

User's Manual

HV/Control 670



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This is a User's manual for HV/Control 670

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Author's address:

ABB AB
Substation Automation Products
SE-721 59 Västerås
Telephone: +46 (0) 21 34 20 00
Facsimile: +46 (0) 21 14 69 18
Internet: www.abb.com/substationautomation

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The chapter “Introduction”

This chapter introduces you to the HV/Control 670 software.

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1 Introduction

1.1 Preface

Welcome to the HV/Control 670 User's Manual. This document will provide you with the necessary information to install, configure and modify the different parts in the HV/Control 670 package.

To be able to understand this document the user should be familiar with MicroSCADA and MicroLIBRARY.

The functions described here are designed and created by ABB Power Technologies AB in Västerås, Sweden.

1.2 Abbreviations and definitions

Base picture	Background picture, including menu bar. The base on which standard functions are installed.
BBONE	Back Bone
FIMIT	ABB Transmit Oy, Finland
FMOD	FIMIT modules
HV	High voltage
HV/Control 670	The program package for the high voltage control functions part of LIB520 for 670 series products.
LAN	Local Area Network
LEC	Local engineering centre
LIB500	Application Library 500, the common platform for ABB application engineering within MicroSCADA
LIB520	High Voltage MicroLIBRARY
LON	Local Operating Network
MicroLIBRARY	Application Library, previous version to LIB 500
MV	Medium voltage
Process symbol	Graphical presentation of a standard function in run-time.
SCT	Standard Configuration Tool
SIT	Standard Installation Tool
SMOD	ABB Automation Technology Products AB modules
SDD	System Design Description
SCS	Substation Control System. A system for monitoring and controlling a complete substation. In this document the system is MicroSCADA.
TCP/IP	Transmission Control Protocol/Internet Protocol.
XMOD	Other LEC specific modules, new or modified modules

1.3

Font conventions

Normal text is written with this font and size.

SCIL CODE, SCIL PROGRAMS AND FILE NAMES ARE WRITTEN WITH THIS FONT AND SIZE.

The chapter “Instructions”

This chapter instructs you how to install the HV/Control 670 software and how to perform some typical tasks when to use the software.

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1 System requirements

In order to operate, the HV/Control 670 software module poses the following requirements on its environment.

1.1 Terminal end

LON-bus communication option installed in the terminals, which is used for process communication in HV/Control 670. The following terminal is supported:

- 670 series

1.2 The MicroSCADA PC

- MicroSYS revision 8.4.4 or later
- LIB500 revision 4.0.4 or later.

2 Installation

Before start using the HV/Control 670 software module it has to be installed on the hard disk of the MicroSCADA computer.

The installation has two objects.

1 Installing the software:

- Installation of the HV/Control 670 software module means copying the files from the CD-ROM disk to the hard disk.

2 Installing the library functions:

- Installation of a HV/Control 670 library function means copying the library function to a picture and create all necessary database.

Important note:

In order to avoid problems, it is recommended not to have the MicroSCADA active during the installation.

2.1 Installation of MicroSCADA software

Before the installation of the HV/Control 670 package can take place, the user must make sure that the MicroSCADA software is already installed on the PC.

2.2 Installation of the HV/Control 670 software package

To install from the CD-ROM drive to the hard disk, please follow the steps below:

1 Start up the Explorer.**2 Run** [drive]:\LIB_520\LIB520_XXX.EXE.**3 Select HVControl_670 and follow the instructions on the screen.**

The HV/Control 670 package is now properly installed on the hard disk of the PC.

4 After installation - read and follow any package specific instruction in the Readme file.

See “Readme file” on page 14.

5 Start the MicroSCADA.

The software is now installed in the following directories:

```
[drive]:\SC\LIB4\SMOD\HVCONTROL_670\INST
[drive]:\SC\LIB4\SMOD\HVCONTROL_670\LANG0
[drive]:\SC\LIB4\SMOD\HVCONTROL_670\USE
```

The following files are also added by the installation:

```
[drive]:\SC\LIB4\BASE\BBONE\USE\PATH4_S67.TXT
[drive]:\SC\LIB4\BASE\BBONE\INST\INDEX4_S6.TXT
```

these two files are used by the system to update the LIB 500 files:

```
[drive]:\SC\LIB4\BASE\BBONE\USE\PATH4.TXT
[drive]:\SC\LIB4\BASE\BBONE\INST\MLIB_INDEX.TXT
```

2.3**Readme file**

It is important to read and follow the instructions in the README.TXT file, which is installed to the directory

```
[drive]:\SC\LIB4\SMOD
```

Note:

Any specific release information, known errors and limitations are stated in the README.TXT file. It is therefore very important that you always read this file.

3

Location of the HVLib functions

HVLib functions are stored on to hard disk in the following way:

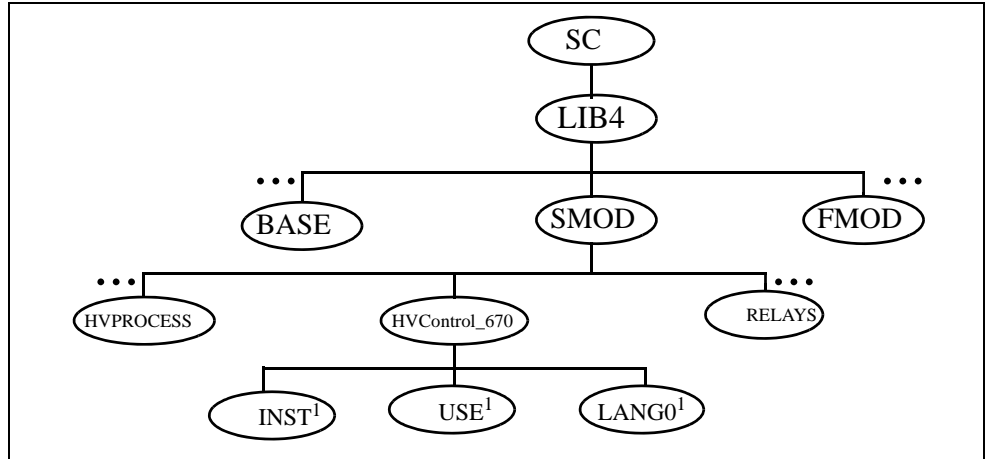


Figure 1: HVLib directory structure.

1. These directories are mostly used with their logical path names S_INST, S_USE and S_LANG defined in file PATH4_S67.TXT.

4

Overview of the standard functions

The functions are designed to be as general as possible. This will make special configurations and customer demands much easier to fulfil for the application engineer. The number of versions of each function should yet be kept to a minimum. The following functions are included in the HVLib, see *table 1*, “Functions included in the HVLib” .

Table 1: Functions included in the HVLib

SQI_GBAY	HV General Bay. Full bay control for 670 series (LON)
SQI_B001, 002, 003	Switch Device function with semigraphic size 1x1 (SQI_B001), 2x2 (SQI_B002), 3x3 (SQI_B003). Full Switch Device control for 670 series (LON)
SQI_M001, 002, 003	Measurement function with semigraphic size of selection button 1x1 (SQI_M001), 2x2 (SQI_M002), 3x3 (SQI_M003). General measurement for 670 series (LON).
SQI_S0001, 0002, 0003	Supervision function with semigraphic size of selection button 1x1 (SQI_0001), 2x2 (SQI_002), 3x3 (SQI_0003)(LON).

4.1 HV General bay

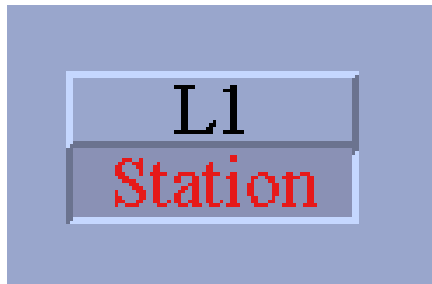


Figure 2: General bay process symbols

File name: SQT_GBAY.PIC

File location in package: HVControl_670/INST

4.1.1 Description

This function is used for control and supervision of a general bay regarding:

- Blockings
- Operator place
- Bay oriented alarms

4.1.2 Target systems

- 670 series

4.1.3 Communication support

- LON according to LON Lag 1.2

4.1.4 Features

- Blocking/Deblocking of alarms, events, printout and remote events & indications internal in MicroSCADA
- Blocking/Deblocking of process update
- Blocking/Deblocking of operation
- Acknowledge alarms
- Help in all dialogs
- Switch Device must and measurements can, be connected to the general bay and be blocked/deblocked from it (concerns blocking/deblocking of internal (MicroSCADA) signals).
- Configurable position of the bay name beside/above/under the process symbol
- Supervision of bay abnormal status

4.1.5

Process commands

- Switching operator place between station and remote
- Blocking/Deblocking of process update
- Blocking/Deblocking of operation

4.2

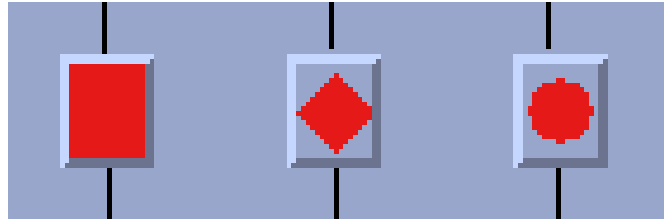
HV Switch Device

Figure 3: Switch Device process symbols.

Function name: SQR_B001.PIC, SQR_B002.PIC, SQR_B003.PIC

File location in package: HVCONTROL_670/INST

4.2.1

Description

This function is used for control and supervision of a Switch Device regarding:

- Position indication
- Operation
- Interlock bypass
- Synchrocheck bypass (only for breaker)

4.2.2

Target systems

- 670 series

4.2.3

Communication support

- LON according to LON Lag 1.2

4.2.4

Features/Options

- Blocking/Deblocking of alarms, events, printout and remote events & indications internal in MicroSCADA
- Blocking/Deblocking of process update
- Blocking/Deblocking of operation
- Acknowledge alarms
- Help in all dialogs
- Operable or non-operable Switch Device

- Switch Device presented with or without function key
- Semigraphical size of the Switch Device symbol is 1x1, 2x2, 3x3 without suffix
- Free choice of representation (square, diamond or circle) for presentation of the Switch Devices.

