

3. IMAGES

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The menu is divided into several parts. In the upper part are the basic figures for control of the 110kV system. In the central part of the menu are offers from networks and high-voltage sub-stations according to the individual areas. In the last part are the items “Diagrams of low-voltage networks” for selection from all “EVI” low-voltage network diagrams which serve for EVI employees, “Change line” serving for selection of the window for the resulting change signals, “Searching of object” for searching of objects, “Special figures” and “Normal statuses” serving for the display of normal statuses.

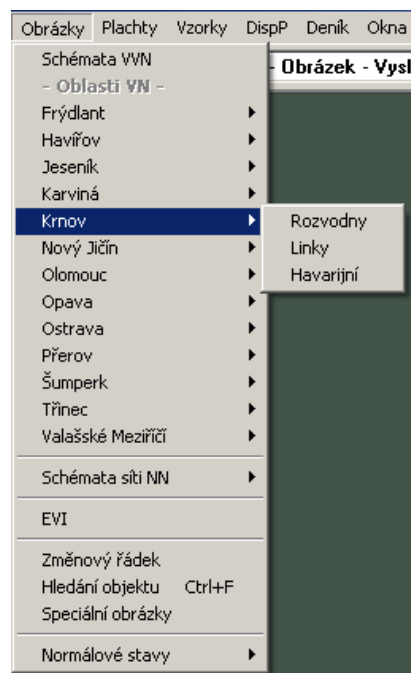


Fig. 1 Menu after opening the object

3.1 Live images

In the line images it is possible to display signals, measurements, counters, marks, calculated measurements, type recalculations and change signals. These can be arranged arbitrarily according to the requirements of the user. After activation of this function a list of figures is displayed which can be separately defined for each user. After selection of the image from the list, the image appears in the window. This window can be new or can be selected from the already opened windows, it is also possible to select the type of window – everything is described in detail in the Chapter “Windows”. A series of actions can be performed in the image – change the statuses of signals, remotely control devices, change the attributes of signals and measurements, change measurements, create marks, cancel marks, write and change the commentary to the marks, display a description of the element, browse the recalculation of measurements, display the commentary to the element, set the limit of measurement I, display the list of values in the object, display the list of objects. During the first opening of the image the default scale is set which is stated by the system administrator.

After the opening, the base of the image is displayed as a diagram, texts, etc., and then the actual statuses and measurements start to be gradually displayed. The time during which they all are refreshed depends on the volume and the method of the connection in the WAN network. After the first display the system keeps the actual values of all images in all opened windows. During normal operation these can be displayed for no later than 2 seconds after receipt at the dispatching workplaces; for other users the speed of refreshing is set at 60 seconds by the administrator.

The appearance of the displayed signals is described in uniform type database. The following symbols are currently used:

- Square - switch, disconnector, power section switch
- Wheel - disconnector, section switch, ground blades
- Rhomb - recloser
- Triangle - disconnecting unit without manipulation draw bar (disconnecting jumper)

It is possible to manually edit the displayed values if the user is authorised to do so. If the user is not authorized with the respective authority, the under mentioned functions are not displayed in the menu window after clicking with the right mouse button on the respective element. The authority is set by the system administrator for individual user groups. Operations with displayed values can be performed by pressing the right mouse button and selecting the respective item in the displayed menu window.

With the statuses of the signals which have the **telemetric** or **semi-position** attribute, it is possible to manually change these by clicking with the right mouse button on the respective signal and selecting the item *Change of status* or the item *Manipulation with the element* – which also changes the attribute of the signal – see Fig. 2. Measurements which do not have the mentioned attribute, can be arbitrarily overwritten in the window displayed after selection of the item *Manipulation with measurement* – see Fig. 3. If you want to change the value with the **telemetrically** or **semi-position** attribute, first of all change the attribute in the displayed window to “**manually non-rewritable**” by clicking on the field “not rewritable” (dot or check symbol is displayed) and confirm by clicking on the “Set attribute” buttons (for the signal) or on the “Set value” button (for measurement). If before manually changing, the attribute was set for **doubted** or **telemetric error**, then the overwritten value will have the attribute **manual rewriteable**. In other cases the attribute remains kept.

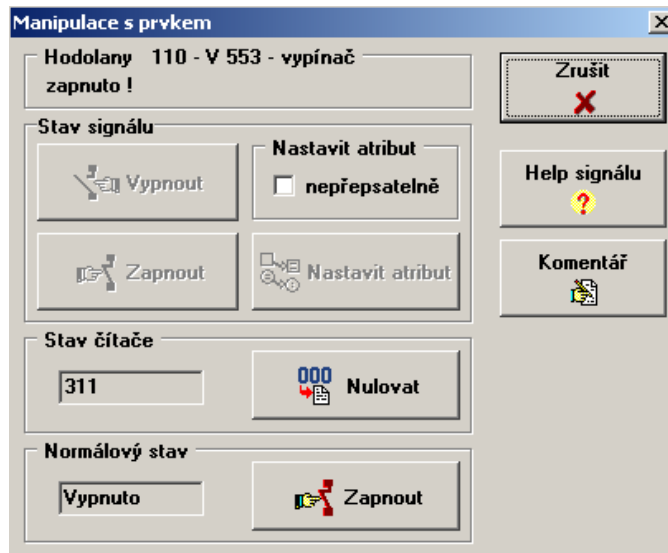


Fig. 2 Window of manipulation with the element

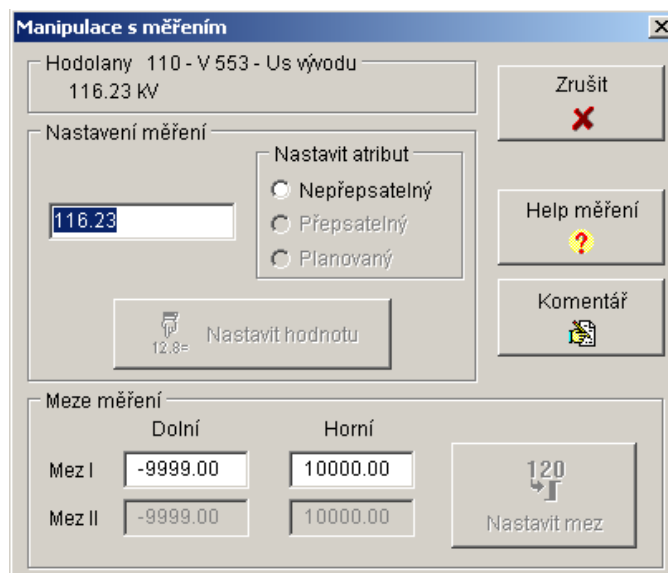


Fig. 3 Window of manipulation with measurement

From these manipulation windows with the element and manipulation with measurement it is possible to switch to the help commentary for the actual signal or measurement by clicking with the mouse on the buttons with the same name - detailed information about these items is found in the further text.

If the signal is **telemetric** or **semi-position** and the remote control is defined for the respective control, the option **Change of the status** will call up the dialogue window for the change of the status of the element. It is possible to also call up the window with the option **Manipulation with element** and then by clicking on the button “OFF” or “ON” The procedure during control is described in a separate chapter of this description of the system.

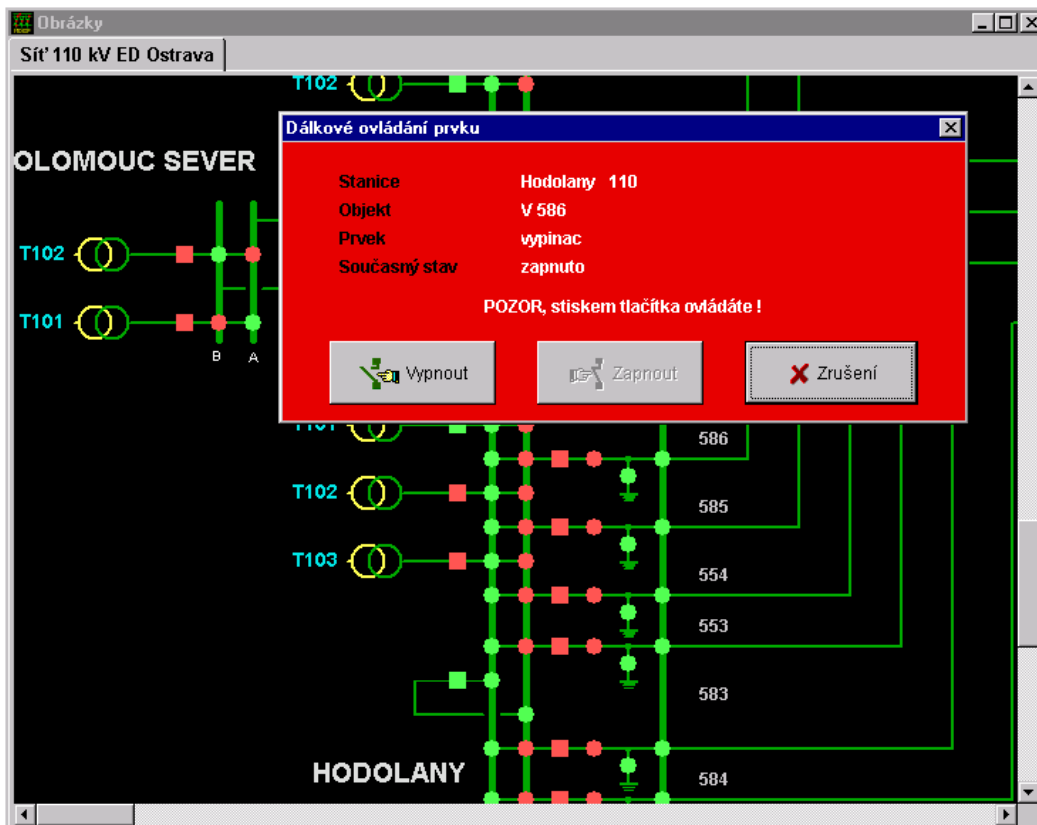


Fig. 4 Remote control window

During the **automatic and telemetric change of the signal** the element will start to flash. The flashing is stopped by the acknowledgement of the change in the diary or through clicking with the right mouse button on the flashing element and selecting the item **Acknowledgement** (it does not acknowledge the signal in the diary). The flashing of the concerned elements can only be removed by acknowledging all the elements from which the signal is calculated.

It is possible to write a comment to each signal and measurement which can be changed at anytime. The change is bound by permission; users without permission to make changes may only view these comments. The window with the comment is displayed after clicking with the right mouse button on the signal or measurement and selection in the **Comment** item. The window is terminated without saving the changes by pressing the button <Esc>, clicking with the mouse button on the icon in the header of the window or on the button "Cancel". The text is edited using the keyboard, using the mouse it is possible to work with marked text. The text is marked by pressing and holding the left mouse button and dragging through the text which is to be selected – the text is highlighted in blue for the standard set Windows colour pattern. Then by clicking with the right mouse button and selecting the required function (see Fig. 5) it is possible to copy (saving into the clipboard) or delete the selected text.



