

Page Editor

Editing Software for Control Pages

Manual PAGEED-1.6-EN-MAN



Page Editor

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Woodward Kempen GmbH

Krefelder Weg 47 • D-47906 Kempen (Germany)

Postfach 10 07 55 (P.O.Box) • D-47884 Kempen (Germany)

Telephone: +49 (0) 21 52 145 1

Internet: www.woodward.com

Telephone: +49 (0) 21 52 145 331

Fax: +49 (0) 21 52 145 354

Email: SalesPGD_EMEA@woodward.com

Telephone: +49 (0) 21 52 145 614

Fax: +49 (0) 21 52 145 354

Email: industrial.support@woodward.com

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1 Important Definitions


The types of messages shown below serve the safety of life and limb as well as for the appropriate operating life of the device.

DANGER!




DANGER indicates an immediately dangerous situation that will result in death or serious injury if it is not avoided.

WARNING!




WARNING indicates a hazardous situation that can result in death or serious injury if it is not avoided.

CAUTION!




CAUTION indicates a possibly hazardous situation that can result in minor or moderate injuries if it is not avoided.

NOTICE!




NOTICE is used to address practices not related to personal injury.



This symbol indicates useful tips and recommendations as well as information for efficient and trouble-free operation.

Proper Use of the Device and of This Manual

WARNING!



FOLLOW INSTRUCTIONS

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.

WARNING!**PROPER USE**

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (1) constitute “misuse” and/or “negligence” within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (2) invalidate product certifications or listings.

The programmable devices subject to this manual are designed for protection and also control of power installations and operational devices that are fed by voltage sources with a fixed frequency, i.e. fixed at 50 or 60 Hertz. They are not intended for use with Variable Frequency Drives. The devices are further designed for installation in low-voltage (LV) compartments of medium voltage (MV) switchgear panels or in decentralized protection panels. The programming and parameterization has to meet all requirements of the protection concept (of the equipment that is to be protected). You must ensure that the device will properly recognize and manage (e. g. switch off the circuit breaker) on the basis of your programming and parameterization all operational conditions (failures). The proper use requires a backup protection by an additional protective device. Before starting any operation and after any modification of the programming (parameterization) test make a documentary proof that your programming and parameterization meets the requirements of your protection concept.

The Self-Supervision Contact (Life-Contact) has to be wired with the substation automation system in order to supervise and monitor the state of health of the programmable protective device. It is very important that an alarm annunciation is driven from the programmable protective device self-supervision contact (Life-Contact) that requires immediate attention when tripped. The alarm indicates that the protective device is no longer protecting the circuit and the system should be serviced.

Typical applications for this product family/device line are for instance:

- Feeder protection
- Mains protection
- Machine protection
- Transformer Protection
- Generator Protection

Any usage beyond these applications the devices are not designed for. This applies also to the use as a partly completed machinery. The manufacturer cannot be held liable for any resulting damage, the user alone bears the risk for this. As to the appropriate use of the device: The technical data and tolerances specified by *Woodward* have to be met.



Out-of-date documentation?

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, please visit the download section of our website.

Please check the web site of Woodward for the latest revision of this Technical Manual and if there is an Errata Sheet with updated information.

- Visit the company website (\Rightarrow www.woodward.com) and search for the documents you are interested in. (The ID of every document is printed on its cover page.)
- Alternatively, every Prot_WIN_SW device has a QR code printed on it. Scan this code, and you are taken to an online directory that contains all relevant documents in the most recent version.

Important Information

WARNING!



In line with the customer's requirement the devices are combined in a modular way (in compliance with the order code). The terminal assignment of the device can be found on the top of the device (wiring diagram).

CAUTION!**Electrostatic Discharge Awareness**

All electronic equipment is electro static-sensitive, some components more than others. To protect these components from electro static damage, you must take special precautions to minimize or eliminate electrostatic discharges. Follow these precautions when working with or near the control.

1. Before doing maintenance on the electronic control, discharge the static electricity on your body to ground by touching and holding a grounded metal object (pipes, cabinets, equipment, etc.).
2. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
3. Keep plastic, vinyl, and Styrofoam materials (such as plastic or Styrofoam cups, cup holders, cigarette packages, cellophane wrappers, vinyl books or folders, plastic bottles, and plastic ash trays) away from the control, the modules, and the work area as much as possible.
4. Do not remove any printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
 - Verify the safe isolation from supply. All connectors have to be unplugged.
 - Do not touch any part of the PCB except the edges.
 - Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
 - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.

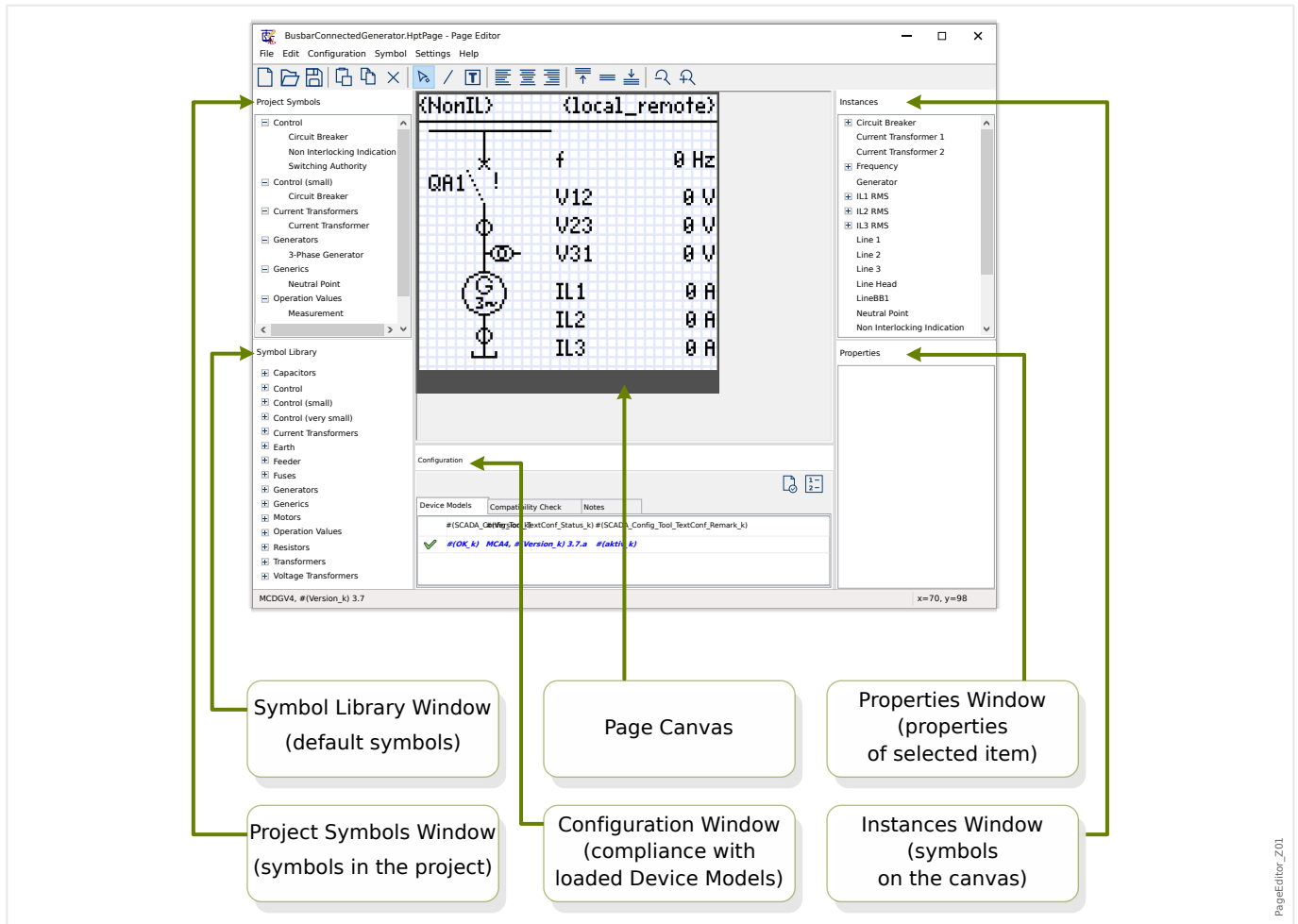
To prevent damage to electronic components caused by improper handling, read and observe the precautions in the *Woodward* manual 82715, "Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules".