4.2.5**Not supported features**

- Operation of several Switch Devices at a time is not supported
- “Stand-alone” Switch Device, should always be connected to a bay

4.2.6**Process commands**

- Open/Close operation of a Switch Device
- Interlock bypass
- Synchrocheck bypass (only for breaker)
- Blocking/Deblocking of process update
- Blocking/Deblocking of operation
- Substitute the position

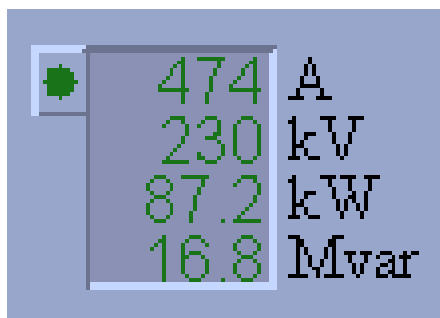
4.3**HV Measurement**

Figure 4: Measurement process symbols

Function name: SQI_M001.PIC, SQI_M002.PIC, SQI_M003.PIC

File location in package: HVCONTROL_670/INST

4.3.1**Description**

This function is used for:

- Measurement monitoring
- Displaying and editing alarm and warning limits

4.3.2**Target systems**

- 670 series

4.3.3 Communication support

- LON according to LON Lag 1.2

4.3.4 Features

- Up to 4 values within the same function
- Blocking/Deblocking of alarms, events, printout, update and remote events & indications
- Acknowledge alarms
- Help in all dialogs
- Show/Erse Measurements
- Configurable number of decimals: 0, 1 or 2
- Configurable type of measurement: Analogue value or Pulse counter
- Configurable presentation of unit
- Semigraphical size of the selection button is 1x1, 2x2 or 3x3
- Configurable presentation of sign: only -, ABS() and +/-
- Context sensitive help in all dialogs
- Normal, Frozen and None value presentation
- Bar presentation

4.3.5 Process commands

No process commands available for this function:

- Only internal commands within the MicroSCADA database available
 - Internal blockings
 - Edit of limits for analogue values

4.4 Supervision function

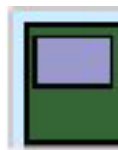


Figure 5: 670 series Supervision process symbol.

File name: SQI_S0001.PIC, SQI_S0002.PIC, SQI_S0003.PIC

File location in package: HVCONTROL_670/INST

4.4.1 Description

This function is used for monitoring a 670 series product regarding:

- Internal Fail
- Warning
- CPU Fail
- CPU Warning
- LDCMs comm Fail
- Active setting group
- Settings changed (only event treated, not visible in object picture)
- TRMs
- RTC Error
- TimeSynch Error
- I/O Boards

4.4.2 **Target systems**

- 670 series

4.4.3 **Communication support**

- LON according to LON Lag 1.2

4.4.4 **Features**

- Blocking/Deblocking of alarms, events, printout, update and remote events & indications
- Acknowledge alarms
- Help in all dialogs
- Device information dialog

4.4.5 **Process commands**

No process commands are possible for the 670 series Supervision function.

5 **Creating and preparing an application**

The following steps are essential when creating a new application and preparing it for use with HV/Control 670 functions.

1 **Consider and define the Authorization grouping.**

The *Authorization levels* can be defined later. The setup is taken in account during standard function configuration. The *Authorization grouping* is defined in the User Management tool.

2 Setup the APL:BSV15 in SYS_BASCON.COM for OI attribute in Process database.

3 Start with the HV General Bay functions first during installation.

Functions (HV Switch Device and HV Measurement) which are/can be connected to the HV General Bay function, will get the right selections during their configuration.

4 Set the limit supervision.

Decide if the *limit supervision* of the analogue values shall be made by the terminal or by the process database of MicroSCADA for the *HV Measurement* function

The installed functions demands that *process objects* are created to work properly in run-time mode. This will avoid error codes appear.

6

Installing and configuring HV/Control 670 functions

The installation of standard functions is divided into two main parts: installation and configuration.

During the installation, name of the picture function (5 to 10 characters) is required from the user, as well as the position of the picture function in the base picture. Choice of the name and the position is free.

During the configuration, change of the default settings may be done. Process objects are created via the Process Object Tool. An advantage with this procedure is that several picture functions can be installed at once, without leaving the installation tool, and bring up the SCT afterwards for adjustment of configurable parameters and creation of the process objects.

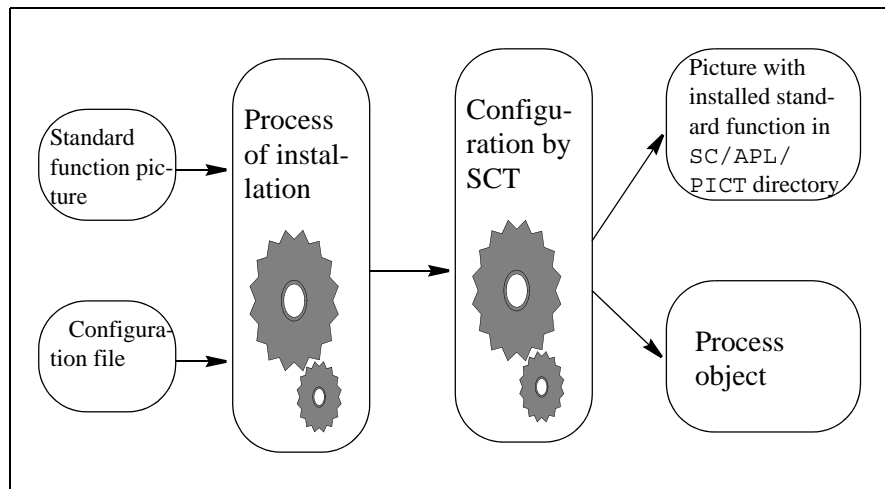


Figure 6: Process of the installation and configuration.

HVLib standard function pictures are stored in directory SC\LIB4\SMOD\HVCONTROL_670\INST. The following guidelines assumes that you have the base function properly installed in the picture.

6.1

Installation Tool

For installation of HVLib standard functions in the base picture, the installation tool is used. By means of this tool is possible to choose what kind of function to install and assign an ID, i.e. a unique name for the picture function before it is installed in the picture.

To install a new function select a picture and open the picture editor. In the picture editor standard tool select installation tool. The installation tool will appear. In the directory structure, select LIB4/LIB520 and after that HVControl_670 to bring up the HV/Control 670 functions. Mark the desired function, give an ID and press Install. Position the function anywhere within the base picture.

6.2

Standard Configuration Tool (SCT)

After installing the standard function in the picture, it is necessary to configure the function. For this purpose, the SCT is used. The user can adjust the configurable parameters and create the process objects.

SCT is accessible via standard picture editor by selecting of Picture Functions | Conf.Tool. More information about installing and configuration of each function is given later in the document.

6.3 Process Object Tool

From the SCT, the process object tool can be accessed by pushing of the button “Tools”. This tool is used for creating all necessary process objects in the data base. The process object tool is only accessible when the installed function needs a process database.

This tools gives automatically suggestion for logical name and value of OI attribute.

6.4 Representation Tool

The representation tool is also accessible from the SCT, by pushing of the tab “Tools”. Here it is possible to change the representation. Not all functions have different representations.

6.5 General bay function

In the installation tool, choose LIB4/HVControl_670/General Bay. Point the General Bay and click once by mouse. After the General Bay has been highlighted, enter an ID for the function and press Install button. Place the picture function anywhere in the base picture.

Bring up the SCT to alter the configurable attributes.

Table 2:

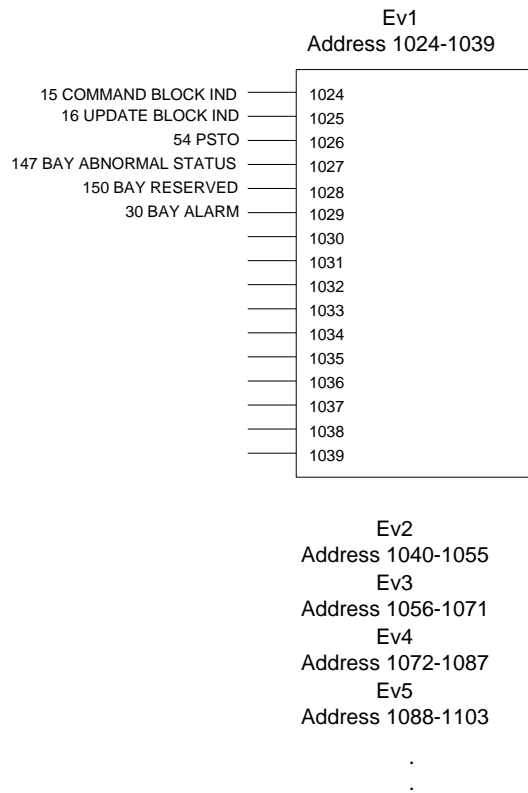
Configurables	Description
STATION_NAME	Text string defining the station name.
BAY_NAME	Text string defining the bay name.
BAY_LABEL	Label to be shown in the process picture. By default the same as process object logical name.
P_OBJECT_LN	Process object logical name.
STATION_NUMBER	The station number in the system definition. The Unit Number attribute (UN) is equal to this. The range is 0 to 2000, default is 0. The STATION_NUMBER has callback function. STATION_NUMBER must be set before EVENT_BLOCK and FUNCTION_TYPE_ NUMBER otherwise these configurable appears disabled.
DATA_ACQUISITION_UNIT	This configuration is not applicable for this version of the function.

Table 2: (Continued)

Configurables	Description
EVENT_BLOCK	String which defining the event block used in the target unit. The value is EV01 to EV20 (the number of selectable event block is depending on how many is available in the target unit). Default is "Not defined". If "Not defined" is chosen no automatic addressing of the database. The number is used to calculate the Object Address (OA) of the process objects. The calculation is targeted for the DEFAULT terminal configuration which means that the addresses are as follows: EV01 -> 1024..1039 (16 signals) ... EV20 -> 1328..1343(16 signals) OA=(event block nr -1)*16 +1023+bit nr
FUNCTION_TYPE_NUMBER	Function type number QCBAY1 to QCBAY12, if chosen QCBAY1, the commands gets the addresses from 7001, if chosen QCBAY 2, the commands gets the addresses from 7011 etc. These addresses are just internal in MS, then the SPA mapping must to be done in System Configuration, Engineering tool. The SPA address for Bay command is found in chapter "Station communication" in the Technical reference manual for 670 series.
STATION_TYPE	For this version of function, only LON protocol is available.
AUTHORIZATION_GROUP	Selects the authorization group among the ones defined in the User Management tool. The default value of this attribute is GENERAL.
NO_OF_SECTIONS	This parameter is always disabled in this version.
SET_SWITCH_STATE_TO_AUTO	This configurable is telling the Process Object tool to set the switch state (SS) attribute to either be AUTO or MANUAL for the process objects at creation. Default is FALSE

Enter the Process object tool and create the process object. Press Create All and then Close. Before leaving the SCT, remember to save your changes by choosing OK or Apply.

6.5.1 Default Event mapping



The Event block has following execution time EvBl 1-3 3ms, EvBl 4-9 6ms and EvBl 10-20 100ms. For Bay it is recommended to use EvBl 10-20 with the execution time 100ms.

6.5.2 Installation process

The process objects belonging to the General Bay function are created.
 The scale 1_1 : X, used for the command process object, is created (if it does not exist)
 Finally the datalog object A_HTIMEOUT : D is created (if it does not exist). This object is used for dialog time-out of all HV/Control 670 functions.

6.5.3 Delete process

When a General Bay is deleted the engineer is prompted to delete the process objects, 'P_OBJECT_LN' : P, or not.