Fig. 5 Comment window

Text from the clipboard can be called up again in the place of the cursor by clicking on the right mouse button and selecting the item **Insert**. The actual date and time can be inserted into the text by clicking on the "Insert time" button. By clicking on the "Save" button the changes are saved and, at the same time, the editing window is closed. It is possible to also call up the text from the clipboard in the editing of the comment to another element, in the editing of the text of the mark or another text editor working in Windows.

It is possible to use so-called **type recalculations** in the system. These are recommended for the simplification of the sub-station diagrams which can describe the status with one element, e.g. "activated for collection unit A". It is possible to create this element by recalculation between the switch and disconnecting unit without the necessity to use a physical recalculation in the database. Type recalculations are valid for all databases, they use and are based on the same position of the corresponding signals in the databases. If the signal in the database is not described then it is not applied in the type recalculation (e.g. outlet disconnecter, etc.) For the display of type recalculations it is valid that if the resulting signal is to be in the status "ON", all elements of type recalculation must be "ON" (i.e. logical product). The attribute of the type recalculation is stated by the weight (quality) – the type recalculation will have the attribute with the lowest quality from the attributes representing the type recalculation.

On each displayed value which is defined within an object it is possible to display the list of all values contained in this object. This is performed again by clicking with the right mouse button on the displayed value and selecting the item **Opening the object**. In addition, it is possible to display the list of objects of the database into which the displayed value belongs by selecting the item **Open list of objects**.

Measurement which does not have a telemetric attribute can be overwritten manually. The recalculated measurement can only be changed by changing the measurement which represents the recalculation. For measurement it is possible to set **limit I** of the values by clicking with the left mouse button and selecting **Manipulation with measurement**. Dialogue window will appear (see Fig. 3), in whose lower part it is possible to rewrite the upper and lower **limit I** of the respective measurement. It is possible to switch between limits by clicking with the mouse on the respective field. It is necessary to save the changed limits by clicking on the "Set" button and then the dialogue window closes. Limit I is set by the user according to the actual operating demand. Limit II is set by the system administrator.

Counters display the number of changes of the respective element, e.g. the number of actions of short-circuit protection from the last version of the switch. The status of the element counter can be ascertained in the displayed window through clicking with the right mouse button on the element and selecting the item *Help element*. By selecting the item *Manipulation with the element* it is possible to reset the counter in the displayed window (see Fig. 2) (the “Reset” button is active only for users with the valid authority).

The description of the signal or measurement is displayed in the window after clicking with the right mouse button between the selection of the item *Help with the element*. The window is terminated without saving changes by pressing the button <Esc>, clicking with the mouse button on the icon in the header of the window or on the “Close window” button. Less important information (current status of the counter) is displayed after clicking on the button “Other information” so that the name of the button is changed to “Hide information” and by re-clicking it is possible to return to the basic description.

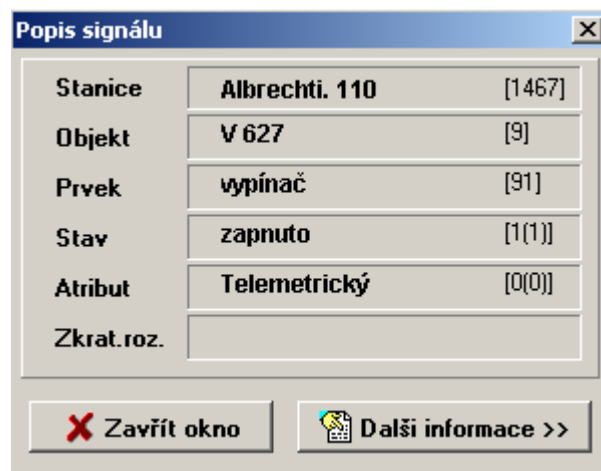


Fig. 6 Basic window of the help element

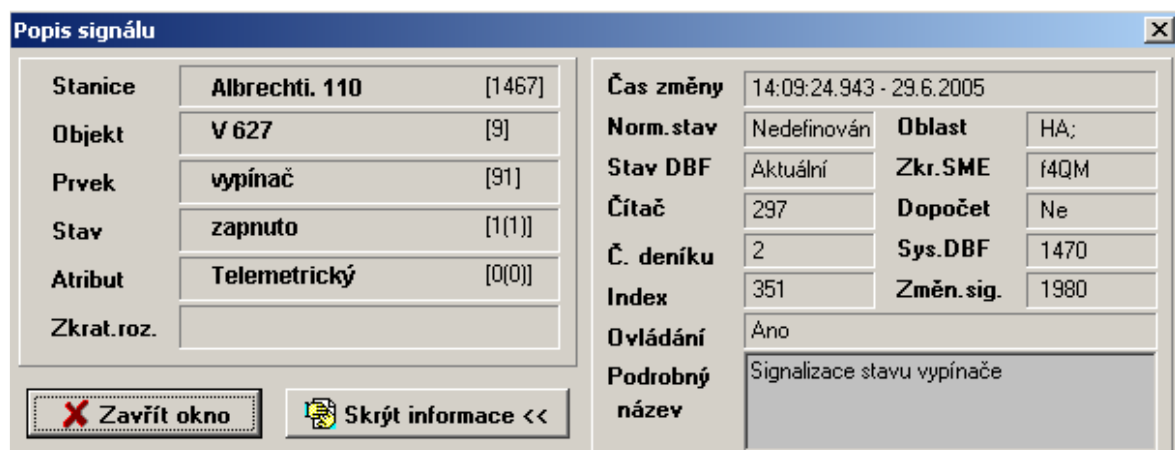


Fig. 7 Full window of help element

Marks serves for signalling and recording temporary changes and notes (generator, normals for substation, failure, work on line, bolting, grounded, ...) in figures. In addition to the default types of marks, after agreement it is possible to additionally define the further types. The number of marks in the image is not restricted. The mark is created on the position of the cursor anywhere in the image by clicking with the right mouse button and selecting the item *Creation of mark*. The dialogue window is called up by typing the type of the mark, the further parameters of the display of the mark and with the text window (commentary) for the mark. If the click on the right mouse button is performed on the already existing mark, it can be edited by selecting *Edit mark* or cancelled by selecting *Cancel mark*. When editing of the comment to the mark, the line with the date and the time of editing is automatically generated which cannot be changed. The closed commentary which is displayed in grey cannot be changed; it can only be changed by the system administrator. The window is closed by pressing the key <Esc>, by clicking on the icon in the header of the window or on the “Cancel” button.

Marks are created as additional information to the specific graphic objects with which they have a direct relation. The mark can be located anywhere in the diagram, during its creation it is necessary to link it with the object to which the information relates.

In low-voltage networks the marks are linked to individual objects. During the movement of the mouse over the diagram the objects are highlighted at which the mouse is pointed. If the mouse is on a select-

ed object and creation of the mark is selected, it is automatically linked to the highlighted object. In the case that it is necessary to locate the mark to another place, place the mouse on the required place and select *Create mark*. No object is selected and the system will automatically call to select the object. Click on the required object to create the mark.

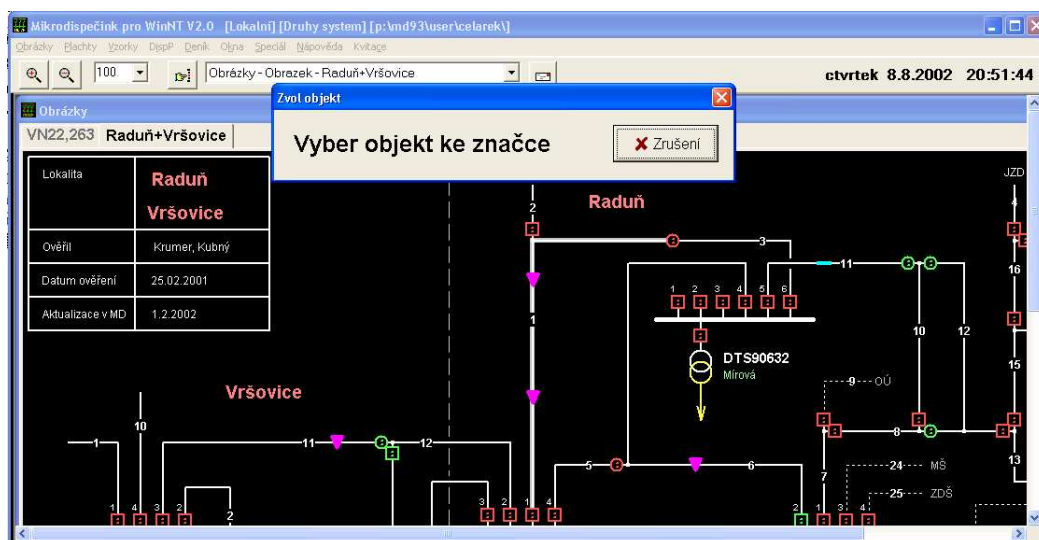


Fig. 8 Selection of the object to the mark

The text is edited using the keyboard, using the mouse it is possible to work with marked text. The text is marked by pressing and holding the left mouse button and dragging through the text which is to be selected – the text is highlighted in blue for the standard set Windows colour pattern. Then by clicking with the right mouse button and selecting the required function it is possible to copy (saving into the clipboard) or delete the selected text. Text from the clipboard can be called up again in the place of the cursor by clicking on the right mouse button and selecting the item *Insert*. By clicking on the “Save” button the changes are saved and, at the same time, the editing window is closed. It is also possible to call up the text from the clipboard in the editing of the text of another mark, in editing of the comment to the text of the mark or another text editor working in Windows.