Woodward reserves the right to update any portion of this publication at any time. Information provided by *Woodward* is believed to be correct and reliable. However, no responsibility is assumed by *Woodward* unless otherwise expressly undertaken.

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2 Introduction to the Page Editor

2.1 Application Overview



The Control Page (single-line diagram) is displayed after the »CTRL« has been pressed at the HMI of the Prot_WIN_SW device. It can be replaced by another one, so that you are able to adapt it to your application. The following is important to know in this context:

Remark: The default single-line that the protection device displays after a factory reset can be found as an HptPage file on the product CD that has been part of the delivery. Alternatively, it can be downloaded from the web-address that is printed as a QR-code on a sticker fastened on the device. In most cases you can use it as a template and adapt it to your individual needs.

The *Page Editor* is the software to be used for editing an HptPage file. It is a stand-alone application which is installed along with the *Smart view* installation. It is possible to launch it the usual way, (for example) via the Windows Start button. But if you have *Smart view* already running it is probably more convenient to use the menu item [Tools → Page Editor].

2.2 Panels of Page Editor's Main Window

Page Canvas (Drawing Area)

The Page Canvas is the drawing area where you can place any symbols, text and connection elements. It is the area that represents the Control Page (single-line) of the protective device. It has exactly the same amount of pixels as the display of the protective device. All symbols (bitmaps, lines and texts) placed on the Page Canvas are displayed in exactly the same size and position as will be presented on the protective relay's display. ("What you see is what you get", *WYSIWYG*). A thick horizontal bar at the bottom margin represents the space that is reserved for the Softkeys.

Symbol Library Window

The Symbol Library window provides a catalog of symbols that are available and ready to be used on the Page Canvas.

All these symbols have been installed together with the *Page Editor* application.

Project Symbol Window

All symbols that are used on the Page Canvas can be found on the Project Symbols window. Each used symbol appears only once in this window, because it represents the abstract symbol and not an explicitly configured instance of the symbol.

So, for example, if you have placed two Voltage Transformers on the canvas, the symbol "Voltage Transformer" can appear only once on the Project Symbols window.

Instances Window

All symbols placed on the page canvas have a representation on the Instances window. They are listed with their identifier names. If you have created six lines on canvas, you will find all six lines on the Instances window. If you click on any instance it gets highlighted together with the corresponding symbol on the Page Canvas. (This is also functioning vice versa: Clicking on any symbol on the Page Canvas also highlights the corresponding instance.)

So, contrast to the Project Symbol window, where two Voltage Transformers appear as only one entry, there are two Voltage Transformer Instances being listed on this panel.

Properties Window

When a symbol is selected, all of its representation properties are displayed on the Properties panel.

You can edit the representation values, so that you can move, rotate, flip or further adapt the symbol on the page canvas.



Configuration Window



This panel comprises the following tabs (sub-elements):

- *Device Models* – Overview of all loaded Device Models. It is possible to load several Device Models and to declare one of these as "active" (via right mouse-button click). The "active" Device Model controls which symbols and symbol configuration values appear in the Symbol Library Window. All other (i. e. "inactive") Device Models are only included in the compatibility check. The "Status" field shows for each opened Device Model whether the created Control Page (single-line diagram) is compatible with it.

- *Compatibility Check* - Compatibility Table between all loaded Device Models and all defined symbol configuration settings.
- *Notes* - User-defined text to describe the purpose of the Control Page under construction. Also version and end user information can be saved here.

There are two additional buttons »Page Test...« and »Switching Device Order...« in the Configuration window. These will be described in specific sections:

- »Page Test...« - See  “Step 3: Save the Control Page”.
- »Switching Device Order...« - See  “Changing the Order of the Switchgear in the Page Editor”.

The creation process of a Control Page is a six-steps procedure, detailed in  “4 Creation of a Control Page”, with some advanced topics in  “6 Advanced Topics”.

3 Control Pages

The *Page Editor* is a software in order to create and edit a Control Page (single-line) for Prot_WIN_SW protective devices. The Control Page is displayed on the relay's HMI after the »CTRL« key has been pressed.

The most common use case is to create a single-line diagram on the Control Page, representing the single phase representation of the electrical equipment (switching devices, measured values, state values and static symbols).

Control Page Elements

Typically the Control Page shows a single-line with the breaker and switching devices position. But it can also show measured values, states and user-defined bitmaps.

On the Prot_WIN_SW device, the Control Page features a control menu. This menu cannot be seen within the *Page Editor*. The *Page Editor* only shows a place-holder at the bottom of the page. The device's Control Page menu adapts itself automatically to the user-defined Control Page. Via this menu it is possible to operate the control elements of the Control Page.

Elements that can be placed on the Control Page:

- measured values
- state values
- static bitmaps
- static text
- symbols that have to be configured (e. g. circuit breakers, switches)
- static symbols (e. g. capacitor, current transformer)
- connection elements (e. g. busbars)