6.6 Switch device function

In the installation tool, choose LIB4/LIB 520/HVControl670/SwitchDevice. With desired size of the picture function symbol highlighted, enter an ID for the function and press "Install". Place the picture function somewhere in the picture.

Bring up the SCT to alter the configurable attributes.

Table 3:

Configurable	Choices
STATION_NAME	Text string defining the station name.
BAY_NAME	Text string defining the bay name.
DEVICE_NAME	Text string defining the name of the Switch Device.
P_OBJECT_LN	Process object logical name.
STATION_NUMBER	The station number in the system definition. The Unit Number attribute (UN) is equal to this. Therein is 0 to 2000, default is 0. The STATION_NUMBER has callback function. STATION_NUMBER must be set before EVENT_BLOCK and DEVICE_TYPE_NUMBER otherwise these configurable appears disabled.
DATA_ACQUISITION_UNIT	Disabled in this version of Switch Device function.
DEVICE_TYPE	Which type of Switch Device: CB = Breaker DISC = Disconnecter ES = Earth Switch.
EVENT_BLOCK	String which defining the event block used in the ocratic unit. The value is EV01 to EV20 (the numbered selectable event block is depending on how many is available in the target unit). Default is "Not defined". If "Not defined" is chosen no automatic addressing of the database. The number is used to calculate the Object Address (OA) of the process objects. The calculation is targeted for the DEFAULT terminal configuration which means that the addresses are as follows: EV01 -> 1024..1039 (16 signals) ... EV20 -> 1328..1343(16 signals) OA=(event block nr -1)*16 +1023+bit nr

Table 3: (Continued)

Configurable	Choices
FUNCTION_TYPE_NUMBER	Device type number SCSWI01-SCSWI32. Default is "Not defined". If "Not defined" is chosen no automatic addressing of the database. The number is used to calculate the Object Address (OA) of the process objects. If chosen SCSWI01, the commands gets the addresses from 6000, if chosen SCSWI02, the commands gets the addresses from 6010 etc. These addresses are just internal in MS, then the SPA mapping is going to be done in System Configuration, Engineering tool. The SPA address for Switch Device is found in chapter "Station communication" in the Technical reference manual for 670 series.
CONNECTED_TO_BAY	Choose the appropriate general bay function to which the Switch Device is connected. The selector list shows the available choices. Note that the bay function need to be installed before the Switch Device function. Indications for operator place (Station/Remote), remote events and indications blocked and orders to block events, alarms and printouts will come from the bay with the logical name stated here. This attribute does not have a default value. Note: You must enter a bay name for the Switch Device function to work!
AUTHORIZATION_GROUP	Selects the authorization group among the ones defined in the User Management tool. The default value of this attribute is GENERAL.
STATION_TYPE	Disabled in this version of Switch Device. Set to LON as default.
POSITION_REPRESENTATION	Choices: 1=Open, 2=Close for IED version 1.0 and 1.B 2=Open, 1=Close for IED version 1.1 or later and 1.B_01 or later
OPERABLE	When "True" the open/close button appears. When "False" the open/close button is not shown. Default value is "True".
SENSITIVE	"True" or "False". "False" means that the Switch Device is drawn without a push button and that the function key is disabled, i.e nothing happens when clicking on the Switch Device. The default value of this attribute is "True".
SET_SWITCH_STATE_TO_AUTO	This configurable is telling the Process Object tool to set the switch state (SS) attribute to either be AUTO or MANUAL for the process objects at creation. Default is FALSE

Enter the Process object tool and create the process object. Press Create All and then Close. Before leaving the SCT, remember to save your changes by choosing OK or Apply.

6.6.1

Default Event mapping

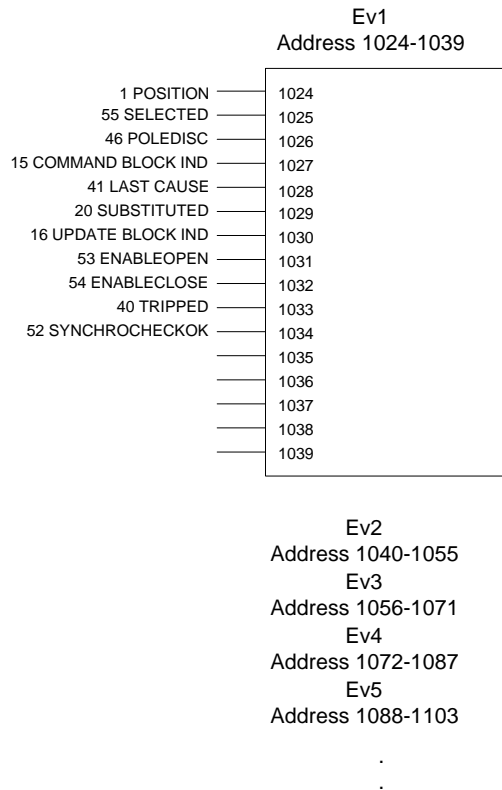


Figure 7: Event block mapping

The Event block has following execution time EvBl 1-3 3ms, EvBl 4-9 6ms and EvBl 10-20 100ms. For Switch Device it is recommended to use EvBl 10-20 with the execution time 100ms.

Note:

*A Switch Device **must** have a bay function to which it can be connected. For Switch Device that do not belong to any physical bay, a dummy bay can be installed in the picture. The Switch Device can then be connected to this dummy bay. The picture function for the bay function should then be deleted, but without deleting the database. In general, a bay to which a Switch device (or measurement) will be connected may be installed after the Switch device has been installed, but Switch device must be connected and configured properly, via SCT.*

6.6.2 Installation process

The process database is updated by the creation of the process objects, 'P_OBJECT_LN' : P.

The datalog object A_HTIMEOUT : D is created (if it does not exist). This object is used for dialog time-out of all HV/Control 670 functions.

The scale 1_1 : X, used for the command process object, is created (if does not exist).

6.6.3 Delete process

Process objects, 'P_OBJECT_LN' : P, with the same logical name are deleted from data base.

6.6.4 Busbar coloring

For information about busbar coloring, refer to “Appendix B” on page 131.

6.7 Measurement function

In the installation tool, choose LIB4/LIB 520/HVControl670/MEASUREMENT. With desired size of the picture function symbol highlighted, enter an ID for the function and press “Install”. Place the picture function somewhere in the picture. It is possible to have four measurement values for one measurement function.

Bring up the SCT to alter the configurable.

Table 4:

Configurables	Description
STATION_NAME	Text string defining the station name.
BAY_NAME	Text string defining the bay name.
DEVICE_NAME	Text string defining the device name. This configurable shall be filled in, if the same name is for all measurements within the same function (if more than one measurement is configured). If separate names is desired leave this field empty, see MEAS_X_DEVICE_NAME.
MEAS_X_DEVICE_NAME (X => 1 - 4)	Text string defining the device name. This configurable shall be filled in if different names are used for the different measurements within the same function (if more than one measurement is configured). If same name is desired leave this field empty, see DEVICE_NAME.
P_OBJECT_LN	Process object logical name.
SCALE_SELECTION	Is the name of the MicroSCADA Scale object which is to be used by the measurement function. Note that the scale must exist before configuring the picture function. The default scale is 1_1.

Table 4: (Continued)

Configurables	Description
LIMITS_SUPERVISED_BY	Decides weather the limits are supervised by MicroSCADA or the terminal. TERMINAL or SCADA are selectable, default is SCADA.
CONNECTED_TO_BAY	Choose the appropriate general bay function to which the measurement is connected. The selector list shows the available choices. Note that the bay function hence need to be installed before the measurement function. If not the measurement function must be reconfigured. This attribute does have NONE as default value.
AUTHORIZATION_GROUP	Is the authorization group to which the HV Measurement is connected. Default is General.
STATION_NUMBER	Disabled in this version of measurement function. Set to 0 as default. Must be manually defined in DB.
STATION_TYPE	Disabled in this version of measurement function. Set to LON as default.
SET_SWITCH_STATE_TO_AUTO	Disabled in this version of measurement function. Set to FALSE as default
TYPE_MEAS_X (X => 1 - 4)	Only two types should be available; Analogue value or Pulse Counter (for measure energizing).
DATA_ACQUISITION_UNIT_X (X => 1 - 4)	Disabled in this version of the measurement function.
MEAS_X_EVENT_BLOCK (X => 1 - 4)	Disabled in this version of the measurement function.
FOLDER_X_TITLE (X => 1 - 4)	Texts string defining which title each folder shall have in the main dialog. Default is " ".
MEAS_X_DECIMALS (X => 1 - 4)	Is the number of decimals used for presentation. Each measurement within the same function has its own definition. Allowed values are 0, 1 or 2. Default is 0.
MEAS_X_SIGN_POLICY (X => 1 - 4)	Decides how the sign - and + shall appear. Each measurement within the same function has its own definition. Three possible selections, only -, none (ABS()) and both +/- . Default is only -.
SHOW_MEAS_X (X => 1 - 4)	Defines if the measurement(s) shall be shown in the process picture. Default is TRUE (for measurement 1 the rest is FALSE). The value can be changed in runtime in the main dialog.
SHOW_MEAS_X_AS_BAR (X => 1 - 4)	Defines if the measurement(s) shall be shown as bar representation in the process picture. Default is FALSE.
SHOW_MEAS_X_UNIT (X => 1 - 4)	Defines if the measurement unit(s) shall be shown in the process picture. Default is TRUE.

Enter the Process object tool and create the process object. Press Create All and then Close. Before leaving the SCT, remember to save your changes by choosing OK or Apply.

6.7.1 Installation process

The process database is updated with the process objects, 'P_OBJECT_LN':P, created for the measurement function(s) that has been installed and configured.

Scale 1_1:X is created (modified if it exist) if it does not exist. This scale is demanded for the analogue objects of this function.

The command procedure SPU_UPDATE:C is created (modified if it exist). It is used for force up the data form the terminal when update deblock is performed.

Finally the datalog object A_HTIMEOUT:D is created (if it does not exist). This object is used for dialog time-out of all HV/Control 670 functions.

6.7.2 Delete process

When a Measurement function is deleted, the process database is updated by the deletion of process objects, 'P_OBJECT_LN':P.

6.8 Supervision function

In the installation tool, choose LIB4/LIB 520/HVControl670/SUPERVISION/IED 670. With desired size of the picture function symbol highlighted, enter an ID for the function and press "Install". Place the picture function somewhere in the picture.

Bring up the SCT to alter the configurable attributes.

Table 5:

Configurables	Description
STATION_NAME	Text string defining the station name.
BAY_NAME	Text string defining the bay name.
DEVICE_NAME	Text string defining the device name.
P_OBJECT_LN	Process object logical name.
STATION_NUMBER	Always disabled in this version of the function. Must be manually set in the DB.
DATA_ACQUISITION_UNIT	Always disabled in this version of the function.
EVENT_BLOCK	Always disabled in this version of the function. Must be manually set in the D, i.e. OA attribute must be defined.
LABEL	The label to be presented for the terminal in the supervision picture.
LABEL_POSITION	Position of the label with alternatives: Top, Bottom, Right, or Left. Default value is Bottom.
STATION_TYPE	Only LON available in this version of function.

