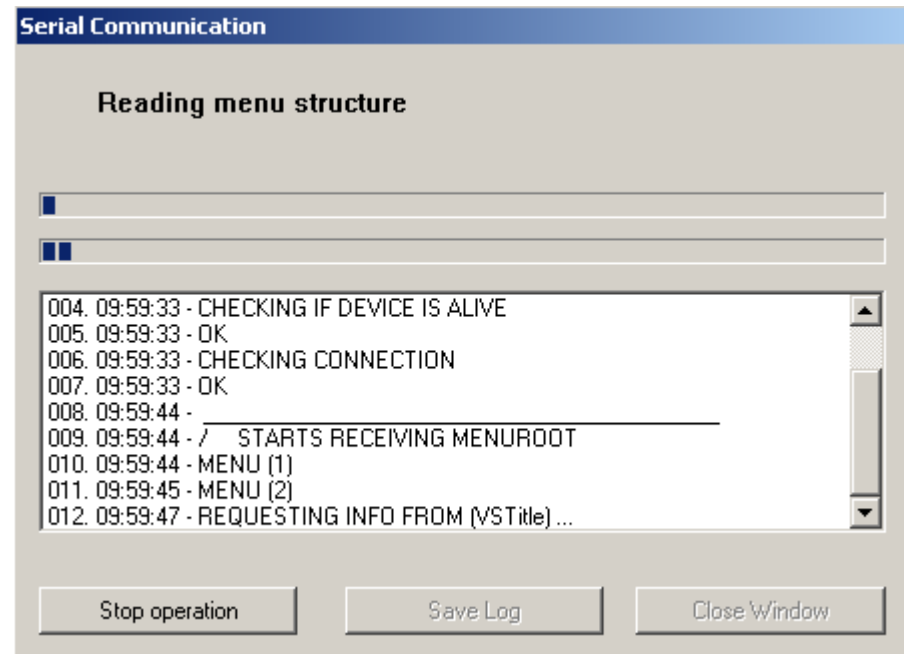
After a couple of seconds VAMPSET will ask the access level. If the password field is left empty, VAMPSET will try to use a default password. See chapter 2.2.4 on how to set the default passwords.




All VAMP devices have the following default passwords:

- Configurator: 2
- Operator: 1
- User: no password required


After pressing the **OK** button, VAMPSET starts to read information about the settings and special features which are available in the relay. Depending on the device and communication speed, this might take several minutes. The transfer can be stopped by choosing the **Stop operation** button on the lower left corner of the communication dialog.




4.2.4. Saving documents

A VAMPSET file can be saved to a disk by pressing  or using menu command: **File/Save as**

4.2.5. Loading documents

A VAMPSET document file can be opened from a disk by pressing  or using menu command: **File/Open**

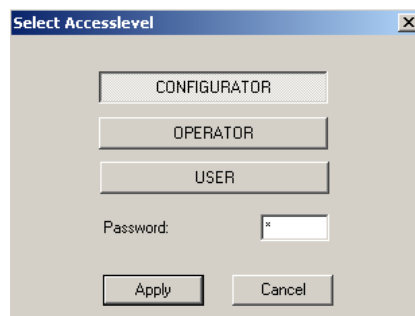
4.2.6. Sending to Device (copying settings between devices)


Open the appropriate document file and connect to the device by pressing  or using menu command: **Communication/Connect Device**


The whole VAMPSET document can be transmitted to the device by using menu command: **Communication/Write all settings to device**

The destination device can be the same one that was used when the file was initially created, or it can be any other device of the same type. This makes it easy to quickly configure several devices with the same settings:

1. Open a previously saved VAMPSET document or create a new one by reading the settings from device.
2. Select the access level for the opened document from the dialog.

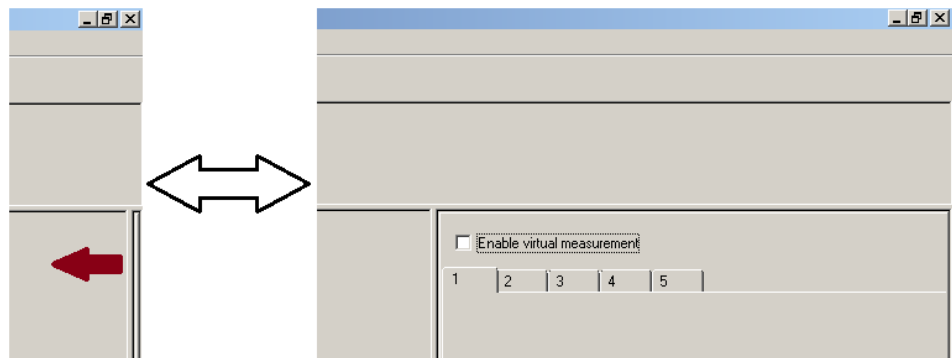


3. Modify the settings if required.
4. Save the document.
5. Connect to the device and write all settings as described in the previous sections.
6. Disconnect the device by clicking  or by using menu command: **Communication/Disconnect Device**.
7. Connect the serial cable in to the new device, or if you are using Ethernet, change the IP-address (see Chapter 2.1.2).
8. Change the device name and location on Device Info setting group, this step is optional but it is a recommended practice to give individual names to different devices.
9. Save the document with a new name by using menu command: **File/Save as**. This step is again optional, but recommended for archiving purposes.

10. Connect to the new device clicking  or by using menu command: **Communication/Disconnect Device**. VAMPSET will give a notice that the serial number of the current device is different from the previously connected device. Click **Ok** and write all settings in to the relay.
11. Go back to step 7 until all devices have been configured.

4.2.7. Virtual measurements

Virtual measurement functionality is available on relays with software version v.10.74 or later. Virtual measurement makes it possible to inject simulated current and voltage with 2nd, 3rd, and 5th harmonic content into the relay, thus allowing simple testing without an external secondary testing device. It is an ideal tool for testing the relay-Scada communication interface and events. VAMPSET 2.2.73 setting tool or more recent version is required for this feature.



Virtual measurement with the VAMPSET is possible when the relay is connected and the menu structure has been read from the relay. The bar for virtual measurement is hidden on the right side of the VAMPSET view.

A ☒ Enable virtual measurement

1 2 3 4 5

B **I_{max}** [Slider] [517 A] [0] [Slider]

IL1 [Slider] [150 A] [0] [Slider]

C IL2 [Slider] [150 A] [-120] **D** [Slider]

IL3 [Slider] [150 A] [120] [Slider]

Cycles: **E** [250] [Go!]

Frequency: [50.000 Hz]

Repeats: [1] [Run sequence!]

After enabling **(A)** the virtual measurement view, it is possible to adjust the maximum for the used signal **(B)** and the value of the signal itself **(C)**. You can adjust the phase angle **(D)** of any of the used signal. After a value greater than zero is typed into the cycles view **(E)** you can initiate the virtual measurement by merely pressing the **Go!** button. The length of the virtual measurement depends on the frequency used and the number of cycles. If the frequency is 50 Hz and the number of cycles is set at 250, the injected length of the virtual signals is as follows:

$$t = \frac{1 \cdot 250}{50}, \text{ e.g. 5 seconds.}$$

☒ Enable virtual measurement

1 2 **F** 3 4 5

Imax:

IL1:

IL2:

IL3:

Cycles: **G**

Frequency:

Repeats: **H**

You can also create sequences with a maximum of 5 windows. To create a sequence, open another sequence window (**F**) and add a value greater than zero to the Cycles menu (**G**). The sequence is launched by pressing the **Run sequence!** button. There will be no delay between the sequence windows. You can also repeat a sequence without any extra delay (**H**).

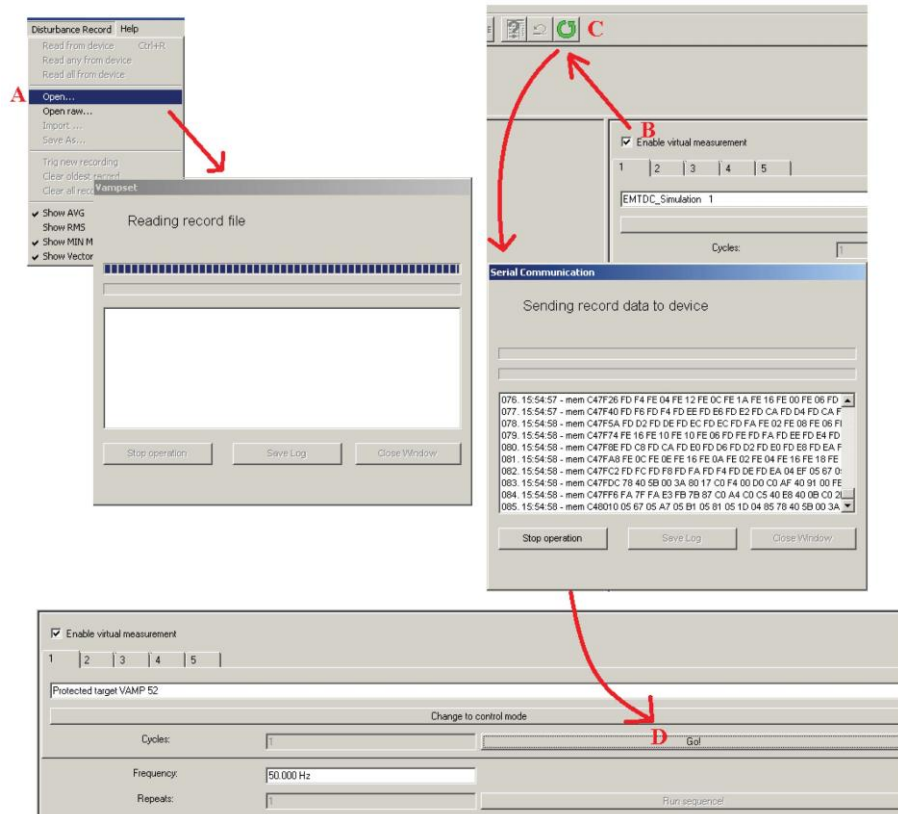
4.2.8. Running virtual comtrade files

Virtual comtrade files can be run with the device. Device behaviour can be analysed by playing the recorder data over and over again in the relay memory.

NOTE! This is not applicable to the arc protection functions of the device.

This describes the steps for opening and using the virtual comtrade files with the VAMPSET setting tool:

1. Go to “Disturbance record” and select **Open...** (A).
2. Select the comtrade file from your hard disc or equivalent. VAMPSET is now ready to read the recording.
3. The virtual measurement has to be enabled (B) in order to send record data to the relay (C).
4. Sending the file to the device’s memory takes a few seconds. Initiate playback of the file by pressing the Go! button (D). The “Change to control mode” button takes you back to the virtual measurement.



NOTE! The sample rate of the comtrade file has to be 32/cycle (625 ϕ s when 50 Hz is used). The channel names have to correspond to the channel names in Vamp relays: IL1, IL2, IL3, Io1, Io2, U12, U23, UL1, UL2, UL3 and Uo.

5. Setting Groups

The device settings have been divided into several groups. There is an individual group for every protection stage, communication protocol, analog output etc. Most of the setting groups are of the basic type, which only contain a list of parameters. There are also special groups like matrix and PQ-diagram.

This chapter gives a short description of the different kinds of setting groups. See the appropriate relay manual for complete description of the setting parameters.

5.1. Device Info

DEVICE INFO

MEASUREMENTS
+ HARMONICS...
POWER
PQ-DIAGRAM
ENERGY
PHASOR DIAGRAM
RMS MEASURING
MONTH MAX
+ MINIMUMS and MAXIMUMS...
+ DEMAND VALUES...
+ DIGITAL INPUTS...
+ INPUTS...
+ RELAYS...
+ VIRTUAL OUTPUTS...
EVENT BUFFER
+ DIST...
RUNNING HOUR COUNTER
+ VOLTAGE...
TIMERS
VALID PROTECTION STAGES
+ PRO...
COLD LOAD/INRUSH
+ OVERCURRENT STAGE...
+ DIRECTIONAL O/C STAGE...
+ REVERSE POWER STAGE...
UNDER CURRENT STAGE I< 37
UNBALANCE STAGE I2> 46
THERMAL OVERLOAD STAGE T> 49
+ EARTH-FAULT STAGE...
+ DIRECTIONAL E/F...
TRANSIENT INTERMITTENT E/F 67NI
+ OVERVOLTAGE STAGE...
+ UNDERVOLTAGE STAGE...
+ ZERO SEQ. VOLTAGE STAGE...
+ FREQUENCY STAGE...
+ UNDERFREQUENCY STAGE...
FREQUENCY STAGE df/dt 81R
+ PROGRAMMABLE STAGE...
CB FAILURE PROTECTION 50BF
+ ARC...
2nd HARMONIC O/C STAGE If2> 51F2
O B J E C T S
AUTO RECLOSING 79
AR Shot settings 79
AR COUNTER TEXTS
CBWEAR
+ SUPERVISOR...
RELAYAS OUTPUT MATRIX LATCHES

DEVICE INFO

Main location	Substation
Sublocation	Bay
Name for this device	Protected target

Device name	FEEDER MANAGER
Device type	VAMP 257
Application mode	Feeder
Installed languages	
Enable language for PC	<input type="checkbox"/>

Serial number	34853
Order code	
Program version	V10.95
Boot-code version	

Minimum setting tool version	2.2.76
Current setting tool version	2.2.88

Date	2012-01-27
Time of day	14:15:08

Display contrast	90
Display backlight ctrl	-

Panel access level	USER
PC access level	CONF

Tested by	OT
Calibration date	2011-5-12
Change password	0

Device info contains general information about the device. These settings also serve to identify the relay from the other possibly similar relays. The device can be individualized by setting the location information and by giving an individual name for it. Calibration information and the firmware version are also shown in this setting group. The last parameter can be used for changing the password of the currently active access level.

5.2. Basic Groups

5.2.1. Protection Stage Groups

FEEDER MANAGER VAMP 255
Protected target
Bay
Substation

OVERCURRENT STAGE I> 50/51

Enable for I> ☒

Max. of IL1 IL2 IL3 0 A
Status -
Estimated time to trip 0.0 s
Start counter 0
Trip counter 0

Set group DI control

Group	Group 1	Group 2
Pick-up setting	600 A	600 A
Pick-up setting	1.20 xImot	1.20 xImot
Delay curve family	IEC	IEC
Delay type	-	-
Operation delay	0.30 s	0.30 s
Inv. time coefficient k	1.00	1.00
Inverse delay (2Ix)	- s	- s
Inverse delay (4Ix)	- s	- s
Inverse delay (1Ix)	- s	- s

Delay function parameters

Constant A	-
Constant B	-
Constant C	-
Constant D	-
Constant E	-

FAULT LOG

Date	hh:mm:ss.ms	Group	Fault type	Fault current	Elapsed delay	Pre-fault current
[1]	-	-	-	0.00 xIn	0 %	0.00 xIn
[2]	-	-	-	0.00 xIn	0 %	0.00 xIn
[3]	-	-	-	0.00 xIn	0 %	0.00 xIn
[4]	-	-	-	0.00 xIn	0 %	0.00 xIn
[5]	-	-	-	0.00 xIn	0 %	0.00 xIn
[6]	-	-	-	0.00 xIn	0 %	0.00 xIn
[7]	-	-	-	0.00 xIn	0 %	0.00 xIn
[8]	-	-	-	0.00 xIn	0 %	0.00 xIn

The protection stage groups consist of the following 4 parts:

Stage enabling:

- The protection stage can be enabled or disabled by checking or clearing the selection box
- Configurator access level is required for changing the parameter

Stage status:

- Shows the state of the input signals which are used by the stage
- Shows the present state of the stage, estimated time to trip, and also the start/trip counters

Stage Settings:

- Contains limit- and delay settings for the stage
- Configurator access level is required for changing the stage settings

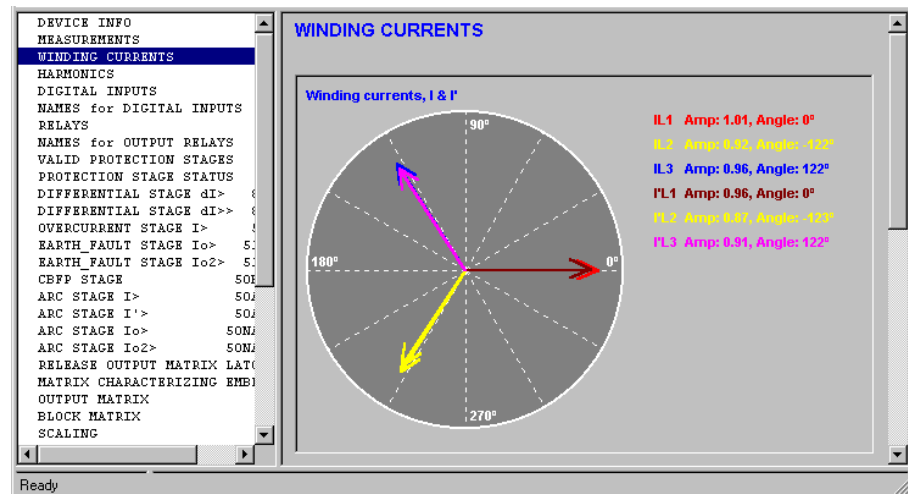
Fault Log:

- Shows 8 latest events of the stage

- The fault log is in descending order; the latest event is on the first row

5.2.2. Diagrams

Angle diagram



This group shows the angles for different analog measurements. The amplitudes are usually in relation to the maximum of all phasors or to a calculated mean value. Some of the angle diagrams have a configurable maximum value for the amplitude and all phasors are drawn in relation to that setting.

When the device is connected and continuous updating is enabled the diagrams are updated in real time.