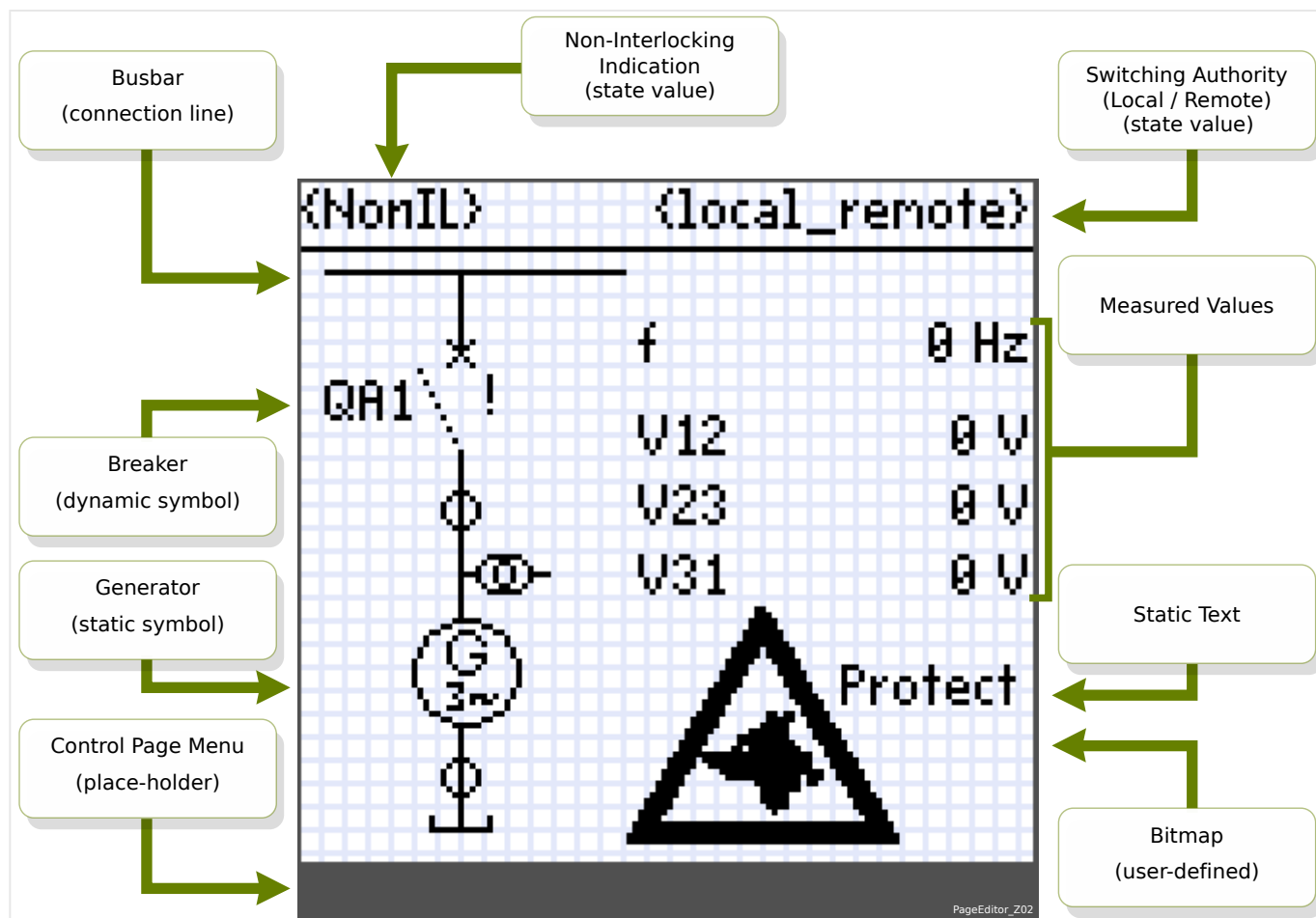


Fig. 1: Control Page Example within the Page Editor.

4 Creation of a Control Page

Creating a control page is a six step procedure:

- **Step 1:** Open a new Control Page [File/ New] and choose the Device Model of the target device.
- **Step 2:** Place and configure symbols (e. g. Single-Line diagram with symbols and connection lines).
- **Step 3:** Save the Control Page to a file.

Transferring the Single Line Diagram onto the protection relay with *Smart view*:

- **Step 4:** Open the target relay's parameter settings in *Smart view*.
- **Step 5:** Exchange the Control Page within the parameter settings.
- **Step 6:** Send the updated parameters settings to the target device.

NOTICE!



Please note that the Prot_WIN_SW Page file can be transferred into the device via *Smart view* but it cannot be copied back from the device to the PC.

When *Smart view* saves the current configuration to a "*.HptPara"-file the currently active single-line diagram is always included. Vice versa, if you load an HptPara file and transfer it to the protection device the single line diagram contained therein gets displayed.

But it is important to note that the other way round is **not** possible: There is no way to retrieve the currently active single-line diagram (in editable form) from the protection device, nor is it possible to export it from the HptPara file. As a consequence, it is strongly recommended to archive all the files that you have come across, not only the original file from which you started, but also all files that you created as individually modified single-line diagrams. There is a dedicated "*.HptPage" file format that keeps a single-line diagram - the so-called "page" - for later re-use.

Step 1: Open a Control Page

Option 1: Start from Scratch

In order to create a new control page select the menu item [File / New].

- **Select a Device Model:** The *Page Editor* will ask you to select the Device Model of your target device. If you do not know the Device Model of your protective relay yet, you can read it out by using the relay's HMI or *Smart view*. There you can find the Device Model [Device Para / Version] »DM-Version«. The selected Device Model provides all the information that the *Page Editor* needs to check compatibility of the Control Page. It is possible to change the target Device Model at a later point in time.
- **You have the option to load additional Device Models for compatibility checks:** Call up menu [Configuration/ Load Device Model...] to load the Device Model of the target device. In the Configuration window you can see if the Control Page is compatible with the loaded Device Model. Incompatible items will be shown under the tab »Compatibility Check«. After resolving all incompatible settings or removing the incompatible symbols, the Control Page will be compliant with the protection relay. Please note that only device models can be loaded that are installed or loaded (from devices) on your computer.

Option 2: Open/Edit an Existing Control Page (Using Templates)

- In order to create a new control page select the menu item [File / Load].
- Since it is not sufficient to simply edit the Page Canvas, but the *Page Editor* must be enabled to check the compatibility against one or more Device Models, it is necessary to also specify the target Device Model: select the menu item [Configuration / Load Device Model...] to load the Device Model of the target device. In the Configuration window you can see whether the Control Page is compatible with the loaded Device Model. Incompatible items are listed under the tab »Compatibility Check«. The Control Page must be made compatible with the protective relay by resolving all incompatible settings or removing the incompatible symbols.

Please note that only device models can be loaded that are installed or loaded (from devices) on your computer.

Remark: The default single-line that the protection device displays after a factory reset can be found as an HptPage file on the product DVD that has been part of the delivery. Alternatively, it can be downloaded from the web-address that is printed as a QR-code on a sticker fastened on the device. In most cases you can use it as a template and adapt it to your individual needs.

Step 2: Place and Configure Symbols

Available Symbols:

All elements on the Page Canvas are called symbols. Also static text elements and connection lines are symbols. There are three types of symbols: static, indication and configuration symbols.

Static Symbols (e. g. text):

These symbols are static. They do not represent changing values, states or switching positions.

Indication Symbols (e. g. measured values, states...):

Indication symbols are updated periodically. Measured values and States are displayed via indication symbols.

Configuration Symbols (e. g. Breakers,...):

These symbols interact with the device. They enhance the relays capabilities. They visualize e. g. switching positions. The relay's functionality is changed by editing the switching devices properties (e. g. by changing the "controlled" property). When removing the switching device from the Control Page, the relay will loose its related functionality.

Symbol Identifier (Symbol name within the Page Editor):

Each symbol that is placed on the page canvas will automatically get a unique identifier name (Line1, Line2, CurrentTransformer1 etc.). You can change this identifier for your convenience to a user-defined string. All placed symbols on the page canvas will be displayed with their symbol identifier within the Instances window.

Place and Configure Symbols

- *Library Symbols:* Drag and drop the required symbol from the Symbol Library window onto the Page Canvas. Adapt the identifier string, if necessary. Further configuration settings can be done later.

- *Project Symbols:* Drag and drop the required symbol from the Project Symbols window onto the Page canvas. Adapt the identifier string, if necessary. Further configuration settings can be done later.
- *Text elements:* Click on the "Text Tool" within the menu bar. Then click on the desired position of the page canvas and enter your text into the »Text box«. Adapt the identifier string, if necessary.

Remark: Prot_WIN_SW devices support only a fixed set of characters. If you use non-supported characters these are displayed as "?" on the Page Canvas.

- *Connection lines:* Select the "Line Tool" in the menu bar. Now you can draw connection elements.

Select Symbols

- Select the symbol on the canvas by clicking with the mouse onto it.
- Select the symbol on the Instances window by clicking with the mouse onto it.

Move Symbols:

Option 1

In order to move a symbol on the page canvas you can move it with the mouse.

Option 2

You can also move a symbol by modifying the symbol properties.

- Select the symbol
- Edit the symbol's representation properties in the properties window.

The available representation properties depend on the symbol type. Here some examples:

- x-, y-position
- rotation
- vertical and horizontal flip
- width and height of the symbol's place holder

Configuration of the Symbol Instances:

The symbol configuration is done within a pop-up window. This pop-up window appears, when:

- the symbol is being created (drag-and-drop)
- the symbol is being double-clicked on the canvas
- the symbol is being double-clicked on the Instances window

Configuration of Static Symbols (e. g. Text):

These symbols are static. They do not have any further configuration settings apart from their identifier string.

Configuration of Indication Symbols (e. g. Measured values, states...):

Indication symbols are updated periodically. Measured values and States are displayed via indication symbols.

Example: Configuration of Measured Values:

Configuration of Measured Values — Select Reference:

Select the measured value that you want to see. Within the drop-down box the values are ordered in the same way as within *Smart view* (e. g. [Operation / Measured Values / Voltage _empty_] »VL31«).

There are not only find measured values under [Operation / Measured Values], but also statistic values under [Operation / Statistics], counter values under [Operation / Count and RevData] state values under [Operation / Status Display]

Configuration of Measured Values — Label:

Name of the measured value as it will be visible on the Control Page (e. g. **VL31**).