Table 5: (Continued)

Configurables	Description
AUTHORIZATION_GROUP	Selects the authorization group among the ones defined in the User Management tool. Default value is GENERAL.
SET_SWITCH_STATE_TO_AUTO	Always disabled in this version of the function. Must be manually set in the DB, i.e. SS attribute must be defined.

Enter the Process object tool and create the process object. Press Create All and then Close. Before leaving the SCT, remember to save your changes by choosing OK or Apply.

6.8.1**Installation process**

The process database is updated with the process objects, 'P_OBJECT_LN':P, created for the Supervision function(s) that has been installed and configured.

The command procedure SPU_UPDATE:C is created (modified if it exist). It is used for force up the data form the terminal when update deblock is performed.

Finally the datalog object A_HTIMEOUT:D is created (if it does not exist). This object is used for dialog time-out of all HV/Control_670 functions.

6.8.2**Delete process**

When a supervision function is deleted, the process database is updated by the deletion of process objects, 'P_OBJECT_LN':P.

7**Additional application engineering**

Below there are some necessary steps to go through after picture building before the complete installation/configuration is ready.

Note:

If the additional configurable attributes STATION NUMBER, EVENT_BLOCK, FUNCTION_TYPE_NUMBER and SET_SWITCH_STATE_TO_AUTO has been configured during configuration of the picture functions the step Remaining tasks is left to do.

7.1 Switch state

Immediately after installation, all process objects will have the switch state set to manual ($SS = 1$), if the configurable `SET_SWITCH_STATE_TO_AUTO = False`, except for process object with $IX = 243$ which is internal process object and should always be updated automatically. Before commissioning, some process objects must be set to auto state ($SS = 2$). Until this is done, “Not connected to process” will be visible in the Main Dialog. See “*Process Objects*” on page 105, regarding what process objects that has to be set to $SS=2$.

7.2 Addressing the process objects

Before the installed functions can communicate with the process, it is necessary to put addresses to all process objects that have the switch state set to auto.

7.3 Remaining tasks

Before commissioning you have to....

- address the 670 series products.
- configure the base system for communication with 670 series products
- configure LON HW and SW
- create and address process objects for signals that are not covered within the scope of HV/Control_670 standard functions.

The chapter “Technical descriptions”

This chapter describes the HV/Control 670 software and its functionality

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1 General principles

Some principles are general and used for all standard functions (colors etc.). A description of these general principles follows below.

1.1 Color coding

The color coding below is applied generally. The colors are stated in priority order, e.g. red takes precedence over yellow.

Table 1: General color coding description

Color	Description
White flashing	Selected object under command
White	Selected on the MicroSCADA screen
Magenta	Not updated, obsolete value, not in use or not sampled
Red flashing	Unacknowledged alarm
Red	Acknowledged alarm or faulty state
Cyan	Update blocked or manually entered
Yellow	Warning or blockings (alarms, events, printouts)
Brown	Control blocked
Green	Normal state

The color coding may be changed by the Color Tool.

1.2 Color definitions

The table below gives definition of colors used for presentation of process symbols and symbols in object picture.

Table 2: Color definitions used in HV/Control_670

Name	color definition
White	("M",27)
Magenta	("M",30)
Red	("M",16)
Yellow	("M",17)
Cyan	("M",29)
Brown	("M",28)
Green	("M",32)
Black	("M",14)

1.3

Attribute expressions for color definitions

The following expressions and attributes are used to calculate the color. See the section for each standard function, what indexes are used.

Table 3: Attributes expressions for color presentation

Description	Attribute used	Color	Comment
Selected object under command	index 243	White flashing	Only for Switch Device
Selected on the Micro-SCADA screen	-	White	The variable 'CALL_ID' : VARMED is used
Not sampled	OS = 10	Magenta	No value is presented
Obsolete value	OS = 1-9	Magenta	Last known value is presented
Unacknowledged alarm	AR = 0	Red flashing	-
Acknowledged alarm	AL = 1	Red	-
Update blocked	UB	Cyan	Only for bays and Switch Device
Manual state	SS = 1	Cyan	-
Alarms blocked	AB = 1	Yellow	Only for indexes with position 27 of RX attribute <> "X"
Events blocked	HB = 1	Yellow	Only for indexes with position 27 of RX attribute <> "X"
Printout blocked	PB = 1	Yellow	Only for indexes with position 27 of RX attribute <> "X"
Remote events and indications blocked	XB = 1	Yellow	Only for indexes with position 27 of RX attribute <> "X"
Control blocked	BL	Brown	Only for bays and Switch Device

1.4

Color definitions for measurement values

The following expressions and attributes are used to calculate the color for measurement values. See the section for the standard function, what indexes are used.

Table 4: Color definitions for measurement values

Description	Attribute used	Color	Comment
Not sampled	OS = 10	Magenta	No value is presented
Obsolete value	OS = 1-9	Magenta	Last known value is presented

Table 4: Color definitions for measurement values (Continued)

Description	Attribute used	Color	Comment
Measurement in alarm zone	AZ = 1-2 AND OS = 0	Red	
Measurement in warning zone	AZ = 3-4 AND OS = 0	Yellow	
Measurement in normal zone	AZ = 0 AND OS = 0	Green	

1.5**Selection**

Selectable objects have “raised” areas according to Motif standard. There are no “hidden” functions.

Note that selectable is not the same as controllable. Pressing on a selectable object will bring up the main dialog, from which other actions can be initiated.

Only one object can be selected per MicroSCADA screen. The selection of another one will automatically cancel the previous selection.

1.6**Alarm acknowledgment**

For all functions the same principle for acknowledgment of alarms is used. For more details see “*Acknowledge alarms*” on page 43.

1.7**Blockings**

Signals coming from the process can be blocked for five different purposes:

- Event blockings
- Alarm blockings
- Printout blockings
- Update blockings¹
- Remote events and indications

¹ Only possible for HV Measurement and HV Supervision and is made in these functions blocking dialogs, not the HV General Bay dialogs.

Blockings can either be made from each function or from General Bay function which works like a central function for a bay. During installation of the functions a configurable attribute is set to the name of the bay function to be “master” of this feature. It is still possible to carry out blocking for a single function e.g Switch Device.

The blocking is made by setting of the corresponding process object attribute HB (event block), AB (alarm block), PB (printout block), UB¹⁾ (Update block) or XB (activation block - for remote events and indications). This means that these blockings are internal in the MicroSCADA.

Blocking function is executed by retrieval of the whole database. Condition for blocking is the OI attribute. If e.g. blocking is done for a bay, all process objects that have the same bay name in their OI attribute definition, will be blocked. Note thus that it is very important to configure the OI attribute correctly in order to have the blocking function to work.

Blocking of control and update is unique for General Bay and Switch Device functions. See “*HV General bay*” on page 45 and “*HV Switch Device*” on page 55. This blocking is performed in the bay controller and not in the MicroSCADA. It thus affects the control possibility and the position indication for all operator places - Local, Station and Remote.

2 Common functions

In this chapter we will give a description of the functions that are common to all library functions in the HV/Control 670 package.

2.1 Blockings

The HVLlib functions have a built in blocking facility that enables blocking and deblocking of alarms, events and printouts for all library functions. For some library functions is also possible to block update or control. The table below shows the blocking possibilities for different HVLlibrary functions.

Table 5: Blockings for HVLib functions

Library function	HV General-Bay	HV Switch Device	HV Measurement	HV Supervision
Events	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Printout	Yes	Yes	Yes	Yes
Rem. events and ind.	Yes	Yes	Yes	Yes
Update	Yes ^a	Yes ^a	Yes	Yes
Control	Yes ^a	Yes ^a	No	No

a. This blocking is performed in the bay controller and not in the MicroSCADA. It thus affects the control possibility, interlocking conditions, and the position indication for all operator places - Local, Station and Remote.

2.2

Update and control block

Update block is made in different ways for HV General Bay/HV Switch Device compared to HV Measurement/HV Supervision. For HV General Bay/HV Switch Device the blocking is carried out bay controller, while HV Measurement/HV Supervision is blocked in the MicroSCADA database. They are accessible from the “More” button in the Main dialogs under the menu selection “Process blockings...”. For more details see dialog description of respective function.

2.3

Screen functionality for blockings

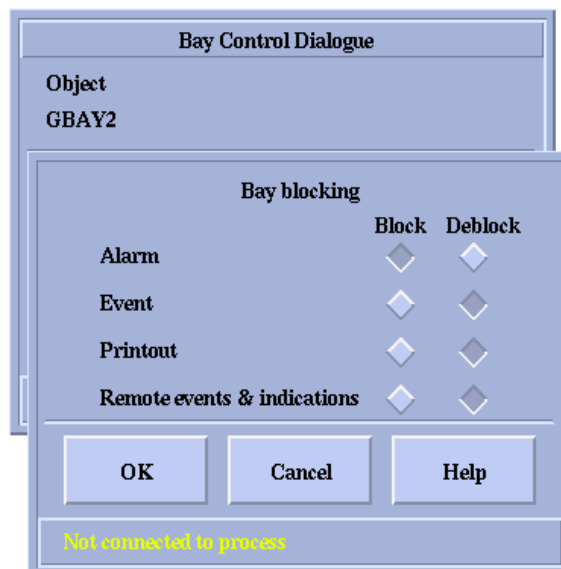


Figure 1: Blockings dialog for General Bay and Switch Device functions. For comparison see “HV Measurement Blockings dialog” on page 76 and “HV supervision Blockings dialog” on page 86.

Blocking and deblocking can be performed from the blocking dialog that is reached from the main menu by pushing drop-down button “More” and then selecting of “Blockings...”. Blocking dialog is placed over the Main dialog of the concerning standard function on such way that title and information bar of the Main Dialog is used, as well as the process object name.

Blockings are presented in object picture for each library function according to “*Color coding*” on page 37.

Following information is displayed in the Blockings Dialog:

- Object name in textual form. The object name presents OI attribute of process object 240 (displayed in the main dialog). However, what will be displayed as the object name is a configurable feature. For details see description of main dialog for respective function.
- Object status in the status bar as specified for each standard function.
- Object to be blocked (Bay, Switch Device etc.).