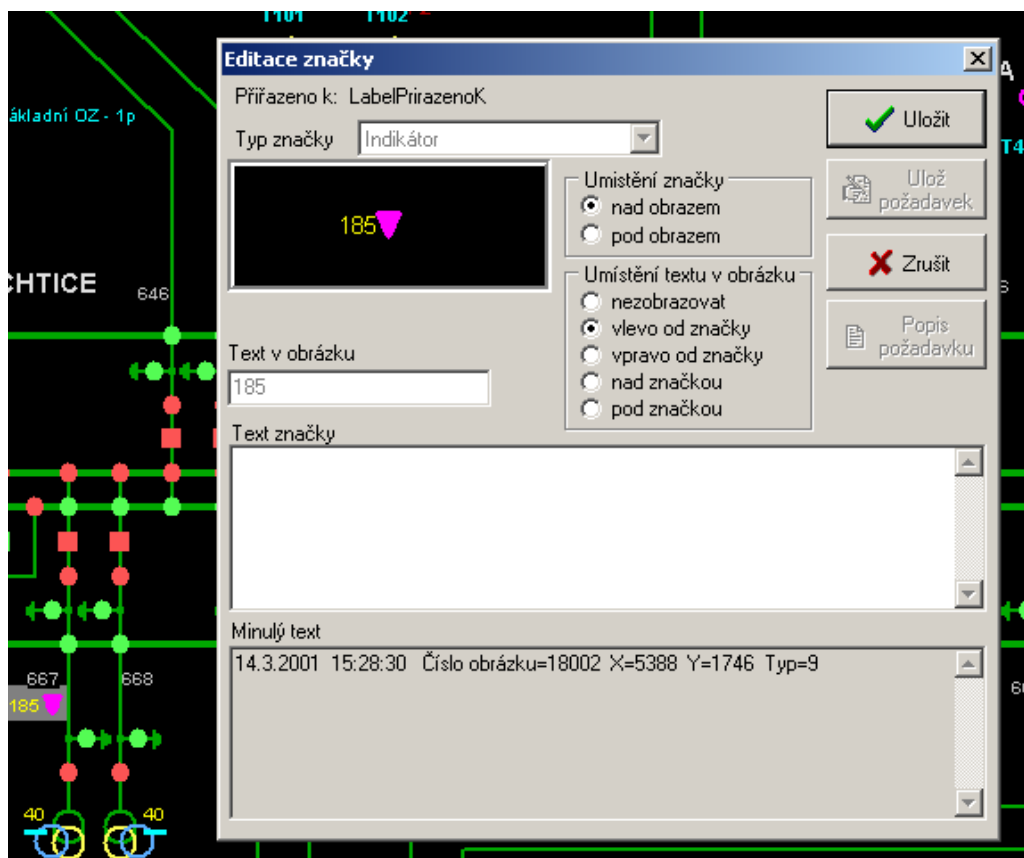


Fig. 9 Window for editing the mark

Normal statuses can be displayed in the figure by clicking with the right mouse button anywhere in the figure and selecting *Activate normal statuses*. Then the display of live statuses is switched into normal statuses. Normal statuses are not refreshed – i.e. a change of the normal status is reflected in the image after closing and re-opening. It is possible to switch to the normal display after the previous procedure but now the name of this selected item in the offered menu is displayed as *Disconnect normal statuses*. In the standard manner the display of the perforated element is used in the colour corresponding to the status of the signal. Elements whose live status does not correspond to the normal status are flashed. Elements without the definition of the normal status are displayed in a white colour. The setting of the normal status is performed traditionally by clicking with the right mouse button on the signal and selecting the item *Manipulation by the element*. In the lower edge of the window (see Fig.2) the normal status is set – it can be changed by clicking with the mouse on the side button. It is not possible to change the normal status for elements displayed in a white colour, first of all, the system administrator must set the normal status. The change of normal statuses is conditioned by permission; the user cannot change the normal statuses without permission. The exceptions are only normal statuses of protective low-voltage elements and signals NetMdisp, whose normal status can be changed only by the system administrator in the graphics editor for the diagrams.

Global acknowledgement This function enables to acknowledge all unacknowledged values visible in the actual window. The values which are outside the displayed window cannot be acknowledged by this function. After selection of the function, you are first asked whether you really want to acknowledge the actual window. If so, then there is the checking of the unacknowledged signals and their list is transferred to the communication computer for processing. The number of acknowledged values is written into the diary. It is possible to call up the function anywhere in the image through clicking with the right mouse button and selecting the item *Global acknowledgement*.

Scale is set by clicking with the right mouse button anywhere on the image and selecting the item *Scale of the image*. In the displayed window (see Fig. 10) select from the pull-down menu a new scale for display and confirm by clicking on the button “Set”.

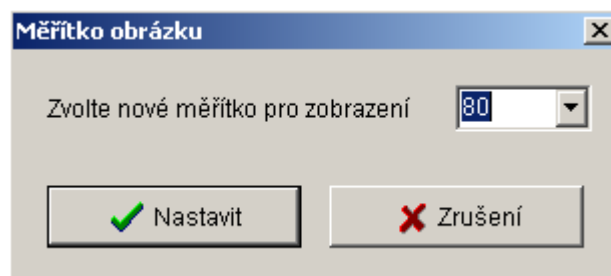


Fig. 10 Window for setting the scale of the image

Select the item **Print** by clicking with the right mouse button anywhere in the image to open the “Print” window for parameterisation of the printing. It is possible to do this by moving the mouse on the “Special” item in the main menu and selecting *Print* in the opened sub-menu by clicking on it.

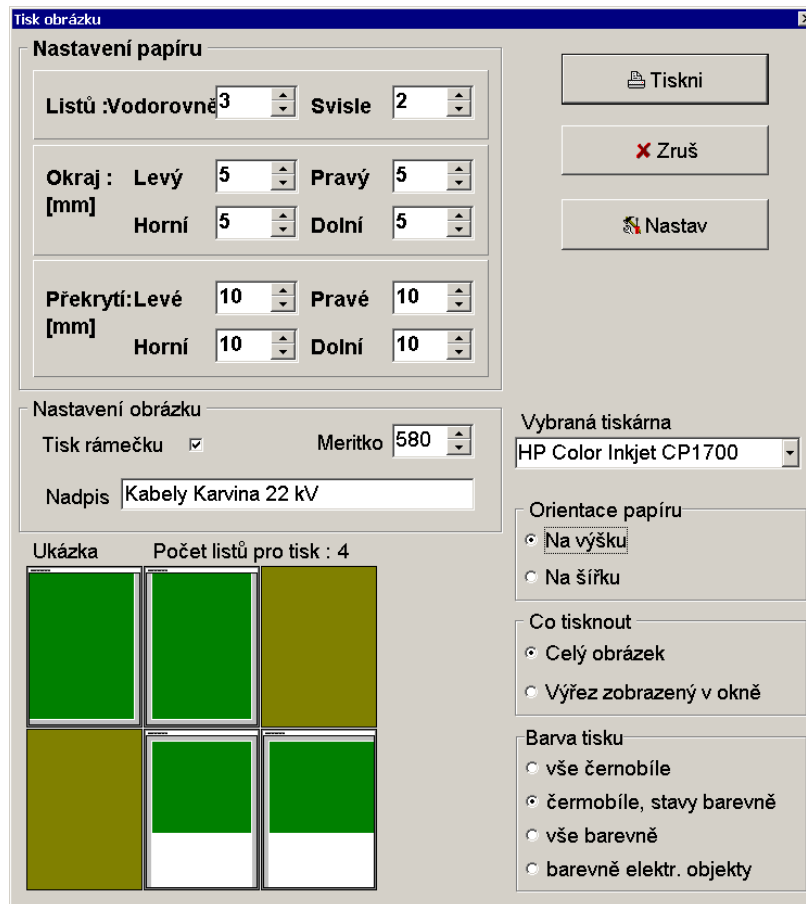


Fig. 11 Parameterisation window for printing the image

In the “Print image” parametrizing window the individual segments are typed by clicking with the mouse on the respective fields of the parameters or clicking on the increasing and decreasing arrows at the dome fields. It is possible to arrange the printing on a certain number of sheets, vertically, horizontally, to set the required margins, overlapping or to define the title of the image.

Overlapping is used in the case of printing on further sheets. The size of the overlapping and the width of the shift of the edges are typed in millimetres.

In the case of a request to print the image on further sheets, the sheets to be printed can be selected. Selection is made by the mouse clicking on the respective sheet in the window of the example. The page which is not printed is displayed in yellow-brown.

The size of printing can be selected by the “number of sheets and the size of the margins and overlapping” or “scale”. The calculation of the size will be controlled according to the method of setting. For setting the “number of sheets and the size of the margins and overlapping” the scale will be automatically recalculated with the use of the area of selected sheets. This method of typing is signalled by highlighting the part for setting the paper. In the case of setting by the “scale”, the necessary number of sheets will be automatically recalculated although it is not necessary to use the maximum amount of sheets. The value of the scale depends on the resolution of the printer being used. The manner of selection of the printer can be found on the printed sheet according to the printed scale or the total number of sheets.

In the case that the diagrams are archived on further sheets, it is possible to additionally print only the sheet on which the change was made. To be able to use the function, it is necessary to remember the following principles:

- First of all, **always set the same** value of margins and overlapping, orientation of the paper and selection of printer settings.
- To be able to print using various printers, it is necessary to use the size control according to the “number of sheets and the size of the margins and overlapping”. After modification, the image must not change its size
- In the case that all printouts are only on one type of printer, it is better to use the control according to the “scale”. It is possible to change the size of the image if there is no overall shift.

- Selection of a larger width of the overlap eliminates small shifts or modifications concerning more sheets.

Printing can be done using printers installed in Windows by selecting the printer from the “Selected printer” pull-down menu and set by clicking on the “Set” icon (the standard setting dialogue of this selected printer in the respective operating system is displayed). The further parameters are the size of the paper and orientation in the printer. The “Example” field serves for consideration for whether the set paper will be used by the printed image. In the “What to print” field it is possible to select the printing of the whole image or only part of (cut) selected in the respective window. After completion of this parameterisation, printing is confirmed by clicking on the “Print” icon.

By clicking with the right mouse button anywhere on the image, the following items can be selected:

- **Colouring** – if the administrator defines the colouring of the whole image, the active sub-menu can be opened by clicking on this menu item with the following functions. “Activate colouring according to sources, Activate colouring according to sources including statuses, Activate colour according to the connection, Activate colouring according to collection units, Activate colouring according to collection units, including statuses, Deactivate colouring”. If the colouring is not defined, the sub-menu has inactive functions (the font colour for the function is grey).
- **Opening the diary** – select this item to open the auxiliary diary (see Chapter Diary).
- **Close window** – select this item to close the window of the image
- **Properties of windows** – moving to this item will open the sub-menu with the options of setting the parameters of the displayed window. Detailed information is provided in the Chapter “Windows”.
- Full menu items displayed by clicking with the right mouse button or signal, measurement, mark or other mentioned marks on any part of the image can be seen on the following printed menu items (Fig. 12, 13, 14, 15). In practice the menu items are less, i.e. if the user does not have the right for the respective function, this function is not displayed in the menu or after selection of the function in the consequently displayed window, some icons are not active.