5.2.3. Event Buffer

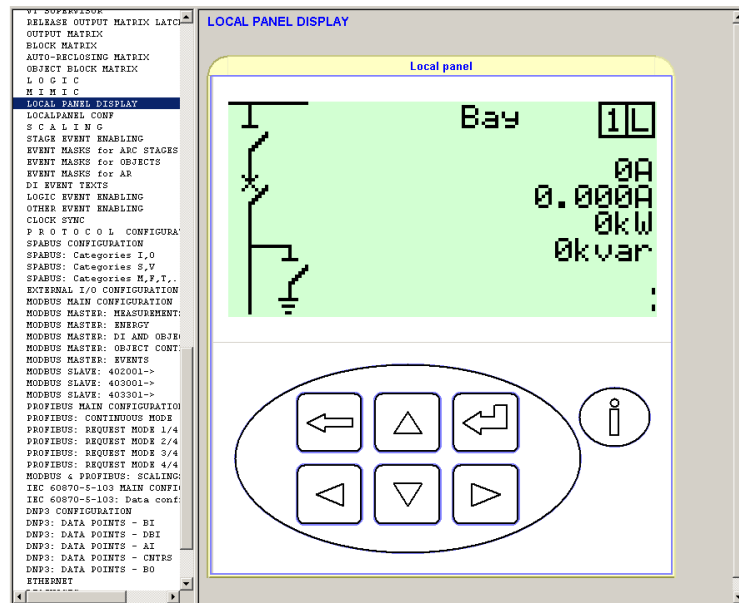
FEEDER MANAGER VAMP 255				
Protected target				
Bay				
Substation				
EVENT BUFFER				
DISTURBANCE RECORD				
DISTANCE TO SHORT CIRCUIT				
DISTANCE TO EARTH FAULT				
RUNNING HOUR COUNTER				
VOLTAGE INTERRUPTS				
VOLTAGE SAG & SWELL				
TIMES				
VALID PROTECTION STAGES				
PROTECTION STAGE STATUS				
PROTECTION STAGE STATUS2				
PROGRAMMABLE DELAY CURVES				
COLD LOAD/INRUSH				
OVERCURRENT STAGE I>				
OVERCURRENT STAGE I>>				
OVERCURRENT STAGE I>>>				
DIRECTIONAL O/C STAGE ID1				
DIRECTIONAL O/C STAGE ID1				
DIRECTIONAL O/C STAGE ID1				
DIRECTIONAL O/C STAGE ID1				
REVERSE POWER STAGE P<				
REVERSE POWER STAGE P<<				
UNDER CURRENT STAGE I<				
UNBALANCE STAGE I2>				
UNBALANCE STAGE I2>>				
STALL PROTECTION Ist>				
MOTOR STATUS				
FREQUENT START PROTECTION				
THERMAL OVERLOAD STAGE T>				
EARTH-FAULT STAGE T>>				
EVENT BUFFER				
[1]	2007-03-26	14:23:56.430	45E06	ARC 2 FAULT ON
[2]	2007-03-26	14:23:56.431	00E56	SelfDiag Alarm Arc
[3]	2007-03-26	14:53:54.904	14E03	T> start off
[4]	2007-04-03	08:34:15.793	00E50	Device restart
[5]	2007-04-03	08:34:17.823	14E01	T> start on
[6]	2007-04-03	08:34:32.360	45E05	ARC 1 FAULT ON
[7]	2007-04-03	08:34:32.360	45E06	ARC 2 FAULT ON
[8]	2007-04-03	08:34:32.361	00E56	SelfDiag Alarm Arc
[9]	2007-04-03	08:46:37.334	14E03	T> start off
[10]	2007-04-03	08:34:32.360	45E06	ARC 2 FAULT ON
[11]	2007-04-03	08:34:32.361	00E56	SelfDiag Alarm Arc
[12]	2007-04-03	08:46:37.334	14E03	T> start off
[13]	2007-04-03	09:27:28.240	00E50	Device restart
[14]	2007-04-03	09:27:30.273	14E01	T> start on
[15]	2007-04-03	09:27:44.809	45E05	ARC 1 FAULT ON
[16]	2007-04-03	09:27:44.809	45E06	ARC 2 FAULT ON
[17]	2007-04-03	09:27:44.810	00E56	SelfDiag Alarm Arc

The event buffer is used for saving and viewing events. The events are shown in ascending order; the oldest event is shown on the first row and the newest on the last row. When the buffer is full the oldest events are discarded when new ones are created. The maximum capacity of the event buffer varies between devices; please consult the relay manual for further information.

An event contains the following information:

- full time stamp
- event code
- short description

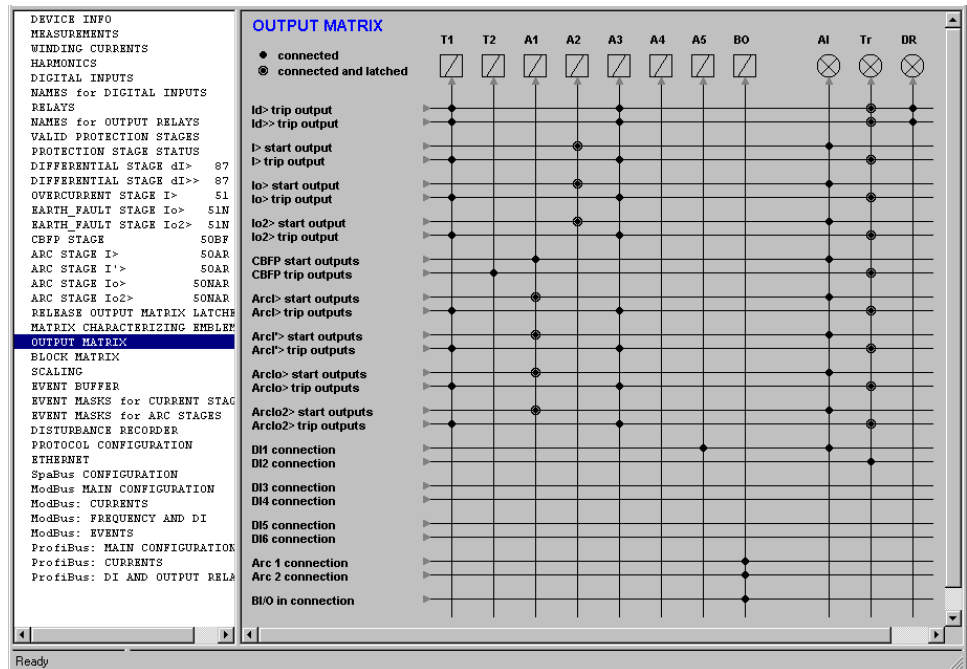
5.2.4. Local Panel Display




The “Local Panel Display”-feature can be used to remotely control the relay and input the commands just as they would be by using the physical HMI in the relay.

5.2.5. Matrix Groups

Output Matrix



The output matrix is used for connecting signals of different protection stages, digital inputs and arc sensors, to the output relays (T1...A5), binary output (BO) and leds (AI and Tr). Depending of the device there may also be a number some other available outputs, such as disturbance record trigger (DR) in above picture.

The output matrix can be viewed by selecting it from the group list or by pressing  button from the toolbar. This matrix has two kinds of connections:

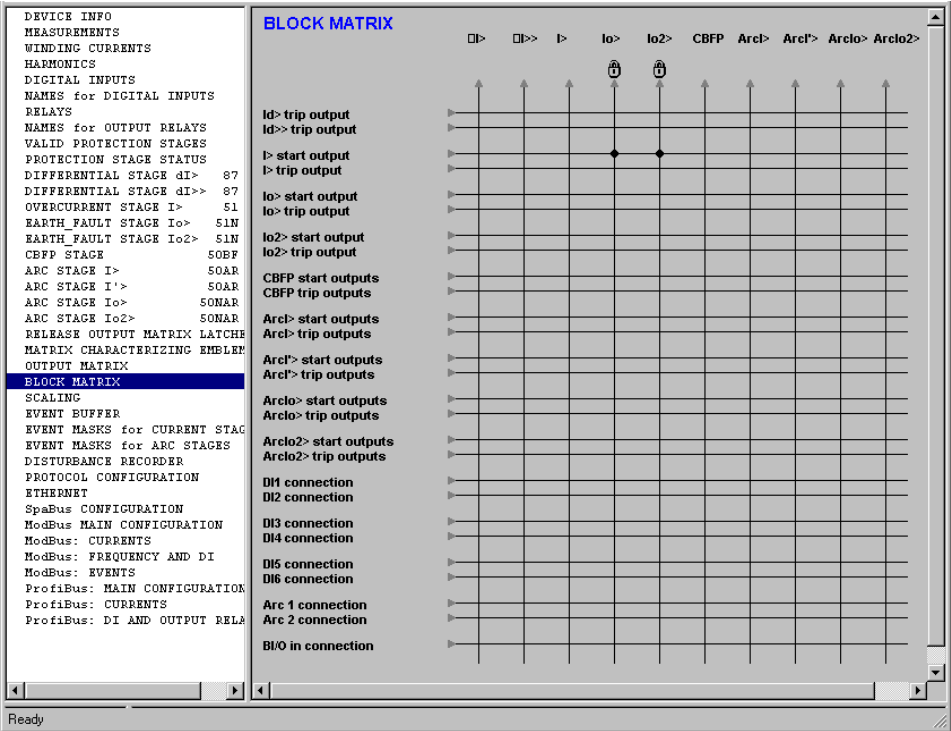
Matrix connection without latch

- When input the signal is activated, the output is activated
- When input the signal is released, the output is released

Latched matrix connection

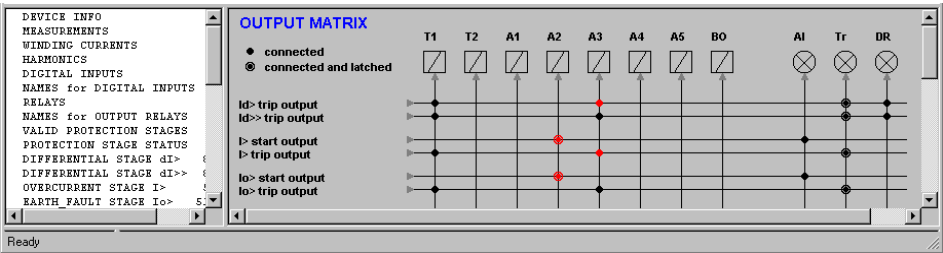
- When input the signal is activated, the output is activated
- When input the signal is released, the output will remain active until cleared manually. Latched outputs can be cleared from the “Release Output Matrix Latches” settings group and from the HMI of the relay.

Block Matrix




The block matrix can be used to prevent protection stages from operating by using input signals from other protection stages, digital inputs and arc sensors. Input signals are shown on the left side and protection stages to be blocked are displayed on the top.

5.2.6. Placing a matrix connection



Placing a connection is done by clicking the left mouse button at a crossing point of a signal and output line.

The whole matrix can also be cleared by pressing .

5.2.7. Disturbance Recorder

VOLTAGE HARMONICS
POWER
PQ-DIAGRAM
ENERGY
ANGLE DIAGRAM
RMS MEASURING
MONTH MAX
CURRENT MINIMUMS and MAXIMUMS
VOLTAGE MINIMUMS and MAXIMUMS
POWER MINIMUMS and MAXIMUMS
DEMAND VALUES
RMS DEMAND VALUES
DIGITAL INPUTS
NAMES for DIGITAL INPUTS
ARC LIGHT INPUTS
VIRTUAL INPUTS
NAMES for VIRTUAL INPUTS
RELAYS
NAMES for OUTPUT RELAYS
EVENT BUFFER
DISTURBANCE RECORDER
DISTANCE TO SHORT CIRCUIT
DISTANCE TO EARTH FAULT
RUNNING HOUR COUNTER
VOLTAGE INTERRUPTS
VOLTAGE SAG & SWELL
TIMERS
VALID PROTECTION STAGES
PROTECTION STAGE STATUS
PROTECTION STAGE STATUS2
PROGRAMMABLE DELAY CURVES
COLD LOAD/INRUSH
OVERCURRENT STAGE I>
OVERCURRENT STAGE I>>
OVERCURRENT STAGE I>>>
DIRECTIONAL O/C STAGE IDi>
DIRECTIONAL O/C STAGE IDi>>
DIRECTIONAL O/C STAGE IDi>>>
DIRECTIONAL O/C STAGE IDi>>>>
REVERSE POWER STAGE P<
REVERSE POWER STAGE P<<
UNDER CURRENT STAGE I<
UNBALANCE STAGE I2>
UNBALANCE STAGE I2>>
STALL PROTECTION Ist>
MOTOR STATUS
FREQUENT START PROTECTION
THERMAL OVERLOAD STAGE T>
EARTH-FAULT STAGE Io>
EARTH-FAULT STAGE Io>>
EARTH-FAULT STAGE Io>>>
EARTH-FAULT STAGE Io>>>>
DIRECTIONAL E/F IoDir>
DIRECTIONAL E/F IoDir>>
OVERVOLTAGE STAGE U>

DISTURBANCE RECORDER

Dist. rec. version 1.2

RECORDER CHANNELS

Ch	Io1,Uo,DI,DO
Add recorder channel	-
Remove all channels	-

Recording mode	Overflow
Sample rate	1/10ms
Recording length	8.00 s
Pre trig time	50 %
Event enabling	<input checked="" type="checkbox"/>
Maximum time setting	89.56 s

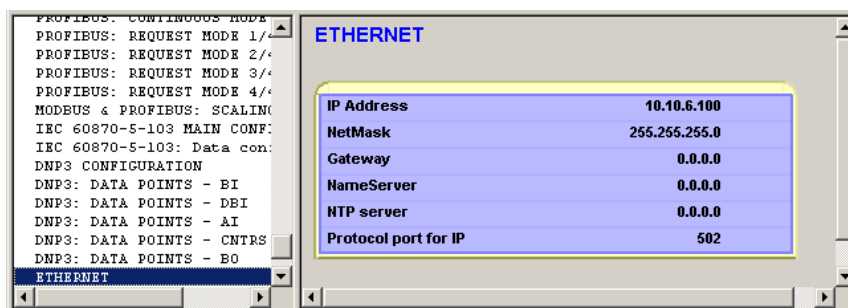
RECORDER LOG

Status	Date	hh:mm:ss.ms
[1]	Run	-
[2]	-	-
[3]	-	-
[4]	-	-
[5]	-	-
[6]	-	-
[7]	-	-
[8]	-	-
[9]	-	-
[10]	-	-
[11]	-	-
[12]	-	-

Manual triggering	-
Clear oldest buffer	-
Clear all buffers	-
Status	Run
Recording completion	50 %
Readable records	0/11

This group is used for configuring the disturbance recorder. See Chapter 6.2 for a more detailed description about the settings of disturbance recorder.

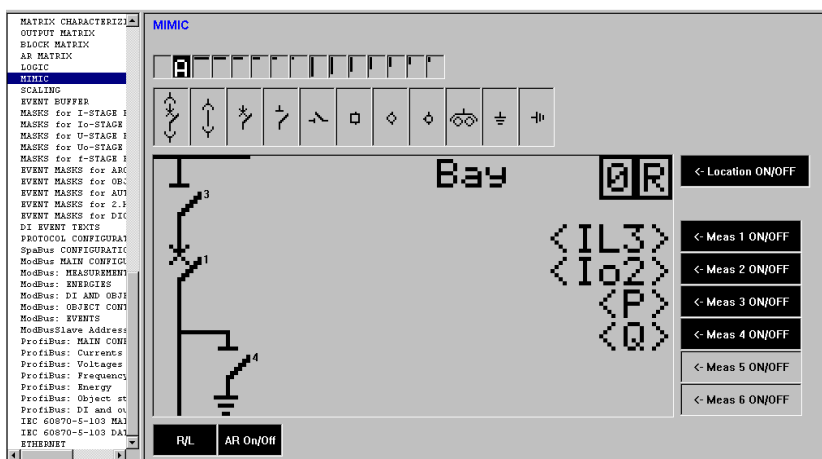
5.2.8. Ethernet



The Ethernet group contains network settings for the device. Depending on the device and software version, the Ethernet settings may also be located under Protocol Configuration group. The figure above is from settings while using external VEA 3CGi Ethernet adapter, but the procedure is similar for the internal adapter as well. In order to use the device with Ethernet, check at the following steps:

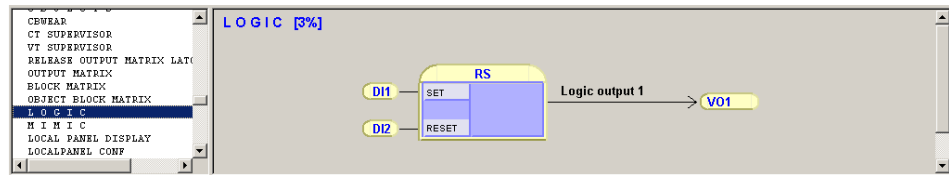
1. Connect to the device by local serial port.
2. Make appropriate changes to the Ethernet settings.
3. Transmit changes to the device.
4. Disconnect the device.
5. Go to **Settings/Communication Settings** and change IP-address to correspond with the one set to the device. See Chapter 2.1.2 for more information.
6. Remove the serial cable from the device. If left connected, the Ethernet interface might not be active, depending on the device in question.
7. Connect to the device via Ethernet.

5.2.9. Mimic



The Mimic editor group is used for creating and editing mimic display of the relay local panel. See Chapter 5.6 about how to use the mimic editor.

5.2.10. Logic



Some devices have the possibility of adding extra logic functions in addition to protection stages. The Logic editor group is used for this purpose. See Chapter 5.7 for more information about using the editor.