The following actions can be performed from the Blockings Dialog:

Table 6: Actions possible in the Blockings Dialog dialog

Function	Condition	Action
Move	-	Movement is made by moving the main dialog.
Block events	Authority level \geq 1	- Set HB=1 for selected objects ^a - Set index 240 to 1 ^a
Deblock events	Authority level \geq 1	- Set HB=0 for selected objects ^a - Set index 240 to 0 ^a
Block alarms	Authority level \geq 1	- Set AB=1 for selected objects ^a - Set index 241 to 1 ^a
Deblock alarms	Authority level \geq 1	- Set AB=0 for selected objects ^a - Set index 241 to 0 ^a
Block printout	Authority level \geq 1	- Set PB=1 for selected objects ^a - Set index 242 to 1 ^a
Deblock printout	Authority level \geq 1	- Set PB=0 for selected objects ^a - Set index 242 to 0 ^a
Block Remote events and indications	Authority level \geq 1	- Set XB=1 for selected objects ^a - Set index 244 to 1 ^a
Deblock Remote events and indications	Authority level \geq 1	- Set XB=0 for selected objects ^a - Set index 244 to 0 ^a
OK	Authority level \geq 1	Execute the blocking actions according to what is set by the buttons explained above. Return to the main dialog

Table 6: Actions possible in the Blockings Dialog dialog *(Continued)*

Function	Condition	Action
Cancel	-	Erase the Blocking dialog and return to the main dialog, without changing the limits.
Help	-	Display help viewer with help about the HV Measurement blocking dialog

a. No action is performed until the 'OK' button is pressed.

Blocking and deblocking require authority level ≥ 1 (Operator authority). If blocking or deblocking is not permitted, the function key is dimmed.

2.4

Acknowledge alarms

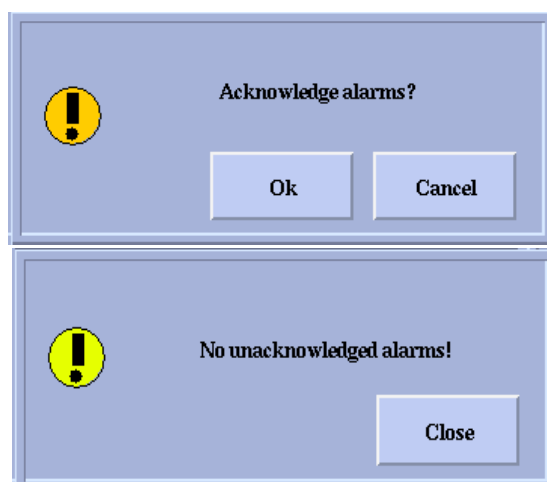


Figure 2: Acknowledge alarms pictures

All alarms can be acknowledged per object. This option is accessible from main dialogs "More" button after choosing of the option "Ack.alarms...".

Text message that appears depends on if active alarms exists or not for the selected object. This picture is not movable separately, but always follows Main Dialog.

However, all alarms are always included in the alarm list accessible on menu bar in the base picture. In this list, alarms can be acknowledged on selective way per active alarm, or all active alarms at the time.

2.5

Object picture

The object pictures of a HVLib function can be reached from the main menu. All object pictures use the same window (MNOBJ).

After being brought up, the object picture is independent of the main dialog, and can be moved around the screen as desired. Closing of the main dialog does not erase the object picture. The object picture is, however, erased by a selection of another (or the same) object. The object picture has no time-out.

The object picture is only used for monitoring and no actions, besides moving and erasing of the object picture, is possible.

Indications in the object picture are presented in index order starting from the lowest index. Symbols in object picture always have square shape. Text describing symbol is fetched from data base OX attribute for the index.

Table 7: Object picture symbols

Description	Attribute	OV = 0	OV = 1
In use	IU = 0	None	None
Not sampled	OS = 10	magenta “?”	magenta “?”
Obsolete value	OS = 1-9	magenta square	magenta filled square
Unacknowledged alarm	AR = 0	flashing red square	flashing filled red square
Acknowledged alarm	AL = 1	red square	red filled square
Manual state	SS = 1	cyan square	cyan filled square
Active blocking	HB or AB or PB or XB = 1	yellow square	yellow filled square
Normal state	otherwise	green square	green filled square

Representation symbols used for all object pictures are stored in the representation SR_OBPIC in representation file SMOD\HVCONTROL_670\USE\SR_LIB670.PIR.

2.6

Representation file

All representation symbols (process symbols and object picture symbols) are stored in S_USE\SR_LIB670.PIR file, where S_USE is logical path as it is defined in PATH4_S67.TXT file. For each standard function an overview of used representations will be given separately. Standard color definition used for presentation of symbols are given in “*Color definitions used in HV/Control_670*” on page 37.

2.7

Dialog closing

The closing behavior (automatic or manual) of dialogs which performs actions such as sending operation commands to the process, editing limits of analog signals or blockings can be configured in the *process pictures menu bar*. Under *Option* select *Settings*. In the appearing picture select *Tools* and *Process control*. In the appearing dialog the button for dialog behavior can be set to either on or off. Default is off e.g not closing.

2.8 Dialog header presentation

The object identifier presentation in dialogs can be configured to present a part of the hole length of the identifier. In a Substation Control system the station name is redundant information and can be excluded in the dialogs. Though the station name it self must be exist for other functions such as the blockings. In the *process pictures menu bar*. Under *Option* select *Settings*. In the appearing picture select *Tools* and *Show object ID*. In the appearing dialog five different buttons are shown, *Station, Bay, Device, Special identifier 1* and *2*. By selecting the appropriate buttons the header will be presented according to the selection. The buttons are set to either on or off. Default is on/on/on/off/off e.g show Station Bay Device.

Note. Depending on the configuration of the use of Object identifier in the SYS_BASCON.COM file, some of the buttons are inactive.

3 HV General bay

Below is a description of the functionality of the HV General bay.

3.1 General functionality

In this section a more general description of the functionality and performance is described.

3.1.1 History registrations

Always when the process objects (index 15, 16, 54-58, 147, 150, 210-211, 240-245) gets a new value, provided that no blockings is prevailing.

3.1.2 Blockings

Signals can be blocked from the blockings dialog (events, alarms, printout or remote events and indications). This will only affect the MicroSCADA Database.

3.1.3 Alarm generation

When the process object 30 gets the value "1" an alarm is generated. The "Bay Abnormal Status" process object 147 will also generate alarm when it is set. Also when the PSTO value is not equal to 1, 2 and 5 an alarm is generated.

3.1.4 System start-up

The process objects (index 15, 16, 30, 54, 147, 150) are updated at system start up.

3.1.5 Process commands

Process commands can be issued for:

- Block/Deblock Commands
- Block/Deblock Update

Authority level 1 or greater is required in order to issue the above commands.

3.1.6

Internal (MicroSCADA) commands

Internal (MicroSCADA) commands can be issued for:

- Block/Deblock Alarms
- Block/Deblock Events
- Block/Deblock Printouts
- Block/Deblock Remote events and indications

Authority level 1 or greater is required in order to issue the above commands.

The above commands affects all the process object of the General Bay functions plus the specified process objects of the picture functions connected to the bay

Note that these blockings are set within the SCADA database.

3.2

Graphical representation

In this section details about the presentation, actions and conditions are described.

3.2.1

Dialog structure

The dialog structure is as follows:

Process Picture Function Key

Main Dialog

Push button "Set Remote"

Push button "Set Station"

Option (More) Button

Acknowledge Alarms

Blocking Dialog

Object Picture

Process blocking dialog

Close push Button

Help Button

3.2.2

Process presentation

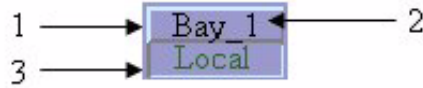


Figure 3: Process representation for HV General bay function

The following information is displayed in the process picture:

- Operator position in textual form - Off, Local, Station, Remote, Error or ---- (if value is not sampled). The process object index 54 - PSTO will receive the value of 0,1,2 or 5 from the IED. Depending on this value, the text is displayed in the picture function

Table 8: PSTO values for Bay position

PSTO Value	Bay Position
0 = Off	Off
1 = Local	Local
2 = Remote	Station or Remote depending on which value is set to 1.
5 = All	Station or Remote depending on which value is set to 1.

- Bay name in textual form (configurable position). The bay name presented is the configurable attribute BAY_LABEL

Table 9:

Description	Presentation	Color	Expression ^a
1. Select area	Unset Function key.	According to the color def for push buttons	'ID':VARMED =FALSE
	Set Function Key	According to the color def for push buttons	'ID':VBAY_LABEL
2. Object Name	Text in lowered field	Black/White	
3. Operator Place, Select area	Text	^b	'LN':PAI(54)==0,1,2,5 'LN':PBI(55..58)==1

a. 'ID' is the ID given during installation of the picture function extended by `_PICTURE_FUNCTION_CONF` (i.e. 'ID' above for a picture function installed as "L1Q0" would be "L1Q0_PICTURE_FUNCTION_CONF". 'LN' is the logical name of the process objects.

b. See table below for attributes expression for color definition. All objects of the standard function (which are in use) are used to express the proper color definition.

The following actions can be performed from the process presentation:

Table 10: Actions possible in the process presentation

Function	Condition(s)	Action
1. Selection	-	Present main dialog

3.2.3

Bay Device Status

Bay status is presented on the status bar for each dialog. Status messages in falling priority for the bay are:

- Not connected to process
- Not updated
- Control blocked
- Update blocked
- Update and control blocked
- Bay reserved

3.2.4

Main Dialog

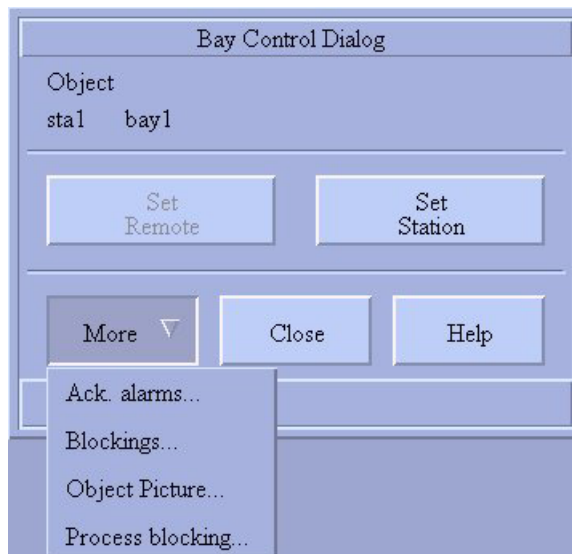


Figure 4: Main dialog for HV General bay function

The main dialog, is displayed when clicking on the Bay Function Key. The main dialog will have information about the bay object with its reference to the station and remote mode.

- Always at start-up, the "Set Remote" button will be set.

- When the bay is set to "Station" mode, the station MicroSCADA will have the permission to control all the devices connected to that particular bay.
- When the bay is set to "Remote" mode, the NCC will have the permission to control all the devices connected to that particular bay.

The table below lists the various conditions of the bay, station with respect to PSTO value. The indexes that are used for operator place indication are 54-PSTO, 55-Remote, 56-Station, 57- Local and 58-Off.