Configuration of Measured Values — Preview Value:

This field contains an example value. You can change the value and/ or the unit of the example value to see how your Control Page might look like during operation. Changes to this field will not have any impact on the visualization later on.

Configuration of Configuration Symbols (e. g. Breakers,...):

These symbols interact with the device. They enhance the relays capabilities. They visualize e. g. switching positions. The relay's functionality is changed by editing the properties of the switching device (e. g. by changing the “controlled” property). When removing the switching device from the Control Page, the relay will loose the related functionality.

Example: Configuration of a Breaker

Name: The symbol name that shall be displayed on the page canvas (e. g. **QA1**).

Checkbox »Controlled«: Set this checkbox if the breaker can be controlled by the protection relay.

Checkbox »Break Capability«: Set this checkbox if the breaker is able to break short-circuit current.

Step 3: Save the Control Page

Compatibility Check

Before you can transfer the Control Page into the target device, you have to check if your page is compatible with your protection relay. The compatibility check of your created Control Page with the target device will be done by means of the device model that you loaded in [step 1](#). Please proceed as follows:

- Check the overall status in the Configuration window on tab »Device Models«. If the status is OK, proceed with the step “Add Notes – Add Metadata” (below). But if the status shows any problems, proceed as follows:
- Select the tab »Compatibility Check«. Here you can see which symbols and/ or configuration settings are incompatible with your target device. Resolve the incompatibilities (see section below).

- Do further validation tests and get more detailed information: Select [Configuration / Page Test...] within the main menu. A new dialog window opens, where you select »Run All Tests«. Now you get detailed information on all open incompatibilities.

Resolve Device Incompatibilities

You have the following options to solve incompatibilities:

- Remove incompatible symbols from your Control Page.
- Adapt the symbol configuration settings to fit your active Device Model.
- Add all switching device (e. g. breakers) objects to the Control Page that are required by your target device.
- Then execute the page validation tests again (see above).

Add Notes - Add Metadata

You should now add some description to your Control Page within the »Notes« tab of the Configuration window. We recommend to add author, revision info, change description, date, purpose and remarks.

Save the Control Page

In order to save the Control Page as a file select the menu item [File / Save]. In case that there are still any pending incompatibilities between your Control Page and the active Device Model, a warning will pop up. You can either resolve the incompatible settings first (see above) or save the incompatible Control Page. Please note that incompatible page files can not be transferred to the target device.

NOTICE!



A page file that does not fulfill the compatibility checks cannot be transferred to the target relay.

NOTICE!



The Prot_WIN_SW page file itself is NOT stored on the target device. The page file can not be restored from a Prot_WIN_SW device or Prot_WIN_SW Parameter file.

It is strongly recommended to archive your Prot_WIN_SW page files carefully.

When all incompatible settings and validation errors are resolved, the Control Page is ready to be transferred into the device.

Step 4: Load or Open the Relay's Project File

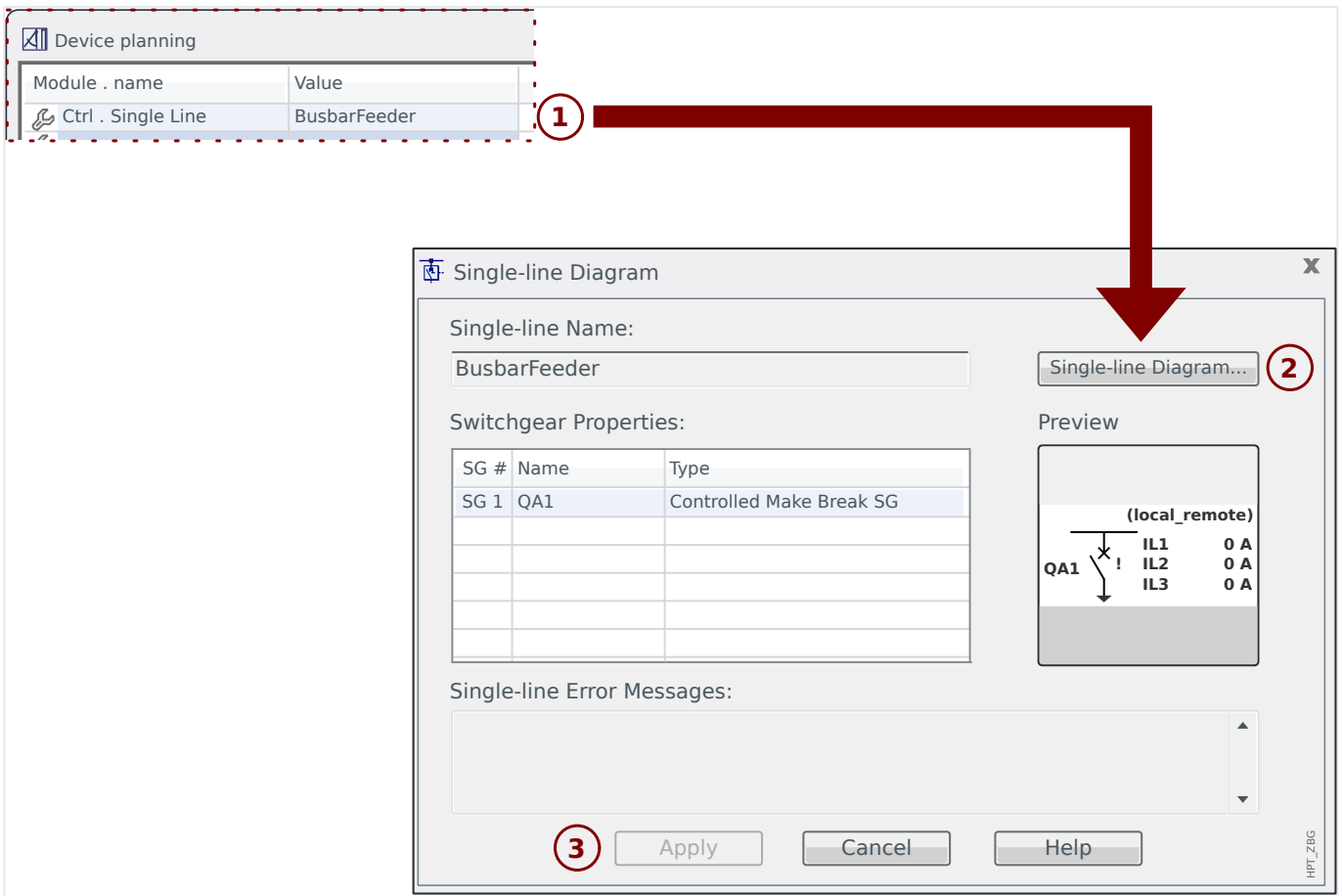
Open the target relay's project file in *Smart view*. This can be done:

- Online: Connect the protection relay to the PC (please refer to the *Smart view* manual). Receive the parameter settings from the device using *Smart view*.
- Offline: Load the relay's project settings file (*.HptPara).

Step 5: Load the Control Page into the Project File

In order to load the Control Page (Single-line Diagram) into the relay's project file (parameter setting file):

- 1. ▷ In *Smart view*, open the menu item [Device planning].
- 2. ▷ A double-click on the entry »Ctrl . Single Line« (“①” in the diagram below), opens the »Single-line Diagram« dialog.
- 3. ▷ Click on the button »Single-line Diagram...« (“②” in the diagram below).
 - ▶ This opens a file-select dialog.
- 4. ▷ Select your HptPage file.
 - ▶ The editing dialog displays the selected file (filename without “HptPage” extension, plus preview. If you have successfully passed the “Compatibility Check” of the *Page Editor* your new single-line should be o.k. so that the field »Single-line Error Messages« is blank.
- 5. ▷ Click »Apply« (“③” in the diagram below) to close the editing dialog.
 - ▶ The parameter »Ctrl . Single Line« is now marked as “modified” (see the description of the “red star” token in the *Smart view* manual).
- 6. ▷ Just as with any parameter change, the final step is to transfer the modifications to the protection device.