5.3. Making Relay Settings

5.3.1. How to change values

A device parameter can have four different access types:

- Read (e.g. measurements)
- User Write (e.g. display brightness)
- Operator Write (e.g. I> current limit)
- Configurator Write (e.g. I> stage enable)

VAMPSET shows parameters in three colours depending on present access level, the access type of the parameter and if the value has been changed or not. The parameters can have one of the following colours:

Red

- Parameter value has been changed but not send to the device

Black


- Parameter value can be changed

Dimmed, gray

- No write access
- Parameter is either read-only or the present access level is not high enough

The setting found in the menu **Settings/Program Settings/Write changes automatically after change (WAC)** controls, when the changed settings are transferred to the device:

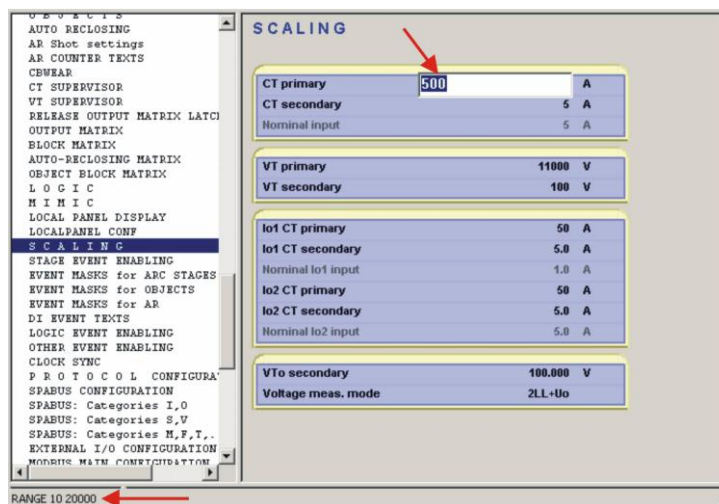
Device not connected or WAC disabled

- Changed values becomes red.
- New value has to be transferred to the device manually, by pressing  or using menu command: **Communication/Write Changed Settings to Device**
- If the document is saved, the changes will also be saved. This makes it possible to make changes offline and to write changes later from a saved document.

Device connected and WAC enabled

- Changed values are transferred to the device immediately
- Changed parameters are read back from the device after the transfer

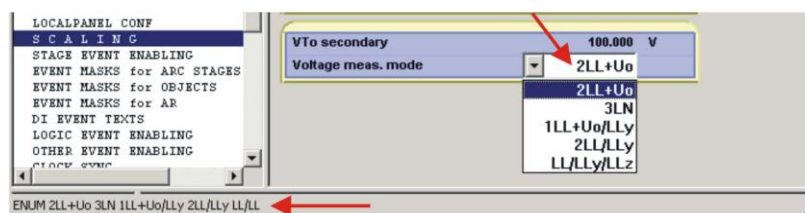
5.3.2. Changing parameter values



Click the left mouse button on the value that needs to be changed. When the text input box appears, use the keyboard to type a new value and press **enter**. Setting range is displayed at the bottom left corner of the main window.

If the typed value is out of permitted the range, VAMPSET will give a warning after transmitting changes to the device and the illegal value will be replaced by the value current stored in the device.

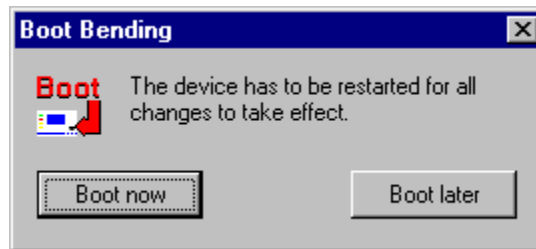
Some of the parameters have a fixed set of values that can be chosen from a list box.



Click the left mouse button on the value and choose the appropriate value by using the mouse.

5.3.3. Booting the device


Some of the parameter changes require that the device is restarted before they are taken into. When such parameter has been changed and transferred to the device, VAMPSET gives the following notice:



Boot now

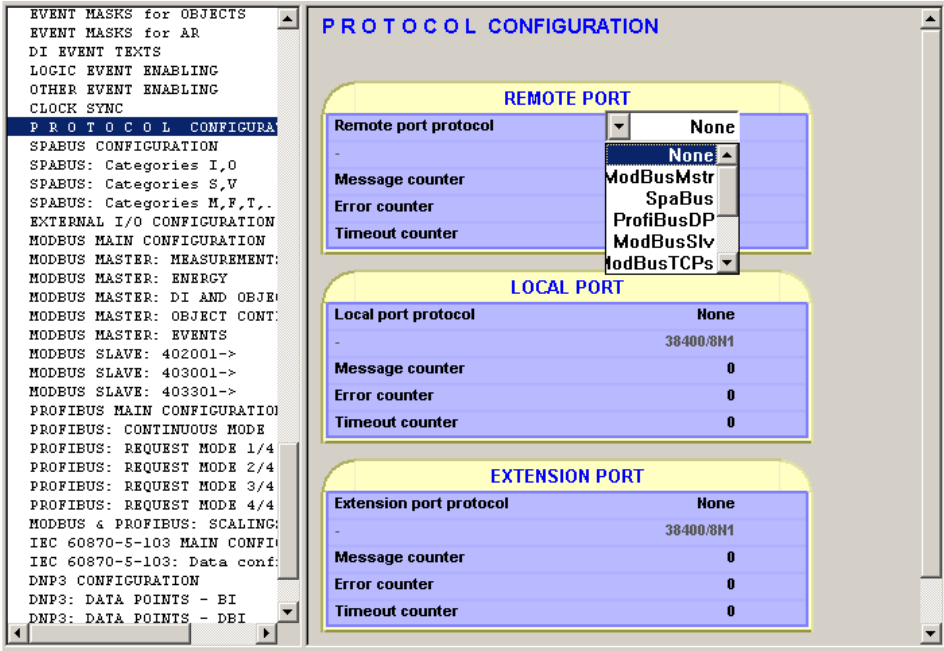
- VAMPSET sends a boot command to the device immediately.

Boot later

- The dialog quits without booting the device
- Latest changes that need booting are not taken into account
- The device can be booted later by pressing  or **F9**, or by using menu command: **Communication/Boot Device**.

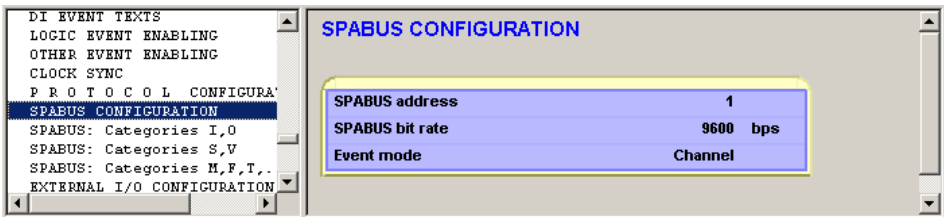
5.4. Making Protocol Settings

5.4.1. Changing Protocol



Remote port, Local port and Extension port protocol can be changed in the Protocol Configuration group. This group also contains message- and error counters for the selected protocol and ports. See the appropriate device manual for complete description of protocol usage. Available protocols depend on the device in question and some of the supported protocols include; ModBus, SpaBus, ProfiBus, IEC-103, External IO, DNP3, DeviceNet, ANSI85, ModBus TCP, and IEC-61850.

5.4.2. SpaBus Settings



SpaBus protocol has following settings available:

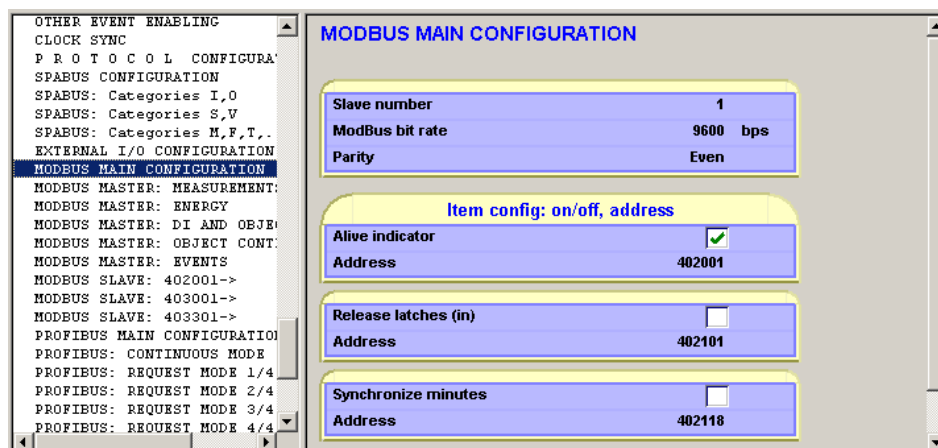
SpaBus address

Setting range 1...899

SpaBus bit rate

The available bit rates are: 1200, 2400, 4800, 9600, 19200

5.4.3. ModBus Settings



MODBUS MAIN CONFIGURATION

Slave number	1
ModBus bit rate	9600 bps
Parity	Even

Item config: on/off, address

Alive indicator	<input checked="" type="checkbox"/>	Address: 402001
Release latches (in)	<input type="checkbox"/>	Address: 402101
Synchronize minutes	<input type="checkbox"/>	Address: 402118

The first three settings in the ModBus MAIN CONFIGURATION group are used by both **ModBus Master** and **Modbus Slave protocols**. In master mode, the slave address is the destination address and in slave mode, the slave address is the device address. Setting range for bit rate is 1200...19200 bps.

ModBus item has the following four settings:

Enable

Enables/disables item. *ModBus master only*

Address

ModBus holding register address. *ModBus master only*

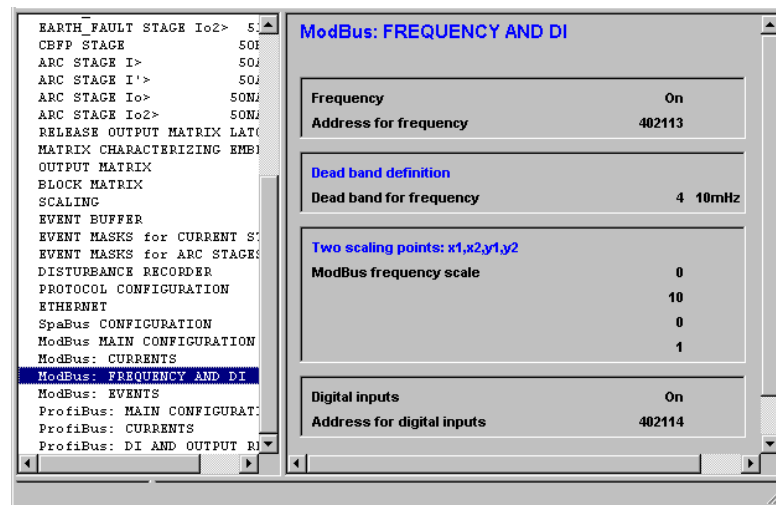
Dead band

If item value has changed more than the dead band setting, it will be sent to the slave. *ModBus master only*

Scaling

Configurable scaling points x1, x2, y1, y2. *Both master and slave.*

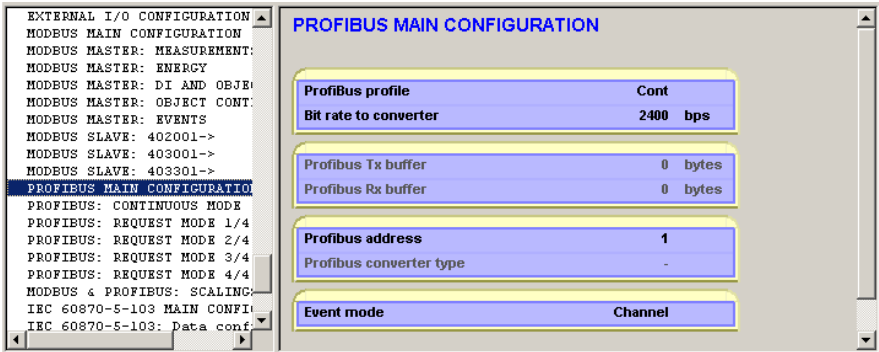
Dead band and Scaling



The picture above shows an example of dead band and scaling settings. Frequency has a dead band of 40 mHz and scaling divides measurement-values by 10. Scaling is needed for frequency, because ModBus can handle only values between –32 768 and +32 767. If for example frequency is 50.000 Hz, the raw value is 50000 which doesn't fit into the permitted range. Dividing the raw value by 10 gives 5000, which is within the permitted range.

ModBus Slave protocol has its own item list with fixed holding register addresses. See the appropriate device manual for a list of ModBus Slave items and addresses.

5.4.4. ProfiBus Settings



Profibus mode can be selected in the PROFIBUS MAIN CONFIGURATION group.

Profibus item has three settings:

On/Off

- Enables/disables item
- Continuous mode only

Offset

- Address for item
- Continuous mode only

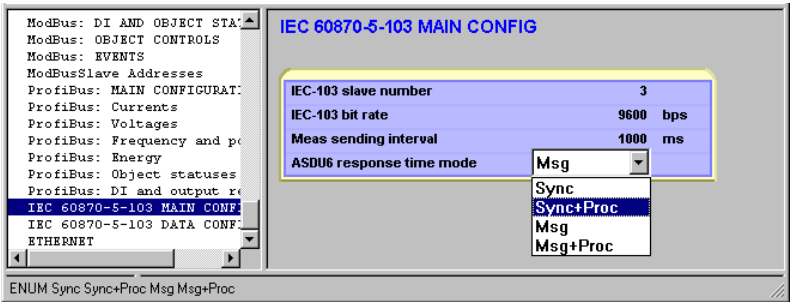
Scaling

- Configurable scaling points x1, x2, y1, y2
- Works exactly the same way as ModBus scaling. See Chapter 5.4.3.

In request mode, all items are enabled and they have fixed offsets. See the device manual for a list of request mode items.

5.4.5. IEC 60870-5-103 Settings

Main configuration



IEC-103 slave number

- setting range 1...254 (255 is reserved for broadcasts)
- this is used as link layer address and as common address of ASDU in application layer

IEC-103 bit rate

9600 or 19200 bps

Meas sending interval

This setting is used for restricting the sending measurements. The next measurement is not sent until the time interval has elapsed since last sending. During this time the device responds to class 2 poll by 'data not available' message.

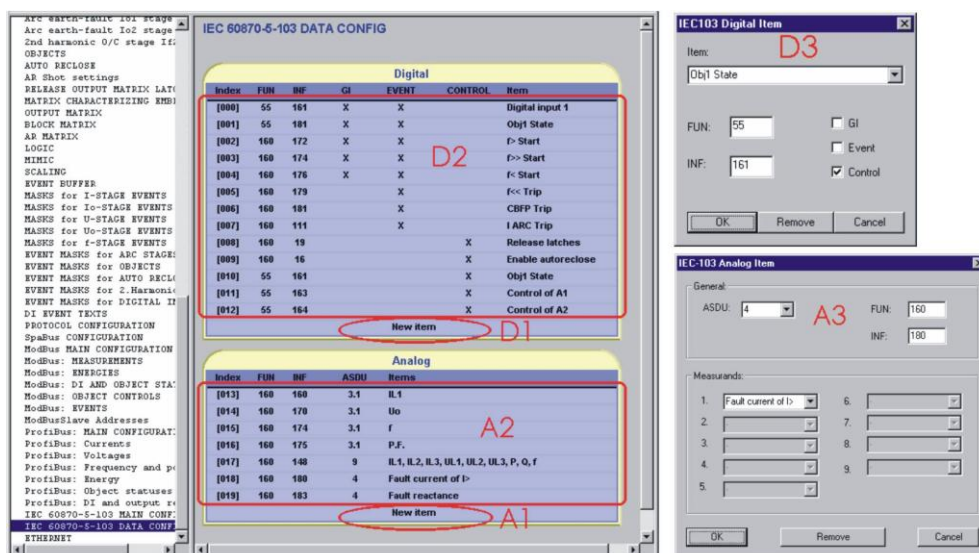
ASDU 6 response time mode

This setting defines which time stamp is sent in response to a time synchronising message. The following modes are available:

- **SYNC**
Device sends back the same time stamp that the master sent in the synchronising message.
- **SYNC + PROC**
Device adds its internal processing time to the time stamp in the synchronising message and sends the sum in the response message.
- **MSG**
Device sends back its internal time stamp of the first received bit of the synchronising message from master. This mode can be very useful because subtracting the time stamp found in the response message from the time stamp that the master sent in the sync message gives the time difference between the master and the device just before the new sync became valid.
- **MSG + PROC**
Otherwise the same as MSG but internal processing time is added to the time stamp

Data configuration

Data configuration is divided into Digital and Analog sections. Any line can be changed or removed and new lines can be added to both sections.



Digital configuration

D1 - Click here to add new lines to digital configuration

D2 - Click any line to change its contents

D3 - Select an item, define FUN and INF and select some of the available functions (GI/Event/Control). Availability of functions depends on the selected item.