Table 11:

PSTO Value	Bay Position	Bay Control Dialog	Control Dialog of Switching device in MicroSCADA
0 = Off	Off	No Controls are possible Set Remote - Inactive Set Station - Inactive	Open button - Inactive Close button - Inactive
1 = Local	Local	No Controls are possible Set Remote - Inactive Set Station - Inactive	Open button - Inactive Close button - Inactive
2 = Remote	Station mode IX56 = 1IX55 = 0	Bay is in "Station" mode, control is possible from Station. Set Remote - Active Set Station - Inactive	Depending on the switching device position, one the button (open or close) is active and the other is inactive.
2 = Remote	Remote mode IX56 = 0IX55 = 1	Bay is in "Remote" mode, control is possible from NCC. Set Remote - Inactive Set Station - Active	Open button - Inactive Close button - Inactive
2 = Remote	Remote mode *IX56 = 0IX55 = 0	Set Remote - Active Set Station - Inactive	Open button - Inactive Close button - Inactive
2 = Remote	Remote mode *IX56 = 1IX55 = 1	Set Remote - Active Set Station - Inactive	Open button - Inactive Close button - Inactive
5 = All	Station mode IX56 = 1IX55 = 0	Bay is in "Station" mode, control is possible from Station. Set Remote - Active Set Station - Inactive	Depending on the switching device position, one the button (open or close) is active and the other is inactive.
5 = All	Remote mode IX56 = 0IX55 = 1	Bay is in "Remote" mode, control is possible from NCC. Set Remote - Inactive Set Station - Active	Open button - Inactive Close button - Inactive
5 = All	Remote mode *IX56 = 0IX55 = 0	Set Remote - Active Set Station - Inactive	Open button - Inactive Close button - Inactive
5 = All	Remote mode *IX56 = 1IX55 = 1	Set Remote - Active Set Station - Inactive	Open button - Inactive Close button - Inactive

Note:

* The condition of $IX56=0$, $IX55=0$ and $IX56=1$, $IX55=1$ is not allowed as the program automatically sets the operator place to "Remote".

Following information is displayed in the Main Dialog:

- Bay name in textual form. The bay name presented is the OI attribute of process object 240
- Bay status according to "Bay Device Status" on page 48.

The following actions can be performed from the Main Dialog:

Table 12:

Function	Condition(s)	Action
Move	-	Move the dialog
Set Remote	Authority level \geq 1Not RemotePSTO value set to 2 or 5	Display Operator Change pop-up dialog for changing to Remote and change operator place to "Remote"
Set Station	Authority level \geq 1Not StationPSTO value set to 2 or 5	Display Operator Change pop-up dialog for changing to Station and change operator place to "Station"
Object picture	-	Display object picture
Acknowledge alarms	Authority level \geq 1	Display acknowledge alarm picture
Blockings	-	Display blockings picture
Process blocking	-	Display picture for process blockings(update and control)
Close	-	Erase the main dialog and any subdialog(except the object picture)
Help	-	Display help viewer with help about the bay main dialog

If no action is performed within a certain time-out, then the dialog window, with exception of object picture, is closed. The dialogs window are also closed if any other function is selected on the MicroSCADA screen.

3.2.5

Object picture

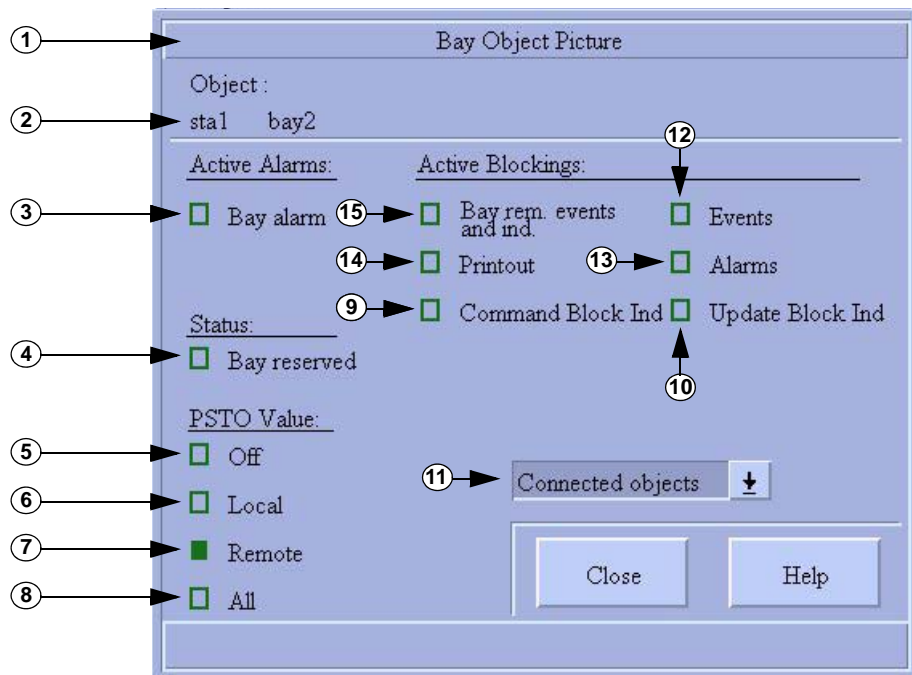


Figure 5: General bay object picture

The following information is displayed in the Object Picture:

- Bay name in textual form - OI attribute of process objects 240.
- Bay status according to table above
- A list of the objects connected to the bay.

Bay status for the following individual signals:

- Bay alarm
- Bay reserved
- PSTO Position - Off
- PSTO Position - Local
- PSTO Position - Remote
- PSTO Position - All
- Command blocked
- Update blocked
- Event block
- Alarm block
- Printout block

- Remote events and indications block

Symbol used for the presentation in the Bay Device object picture is always square, see table below:

Table 13:

Sl. No.	Description	Presentation	Color	Expression ^a
1	Title bar			
2	Object name	Text	Black	'LN':P240
3	Bay Alarm	b	b	'LN':P30
4	Bay Reserved	b	b	'LN':P150
5	PSTO Position - Off	b	b	'LN':P54 = 0
6	PSTO Position - Local	b	b	'LN':P54 = 1
7	PSTO Position - Remote	b	b	'LN':P54 = 2
8	PSTO Position - All	b	b	'LN':P54 = 5
9	Command Blocked Indication	b	b	'LN':P15
10	Update Blocked Indication	b	b	'LN':P16
11	Connected to Bay	List of objects connected to the bay	Black	'c'
12	Event block	b	b	LN:P240
13	Alarm Block	b	b	LN:P241
14	Printout Block	b	b	LN: P242
15	Remote event and indication block	b	b	LN: P244

a. 'ID' is the ID given during installation of the picture function extended by `_PICTURE_FUNCTION_CONF` (i.e. 'ID' above for a picture function installed as "L1Q0" would be "L1Q0_PICTURE_FUNCTION_CONF". 'LN' is the logical name of the process objects.

b. See "General bay object picture" on page 51

c. All devices having the same bay name definition in their OI-attribute will be presented.

The following actions can be performed from the Object Picture:

Table 14: Actions possible in the Object Picture

Function	Condition(s)	Action
Move	-	Move the object picture to a new position
Close	-	Erase the object picture and any sub-dialog (except the object picture)
Help	-	Display help viewer with help about the bay object picture

The object picture is called up from the main dialog, but is not erased if the main dialog is. The object picture is, however, erased if any other function is selected on the MicroSCADA screen.

All signals in the General Bay function are presented in the object picture, provided that IU=1 for the signal. Color coding in the object picture is done according to the description given in “Object picture” on page 43.

The signal name in the object picture is copied from the OX attribute of the corresponding signal. This enables easier and more consistent engineering.

3.2.6

Process Blocking

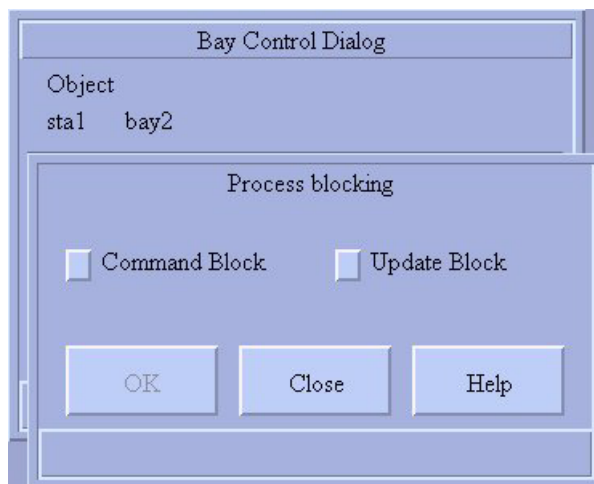


Figure 6: General bay Process blocking dialog

Following information is displayed in the process blockings dialog:

- Object name in textual form - OI attribute of process object 240 (displayed in the Main dialog).
- Bay status in the status bar in falling priority

The following actions can be performed from the process blockings Dialog:

Table 15:

Function	Condition(s)	Action
Move		Move the dialog
Command Blocking	Authority level ≥ 1	Set/Unset command blocking
Update Blocking	Authority level ≥ 1	Set/Unset update blocking
OK	Authority level ≥ 1 and any choice done	Change the blocking status according to toggle button selection and erase the blockings dialog. Commands are only given for those blocking conditions that have been changed
Cancel		Erase the blockings dialog without changing the blocking status
Help		Display help viewer with help about the bay blockings dialog

The process blockings picture is called up from the main dialog, and is also erased if the main dialog is erased.

3.2.7

Acknowledge alarms

Alarms handling is done according to the principle described in “*Alarm acknowledgment*” on page 39.

3.2.8

Blockings dialog

Refer to the general description for blockings. See “*Blockings*” on page 39.

4 HV Switch Device

Below is a description of the functionality of the HV Switch Device. The Switch Device can be a Breaker, Disconnecter or an Earth Switch.

4.1 General functionality

In this section a more general description of the functionality and performance is described.

4.1.1 History registrations

Always when the process objects (index 1, 15, 16, 20, 40, 41, 46, 52, 53, 54, 55, 155,240-242,244) gets a new value, provided that no blockings is prevailing.

4.1.2 Blockings

Signals can be blocked from the blockings dialog (events, alarms, printout or remote events and indications).

4.1.3 Alarm generation

When any of the process objects 40, 46 gets the value “1”.

4.1.4 System start-up

The process objects (index, 15, 16, 20, 40, 41, 46, 52, 53, 54, 55) are updated at system start up.

4.1.5 Process commands

Process commands can be issued for:

- Block/Deblock Commands
- Block/Deblock Update
- Substitute the position
- Open/Close the Switch Device
- Interlock bypass
- Synchrocheck bypass (breaker only)

Authority level 1 or greater is required in order to issue the above commands.

4.1.6 Internal (MicroSCADA) commands

Internal (MicroSCADA) commands can be issued for:

- Block/Deblock Alarms
- Block/Deblock Events
- Block/Deblock Printouts
- Block/Deblock Remote events and indications

Authority level 1 or greater is required in order to issue the above commands.

The above commands affects all the process object of the Switch Device function.

Note that these blockings are set within the SCADA database. No external blockings available for this function.

4.2 Graphical representation

In this section details about the presentation, actions and conditions are described.