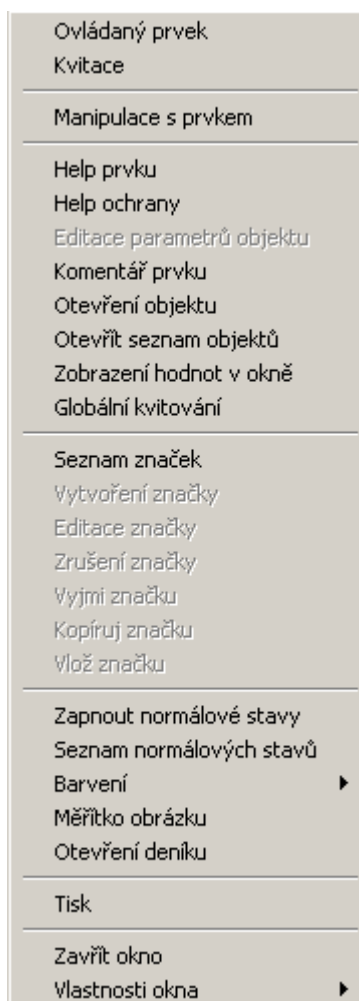


Fig. 12 Menu with functions on the signal

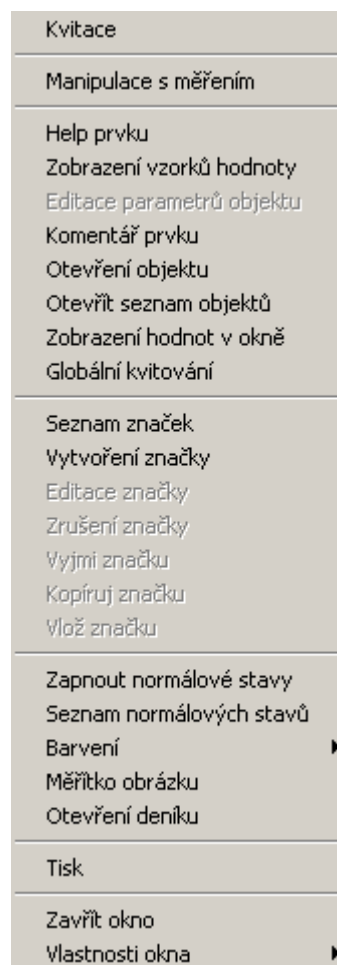


Fig. 13 Menu with measurement functions

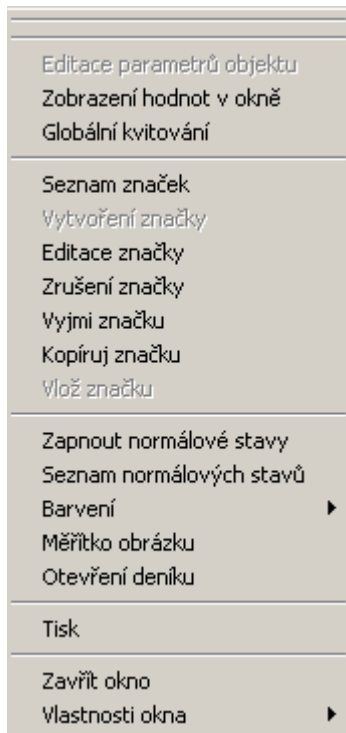


Fig. 14 Menu with functions on the mark

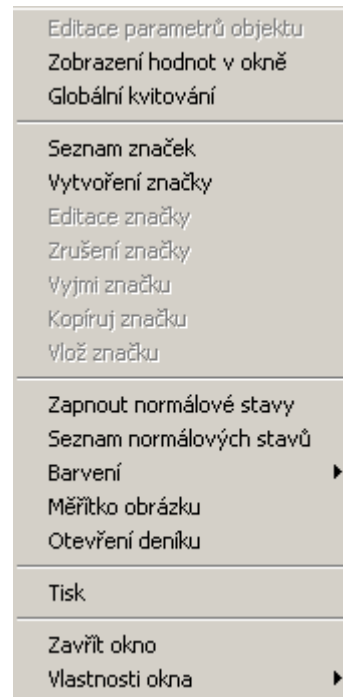
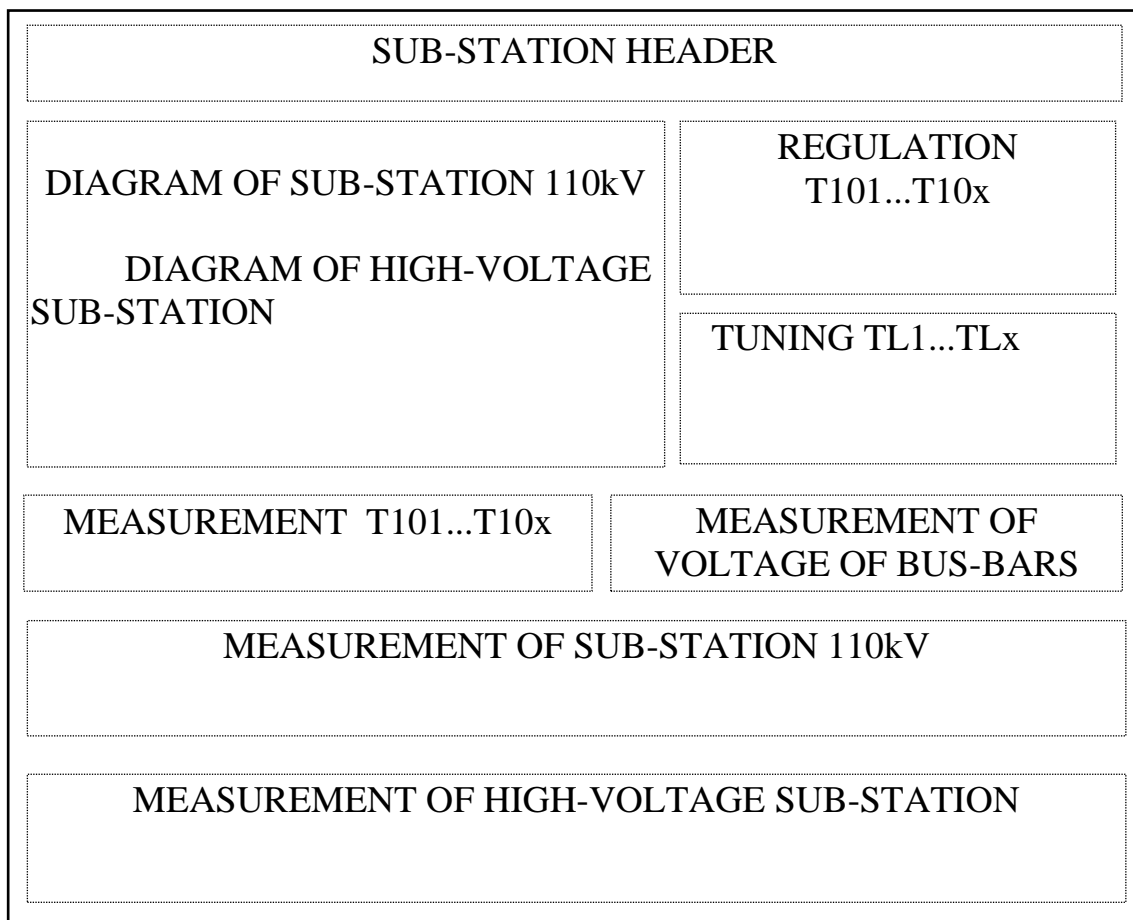


Fig. 15 Menu with functions in the diagram.

3.2 Drawing and use of sub-station images

Sub-station images are drawn according to the following type allocation.



In the header of the sub-station, the voltage system is displayed, the name of the sub-station and the change recalculations through which the user has the option to check the statuses in the respective sub-station. Some signals or measurements cannot be achieved in this manner; however, it concerns the status values which under no circumstances mean the failure or risk (e.g. signalling of the level of operation of OZ). All signals and measurements from the sub-station are contained in the respective objects and can be displayed by clicking with the mouse button on the selection of the item *Open list of objects* (see sub-chapter “Work with objects”). A diagram of the sub-station is produced according to the single-pole diagram so that the allocation of cubicles is kept and the measuring transformers for voltage and current are drawn in the image. The statuses of disconnectors are displayed as the mark circle, switches as the square. For the outlets the voltage and current are displayed (without the attribute and decimal places), in the cubicle of measurement U_s , U_{fL1} , U_{fL2} , U_{fL3} (without the attribute and with one decimal place). Beside the transformers the measurement of active and reactive power is displayed (without the attribute and decimal places). All measured values in diagrams are stated including units. In the case that synchrocheck is used in the sub-station, there is also the element through which it is possible to block the synchrocheck function.

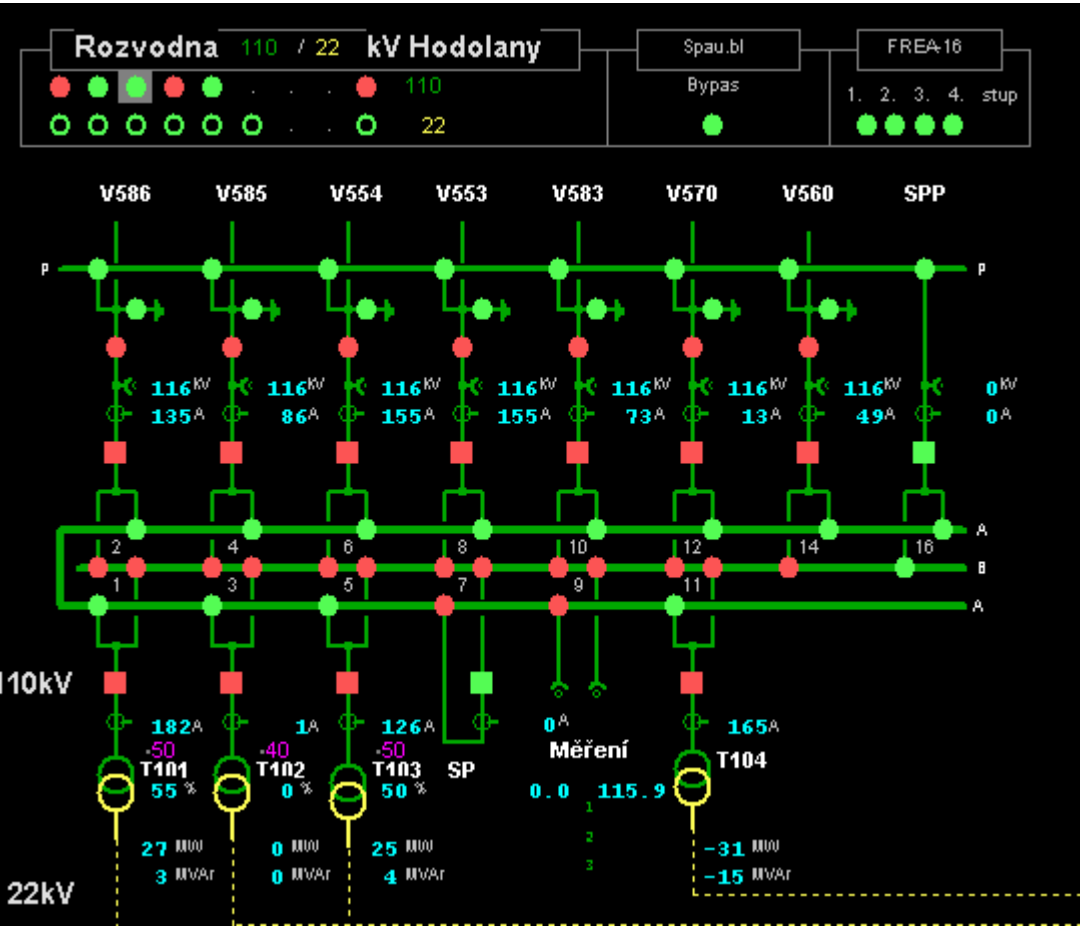


Fig. 16 Diagram 110kV of Hodolany sub-station

Each image contains a table of measurements where all measurements are displayed which occur in the sub-station with the attribute with one decimal place.