Function	Description
GI	Item is included in general Interrogation
Event	Class 1 events are generated. Remember also enable corresponding events on event mask groups. See chapter 5.5.1 about how to enable events.
Control	Item can be controlled via master


Analog configuration

A1 - Click here to add new lines to analog configuration

A2 - Click any line to change its contents

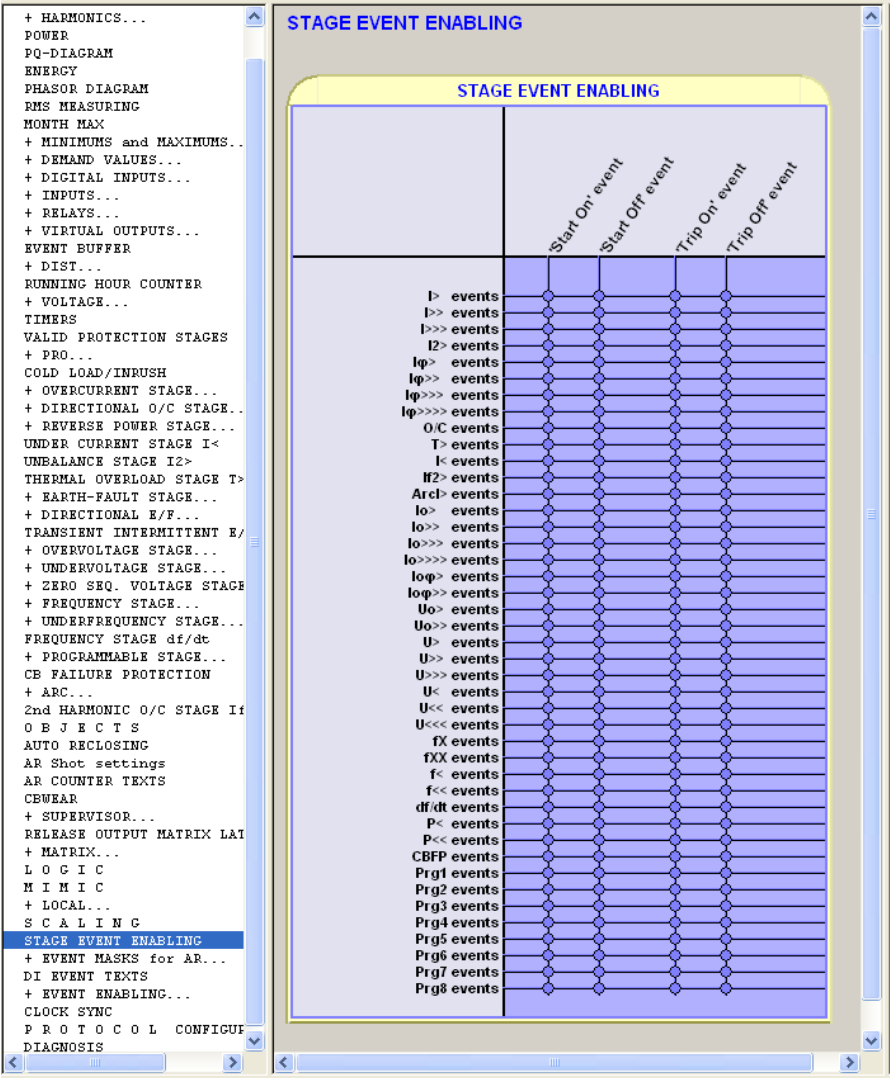
A3 - Select ASDU type and define FUN and INF. Finally select measurement(s). Please notice that ASDU 4 has its own set of available measurements. To use ASDU 4 measurement, first select the ASDU 4 and after that select a measurement.

IEC-60870-5-103 data configuration is sent to the device by

pressing  or from the menu **Communication/Write Changed Settings to Device**

5.5. Working with Events and fault logs

5.5.1. Enabling Events

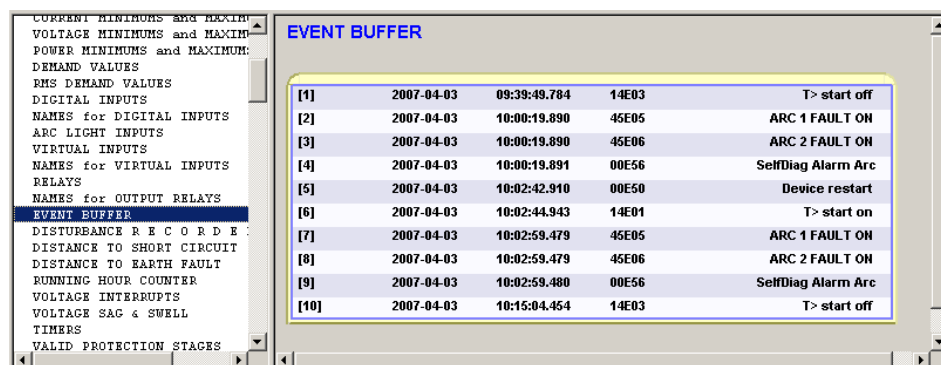



Different events can be activated on the EVENT MASK groups. There are two different types of events. Protection stages have each four individual events which can be enabled; *start on*, *start off*, *trip on*, and *trip off*. All the other events are of binary-type; they can be enabled or disabled.





5.5.2. Reading from device

Events can be read from VAMPSET by selecting EVENT BUFFER group from the group list.



Events can be read from the device by pressing  while in this group.

Events are updated automatically if **Continuous updating** is enabled and the EVENT BUFFER group is selected. **Continuous updating** can be enabled by pressing  and disabled by pressing .

NOTE!


VAMPSET can only read new events (which have not been read previously by VAMPSET) from the device. Once the events have been transferred from the device, it's not possible to read those particular events again, and thus it is very important to save the VAMPSET document.

5.5.3. Saving to disk

Events and fault logs are saved with the VAMPSET document file (.vf2), therefore no special saving commands are needed.

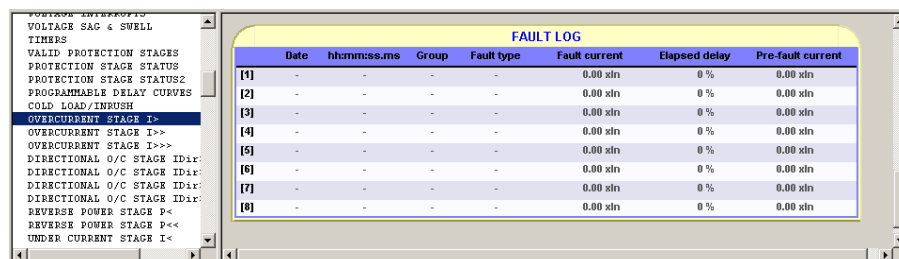
Events can also be saved into a log file, which is updated automatically after reading events from the device. Event logs are plain ASCII files thus they can be opened with any text editor like Windows Notepad. See Chapter 2.2.3 for more information on how to enable event logging.

5.5.4. Clearing Events


VAMPSET event buffer can be cleared by pressing . This doesn't clear events from the device, only those stored in the VAMPSET document.



5.5.5. Reading fault logs from device

In addition to Events, most of the protection stages have also their own fault logs. In order to read a fault log from the device, the appropriate protection stage screen must be selected from the group list.



	Date	hh:mm:ss.ms	Group	Fault type	Fault current	Elapsed delay	Pre-fault current
[1]	-	-	-	-	0.00 xIn	0 %	0.00 xIn
[2]	-	-	-	-	0.00 xIn	0 %	0.00 xIn
[3]	-	-	-	-	0.00 xIn	0 %	0.00 xIn
[4]	-	-	-	-	0.00 xIn	0 %	0.00 xIn
[5]	-	-	-	-	0.00 xIn	0 %	0.00 xIn
[6]	-	-	-	-	0.00 xIn	0 %	0.00 xIn
[7]	-	-	-	-	0.00 xIn	0 %	0.00 xIn
[8]	-	-	-	-	0.00 xIn	0 %	0.00 xIn

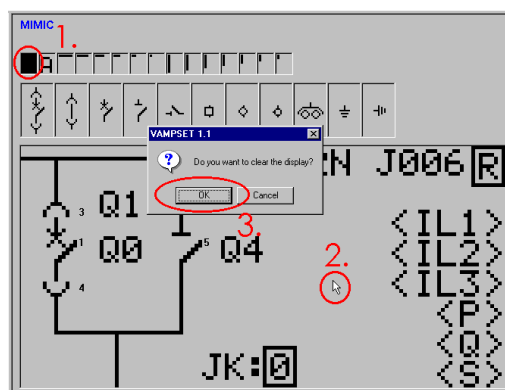
Fault logs are read exactly the same way as the events, by pressing  or keeping **Continuous updating** enabled.

Continuous updating can be enabled by pressing  and disabled by pressing .

5.6. Mimic editor

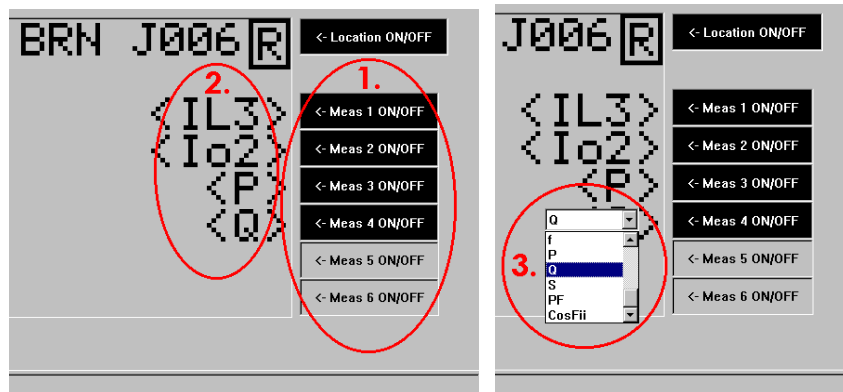
To show the mimic editor, select MIMIC group from the group list.

5.6.1. Clearing mimic display



1. Select the deleting tool
2. Click left mouse button over empty space. Confirmation window appears
3. Press OK to clear the display

5.6.2. Selecting measurements



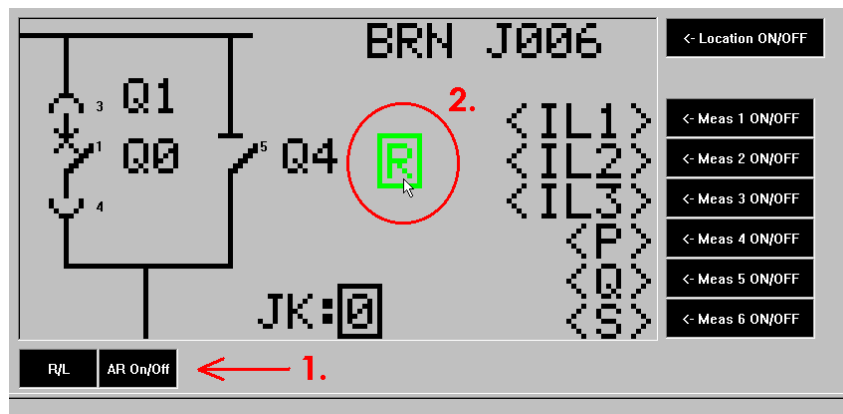
Maximum of 6 measurements can be freely selected on the right side of the display.

1. Set appropriate measurements visible using ON/OFF buttons on the right
2. Clicking a measurement opens a list of all selectable measurements
3. Select measurement from the list

5.6.3. Working with virtual buttons

Depending on the device the local panel mimic display can contain some virtual buttons, like

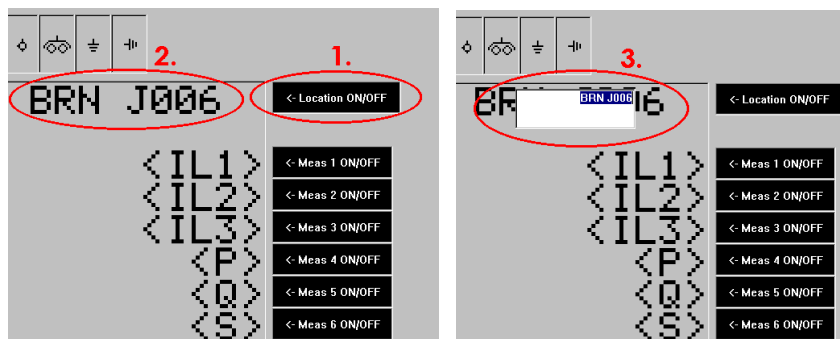
- Auto-reclose ON/OFF
- Remote/Local switch



1. Virtual buttons can be set visible by using ON/OFF buttons on the bottom of the screen
2. Virtual buttons can be moved by holding down the left mouse button if the deleting tool is not selected.

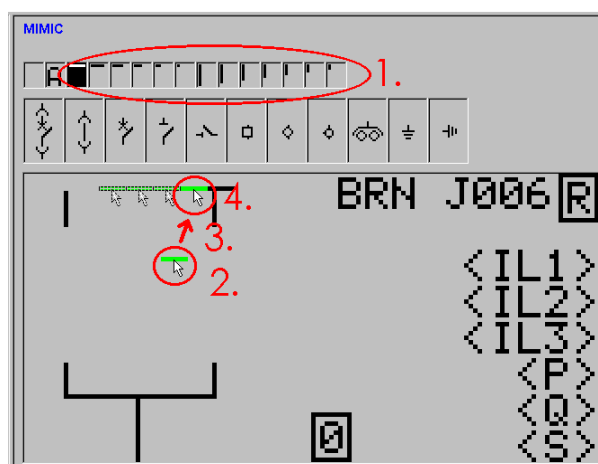
5.6.4. Location information

Location information is displayed in the top of the display. This is exactly the same setting as *Sublocation* on DEVICE INFO group and is also displayed on the caption view of VAMPSET.



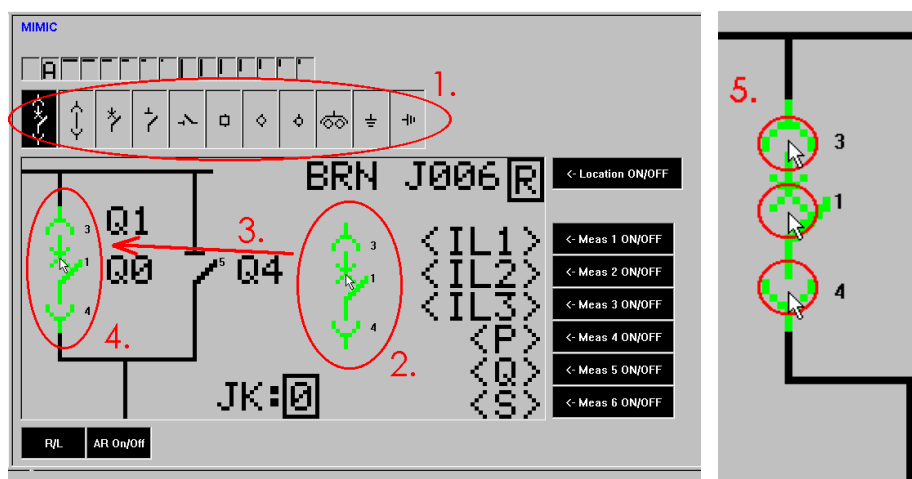
1. Location text can be set visible by using the ON/OFF button
2. Clicking the location text brings up an edit box
3. Type new location information and press ENTER

5.6.5. Adding lines

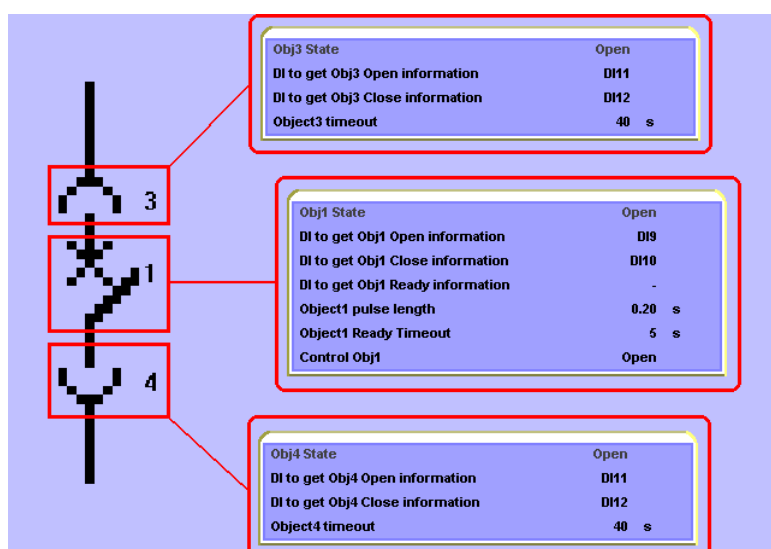


1. Select one of the line characters.
2. Press and hold the left mouse button over empty space. Short piece of line appears at mouse cursor.
3. Move the piece to correct place.
4. Release the left mouse button.
5. Return to step 2 and repeat until the line is complete.