4.2.1 Dialog structure

The dialog structure is as follows:

Process Picture Function Key

Main Dialog

Push button "Open"

Push button "Close"

Option (More) Button

Acknowledge Alarms

Blocking Dialog

Bypassed operation

Object Picture

Process blocking

Close push Button

Help Button

4.2.2 Process presentation

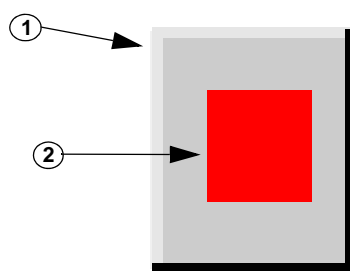


Figure 7: Process representation for HV Switch Device.

Symbols in the process picture for the Switch Device follows choice of the symbol shape in the SCT, e.g. if symbol for the Switch Device is diamond, the same symbol will be used in the process picture.

The presentation below is, for each item, given in priority order; e.g. an alarm will always be shown before a blocking.

Table 16: Process picture representation

Description	Presentation	Color	Expression ^a
1. Select area	Unset Function key	according to the color definition for push buttons	'ID':VARMED = FALSE
	Set Function key	according to the color definition for push buttons	'ID':VARMED = TRUE
2. Position indication			
Not sampled	?	b	'LN':POS1>=10
Middle position (00)	Cross symbol	b	'LN':PDB1==0
Closed	Filled symbol ^c	b	'LN':PDB1==1
Open	Unfilled symbol ^c	b	'LN':PDB1==2
Error position (11)	Cross symbol ^c	b	'LN':PDB1==3

a. 'ID' is the ID given during installation of the picture function extended by `_PICTURE_FUNCTION_CONF` (i.e. 'ID' above for a picture function installed as "L1Q0" would be "L1Q0_PICTURE_FUNCTION_CONF". 'LN' is the logical name of the process objects.

b. See "Attribute expressions for color definitions" on page 38. All process objects of the standard function (which are in use) are used to calculate the color.

c. Symbol used is either square, diamond or circle according to selection made during configuration. See "Graphical representation" on page 56

Table 17: Actions possible from process picture

Function	Condition(s)	Action
1. Selection	-	Present main dialog

Below is a chart of the different symbols used for the HV Switch Device and their corresponding selector value.



Figure 8: Symbol overview for HV Switch Device process presentation.

Representation symbol can have different shapes, depending on choice done in the SCT. Picture above gives representation symbol for square shape. Representations for circle symbols (SQ_APPC1, SQ_APPC2, SQ_APPC3) and diamond symbols (SQ_APPD1, SQ_APPD2, SQ_APPD3) have the same selector values, but square shapes are replaced with circle respective diamond symbols.

Description of representations in priority order is given in table 18, “Representation symbols, HV Switch Device” .

Table 18: Representation symbols, HV Switch Device

Selector value	Description	Color
0	intermediate, selected, under command	White, flashing
1	intermediate, selected on monitor	White
2	intermediate, obsolete value	Magenta
3	intermediate, unacknowledged alarm	Red, flashing
4	intermediate, acknowledged alarm	Red
5	intermediate, warning or blockings (alarms, events, print-outs)	Yellow
6	intermediate, update blocked or manually entered	Cyan
7	intermediate, control blocked or manually controlled	Brown
8	intermediate, normal state	Green
9	intermediate, substitute	Blue

Table 18: Representation symbols, HV Switch Device (Continued)

Selector value	Description	Color
10	closed, selected, under command	White, flashing
11	closed, selected on monitor	White
12	closed obsolete value	Magenta
13	closed, unacknowledged alarm	Red, flashing
14	closed, acknowledged alarm	Red
15	closed, warning or blockings (alarms, events, printouts)	Yellow
16	closed, update blocked or manually entered	Cyan
17	closed, control blocked or manually controlled	Brown
18	closed, normal state	Green
19	closed, substitute	Blue
20	open, selected, under command	White, flashing
21	open, selected on monitor	White
22	open, obsolete value	Magenta
23	open, unacknowledged alarm	Red, flashing
24	open, acknowledged alarm	Red
25	open, warning or blockings (alarms, events, printouts)	Yellow
26	open, update blocked or manually entered	Cyan
27	open, control blocked or manually controlled	Brown
28	open, normal state	Green
29	open, substitute	Blue
30	faulty, selected, under command	White, flashing
31	faulty, selected on monitor	White
32	faulty, obsolete value	Magenta
33	faulty, unacknowledged alarm	Red, flashing
34	faulty, acknowledged alarm	Red
35	faulty, warning or blockings (alarms, events, printouts)	Yellow
36	faulty, update blocked or manually entered	Cyan
37	faulty, control blocked or manually controlled	Brown
38	faulty, normal state	Green
39	faulty, substitute	Blue

Table 18: Representation symbols, HV Switch Device (Continued)

Selector value	Description	Color
40	not sampled, selected, under command	White, flashing
41	not sampled, selected on monitor	White
42	not sampled, unknown	Magenta
-1	shown in representation too	Black

4.2.3

Switch Device status

Switch Device status is presented on the status bar for each dialog. Status messages in falling priority for the Switch Device are:

- Not connected to process
- Not updated
- Control blocked
- Update blocked
- Control and update blocked
- Interlocked

4.2.4

Main dialog

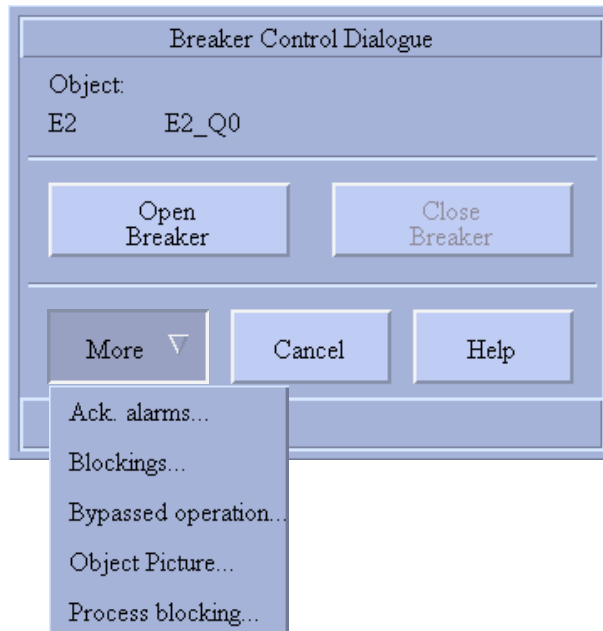


Figure 9: Main dialog for apparatus

The main dialog is displayed after clicking on the Switch Device function key.

Buttons "Open" and "Close" reflects position of the Switch Device. If the Switch Device is opened, the button "Open" is greyed out, and the button "Close" is sensitive, and vice versa if the Switch Device is closed. However, in some cases both buttons can be greyed out:

- Operator does not have required authority
- Object status of the Switch Device is > 0
- The Switch Device is interlocked
- The bay that the Switch Device is connected to is not in station mode

The following information is displayed in the Main Dialog:

- Switch Device name in textual form - the OI attribute of process object 240
- Switch Device according to "Switch Device status"

If the switch Device is configured as Operable - no, then the open and close function keys are not present.

Table 19:

Function	Condition(s)	Action
Move		Move the dialog
Open/Close the SwD	Authority level >=1	Open/Close the SwD
Cancel		Cancel any selection and close the main dialog
Help		Show help dialog
Ack alarms	Authority level >=1	Show Ack alarm dialog
Blockings		Bring up blocking dialog
Bypassed operation		Bring up forced operation dialog
Object picture		Show Object picture
Process blocking		Show process blocking dialog

4.2.5

Object picture

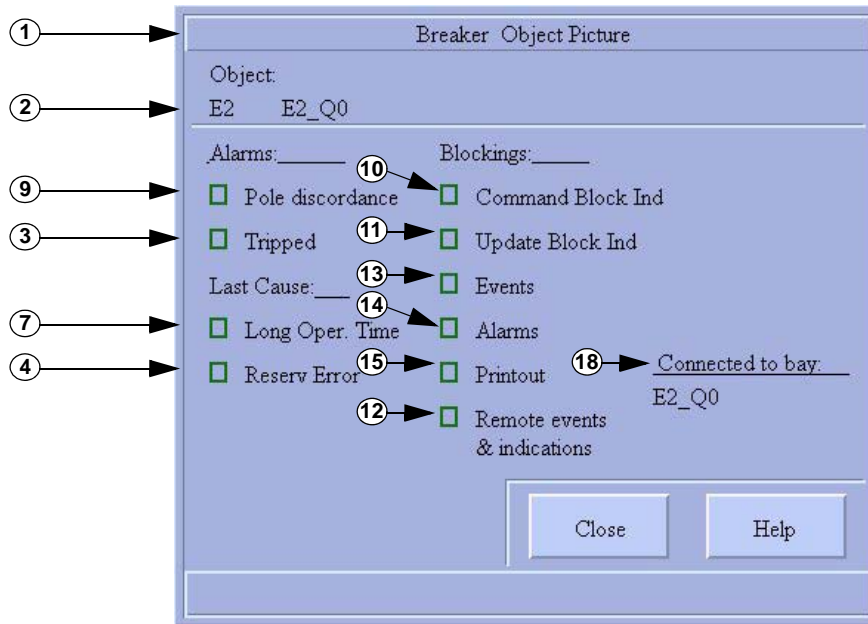


Figure 10: HV Switch Device Object picture

The following information is displayed in the Object Picture:

- Switch Device name in textual form - OI attribute of process objects 240.
- Switch Device status according to table above
- Bay, to which the Switch Device is connected (logical name of the bay)

Switch Device status for the following individual signals:

- Command blocked
- Update blocked
- Tripped (only for breaker)
- Pole discordance
- Long Oper. Time
- Reserv Error
- Event block
- Alarm block
- Printout block
- Remote events and indications block

Symbols in the object picture for the Switch Device does not follow choice of the symbol shape in the SCT. Symbol used for the presentation in the Switch Device object picture is always square, see table below.

Table 20: Switch Device object picture

Description	Presentation	Color	Expression ^a
1. Title bar			-
2. Object name	Text	Black	'LN':P240
3. Breaker tripped ^b	c	c	'LN':P40
4. Reserve error	c	c	'LN':P41
7. Long operation time	c	c	'LN':P41
9. Pole discordance	c	c	'LN':P46
10. Command Block Ind	c	c	'LN':P15
11. Update Block Ind	c	c	'LN':P16
12. Remote event & ind. blocking	c	c	'LN':P244
13. Event blocking	c	c	'LN':P240
14. Alarm blocking	c	c	'LN':P241
15. Printout blocking	c	c	'LN':P242
18. Connected to bay	Text	Black	-

a. 'LN' is the logical name of the process objects.

b. Only present for the Breaker.

c. See "Object picture" on page 43

The table below gives an overview of actions that could be performed from the Switch Device object picture.