Tržba 110/22	T101	T102	T103	T104	ROCV. 110	Měřem. A	Měřem. B
I [A]	746.51	0.01	641.61	913.01	Uc [kV]	0.01	115.51
Uc [kV]	22.71	22.61	22.71	22.01	Uf1 [kV]	0.01	67.61
P [MW]	29.01	0.01	24.91	-30.71	Uf2 [kV]	0.01	67.81
Q [MVar]	3.11	0.01	3.61	-15.11	Uf3 [kV]	0.01	67.51
teplost [°C]	37.21	27.71	38.61	37.31	f [Hz]		

ROCV. 110	V638	V636	V664	BP	V662	V622	V670
I [A]	146.01	89.01	161.01	0.01	164.01	78.01	9.01
U [kV]	115.51	115.51	115.51		115.51	115.51	115.51
P [MW]	-29.21	-17.91	32.91		32.91	15.81	-0.31
Q [MVar]	-4.91	-0.71	2.51		4.11	0.31	-1.81
MLOK [km]						0.01	0.01

ROCV. 22	VM302	VM40	VM18	VM88	VM80	VM20	VM301
I [A]	56.71	49.31	91.91	73.41	0.01	122.31	53.61
U [kV]	22.71	22.81	22.71	22.71	22.71	22.71	22.71

ROCV. 22	VM41	h.18	VM32	h.21	VM38	H00	VM10
I [A]	87.51	0.01	101.71	0.01	6.21	6.51	145.21
U [kV]	22.71	0.01	22.81	0.01	22.71		22.71

Fig. 17 Measurement table

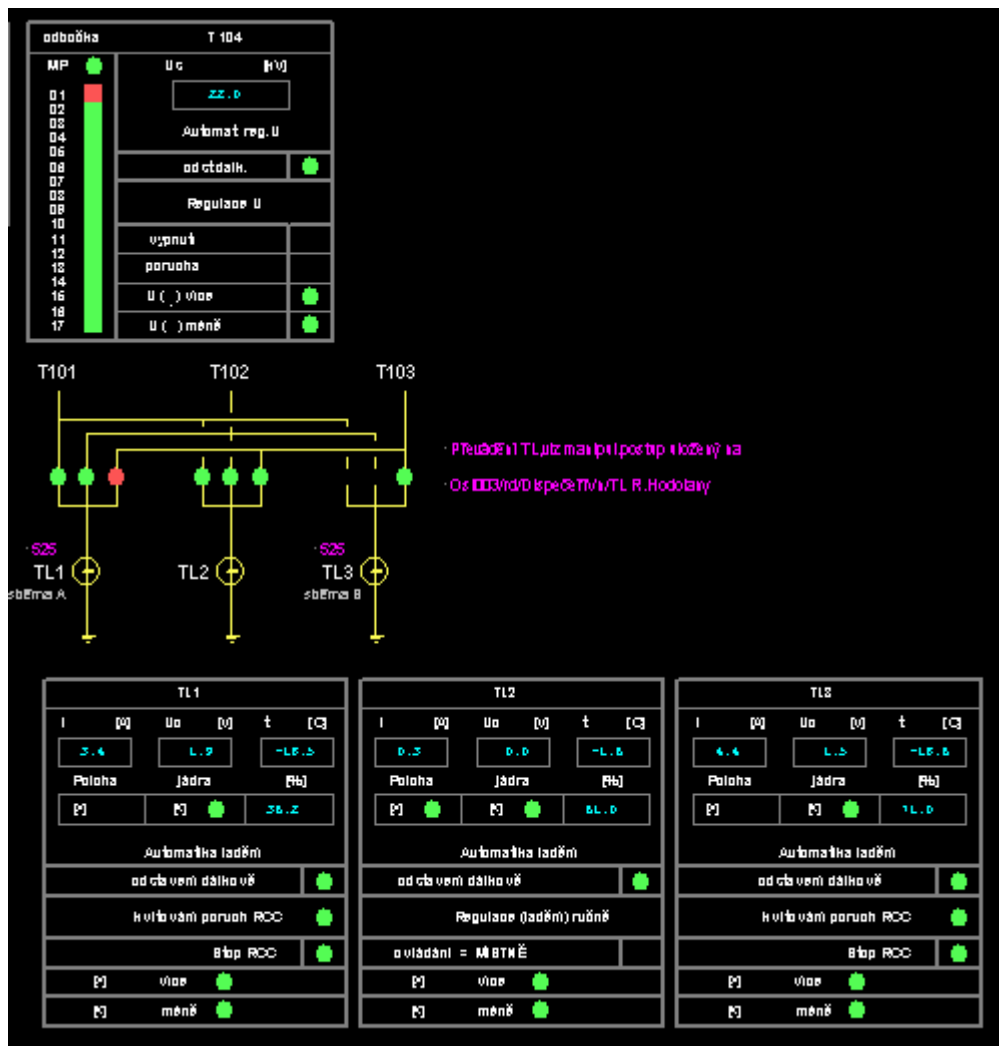


Fig. 3 – example of the tree structure of the COMES system. 18 Regulation of transformers and tuning of choke coils

3.3 Colouring of diagrams

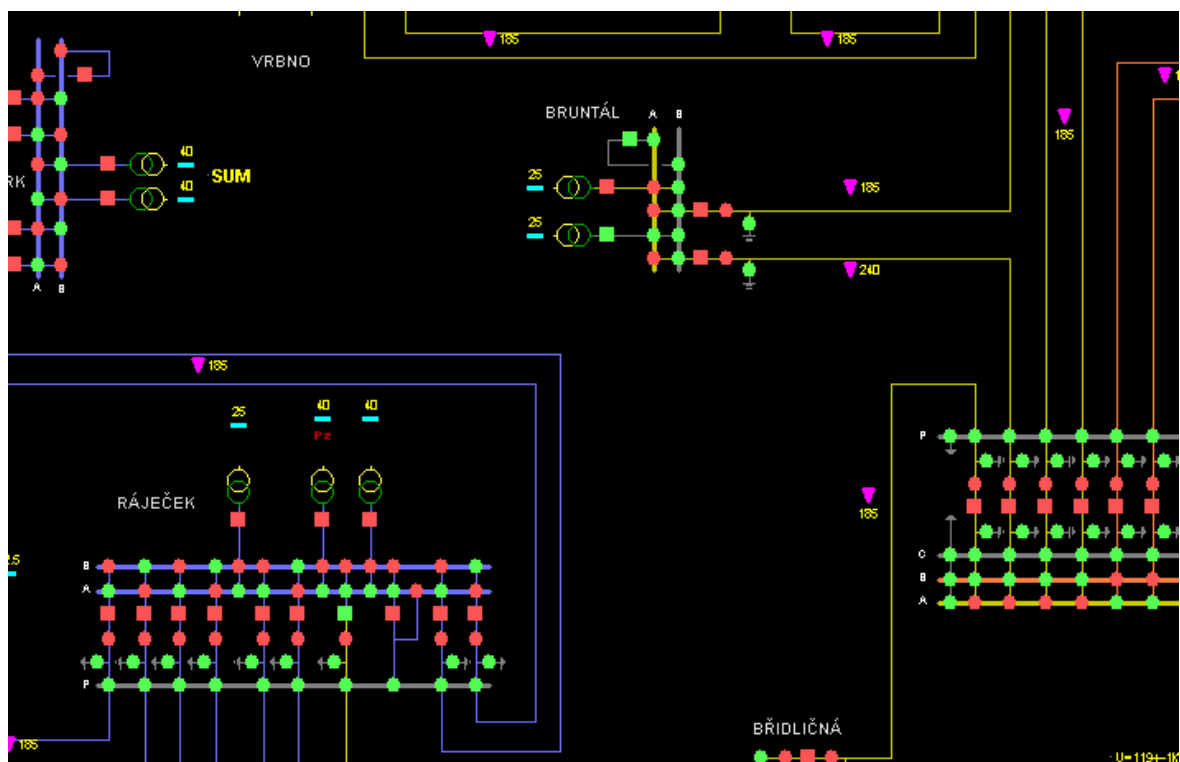
Diagrams of electric networks or sub-stations can be coloured according to the actual status of the network. The colouring is always performed from a defined source by the stated colour up to the object which divides the network. Colours of individual sources are stated by the system administrator and cannot be changed by the user. In the case that the object is supplied at the same time from two sources, the object is coloured by the colour according to the source with the lower sequence order. There are three types of colouring:

- **Colouring according to sources** – diagrams are coloured according to the sources defined on selected objects in the diagram. The colouring does not have any relation to other colouring in other images. If the menu item is not active, no sources of colouring are defined.
- **Colouring according to collection units** – the colouring functions in the sub-station diagrams. The individual collecting units are automatically defined as sources and the colour is assigned to them. The colouring is performed from these collection units and does not express the situation of whether the equipment is under voltage or not and does not relate to any colouring in other images. If the colouring menu item is active, it is necessary that the sub-station is drawn according to the rules for drawing technological sub-stations.
- **Colouring according to connection** – sources for colouring are defined by the system administrator in a special table and can occur in various images. With the aim that the colouring functions correctly, all diagrams in very-high voltage networks – sub-stations – high-voltage network – low-voltage network – must be mutually linked. Colouring according to defined sources passes through all linked diagrams and objects mutually linked are coloured in various images with the same colour.

Colourings according to sources and collection units always have two variants:

- **Basic colouring** – objects outside the power elements are coloured with the source colour. Power elements are displayed in the colour which expresses their status.
- **Colouring with statuses** – all objects, including power elements, are coloured by the source colour.

After selection of the method of colouring, the required diagram is coloured. The coloured image is displayed immediately and is constantly checked for change. For transfer into the normal regime of display, the item *Disconnect colouring* is displayed in the sub-menu. In the sub-menu only active items are active which can be used at the respective time.



3.4 Searching object

For easier finding of certain objects in images, it is possible to use the option *Search object*, which can be called up by means of <Ctrl-F>. Using this option it is possible to find the following objects in images: DTS VN, DTS NN, line section switch, locality by number, locality by name, sub-station, section in low-voltage network, high-voltage voltage.