Step 6: Transfer the new Settings to the Protective Device

Transfer the new project settings (including the control page / single-line) into the protective device:

- Connect the device to the PC.
- Transfer all parameters to the device (»F7« key or by selecting the menu item [Device / Transfer all parameters into the device]), or you transfer the modified settings (»Ctrl«+»F7« or menu item [Device / Transfer only modified parameters into the device]). For further details, however, refer to the *Smart view* manual).

5 Switchgear Control

Representation of a Switchgear in the Page Editor

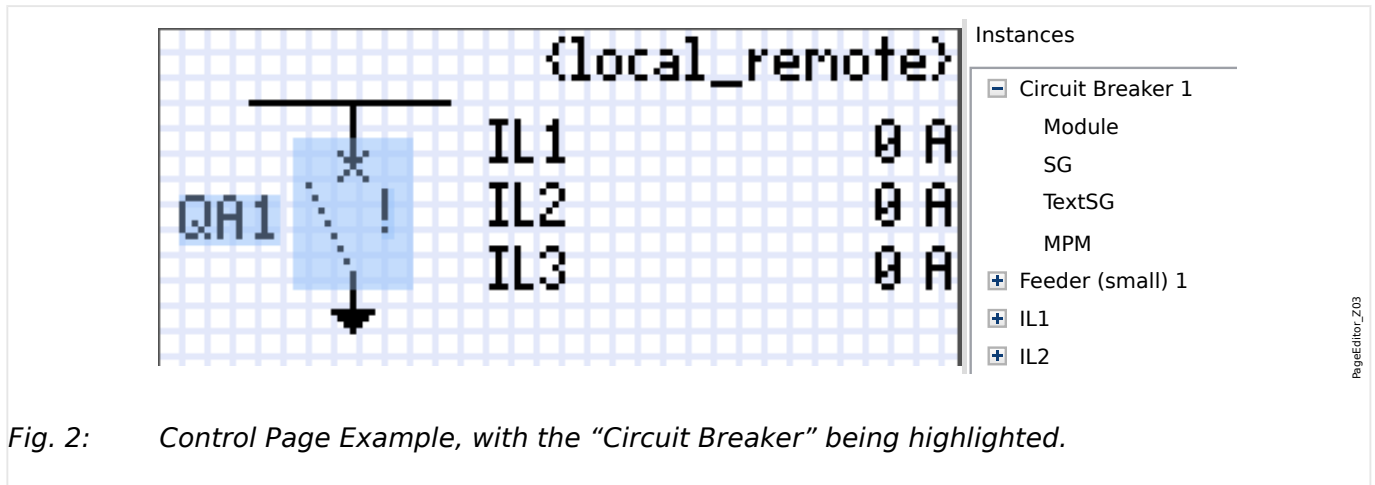


Fig. 2: Control Page Example, with the “Circuit Breaker” being highlighted.

Although a switchgear always appears using a fixed representation in the *Page Editor*, with an exclamation mark “!” being placed aside, this symbol features several representations: one for the closed switchgear, one for the open switchgear, one for the intermediate and faulty positions.

Once the single-line has been transferred to the protection device the switchgear is shown using the representation according to the configured position indication.

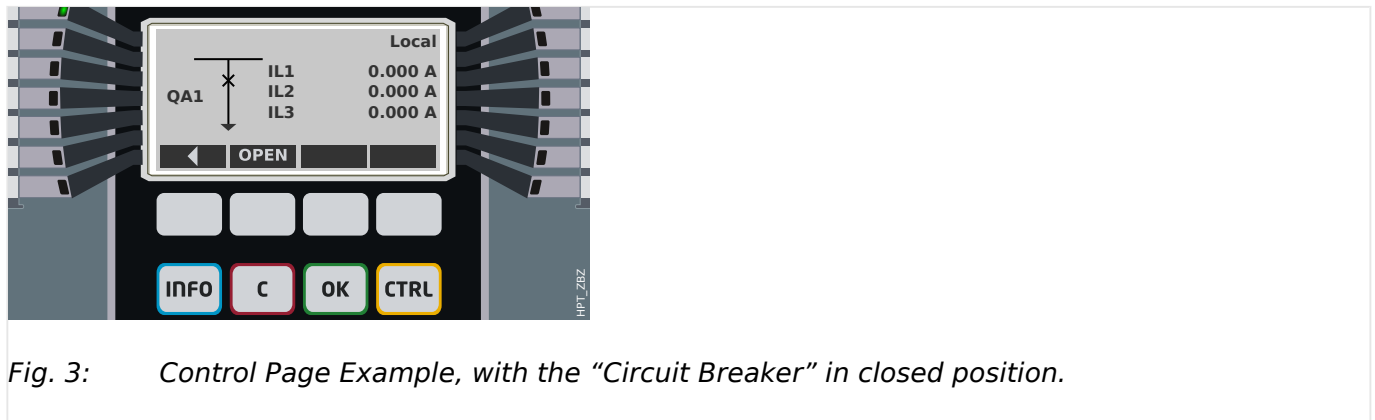


Fig. 3: Control Page Example, with the “Circuit Breaker” in closed position.

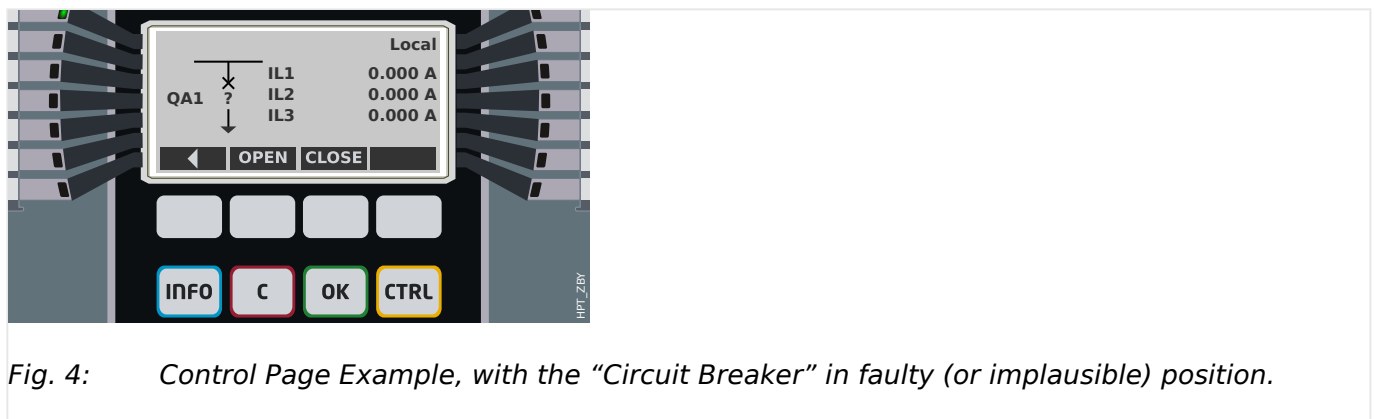


Fig. 4: Control Page Example, with the “Circuit Breaker” in faulty (or implausible) position.

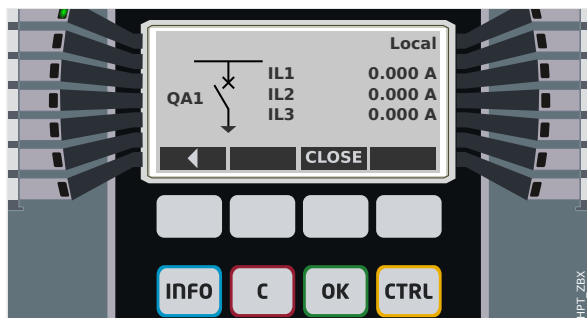


Fig. 5: Control Page Example, with the “Circuit Breaker” in open position.