5.6.6. Adding objects

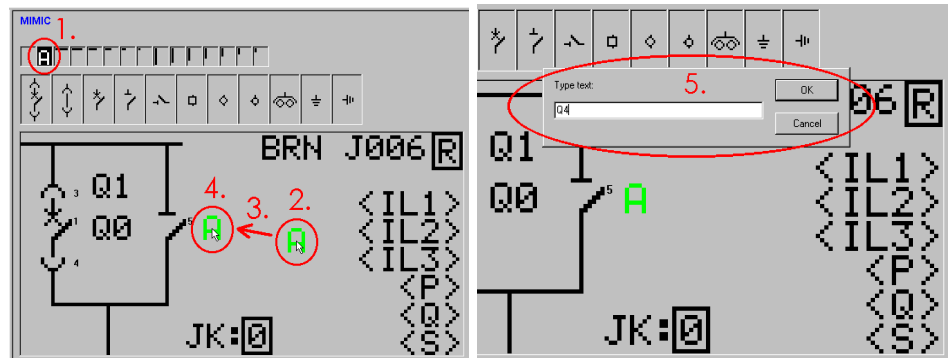


1. Select object type from the palette
2. Press and hold left mouse button over empty space. New object appears at mouse cursor
3. Move the object to correct place
4. Release the left mouse button
5. Select correct internal object numbers by clicking the left mouse button over active part(s) of the object. Clicking alternates unused object numbers. Use numbers 1 & 2 for objects that are going to be controlled by the relay. More objects might be available for these purposes, depending on the relay software version. Please check the Objects group for more information.
6. Make object settings in Objects group (if not done yet)



Relationship between object numbers in Mimic group and object settings in Objects group

5.6.7. Text objects



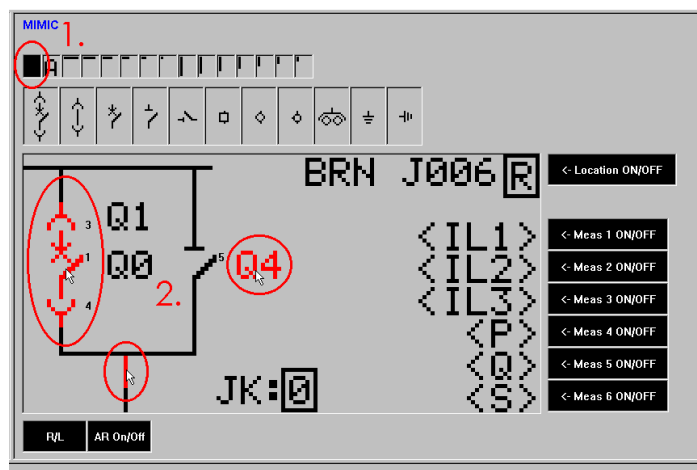
Adding text

1. Select the text tool ('A')
2. Press and hold left mouse button over empty space. New text object appears at mouse cursor
3. Move text object to correct place
4. Release the left mouse button and editing window will be displayed
5. Type text and press OK

Editing text


1. Move mouse over a text object. Text becomes green
2. Click left mouse button to show editing window
3. Type new text and press OK

5.6.8. Deleting objects, text and lines



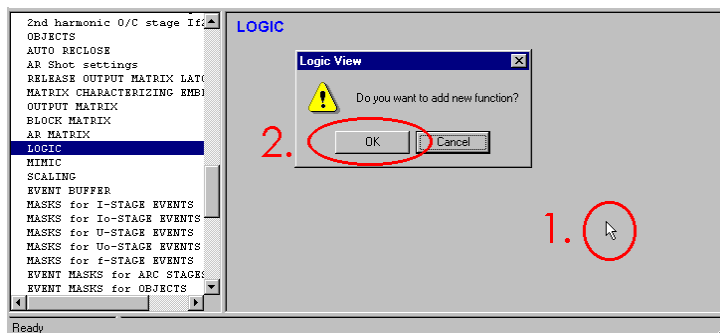
1. Select the deleting tool (an empty box)
2. Move mouse over an object you want to delete. Object becomes red.
3. Click left mouse button to delete the object

5.6.9. Sending to device

MIMIC display configuration is sent to the device by pressing  or selecting from the menu **Communication/Write Changed Settings to Device**

5.7. Logic editor

5.7.1. Adding the first function



If the logic display is empty, to add the first function:

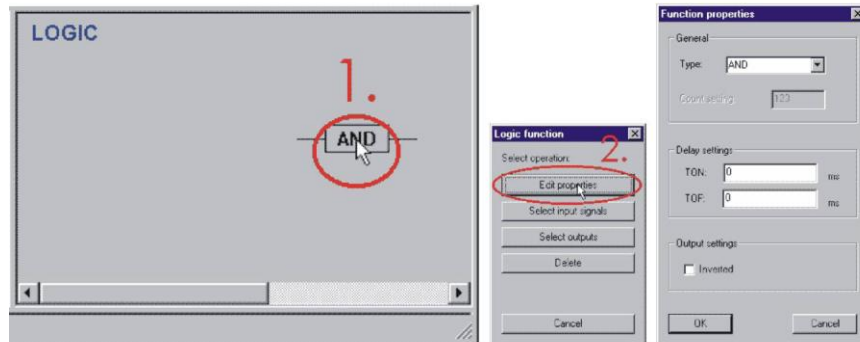
1. Click left mouse button anywhere on the display. A dialog is shown.
2. Press **OK**. Plain AND-function, without inputs and outputs, appears on the screen.

If AND is not the type of function wanted see the next chapter about how to change function types.

5.7.2. Function properties

To edit properties of a function:

1. Click a function
2. Click **Edit Properties** button



Type

- use this setting for changing the function type

Count setting

- this is active only for CT-function
- defines how many rising edges must be detected in inputs before the output is activated

TON

- defines how long it for the input to activate

TOF

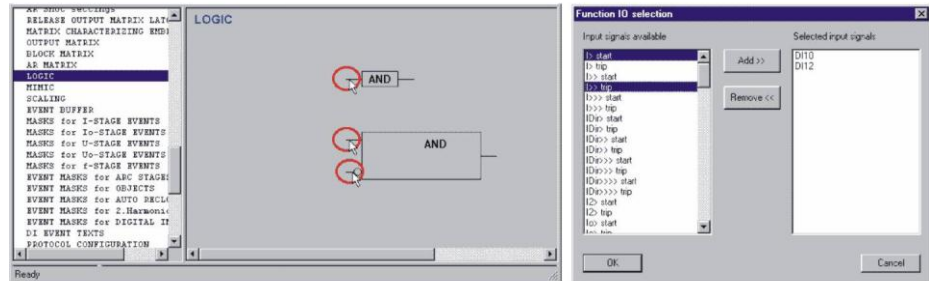
- defines how long it takes for the output to become inactive

Inverted

- this setting can be used for inverting the output

5.7.3. Selecting input signals

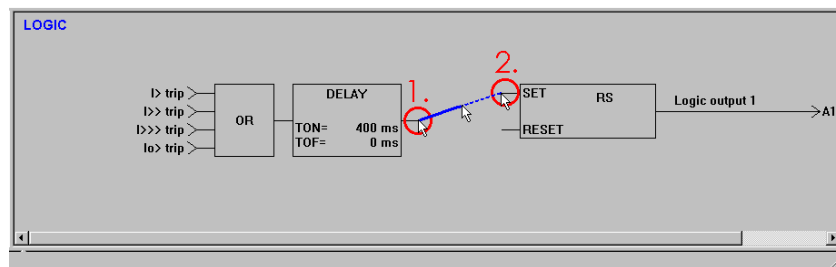
Only the left most functions can take input from signals. Inputs for the other functions can only be taken from the outputs of the other functions on their left side.



1. Click the input line of a function. Some functions may have several input groups e.g. ANDINV has direct inputs and inverted inputs. With those functions click the specific group to change the inputs
2. To add new signals; select input signals from “**Input signals available**” list and press the **Add** button
3. To remove signals; select input signals from “**Selected input signals**” list and press the **Remove** button
4. Press **OK** to accept the changes

5.7.4. Connections between functions

Adding a new connection

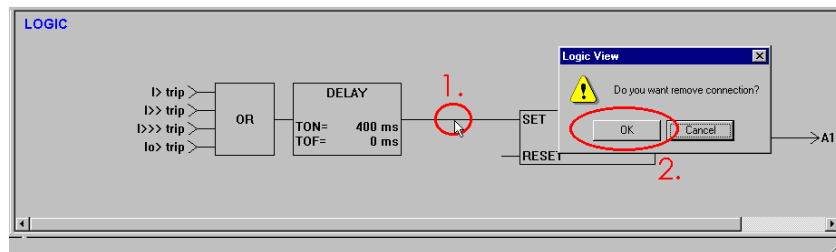


1. Press and hold the left mouse button over function output which is going to be connected to an input of another function
2. Move the mouse near function input and release the left mouse button.

Several functions can be connected to the same destination function. VAMPSET adds new input pins for the destination function as necessary.

Only connections between consecutive functions are legal!

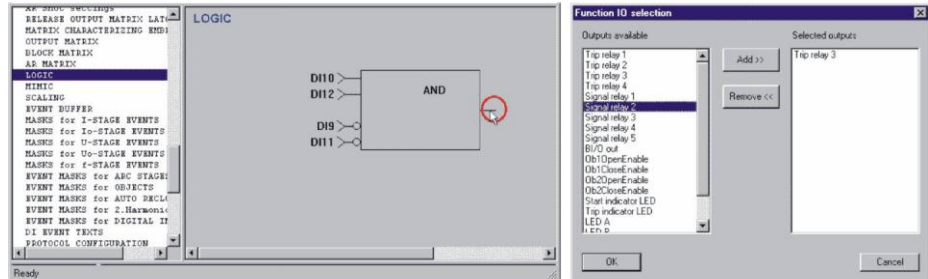
Removing a connection



1. Click a connection. Confirmation window appears
2. Press **OK** button

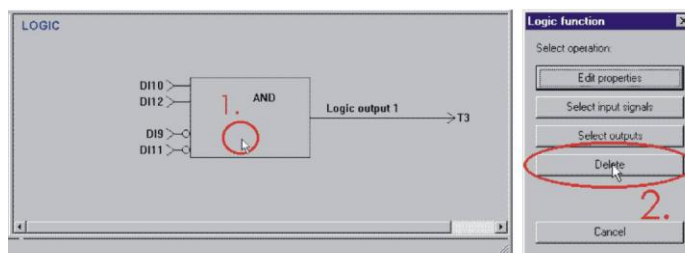
5.7.5. Selecting logic output connections

Only the right most functions can have output connection to relays, leds etc. If a function has 1 or more output connections the function output cannot be connected to input of any other function at the same time.




1. Click input line of a function
2. To add output connections: select outputs from “**Outputs available**” list and press the **Add** button
3. To remove connections: select outputs from “**Selected outputs**” list and press the **Remove** button
4. Press **OK** to accept changes

5.7.6. Deleting functions




1. Click a function
2. Press the **Delete** button

5.7.7. Sending to device

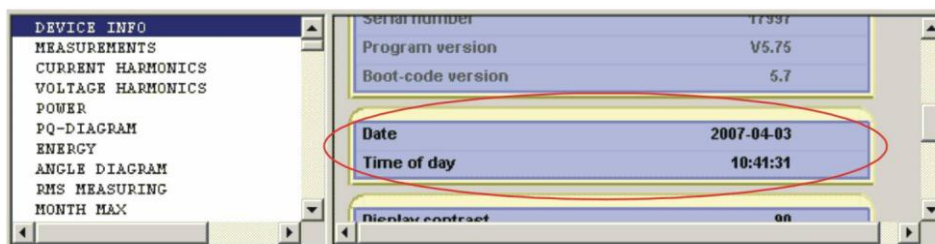
Logic configuration is sent to the device by pressing  or by selecting from the menu **Communication/Write Changed Settings to Device**


5.8. Other functions

5.8.1. Sending time and date to Device


VAMPSET can read time and date from the PC and synchronize them with the device. Time and date are transferred by pressing  or using menu command:

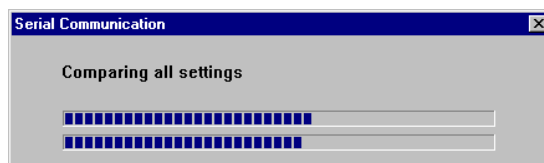
Communication/Sync time and date from computer.



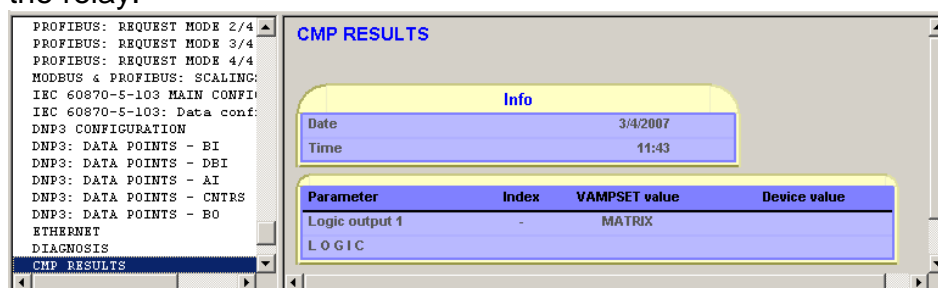
Transfer can be confirmed by selecting Device Info group from the group list and then pressing . Now the device time and date are the same as on the PC.

5.8.2. Comparing settings between VAMPSET and Device

VAMPSET can compare all parameter values between VAMPSET document (.vf2) and the connected device. Comparing can be started by pressing , after which the following dialog is shown:



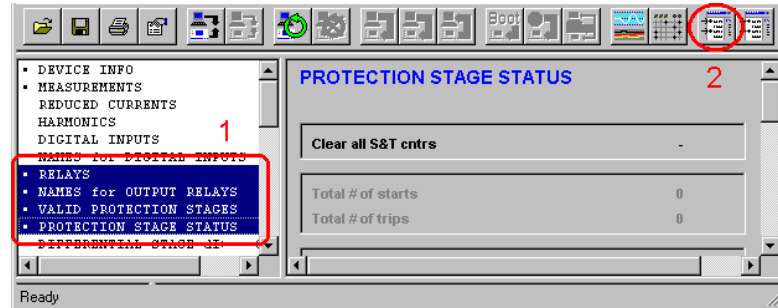
After the comparing process has been completed, a new group will be added to the group list. This group shows the results of the process; differences between the settings on VAMPSET and on the relay.




The results of the comparison are also saved with the VAMPSET document.

5.9. Generating a SerCom-file

SerCom is a communication program, which is used for writing parameters to the device via serial port. SerCom is an old DOS program, so it works only under MS DOS and W95's MS-DOS Prompt. The SerCom is used mainly for writing calibration data to the device during production testing. This feature is usually not needed by the end-user. However this section explains how these files can be created.



Select groups which you want to include in a SerCom file:


1. Select one or more groups from the group list. Hold down **Control**-key and click with mouse to select several items. You can also hold down **Shift**-key or the mouse button to select several items by painting.
2. Press . Go back to step 1 until all required groups have been selected. Selected groups have a little dot before their names in the group list.

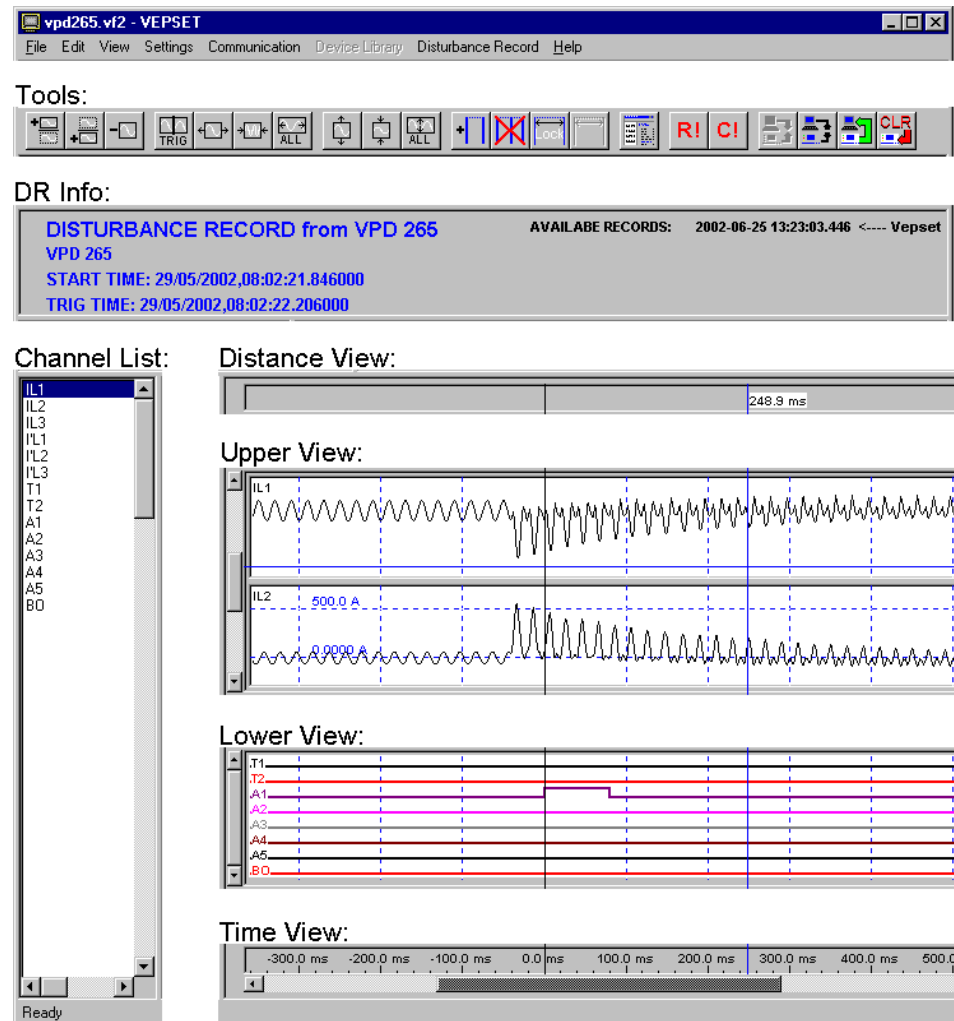
SerCom file is generated by using menu command:

File/Generate SerCom-file from selected groups

6. Disturbance Record Evaluator

6.1. Main Window

The Disturbance Record Evaluator can be opened by pressing  or using menu command: **View/Disturbance Record**.



6.1.1. Views

DR Info

- Shows the device type and custom name
- Shows start & trig time stamps
- If the device is connected, all available records are displayed on the right side of the view

Channel List

- Shows all recorded channels
- Can be used for selecting new channels to the upper and lower views

Distance View

- Displays time between trig point and mouse cursor
- Displays distances between cursors

Upper View and Lower View

- Display analog and digital channels
- By default all analog channels are added to the **Upper View** and digital channels to the **Lower View**
- The right scroll bar is used for scrolling between displays
- The left scroll bar is used for changing the maximum number of displays, that are shown simultaneously

Time View

- Displays the time axis
- The scroll bar can be used for scrolling time

6.1.2.

Tools

Add new display to the upper view	Add new display to the lower view	Remove Selected Views	Show the Trig Point	Zoom in Time	Zoom out Time	Show the Whole Waveform	Zoom in Amplitude	Zoom out Amplitude	Add New Cursor	Remove Cursors	Lock Distances between Cursors	Unlock Cursors	Reset Channel Views	Clear Channel Views	View Groups & Parameters	Connect Device	Disconnect Device	Read the oldest record from device	Clear the oldest record from device	Trigger new disturbance recording	Trigger, read, save and clear recording	Read, save and clear all recordings	Play disturbance recording on device

6.2. Changing Disturbance Recorder Settings

The device has three types of settings which must be configured before using the distance recorder:

1. channel selection
2. sampling settings: mode, rate and time
3. trigger settings: source and pre trigger rate

The following descriptions assume that you have a basic knowledge about configuring the device via VAMPSET. Refer back to the previous chapters for further information.