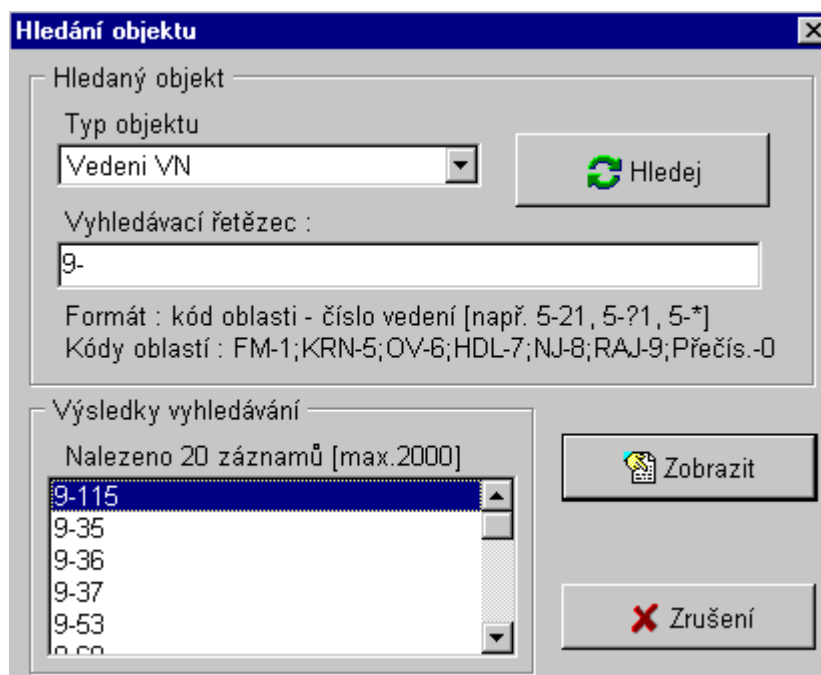


Fig. 20 Searching of sources

First of all select the type of object, type the search string according to the format stated in the table and type the option *Search*. In the lower part, the list of found objects is displayed according to the stated string. It is possible to select from this the object which we want to display and using the item *Display* open the image with the centring to the respective object.

3.5 Change line

The window for the resulting change signals is displayed by moving the mouse on “Images” in the main menu and selecting in the pull-down menu, the item *Change line*.

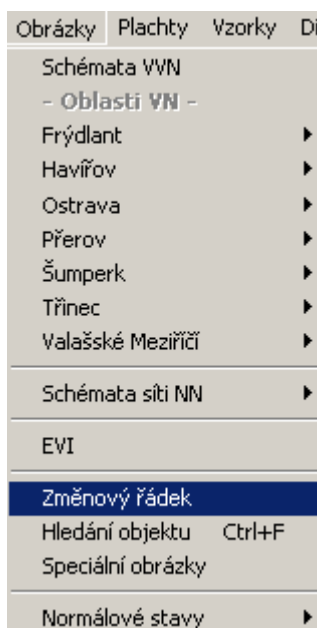


Fig. 21 Opening change line

The window is opened in a standard manner so that it is not possible to close it. It is possible to modify by clicking with the right mouse button in the window and then moving to the item *Properties of window* and in the pull-down menu *I can close the window*.

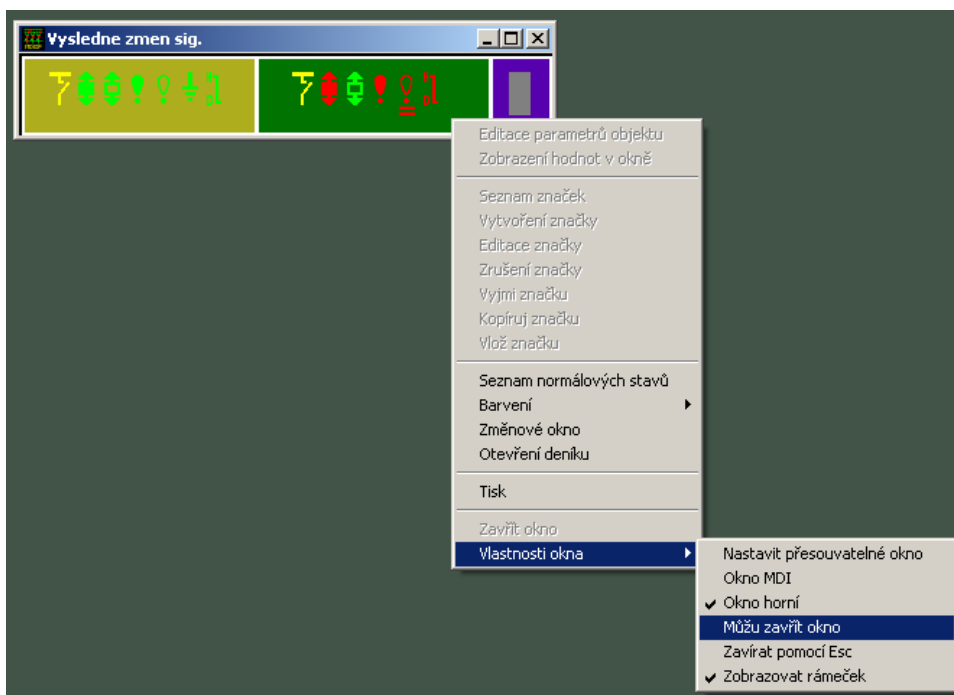


Fig . 22 Selecting closing the Change line window

It is possible to close the window for changing signals by clicking with the mouse button on the respective icon in its header or by clicking with the right mouse button in the header and selecting *Close*.

3.6 Special images

These images display the actual system status, diagrams and tables of failure signals and measurement and other special images.

3.7 Diagrams of high-voltage networks

3.7.1 Summary (dispatching) diagrams

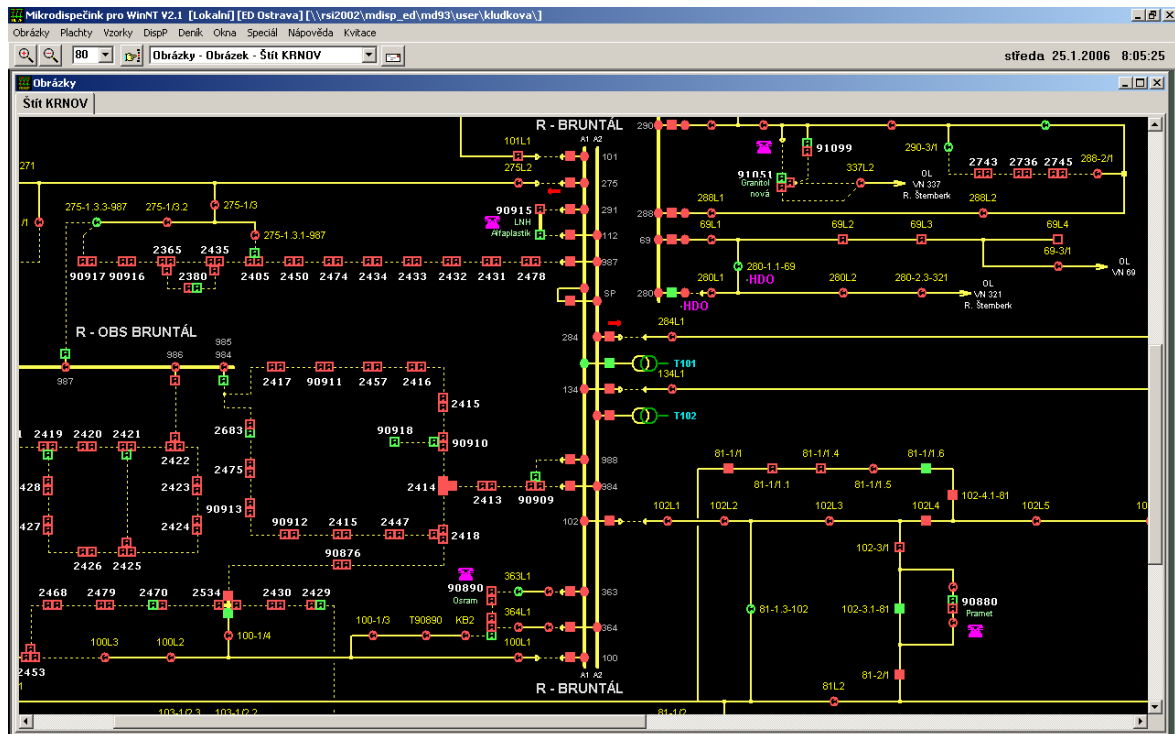


Fig. 22 Dispatching high-voltage diagram

The summary dispatching diagrams of the high-voltage networks serve for basic orientation in the high-voltage network of individual areas. In diagrams of this type are all sub-stations in the respective area, moreover, there is the whole course of the main line, including all regular disconnecting points and connections between individual lines, including all regular disconnecting points. Branches or off-take places in these types of diagrams are not drawn. For identification of individual objects there are the names of sub-stations, operating numbers of the lines and the operating numbers of the disconnection points (section switch and regular DTS). All system functions are available in the summary diagrams.