Switchgear with the Property “Break Capability”

For each switchgear you can define in the *Page Editor* the “**Break Capability**” property. If this is set then you declare that the switchgear is a circuit breaker, that is capable to switch off the phase currents in case of a protection trip.

Therefore the protection device makes the “Trip Manager” available only for switchgears with “Break Capability”. (See also [↳ “Step 2: Place and Configure Symbols”](#), and for information about the Trip Manager, see the Chapter “Control” in the Technical Manual of the protection device.)

NOTICE!



Prot_WIN_SW devices require that the first switching device, »SG[1]«, must have the “**Break Capability**” property set, because this is the switchgear to which a protection trip command is routed by default.

A Control Page without “Break Capability” for »SG[1]« will not pass the compatibility check in the *Page Editor*.

“Controlled” Switchgear

For each switchgear you can define in the *Page Editor* the “**Controlled**” property. If this is set then it shall be possible for the protection device to execute manual switching commands for the switchgear.

If this property is not set, but the “Break Capability” is set, then the switchgear can still be used for **protection** trip commands. However, it will not be available for manual switching operations.

If neither “Break Capability” nor “Controlled” is set then the switchgear is only monitored, i.e. the status / position is available, but it is not meant to be actively used by the protection device.

(See also [↳ “Step 2: Place and Configure Symbols”](#).)

Changing the Order of the Switchgear in the Page Editor

This chapter is only relevant for devices with more than one switching device.

In general, the configured switching devices are presented by their user-defined names. This applies also to their representation on the HMI of the protective device and the dialogs within *Smart view*.

An exception to this representation are the switching device names in the SCADA protocols. SCADA protocols do not know the user-defined names of the switching devices, they are addressed via the number of the switchgear.

Therefore the *Page Editor* allows for changing the assignment to a particular switchgear number: Select the menu item [Configuration / Switching Device Order...] (keyboard-shortcut: »F6«). This opens a dialog window where all configured switchgear devices are listed with their respective number. After selecting any of these, buttons »Up« and »Down« can be used to modify the order.

NOTICE!



Due to application requirements the switching device number 1 should have enabled Break Capabilities. Other switching devices, if available, may be of arbitrary type.

The assignment of a switching device number to a type is checked by *Smart view*: A warning is displayed if the exchange of the user-defined Control Page changes the switching device type of any switching device number. This warning can be confirmed if the modification of the switching device type has been done by intention.

5.1 Settings within the Protection Device

Assignment of Position Indications (Digital Inputs)

Settings in the device menu [Control / SG / SG[x] / Pos Indicators Wirng]:


- »Aux ON« — The CB is in ON-position if the state of the assigned signal is true (52a).
Exception: For the **Earthing Switch part of the “Three Position Switch”**, this is called: »Aux GROUND« — The switchgear is in Earth-position if the state of the assigned signal is true.
- »Aux OFF« — The CB is in OFF-position if the state of the assigned signal is true (52b).
Exception: For the **“Disconnecter-Earthing Combination”**, this is called: »Aux GROUND« — The switchgear is in Earth-position if the state of the assigned signal is true.
- »Ready« — Circuit breaker is ready for operation if the state of the assigned signal is true. This digital input can be used by some protective elements (if they are available within the device) like Auto Reclosure (AR), e.g. as a trigger signal.
- »Removed« — The withdrawable circuit breaker is Removed

Setting of Supervision Timers

Settings in the device menu [Control / SG / SG[x] / General Settings]:

- »t-Move ON« — Time to move to the ON Position
- »t-Move OFF« — Time to move to the OFF Position

Assignment of Commands to Output Relays


Only available if the switchgear has been set **“Controlled”** in the *Page Editor* (see  **“Controlled” Switchgear**”).

Settings in the device menu [Device Para / Binary Outputs / BO Slot Xx / BO y]:

- »Assignment 1« ... »Assignment 7« — for example for switchgear number 1 settable to “SG[1] . ON Cmd” / “SG[1] . OFF Cmd”

See the Chapter “Control” in the Technical Manual of the protection device.

Optional: External OPEN/CLOSE Command


Only available if the switchgear has been set **“Controlled”** in the *Page Editor* (see  **“Controlled” Switchgear**”).

Settings in the device menu [Control / SG / SG[x] / Ex ON/OFF Cmd]:

- »SCmd ON« — Switching ON Command, e.g. the state of the Logics or the state of the digital input
- »SCmd OFF« — Switching OFF Command, e.g. the state of the Logics or the state of the digital input

See the Chapter “Control” in the Technical Manual of the protection device.

Interlockings

Only available if the switchgear has been set “**Controlled**” in the *Page Editor* (see  ““Controlled” Switchgear”).

Settings in the device menu [Control / SG / SG[x] / Interlockings]:

- »Interl ON1« ... »Interl ON3« — Interlocking of the ON command (i. e. close commands are rejected if the assigned signal is true).
- »Interl OFF1« ... »Interl OFF3« — Interlocking of the OFF command (i. e. open commands are rejected if the assigned signal is true).



See the Chapter “Control” in the Technical Manual of the protection device.

Trip Manager (Assignment of Trip Commands)

Only available if the property “**Break Capability**” has been set for this switchgear in the *Page Editor*.

Settings in the device menu [Control / SG / SG[x] / Trip Manager]:

- »Off Cmd1« ... — Off Command to the Circuit Breaker if the state of the assigned signal becomes true.
- »t-TripCmd« — Minimum hold time of the OFF-command (circuit breaker, load break switch)
- »Latched« — Defines whether the Trip Command is latched.
- »Ack TripCmd« — Acknowledgment of the Trip Command

(See also  “Switchgear with the Property “Break Capability””,  “Step 2: Place and Configure Symbols” and the Chapter “Control” in the Technical Manual of the protection device.)

Optional: Synchronous Switching

Only available if the property “**Break Capability**” has been set for this switchgear in the *Page Editor*, and only for devices featuring the »Sync« module.

Settings in the device menu [Control / SG / SG[x] / Synchron Switchg]:

- »Synchronism« — Synchronism
- »t-MaxSyncSuperv« — Synchron-Run timer: Max. time allowed for synchronizing process after a close initiate. Only used for GENERATOR2SYSTEM working mode.

See the Chapters “Control” and “Sync - Synchrocheck” in the Technical Manual of the protection device.

Optional: Switchgear Wear

See the Chapter “Switchgear Wear” in the Technical Manual of the protection device.

Manual Manipulation of the Switchgear Position

In case of faulty position indication contacts (Aux contacts) or broken wires, the position indication resulted from the assigned signals can be manipulated (overwritten) manually, to keep the ability to switch the affected switchgear.

This is available at the device setting parameter [Control / SG / SG[x] / General Settings] »*Manipulate Position*«.

A manipulated switchgear position is indicated on the display by an exclamation mark “!” besides the switchgear symbol.



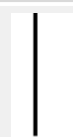
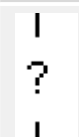
WARNING!



Manipulation of the Switchgear Position can lead to serious injuries or death!

5.2 Switch

Generic switching device.

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			

Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatrns Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓

5.3 Invisible Switch

Switching device which is not visible on the single-line diagram, but available in the protection device.

(Since it is not existing on the single-line, it cannot be selected via the HMI (panel), and therefore cannot be operated manually.)

[Operation / Status Display / Control / SG[x]] »Pos«

= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
--------------------	---------------	--------------	-------------------

(Invisible)

Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatr Wirng]

»Aux ON«	»Aux OFF«	»Ready«	»Removed«
----------	-----------	---------	-----------

✓





✓

✓

✓

5.4 Circuit Breaker

Switching device, capable of making, carrying and breaking currents under normal conditions and also making, carrying for a specified duration and breaking currents under specified abnormal conditions (e.g. short circuit).

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			


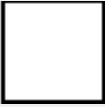
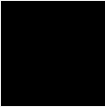

Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatr's Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓

5.5 Circuit Breaker1

Switching device, capable of making, carrying and breaking currents under normal conditions and also making, carrying for a specified duration and breaking currents under specified abnormal conditions (e.g. short circuit).