Before making any DR settings, the device must be connected to VAMPSET. Otherwise it's not possible to select channels or sampling time correctly. It's also recommended that **Settings/Program Settings/Write changes automatically after change** is enabled, because this makes the selecting the channels easier.

All device settings, except the trigger source selection (which is explained later in more detail), are made in the Disturbance Record group. Select the group from the group list.

DISTURBANCE RECORDER

Dist. rec. version: 1.2

RECORDER CHANNELS

Ch	Io1,Uo,DI,DO
Add recorder channel	-
Remove all channels	-

Recording mode: Overflow

Sample rate: 1/10ms

Recording length: 8.00 s

Pre trig time: 50 %

Event enabling: ☒

Maximum time setting: 89.56 s

RECORDER LOG

	Status	Date	hh:mm:ss.ms
[1]	Run	-	-
[2]	-	-	-
[3]	-	-	-
[4]	-	-	-
[5]	-	-	-
[6]	-	-	-
[7]	-	-	-
[8]	-	-	-
[9]	-	-	-
[10]	-	-	-
[11]	-	-	-
[12]	-	-	-

Manual triggering: -

Clear oldest buffer: -

Clear all buffers: -

Status: Run

Recording completion: 50 %

Readable records: 0/11

6.2.1. Channel Selection

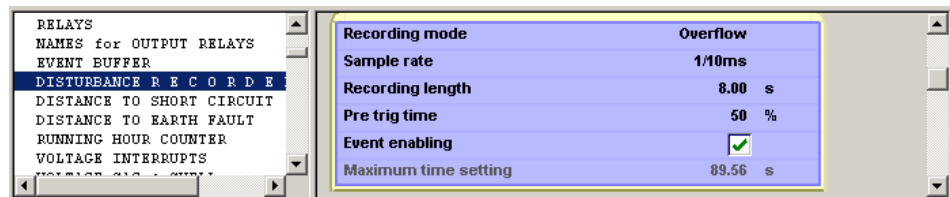


Use the following procedure to select channels:

1. Clear all recorded channels by setting “**Clear**” to the “**Remove all channels**” -selection
2. Use “**Add recorder channel**” to select one channel from the list of all available channels
3. Go back to step 2 until all required channels have been selected

The selected channels are shown in grey colour on the “Ch” object.

6.2.2. Sampling Settings



Set the “**Recording mode**” according to desired operation:

Saturated

- All buffers will be recorded once. If there are no empty buffers, the recording is stopped.
- NOTE! All buffers will be lost if:
 - ⇒ relay is rebooted (power supply fails)
 - ⇒ changes are made to the sampling settings, excluding Pre trigger rate.
- Buffers can be cleared manually. If new triggering occurs the cleared buffer will be used for recording

Overflow

- If new triggering occurs and there are no empty buffers, the oldest buffer will be overwritten

VAMP devices can do two different type of sampling. The sampling type depends on the sampling rate setting as follows:

Sampling Type	Sampling Rate	Sampling source	
		Analog	Digital
Waveform	32 / cycle	ADC samples	Instant
	16 / cycle		
	8 / cycle		
Amplitude	1 / 10 ms	20 ms mean	Instant
	1 / 20 ms	200 ms mean	
	1 / 200 ms		
	1 / 1 s	1 s mean	
	1 / 5 s		
	1 / 10 s		
	1 / 15 s		
	1 / 30 s		
	1 / 1 min	1 min mean	

The available sampling rates can vary between different devices and firmware versions.

Note!

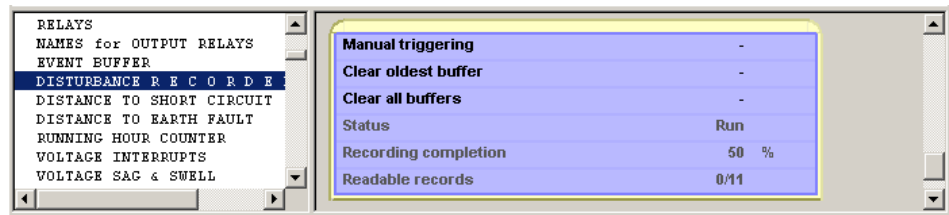
Changing the sampling rate will clear the record buffers.

Time setting defines the recording time. The setting cannot be greater than the **MAX time**, which is displayed in grey colour in the Disturbance Record group. **MAX time** is total time available for all records. The following table shows the relationship between time settings and MAX time:

Time (less or equal)	Number of records	
	Recording mode Saturated	Overflow mode
1/5 MAX time	5	9
1/4 MAX time	4	7
1/3 MAX time	3	5
1/2 MAX time	2	3
MAX time	1	1

Maximum number of records is 12. Even if the time setting is 1/6 **MAX time** the number of available records remains at 12.

6.2.3. Recorder controls

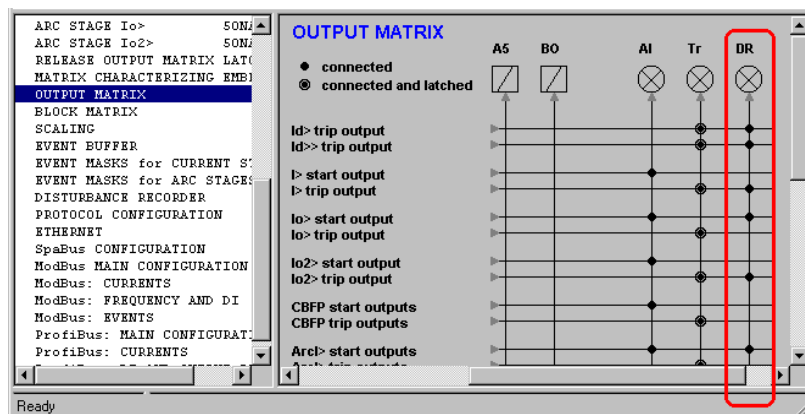


- By selecting 'Trig' from the 'Manual triggering' –menu the Disturbance recorder may be triggered to capture the waveform from the present measurements.
- By selecting 'Clear' from the 'Clear oldest buffer' –menu will delete the oldest triggered disturbance recording from the relay's memory.
- By selecting 'Clear' from the 'Clear all buffers' –menu will delete all of the disturbance recordings from the relay's memory.

6.2.4. Trigger Settings

Pre Trigger Rate defines how many samples will be recorded before the trig. If **Pre Trigger Rate** is 50% and **Time** is 0.50 s the device will record 0.25 s before and 0.25 s after the trig.

Trigger source is selected on Output Matrix group. Select the group from the group list.



Select the trigger sources by connecting appropriate signals to the DR-line. All connected signals will cause a new recording when activated.

6.3. Evaluating recordings with VAMPSET

VAMPSET stores the disturbance recordings to disk in COMTRADE format (revision year 1999). Data files are saved in ASCII format (binary format is not supported).

6.3.1. Reading from Device

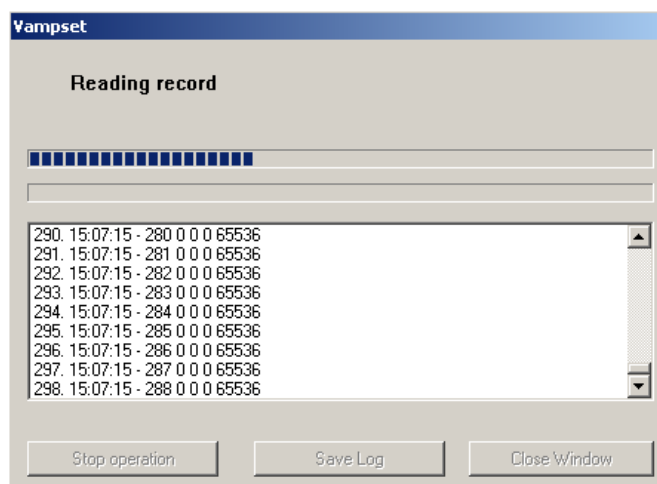
Reading starts by menu command:

Disturbance Record/Read from device or **Read any from device** or **Read all from device** depending of the desired operation.

If the menu command is disabled,

- the device is not connected or
- the device does not have DR recorder or
- there are no records available


The following dialog is displayed when reading is in process:



After the reading is ready the record must be saved and cleared from the device.

If user selected **Disturbance Record/Read all from device**, VAMPSET will read all records from the relay one-by-one and will ask for the user to save the comtrade file to disk after each of the records have been read. User may choose to save or discard the file.

If user selected **Disturbance Record/Read any from device**, a pop-up window will appear and user may select the desired recording to be read.

The oldest record is cleared by pressing  or using menu command:

Disturbance Record/Clear oldest Record. All recordings from the recorder can be cleared by selecting **Disturbance Record/Clear all Records**.

6.3.2. Saving to Disk

The record can be saved to disk by menu command:

Disturbance Record/Save As...

6.3.3. Printing

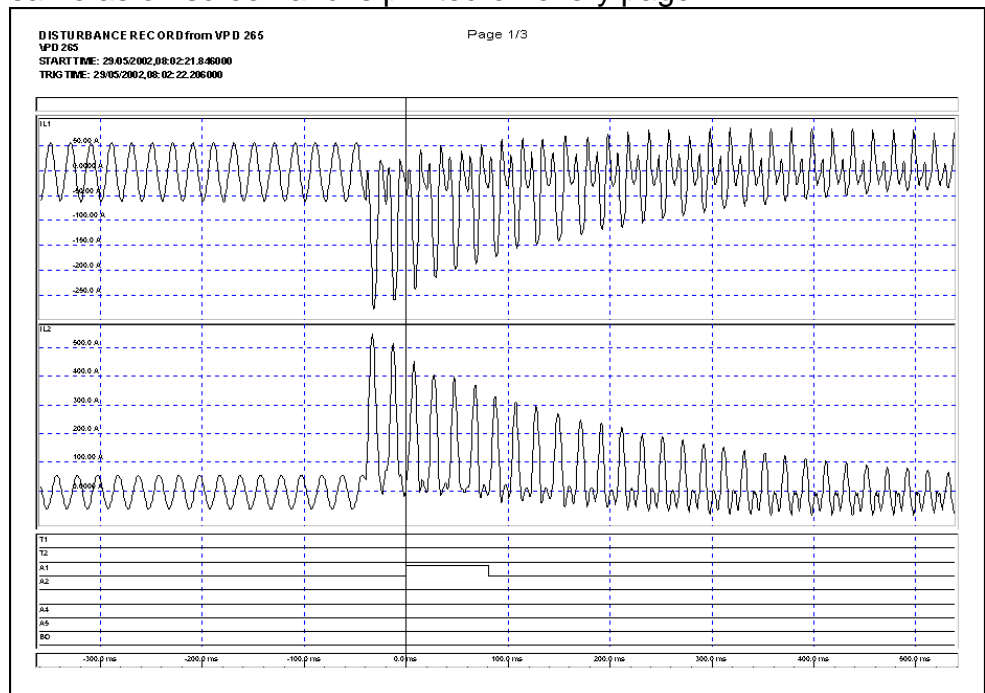
Record printing is controlled by the following commands on the **File** menu:

Command	Description
Preview Active View	Shows a preview of printed record
Print Active View	Prints the record
Print Setup	Printer selection & settings
	Paper type & orientation

Paper layout is dependent on the following settings:

Paper Layout	Settings & notes
Upper View displays per page	Same as on screen
Lower View displays	Same as on screen Printed to the footer of every page
Number of pages	Upper View displays / displays per page (left scroll bar)
Time period	Same as on screen
RMS, AVG, Min & Max	Same as on screen
Cursors	Same as on screen

See the following example page. The Upper View has 6 displays and the left scroll bar position is 2, resulting in 3 pages and 2 Upper View displays per page. The Lower View on paper looks the same as on screen and is printed on every page.





6.3.4. Opening from Disk

Disturbance record can be opened from a file by menu command:
Disturbance Record/Open...

6.4. Channel displays


6.4.1. Adding

Use the following sequence to add a new display

- 1. Select one or more channels from the Channel List
- 2. Press  to add a display to the Upper View or  to the Lower View. The display will contain all the selected channels.

6.4.2. Removing

To remove one or more displays:







- 1. Select one or more displays by double-clicking them with the mouse
- 2. Press  to remove the selected displays

All displays can be removed by pressing .

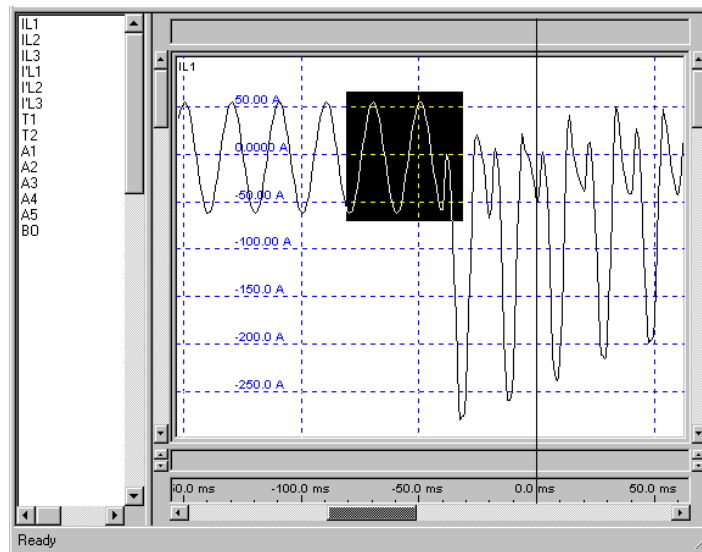
6.5. Zooming

6.5.1. By buttons

The following buttons are used for zooming:

Axis	Direction	Button	Note
Time	In		
	Out		
	View all		
Amplitude	In		If displays or channels are selected only those will be zoomed. All displays and channels are zoomed.
	Out		
	View all		

6.5.2. By mouse




Time and amplitude can be zoomed by using the mouse as follows:

1. Press left mouse button down
2. Drag a rectangle
3. Release the left mouse button

6.6. Using Cursors

6.6.1. Adding

New cursor is added by pressing . The cursor appears in the middle of the screen. The maximum number of cursors is 5.

If more than one cursor is used, all calculations (like RMS and AVG) are made from samples between the 1st and the 2nd cursor. The 1st cursor is the left most and the 2nd is the second right most.

6.6.2. Moving



To move a cursor with the mouse:

1. Move the mouse over a cursor
2. Press left mouse button down
3. Move the cursor to required place
4. Release the left mouse button

6.6.3. Removing

All cursors are removed by pressing .

6.6.4. Locking together

Distances between cursors can be locked by pressing  and unlocked by .

Locking can be used for example to examine instant RMS values of a waveform display:

3. Add two cursors
4. Move one cursor to one cycle distance from the other
5. Lock the cursors together
6. Enable RMS calculation. The displayed RMS value is calculated from samples between the two cursors.
7. Move one cursor with the mouse. The RMS value is updated in real time.

6.7. Calculations


VAMPSET can calculate RMS and Average values and show min & max from recorded samples. Calculations are based on samples between the first and last sample or between two cursors, if cursors have been enabled.

Calculations can be activated from the **Disturbance Record** menu:




6.8. Other functions

6.8.1. Finding the trig point

The trig point is found easily by pressing .

6.8.2. Resetting all Views

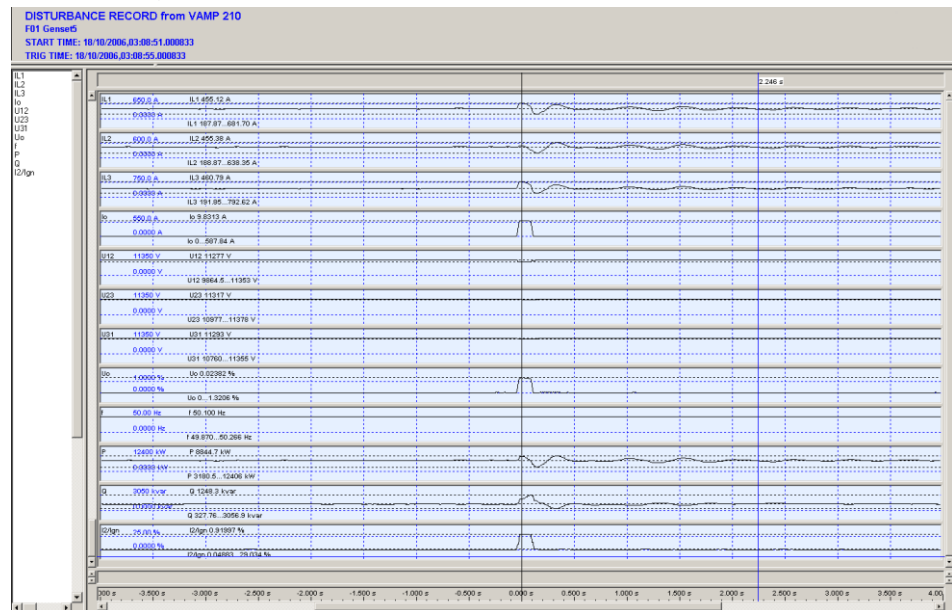
All view can be reset to the initial state by pressing . The views will look the same as after loading the record from file or after reading the record from device:

- analog channels are added to the upper view
- digital channels are added to the lower view
- all cursors are removed
- amplitudes are zoomed to fit in the display
- time is zoomed to show all record

In the VAMPSET is available some evaluating properties, which are helpful for the user.