3.7.3 Emergency diagrams

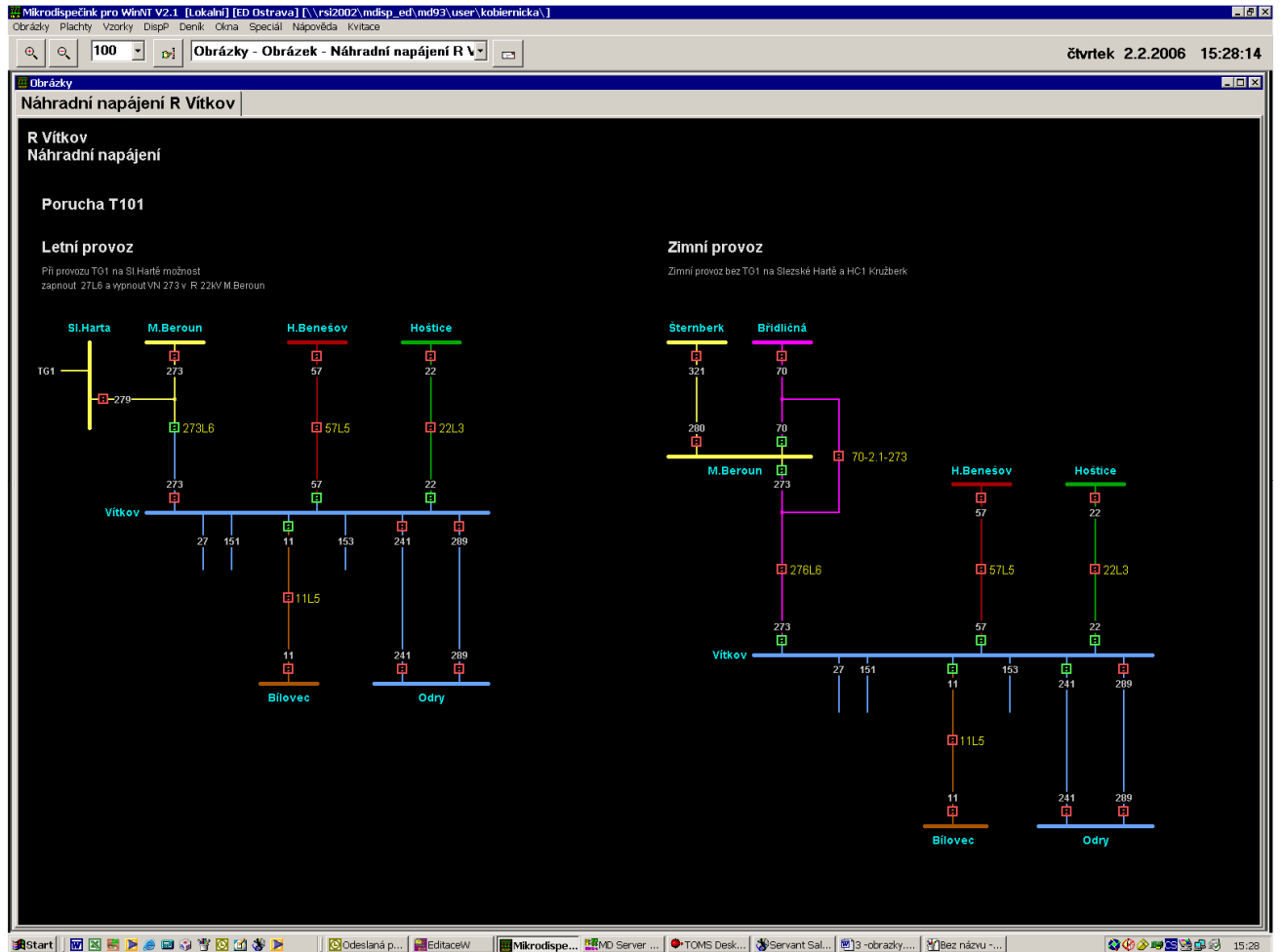


Fig 24 Emergency diagram

The emergency diagrams are classified according to individual areas and are drawn for all substations. They indicate the options for solutions to the possible failure for which they were defined. The statuses of the switching elements drawn in these diagrams show the required status and do not have any relation to the actual status of the disconnecting element. The statuses of these elements cannot be used by users; these are only within the competence of the system administrator. The colours of lines and collection units in these diagrams represent various areas of supply /they do not have any relation to the voltage level of the line).

3.8 Diagrams of low-voltage networks

After moving to this menu item we enter the sub-menu for individual districts and then the alphabetical list.

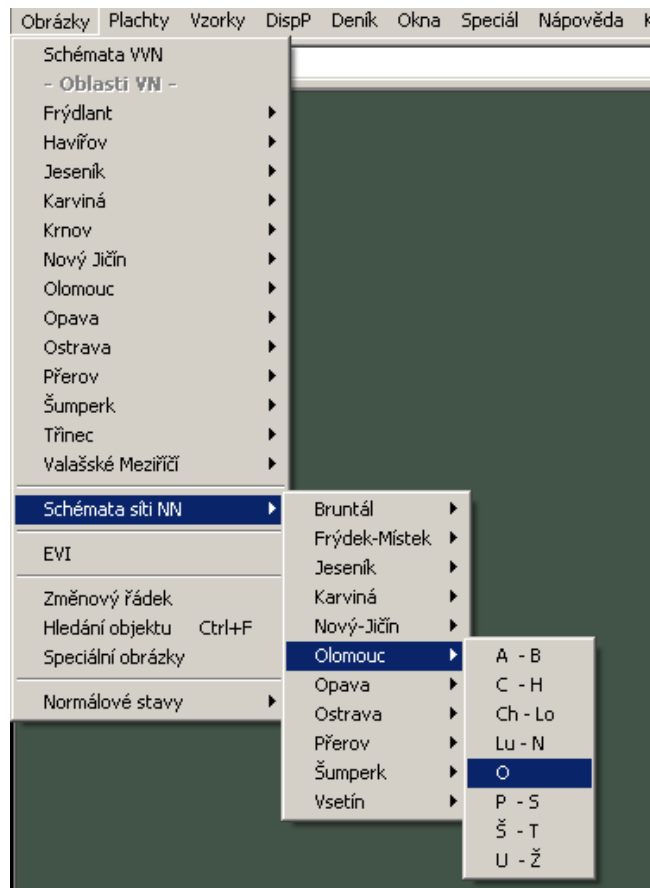


Fig. 25 Selection of low-voltage networks

After clicking on the selected item in the alphabetical selection, the window opens according to the selection. Click on the respective municipality or the city to open the window with the respective diagram of the low-voltage network.

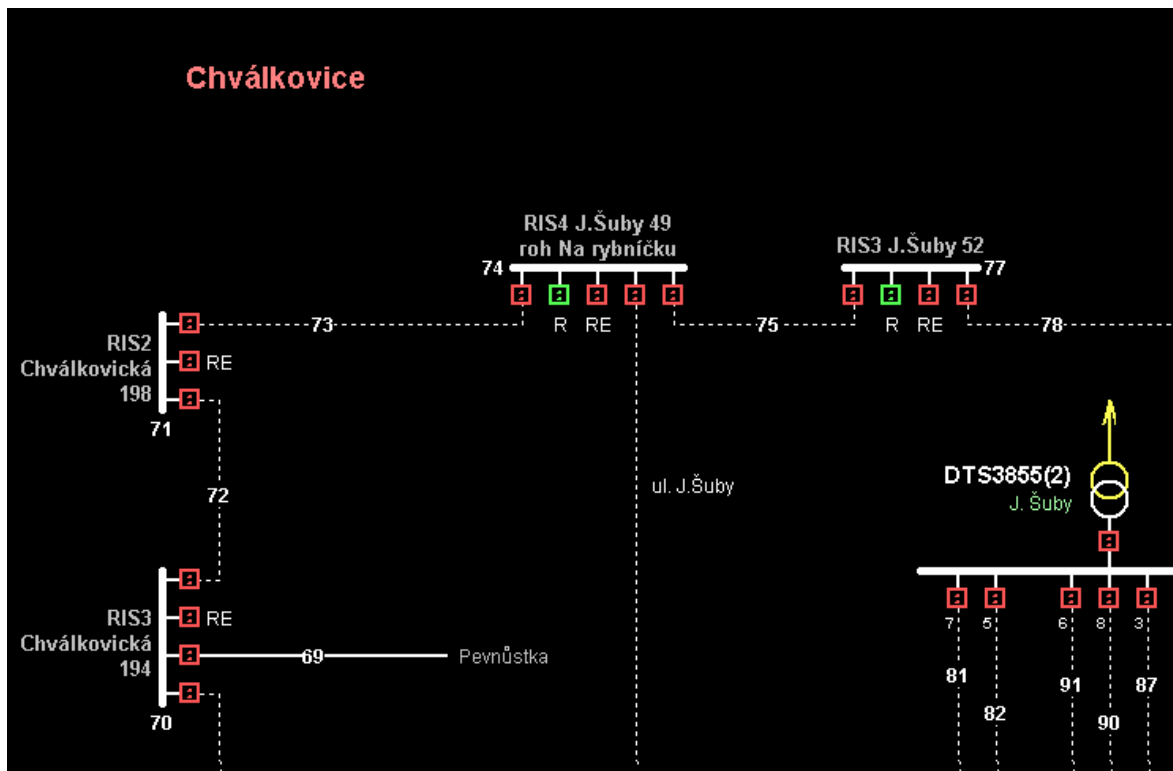


Fig. 26 Diagram of low-voltage network

The basic object in the low-voltage diagram is the locality. The number of the locality which is the unique identifier is taken from the TIS system. It is possible to draw DTS into a low-voltage diagram only in the case that DTS is defined in a high-voltage diagram. It is possible to draw DTS in any orientation which should be selected with respect to the maximum orientation in the diagram. DTS which are the property of other companies can be drawn into diagrams in a simplified manner. Independent identifiers are in these diagrams and low-voltage outlets from DTS. For stating the position of the respective DTS outlet within the master DTS its numeric indication is used. The graphic sequence order of the DTS outlet in the low-voltage diagram need not correspond to the numeric indication due to simplification. The low-voltage section is defined as a group of all mutually electrically linked conductors which is bordered by circuit breakers and the end of the line (in some cases the border of the low-voltage section can be in the node). Each low-voltage section must have the number of the section and this number must be unique within one locality. These numbers serve as the identifier of low-voltage sections and in the TIS system. For the connection of individual low-voltage diagrams, where necessary, connections are drawn. The linkage in both related diagrams is indicated by the number of the locality and the section number of the related diagram. The box with circuit breakers in the low-voltage diagram may generally contain any number of circuit low-voltage breakers, collection units, outlets and joints. According to the requirement of the user it is possible to draw individual off-take points into low-voltage diagrams. Moreover, it is possible to add any texts (e.g. names of streets, registration and orientation numbers, types and names of boxes with circuit breakers, etc.) whose range should not restrict the simplicity and understanding of the diagrams.

3.8.1 Graphic database help

In the images of the low-voltage network the help for graphic objects can be displayed. When moving with the mouse over the object, the object where the help can be displayed is backlit in grey. Click with the left mouse button on the backlit object to display the help.

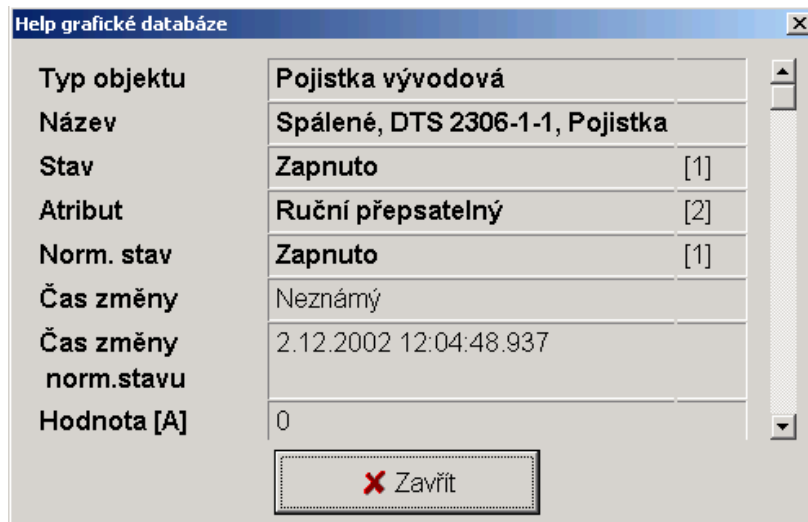


Fig. 27 Graphic database help

Data from TIS can be displayed for selected objects. If the data is available from TIS, the help window is expanded by the option to display this information.