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			




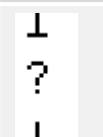
Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatrs Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓

5.6 Disconnecter (Isolator)

Switching device which provides, in the open position, an isolating distance.

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			




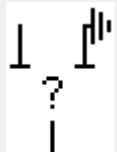
Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatrns Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	—	—

5.7 Disconnecter-Earthing Combination

A switch which combines a disconnecter and an earthing switch. This switch has two positions (connected - earthed).

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			




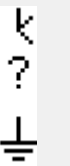
Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatrs Wirng]			
»Aux ON«	»Aux GROUND«	»Ready«	»Removed«
✓	✓	—	—

5.8 Earthing Switch

Earthing Switch with short-circuit making capacity.

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			





Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatr Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	—	—

5.9 Fuse-Load Switch

Switching device capable of making, carrying and breaking normal currents, in which a fuse-link forms the moving contact.

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			

Assignment of Position Indications (Digital Inputs)



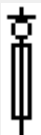
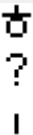
See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatrs Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓

5.10 Fuse-Load Switch - Disconnecter

Switching device capable of making, carrying and breaking normal currents.

Satisfies in the open position the isolating requirements for a disconnecter, in which a fuse-link forms the moving contact.

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			




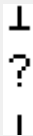
Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatrns Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓

5.11 Fused-Disconnecter (Isolator)

Switching device which provides, in the open position, an isolating distance, in which a fuse-link forms the moving contact.

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			





Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatrns Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	—	—

5.12 Load Switch

Switching device capable of making, carrying and breaking normal currents.

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)
			

Assignment of Position Indications (Digital Inputs)

See  "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatrns Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓

5.13 Load Switch - Disconnecter

Switching device capable of making, carrying and breaking normal currents.

Satisfies in the open position the isolating requirements for a disconnecter.

[Operation / Status Display / Control / SG[x]] »Pos«			
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)





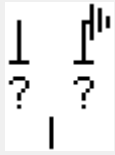
Assignment of Position Indications (Digital Inputs)

See "Assignment of Position Indications (Digital Inputs)". These settings are available in the device menu:

[Control / SG / SG[x] / Pos Indicatr Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓

5.14 Three Position Switch

A switch which combines a disconnecter and an earthing switch. This switch has three positions (connected - disconnected - earthed) and is intrinsically safe against maloperation.

[Operation / Status Display / Control / ...]				
[... / SG[1]] »Pos« = 0 (Pos Indeterm)	[... / SG[1]] »Pos« = 2 (Pos ON)	[... / SG[1]] »Pos« = 1 (Pos OFF)	[... / SG[1]] »Pos« = 1 (Pos OFF)	[... / SG[1]] »Pos« = 3 (Pos Disturb)
[SG[2]] »Pos« = 0 (Pos Indeterm)	[SG[2]] »Pos« = 1 (Pos OFF)	[SG[2]] »Pos« = 1 (Pos OFF)	[SG[2]] »Pos« = 2 (Pos GROUND)	[SG[2]] »Pos« = 3 (Pos Disturb)
				

The “Three Position Switch” is composed of two switchgears. One switchgear corresponds to the disconnecter of the “Three Position Switch”, and the second switchgear corresponds to the earthing switch.

The separation into two switchgears makes switching from the »Pos ON«-position via the »Pos OFF«-position into the »Pos GROUND«-position available.

From security aspects there are two clear switch positions »Isolating« and »Earth«. Thanks to this separation, individual supervision and switching timers for the earthing and isolating part can be set. In addition to that individual interlockings and device names (designations) can be set for the earthing and the isolating part.

NOTICE!



The Command Execution Supervision will issue the following message in case of a switching attempt from the earthing position (directly) into the isolator position and vice versa:

- [Operation / Status Display / Control / SG[x]] »CES SwitchDir«

The “Pos GROUND” position of the “Three Position Switch” is shown as “CB POS OFF” within the SCADA documentation (register maps)

Assignment of Position Indications (Digital Inputs)

See  “Assignment of Position Indications (Digital Inputs)”. These settings are available in the device menu:

Disconnecter, e. g. »SG[1]«:			
[Control / SG / SG[1] / Pos Indicators Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓

Earthing Switch, e. g. »SG[2]«:

[Control / SG / SG[2] / Pos Indicatrns Wirng]

»Aux GROUND«	»Aux OFF«	»Ready«	»Removed«
✓	✓	—	—

5.15 Withdrawable Circuit Breaker

Truck mounted (“Draw-Out”) circuit breaker.

[Operation / Status Display / Control / SG[x]]				
»Pos« (*) (*) the same value for both switchgears - see also remark below.				»Removed«
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)	= 1

(*) Remark: The table above does not list all combinations of positions that are technically possible for the two switchgears, but only some typical “end positions” are shown as examples.

The “Withdrawable Circuit Breaker” is composed of two switchgears. One switchgear corresponds to the circuit breaker, and the second switchgear corresponds to the movable truck.

There is no fixed connection between the circuit breaker and the truck. An interlocking has to be set by the user because it is not allowed to withdraw the circuit breaker as long as it is in the closed position. The circuit breaker can be switched in the withdrawn and in the non-withdrawn position. The signals of the control circuit (low voltage) plug have to be wired and configured within the protective device. The control (supervision) is set to »Removed« when the control circuit plug is removed. The circuit breaker is set into the »Pos OFF«-position as long as the »Removed«-signal is active.

NOTICE!	
	It is not possible to manipulate the position signals of a withdrawn (removed) circuit breaker.

Assignment of Position Indications (Digital Inputs)

See “Assignment of Position Indications (Digital Inputs)”. These settings are available in the device menu:

Circuit Breaker, e. g. »SG[1]«:			
[Control / SG / SG[1] / Pos Indicatrns Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓






Movable Truck, e. g. »SG[2]«:

[Control / SG / SG[2] / Pos Indicatr's Wirng]

»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	—	—

5.16 Withdrawable Fuse Load Switch


Truck mounted fuse load switch.

[Operation / Status Display / Control / SG[x]]				
»Pos« (*) (* the same value for both switchgears - see also remark below.)				»Removed«
= 0 (Pos Indeterm)	= 1 (Pos OFF)	= 2 (Pos ON)	= 3 (Pos Disturb)	= 1
				

(*) Remark: The table above does not list all combinations of positions that are technically possible for the two switchgears, but only some typical “end positions” are shown as examples.

The “Withdrawable Fuse Load Switch” is composed of two switchgears. One switchgear corresponds to the fuse load switch, and the second switchgear corresponds to the movable truck.

There is no fixed connection between the fuse load switch and the truck. An interlocking has to be set by the user because it is not allowed to withdraw the fuse load switch as long as it is in the closed position. The circuit breaker can be switched in the withdrawn and in the non-withdrawn position. The signals of the control circuit (low voltage) plug have to be wired and configured within the protective device. The control (supervision) is set to »Removed« when the control circuit plug is removed. The circuit breaker is set into the »Pos OFF«-position as long as the »Removed«-signal is active.

NOTICE!	
	It is not possible to manipulate the position signals of a withdrawn (removed) fuse load switch.

Assignment of Position Indications (Digital Inputs)

See  “Assignment of Position Indications (Digital Inputs)”. These settings are available in the device menu:

Fuse Load Switch, e. g. »SG[1]«:			
[Control / SG / SG[1] / Pos Indicatrns Wirng]			
»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	✓	✓

Movable Truck, e. g. »SG[2]«:

[Control / SG / SG[2] / Pos Indicatrns Wirng]

»Aux ON«	»Aux OFF«	»Ready«	»Removed«
✓	✓	—	—

6 Advanced Topics

You might come in touch with some optional and/or advanced topics.