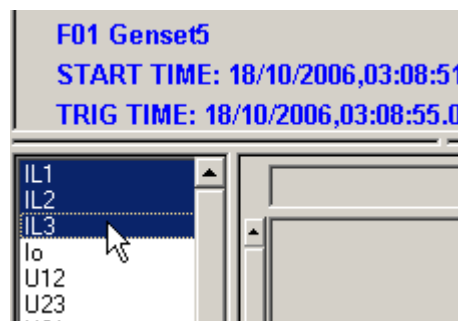
7. Disturbance recording evaluation example

In this example shows how the disturbance recordings can be evaluated with VAMPSET. Following disturbance recording has been read from the relay. The default display will show the recording in such manner that all of the signals are separated to their own graphs.

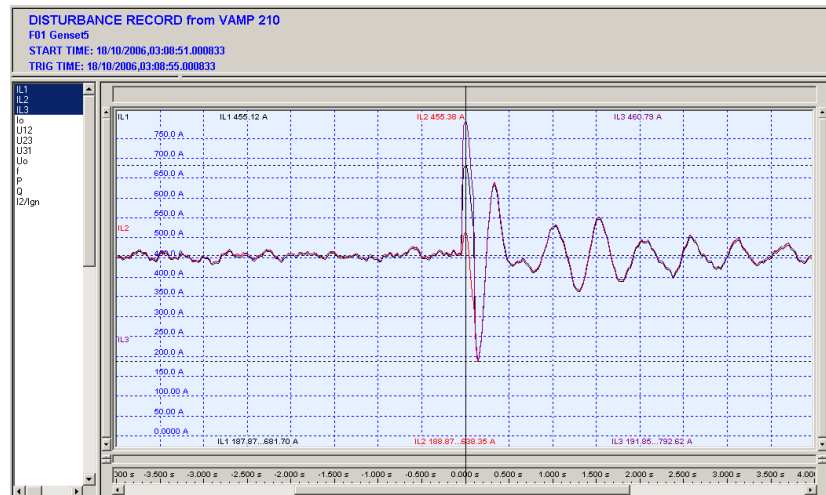



The first step is to arrange the view so that all of the currents are displayed in one graph and all of the voltages in another. This can be accomplished by following this procedure:

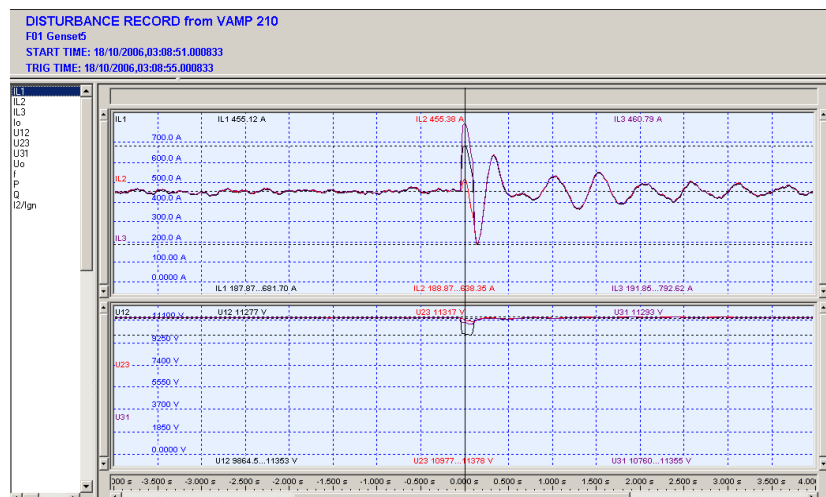
1. Clear the view by pressing **CI** button
2. Select the currents from the signal list with mouse, by holding down **Control**-button.




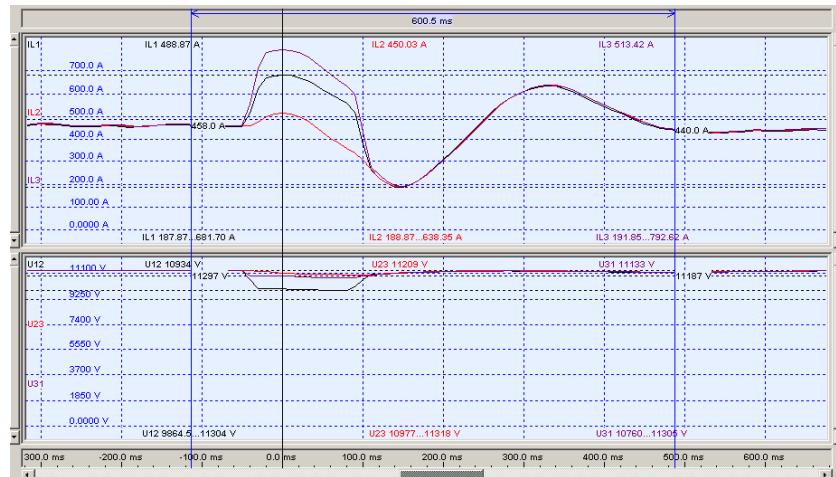
3. By pressing the **+** button the selected signals are plotted in to the upper view.



4. Next do the same for the voltages; select all voltages from the list of signals and plot them to the lower view pressing  button

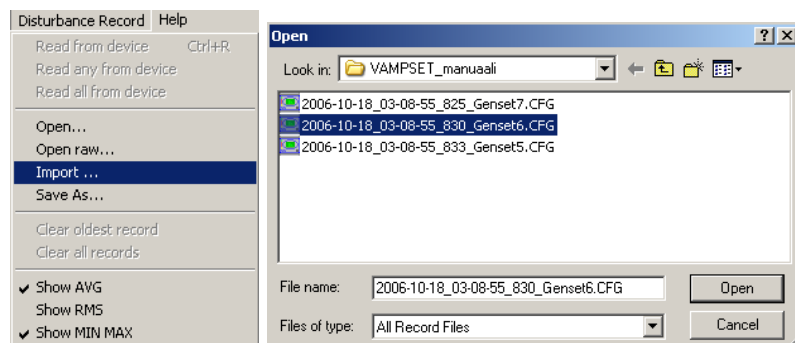


5. Now when the recording display is as desired, cursors can be added for evaluating, by pressing  button. If more than one cursor is added VAMPSET will display the time difference in between the cursors and the measurement value of each cursor. With the zoom buttons the graphs may be adjusted in to area of interest.



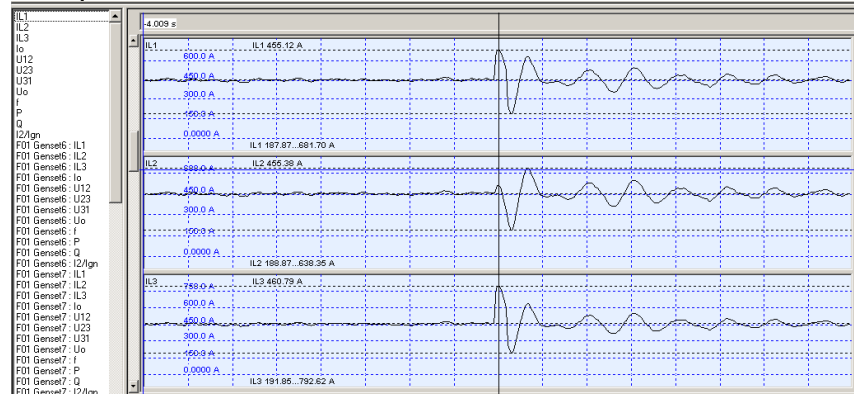
In cases where it is necessary to evaluate several recordings from the same situation, VAMPSET has option to import older recordings in to the disturbance recording evaluator. This can be done by following this procedure:

1. Read recording no.1 from the relay or open it with VAMPSET.
2. Select **“Disturbance Record” - “Import”** and select the desired disturbance recording, and click **“Open”**. Repeat the importing procedure as many times as necessary to get all of the desired recordings in to the VAMPSET.

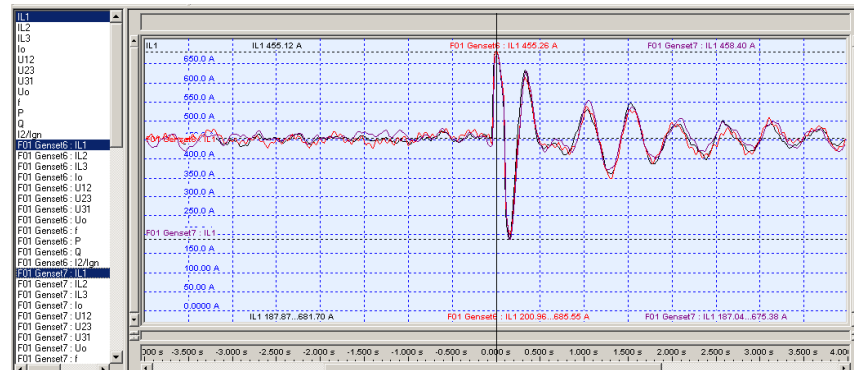


3. The name of the file, from which the recordings were imported, is shown in front of the signal names. The signals from the initially loaded disturbance recordings make an

exception, as the file name is not shown in their case

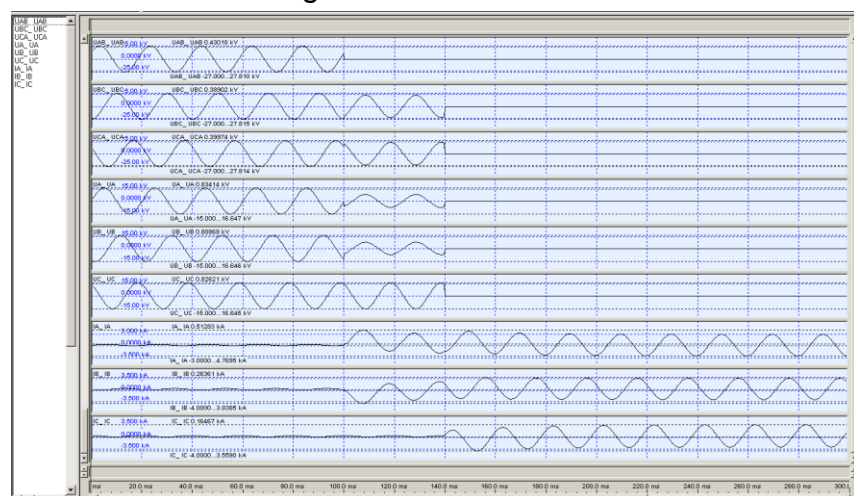


4. Clear the display by pressing the button
5. Select the desired signals from the signal list by using mouse and by holding down **Control**-button from the keyboard. Plot the signals in to VAMPSET by pressing button and evaluate the recordings.

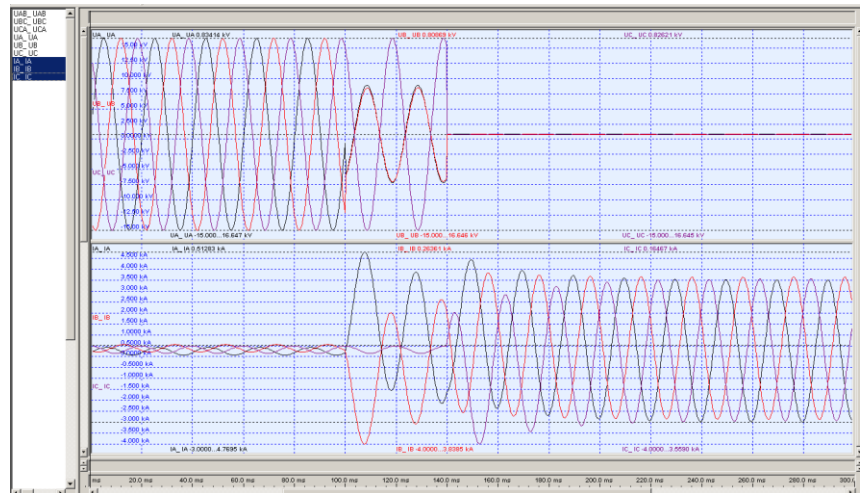


For the waveform data VAMPSET will show the phase vectors in the cursors. This is a useful function, because waveform data usually requires more complicated analysis.

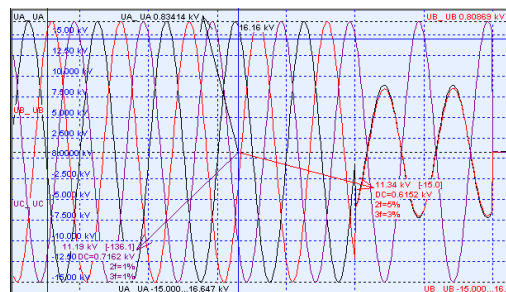
1. Read from the relay or open the desired waveform disturbance recording.



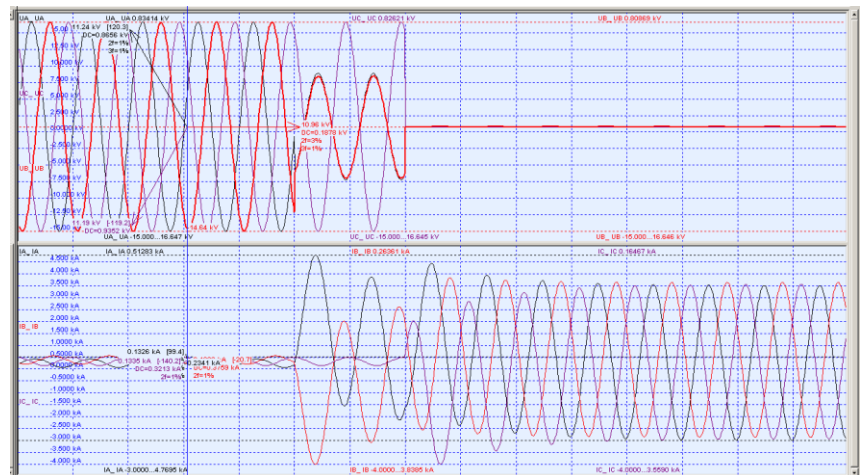
2. Clear the view and plot for example currents and voltages in to their own views. .



3. Add cursor in to the graph with **+|** button. The graph will now show cursors with the phasor vectors.



4. For the vector display to be convenient, select one of the phase waveforms as reference by double-clicking the curve.



In this example the voltage signal UB (red) has been selected as the phasor display reference and the signal curve is shown as bolded in the upper graph. To change the reference to another signal, double-click another curve. Phasors in all of the graphs will be shown in relation to the same selected reference. By moving the cursors in the recording the phasors will change according to the measurement data.

8. How to get communication working between the relay and VAMPSET

There are few things which should be checked if there are any problems in communication between relay and PC (VAMPSET).

8.1. VAMPSET version

Download latest version of VAMPSET-tool from our website.

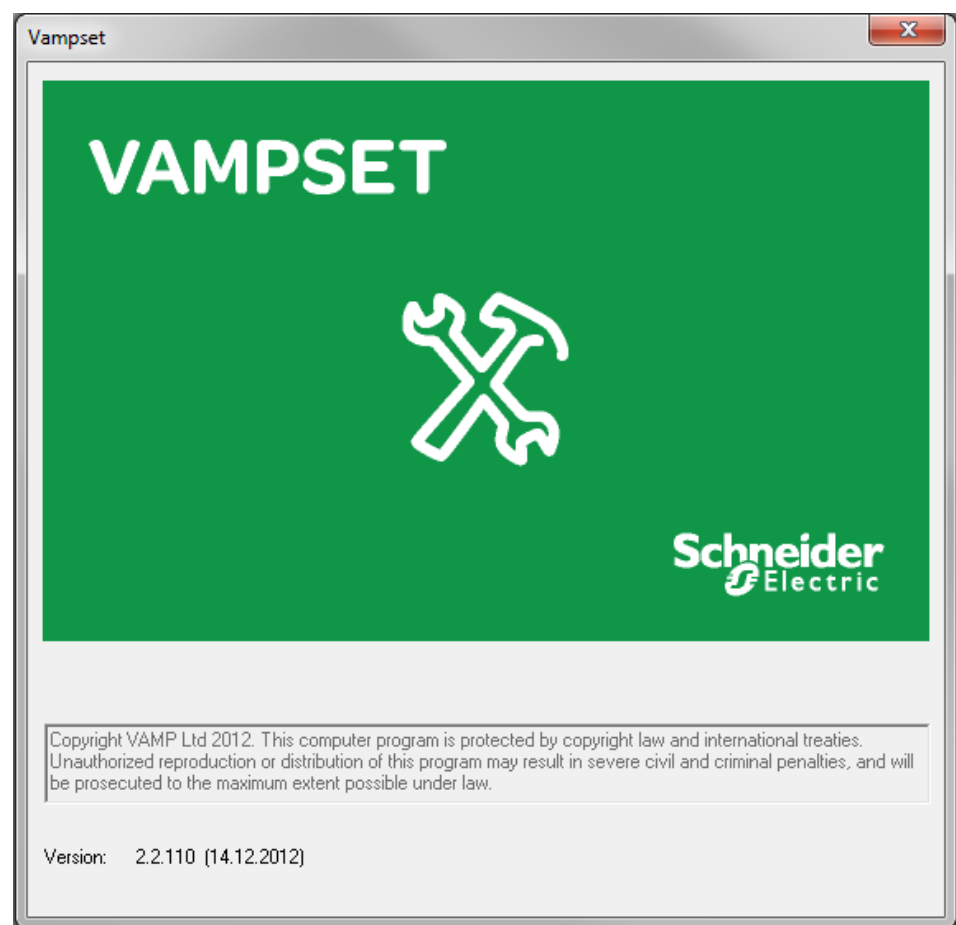


Figure 8.1-1 Your current VAMPSET version can be checked from-> Help->About.