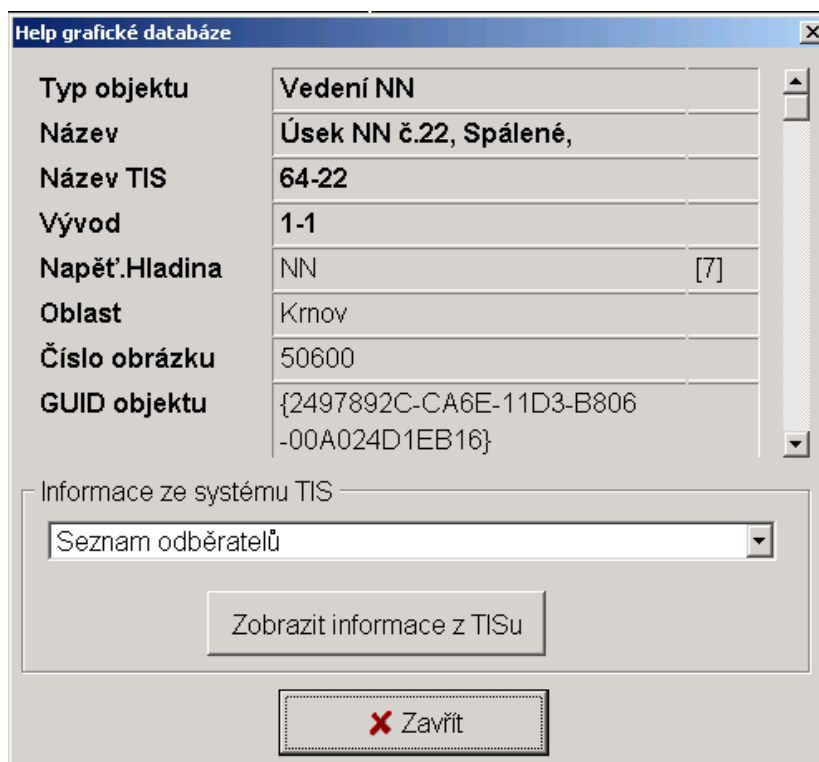


Fig. 28 Graphic database help with the option to read data from TIS.

When loading data from the TIS system it is necessary to wait as long as the loading is performed which may take a longer period in the case of loading of the TIS system.

Help systému TIS

Seznam odběratelů - 64-22

Poř.	ČOM	Jméno	Ulice
1	3097205	Valenta Jiří	SPÁLENÉ 15
2	3097234	Bečvářová Pavla	SPÁLENÉ 39
3	3097256	RIEDICH JAN	SPÁLENÉ 260
4	3097322	Svoboda Vítězslav	SPÁLENÉ 195
5	3097325	KOZANY VACLAV	SPÁLENÉ 199
6	3097331	Šrubařová Marie	SPÁLENÉ 208
7	3097366	Berkešová Helena	SPÁLENÉ 57
8	3097298	LOSOVSKY PETR	SPÁLENÉ 141

X Zrušení

Fig. 29 TIS system help

3.9 Relations between images

The diagrams of networks and sub-stations are mutually linked. Move to the line, e.g. in the diagram 110kV and the part will be backlit (see Fig. 31) and by clicking on this area there will be the switch into the respective sub-station. Mutual relations are evident from Fig. 32.

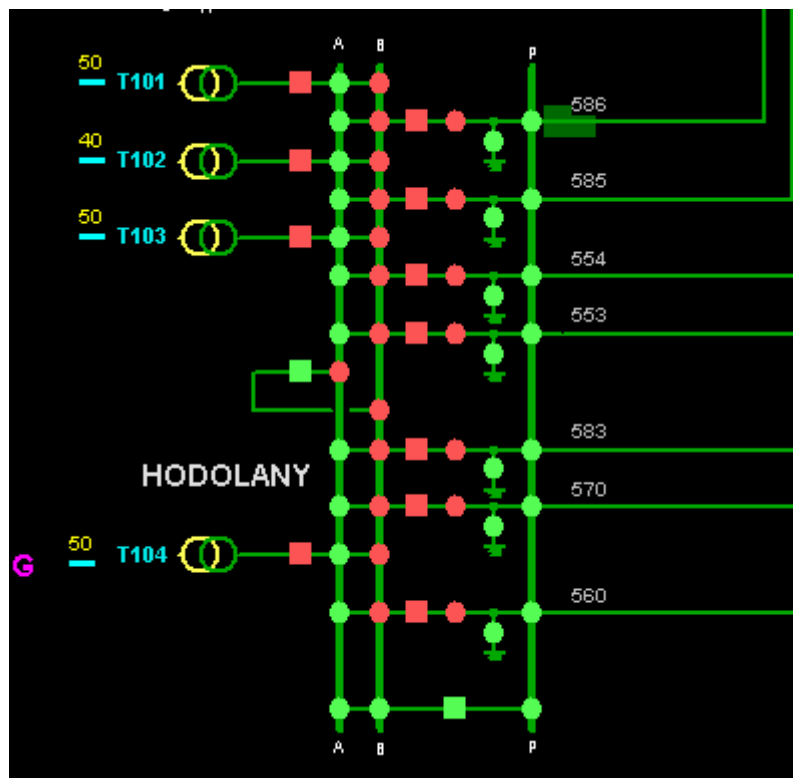


Fig. 30 The backlit area for line V586 for switching between images.

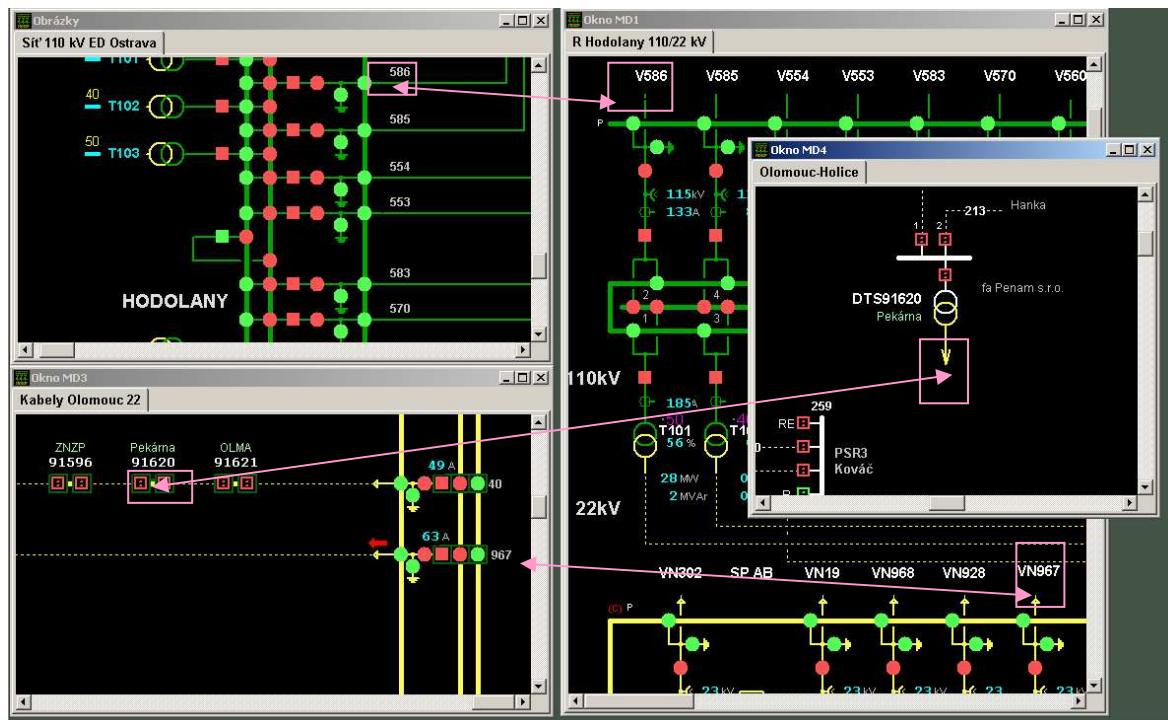


Fig. 31 Relations between images

3.10 Normal statuses

This option contains the further sub-menus: “List of differences” and “List all”.

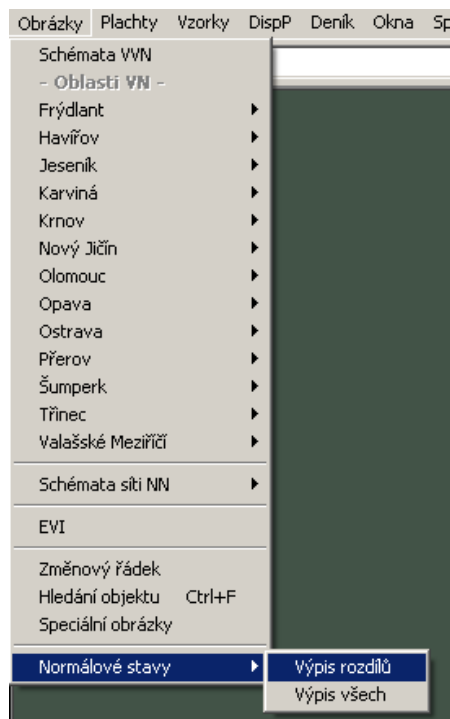


Fig. 32 Menu: “Type of display”

Using the option *List of differences* it is possible to display all normal statuses differing from live statuses. At the same time, the date and time of the last change of live signals is displayed. First of all the dialogue window is displayed which can be selected for whether you want to update the differences between

normal and live statuses. The updating of differences is time demanding and if it was updated by another user several minutes previously it does not make sense to do it again. After selection, the differences in the normal statuses are displayed.

All normal statuses can be listed with the option *List all*.

In the selected type of list, by clicking with the right mouse button it is possible to display the functions menu and by clicking on the respective items it is possible to change the size of the font in firmly stated steps or to print the content of the list or change the properties of the window.

The screenshot shows a window titled "ROZDILY NORMALOVYCH STAVU" with a table of data. A context menu is open over the table, showing options like "Velikost písma Ctrl+P", "Tisk", "Zavřít okno", and "Vlastnosti okna".

Řádek	Stanice	Objekt	Prvek	Norm. stav	čas
15	Hodolany 110	V 554	odpojovac A	VYPNUTO	12:0
16	Hodolany 110	V 554		VYPNUTO	12:0
17	Hodolany 110	V 553		VYPNUTO	13:0
18	Hodolany 110	V 553		VYPNUTO	13:0
19	Hodolany 110	V 553		VYPNUTO	13:0
20	Hodolany 110	Mer		VYPNUTO	08:0

Fig. 33 List of differences of normal statuses and the functions menu