Compatibility Check with Multiple Devices

By using [Configuration / Load Device Model...], it is possible to load multiple Device Models. They are displayed within the Configuration window. Adding multiple Device Models enables to verify the compatibility of your Control Page with multiple relay types and versions. In the Configuration window you can select which of the Device Models is specified as the active one for the compatibility check.

Editing Symbol Groups

Some symbols, such as breakers (and other switching devices) and measured values, consist of a group of sub-elements (bitmaps, texts...). These sub-elements can be positioned independently on the Page Canvas.

Options to select a particular sub-element:

- Select the desired sub-element from the list on the »Instances« window.
- Select »Alt« + »Left-Click« on a particular sub-element.
- Use the »Tab« key to jump to the next sub-element. Use »Shift« + »Tab« to jump to the previous sub-element.

No Updates on Persistent Symbols within the Project Symbols Window

When updating the *Page Editor* application to a newer version, the Symbol Library might be updated as well. But symbols that are stored as Project Symbols always remain unchanged. So, even if a particular symbol has been removed from the Symbol Library, it is still available in the Project Symbols panel and can be dragged+dropped onto the Page Canvas from there.


You can also drag and drop a symbol from the Symbol Library window directly to the Project Symbols window. Hereby the symbol is added to the Page project (and gets stored as part of the HptPage file), but there it does not get placed on the Page Canvas. From now on, the symbol will be available in the Page project.

Creating Monochrome Bitmaps

Monochrome bitmaps (black and white) can be imported into the *Page Editor*:



1. ▷ Create a monochrome bitmap with an appropriate drawing tool.
 2. ▷ Select the menu item [Symbol / Create from Bitmap...] within the *Page Editor*.
 3. ▷ In the new dialog, click the »Browse« button and select the bitmap file.
The file formats BMP and PNG are supported. If the selected file uses more than two colors then the *Page Editor* uses an image that is reduced to the two colors black and white.
 4. ▷ Complete the form.
 5. ▷ Select »OK«.
- ▶ The bitmap is now available in the Project Symbols window.

You can also export this symbol (see section "Importing and Exporting Symbols", ) "Import and Export Symbols", to make it available within other Control Page projects.

Import and Export Symbols

Export a Symbol in a File:



1. ▷ Right-click a symbol within the Project Symbols window or Symbol Library window.
2. ▷ Select the context-menu item [Export Symbol...].
3. ▷ Save the symbol to a file. The file type extension is *.HptSymbol.

Now the symbol can be imported to another Page project.

Import Symbols:

It is possible to use symbols that have been exported to Symbol files.

NOTICE!



Sometimes you might need additional symbols that are not supplied by the Symbol Library and you cannot create yourself. You can request those symbols from the Woodward Service. In case that the symbols can be created for you, they will be provided as Symbol files.

Option 1: Importing a Symbol File:



1. ▷ Select the menu item [Symbol / Import Symbol file...].
2. ▷ Select the *.HptSymbol Symbol file.
- ▶ Now the symbol is available on the Project Symbols window and can be dragged onto the Page Canvas.

Option 2: Importing from a Page File (Page Editor project file):

Follow these instructions if you want to reuse a symbol from an existing Page file:



1. ▷ Select the menu item [Symbol / Import from Page file...].
2. ▷ Select the *.HptPage file from which you want to import symbols.
- ▶ Now an additional window »External Symbols« is available on the left side of your application window. You can drag and drop the required symbols onto the Page Canvas or onto the Project Symbols window.

Finally you can close the »External Symbols« window.

7 Troubleshooting

Restore the Default Control Page

You can restore the default Control Page by loading the default Control Page into the parameter settings (following the description in [↳ “Step 5: Load the Control Page into the Project File”](#)).

You can find the default Control Page on the Product CD, or online in the download area for the protective device. (The web address can be found as a QR-code sticker glued on the housing of the device.)

Warning: Control Page Cannot be Loaded into the Parameter Settings

During “Step 5: Exchange the Control Page” ([↳ “Step 5: Load the Control Page into the Project File”](#)) an error occurs. If the Control Page contains a measured value or state that is not supported by the protective relay (or not available for this specific typecode of the protective relay), *Smart view* rejects the use of the Control Page.

*

Example:

A device with the typecode MCA4-2A0ACA does not feature the IEC 61850 communication protocol. Therefore a measured value belonging to IEC 61850 cannot be used for this device.

Re-edit the Control Page, using only supported symbols.

Warning: Changed Breaker (Switching Device) Type

During “Step 5: Exchange of the Control Page” ([↳ “Step 5: Load the Control Page into the Project File”](#)) a warning occurs that “*at least one switching device changed its type*”.

This warning is displayed if the upload of the user-defined Control Page change the switching device type of a SCADA breaker (switching device) number (compared to the previously loaded Control Page).

The warning can be safely confirmed if the modification of the breaker (switching device) type has been done by intention. Otherwise the breaker (switching device) numbers have to be adapted within the *Page Editor*. (See [↳ “Changing the Order of the Switchgear in the Page Editor”](#) how to do this.)

Warning: Symbol Outside Page Canvas

A symbol is not visible because it has been placed outside the Page Canvas:


In this case the execution of [Configuration / Page Test...] fails with an error that a placed symbol is outside of the drawing area. When saving the Control Page to a Page file, there is a warning about failed test(s).

Resolve Options:

Although the symbol is not visible on the Page Canvas, it is listed in the »Instances« Window. Therefore you can select the symbol instance within the »Instances« window, and you can either delete it, or you edit the properties, so that the symbol is moved back into the Page Canvas.

8 Appendix

Terms and Abbreviations

Control Page	HMI page that is visible on the display of the protective relay when pressing the »CTRL« key. The control page gives visual feedback on the position of the switching devices (breakers, isolating switches, earthing switches). In addition to that it can show measured values (option).
DM	Device Model
Device Model	Each relay has a dedicated Device Model such as “MCA4 Version 3.0.a”. The Device Model defines all parameters, binary states, values, dependencies and other capabilities of the device.
Page	A page on the relay's HMI (Display), e. g. Control Page.
Page Canvas	The drawing area of the <i>Page Editor</i> . The are that represents the Display of the protective device.
Page file	<p>*.HptPage</p> <p>This is the file format used by the <i>Page Editor</i> when storing a created Control Page on the PC. It comprises all data of the created page (project symbols, symbol instances, symbol properties and configuration, loaded symbols). It does not contain the entire symbol library. After re-opening this file with the <i>Page Editor</i> you can continue your work on the Prot_WIN_SW Page.</p>
Parameter file / Project File	<p>The parameter file container / project file “*.HptPara” comprises:</p> <ul style="list-style-type: none"> • The device model • The parameter (customer) settings • Single Line / Control page • Languages • ICD (for IEC 61850) <p>Please note: A *.HptPage control page cannot be transferred to a protective device directly, but it has to be imported into a *.HptPara parameter file first, and then you can transfer the parameters to the protective device. (See “Step 5: Exchange of the Control Page”,  “Step 5: Load the Control Page into the Project File”)</p>
Symbol	Any individual item (e. g. breaker symbol) on the Page Canvas is called a Symbol.
Symbol File	*.HptSymbol: File that contains a symbol that can be imported into the <i>Page Editor</i> for further use.

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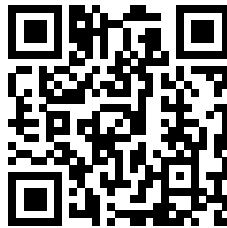
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Woodward Kempen GmbH
Krefelder Weg 47 • D-47906 Kempen (Germany)
Postfach 10 07 55 (P.O.Box) • D-47884 Kempen (Germany)
Telephone: : +49 (0) 21 52 145 1

Internet: — www.woodward.com

Sales

Telephone: : +49 (0) 21 52 145 331
Fax: : +49 (0) 21 52 145 354
Email: : SalesPGD_EMEA@woodward.com

Service

Telephone: : +49 (0) 21 52 145 614
Fax: : +49 (0) 21 52 145 354
Email: : industrial.support@woodward.com

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