Link to latest VAMPSET:

[http://www.vamp.fi/In English/Products/Softwares/VAMPSET setting and configuration tool/Default.aspx](http://www.vamp.fi/In%20English/Products/Softwares/VAMPSET%20setting%20and%20configuration%20tool/Default.aspx)

8.2. VAMPSET and relay settings

8.2.1. Communication speed

- Communication speed should be same in VAMPSET and in relay
- Communication speed can be changed in VAMPSET->Settings->Communication settings as shown in Figure 8.2.1-1

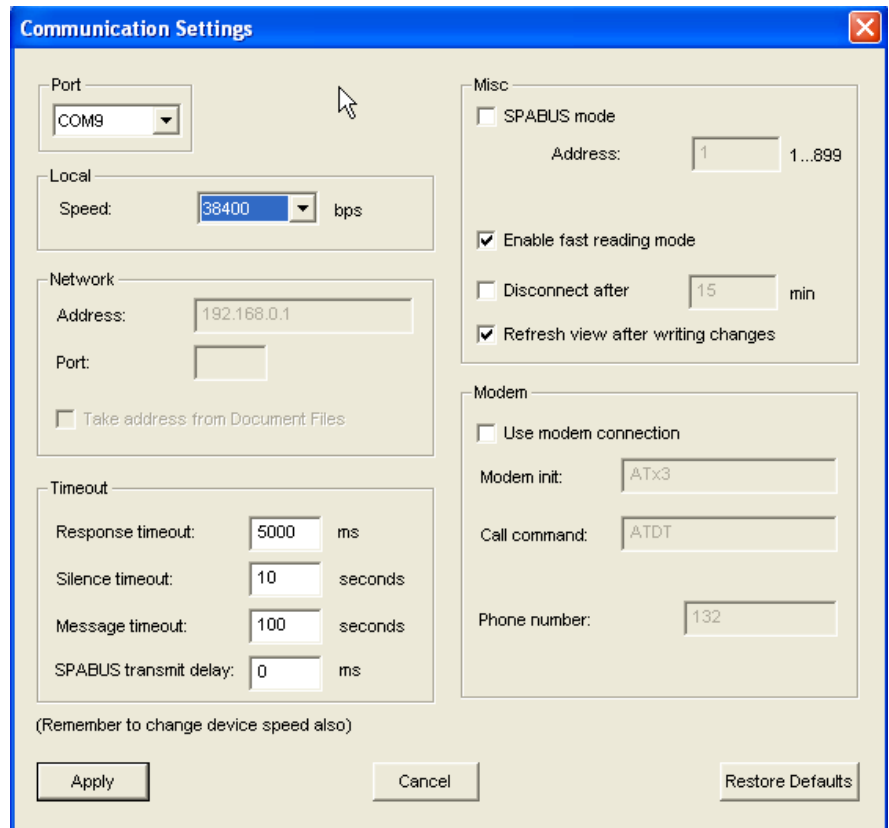


Figure 8.2.1-1 Setting the communication speed in VAMPSET.

- Relays default communication speed is 38400bps.
- Communication speed can be changed in relays HMI or if connection is already working between VAMPSET and relay then from: Mimic->local panel display->CONF.

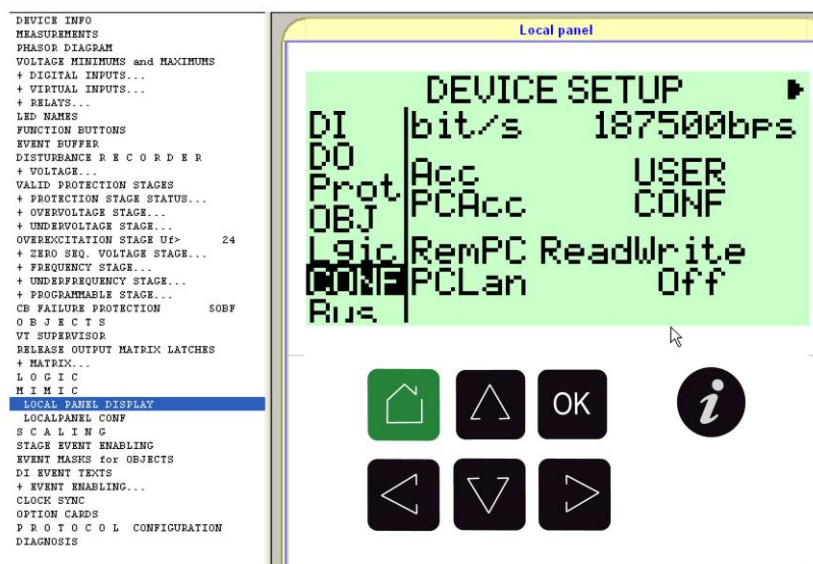
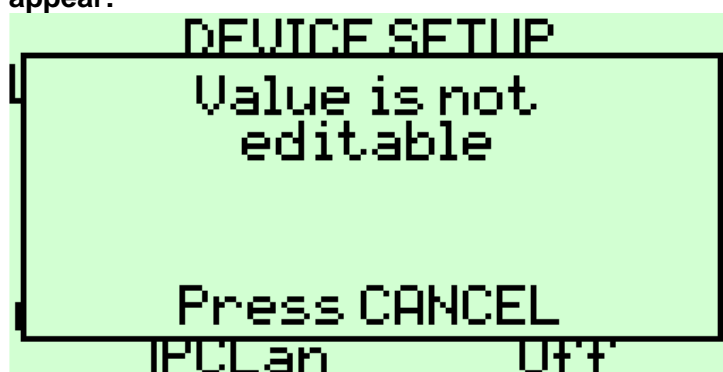




Figure 8.2.1-2 Changing relays communication speed

NOTE: If you haven't set the configurators password following text will appear:



In case shown above:

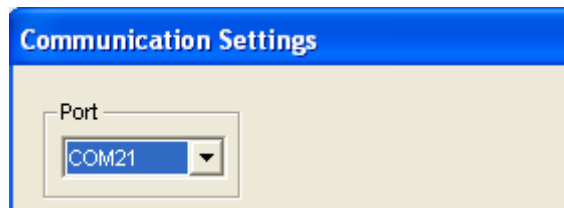
- Press info button:  and then enter 
- Set configurators password by using arrow buttons (default is 0002):



- Press enter again 

8.2.2. Communication port

- VAMPSET's communication port can be set in ->Settings->Communication settings



- If there is lots of options and you don't know which is the right one, you could disconnect the cable from PC and open the Communication settings again and check which COM-port disappeared from the menu or you could go windows ->Control panel-> System-> Hardware -> Device manager-> Ports (COM&LPT) as shown in Figure 8.2.2-1. If computer gives a very high com-port number for you then you may have to change it manually to some lower because VAMPSET doesn't support COM-port numbers above 25. Changing COM-port number is shown in Figure 8.2.2-2

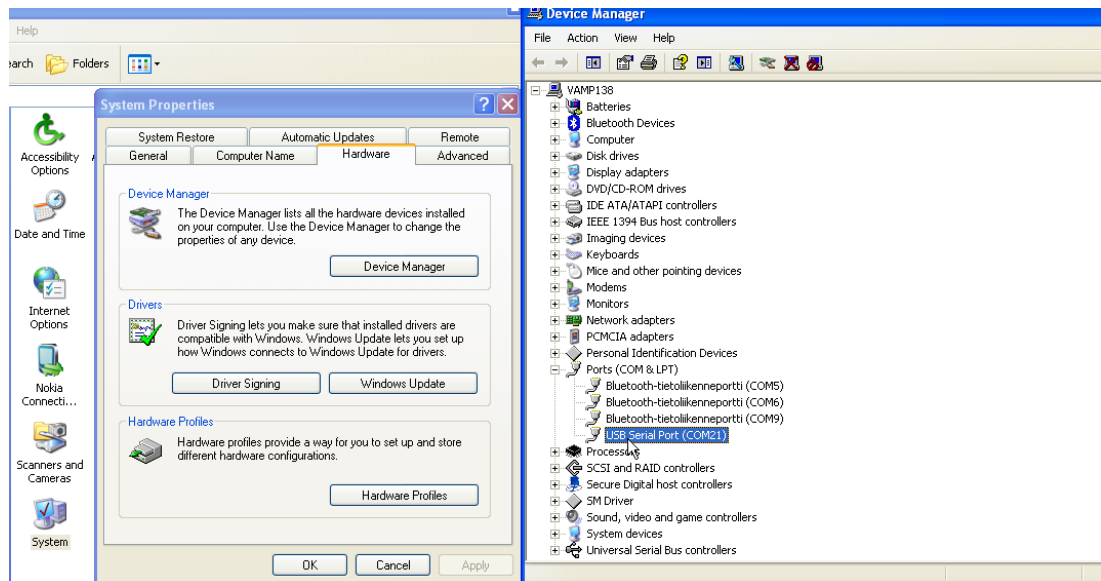


Figure 8.2.2-1 Communication port settings

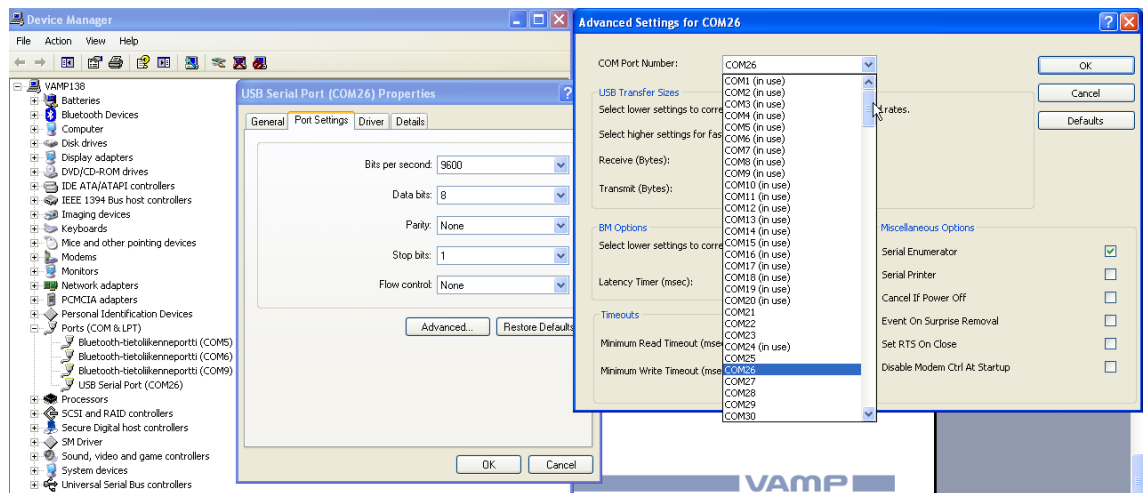


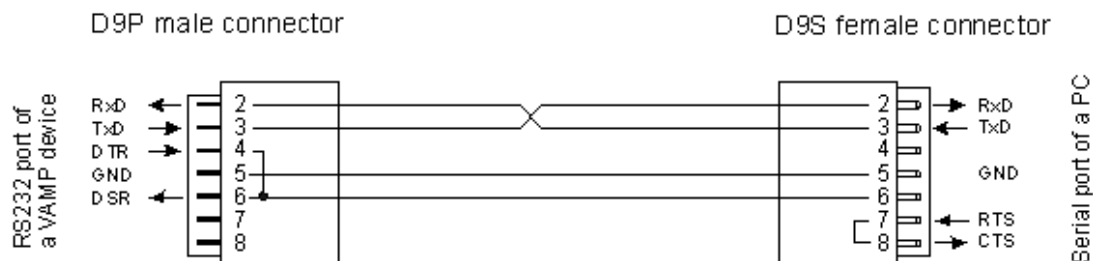
Figure 8.2.2-2 How to change communication port number

8.3. Connection cable and adapters

- There is special RS-232 serial cable between PC and relay: VX-003. (connection diagram in picture 6.)
- VAMP 50-series uses standard: USB A-B cable.

RS232 Cable

PC cable for RS232 port of VAMP relays



Ordering code: VX003 -
 Cable length in metres 3 or 4

Example:

Specified cable length is three metres. Ordering code: VX003 - 3

Figure 8.3-1 The cable between PC and VAMP relay (40-,100-,200-series)

- If USB-Serial adapter is used, there are only 2 adapters which are tested and proven good by VAMP Ltd.
 - FTDI CHIP ES-U-1001-R100/ US232R-100
 - 2.ATEN USB-to-Serial (RS-232) Converter Model: UC-232A
- USB-Serial adapters driver should also be up to date. Driver can be updated according picture 7 and 8 if you have internet connection available.

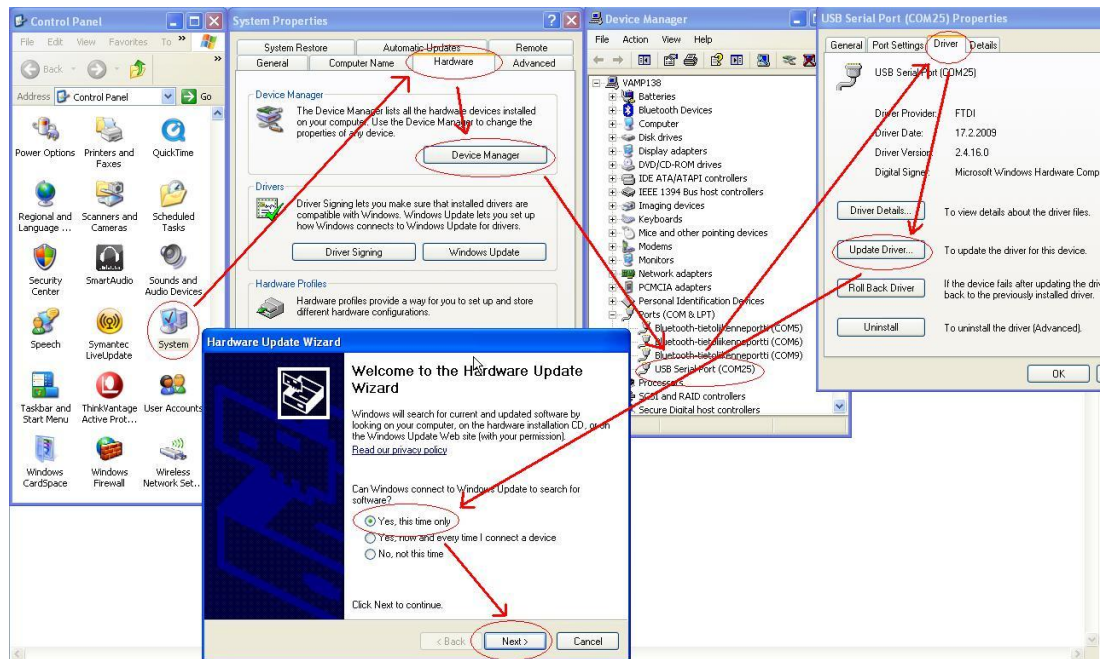


Figure 8.3-2 How to update USB-Serial adapters driver

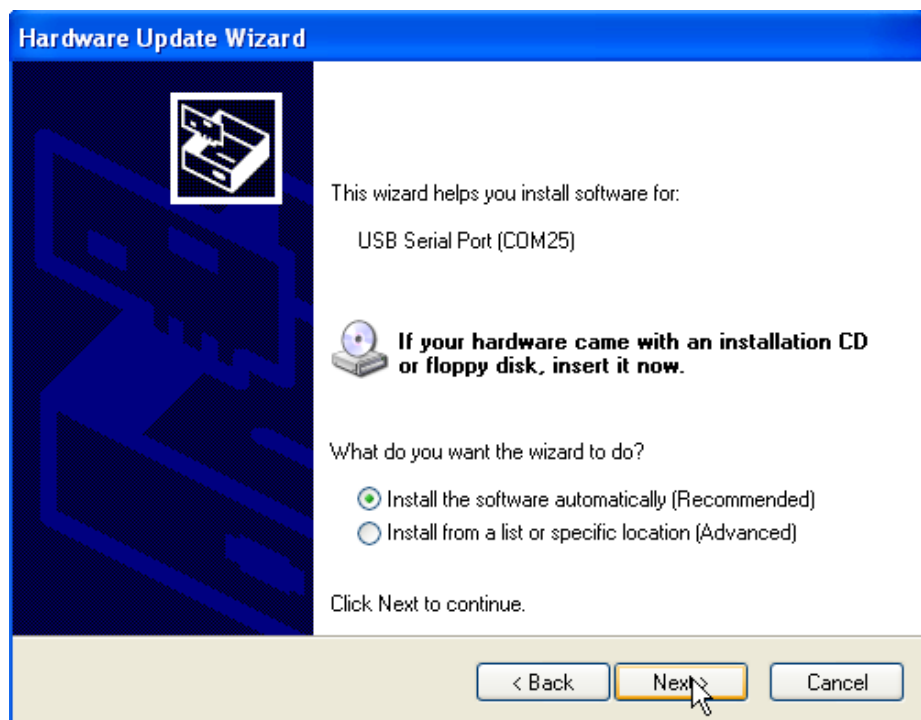


Figure 8.3-3 After clicking "Next>", the updating should begin

8.4. Connection is working but password isn't accepted

Sometimes might happen that connection is successful but for some reason VAMPSET isn't accepting any password:

- Try to restart VAMPSET and connect to relay again.
- Try to boot relay (if incorrect password is tried three times-> relay locks itself and you will have to wait 30 min or boot the relay).

8.5. "File is incompatible with the device. Cannot connect..."- message on screen

1. Device type is different. For example a file from VAMP260 cannot be sent to VAMP265. If VAMP260 file is open, VAMPSET cannot connect to VAMP265.
2. The major version number is different. For example V6.21 file cannot be sent to device, which has V10.55 firmware, because the major version numbers are different (6<-->10). Version number can be checked from the DEVICE INFO view.
3. The minor version number of the file is greater than the version on device. For example V6.46 file cannot be sent to device, which has V6.21 firmware, because the minor version of the file is greater (46 > 21).



Customers Care Center

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