Table 21: Actions possible from Object picture

Function	Condition(s)	Action
1. Move	-	Move the dialog to a new position
2. Close	-	Close dialog's window
3. Help	-	Open help window for Switch Device object picture

4.2.6

Bypass operation

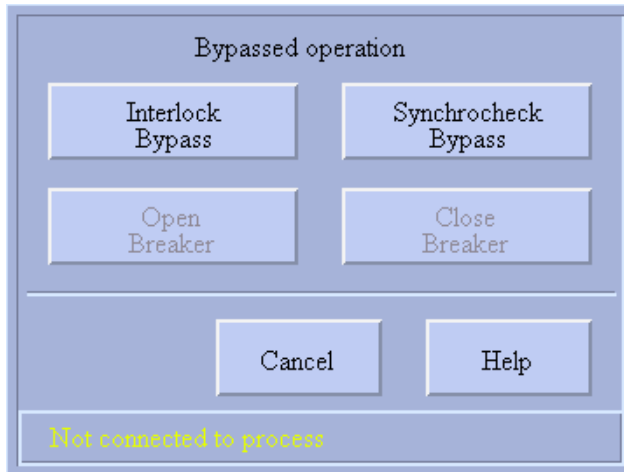


Figure 11: Bypass operation dialog

When this dialog window is opened, buttons “Open” and “Close” are greyed out and insensitive. These buttons becomes sensitive after one of buttons “Interlock Bypass” or “Synchrocheck Bypass” is pushed down. Note that both buttons “Open” and “Close” are sensitive at the same time.

After execution of any of the operations open or close the bypass of interlock or synchrocheck is reset and the dialog window is closed.

The following information is displayed in the Bypassed Operation dialog:

- Switch Device status according to “Switch Device status” on page 60.

For disconnectors and earthing switches, the Synchrocheck bypass button is not present.

Table 22:

Function	Condition(s)	Action
Move		Move the dialog
Interlock bypass	Authority level ≥ 2	Bypass interlocking
Synchrocheck bypass (only for Breaker)	Authority level ≥ 2	Bypass synchrocheck control
Open Switch Device	Authority level ≥ 2 and IBy or SynBy	Open the SwD
Close Switch Device	Authority level ≥ 2 and IBy or SynBy	Close the SwD
Close		Close the dialog's window and cancel any selection made
Help		Open Help window

4.2.7

Process blockings

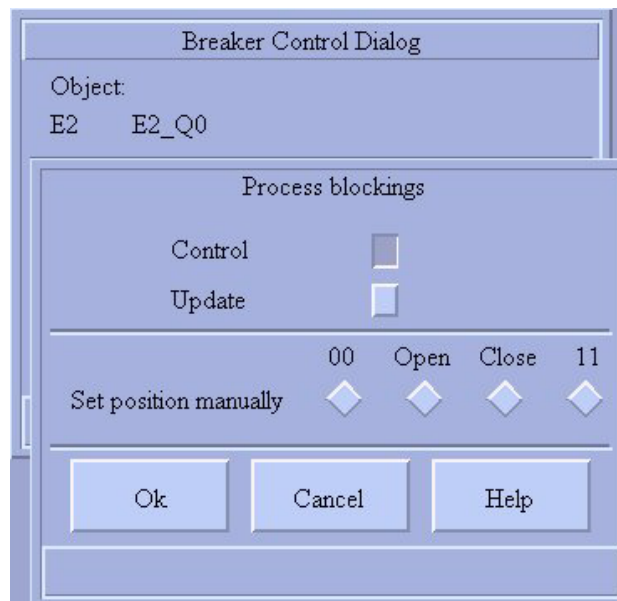


Figure 12: Process blocking dialog

When dialog window is opened, position of buttons shows setting in the selected Switch Device data base. Buttons "OK" and "Cancel" are greyed out and insensitive until a choice is done (some of buttons is pushed down).

The following information is displayed in the Process blockings dialog:

Table 23:

Function	Condition(s)	Action
Move		Move the dialog
Command Blocking	Authority level >=1	Set/Unset command blocking in IED
Update Blocking	Authority level >=1	Set/Unset update blocking in IED
Manually middle position (00)	Authority level >=1 and UpdBI	Put the SwD to middle position
Manually open	Authority level >=1 and UpdBI and Closed	Open the SwD
Manually Close	Authority level >=1 and UpdBI and Opened	Close the SwD
Manually error position (11)	Authority level >=1 and UpdBI	Put the SwD to error position
OK	Authority level >=1 and any choice done	Execute done choices
Cancel		Cancel any selected choices and close the window
Help		Open Help window

4.2.8

Acknowledge alarm

See “*Alarm acknowledgment*” on page 39.

4.2.9

Blocking dialog

See “*Blockings*” on page 39.

5

HV Measurement

Below is a description of the functionality of the HV Measurement.

5.1

General functionality

In this section a more general description of the functionality and performance is described.

5.1.1

History registrations

Always when the process objects 10..32 passes an alarm or warning limit, provided that no blocking is prevailing. Events are also generated when blocking (index 240, 242, 244, 245) is performed. Pulse counter object 33-49 do not have event registrations as default.

5.1.2**Blockings**

Process signals can be blocked from the blockings dialog (events, alarms, printout update or remote events and indications). Other control system signals (internal signals) are not blocked by this facility.

5.1.3**Alarm generation**

When any of the process objects for AI's passes the alarm limit independently if the limits are supervised by the SCADA or the relay. Pulse counter object do not have alarm registrations.

5.1.4**Process commands**

Process commands can be issued for editing alarm and warning limits. For LON communication it is possible to let the terminal handle the supervision. Then limits are both stored in the terminal and in the process database. The installed library function must be configured as LON-NET station type and the terminal must supervise the limits.

Note that the commands for edit of limits only have affect when configurable LIMITS_SUPERVISED_BY is set to SCADA. Otherwise the features in this sub dialog is disabled. These commands only affect the SCADA database. The attributes that are manipulated are HA, HW, LA and LW.

5.1.5**Internal (MicroSCADA) commands**

Internal (MicroSCADA) commands can be issued for:

- Block/Deblock Alarms
- Block/Deblock Events
- Block/Deblock Printouts
- Block/Deblock Update
- Block/Deblock Remote events and indications

Authority level 1 or higher is required in order to issue the above commands. The above commands affect all the process object of the Measurement function. The total time for Blocking/Deblocking the Measurement is less than 1s.

Note that these blockings are set within the SCADA database. No external blockings available for this function

5.2**Graphical representation**

In this section details about the presentation, actions and conditions are described.

5.2.1

Dialog structure

The dialog structure is as follows:

Process Picture Function Key**Main Dialog**

Reset Min value

Reset Max Value

Reset Frozen Value

Option (More) Button

Acknowledge Alarms

Blocking Dialog

Edit Limit Dialog (not for PC PO's)

Object Picture

Close Button

Help Button

5.2.2

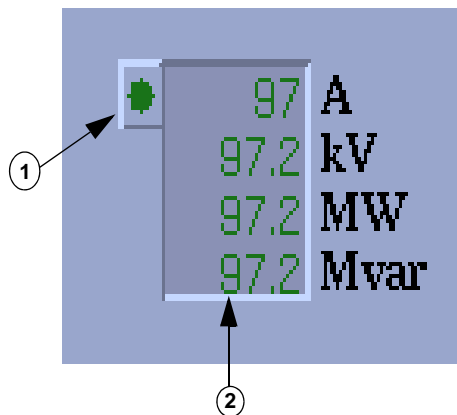
Process presentation

Figure 13: Process representation for HV Measurement.

The following information is displayed in the process picture when the measurement is in mode “Show”:

- Measurement value with the configured number of decimals and sign.
- Measurement status as summary color information (alarms, blockings, uncertain value etc).

The following information is displayed in the process picture when the measurement is in mode “Hidden”:

Only dynamic presentation of the measurement symbol and minimum one empty value frame.

Table 24: Process picture representation for HV Measurement

Description	Presentation	Color	Expression ^a
1. Select area	Unset Function key. (Not selected)	b	'ID':VARMED = FALSE
	Set Function key. (Selected)	b	'ID':VARMED = TRUE
2. Value presentation area			'LN':POV'IX'
Not sampled	"?"	d	
Value overflow	"*****"	c,d	
Value	Value	d	

- a. 'ID' is the ID given during installation of the picture function extended by _PICTURE_FUNCTION_CONF (i.e. 'ID' above for a picture function installed as "L1Q0" would be "L1Q0_PICTURE_FUNCTION_CONF". 'LN' is the logical name of the process objects.
- b. See *"Attribute expressions for color definitions"* on page 38. All objects of the standard function (which are in use) are used to express the proper color definition.
- c. 6 characters (sign and decimal point included) is used to show the value. If the value has increased beyond 6 characters it is still readable in the main dialog presentation.
- d. See *"Color definitions for measurement values"* on page 38

The following actions can be performed from the process presentation:

Table 25: Actions possible from process presentation

Function	Condition(s)	Action
1. Selection	-	Present main dialog

5.2.3

Measurement status

Switch Device status is presented on the status bar for each dialog. Status messages in falling priority for the measurement are:

- Not connected to process
- Not updated
- Alarm indication
- Blocking/deblocking, please wait.

5.2.4

Main dialog

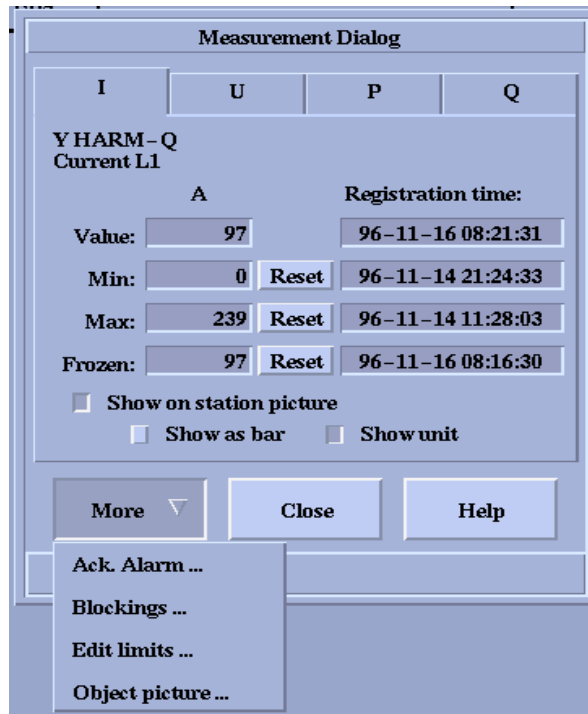


Figure 14: Main dialog for HV Measurement function

The main dialog is displayed after clicking on the measurement function key.

Following information is displayed in the Main Dialog individually for each value within the function (max 4):

- Object name in textual form. The Object presented is the OI attribute of process object 10..49, depending on which measurement is configured and which is selected for presentation in main dialog.
- Actual value
- Minimum logged value (not for pulse counters, “-”)
- Minimum logged value registration time (not for pulse counters, “-”)
- Maximum logged value (not for pulse counters, “-”)
- Maximum logged value registration time (not for pulse counters, “-”)
- Frozen value
- Frozen value registration time
- State of Show mode
- State of Show unit mode
- State of Show as bar

The following actions can be performed from the Main Dialog:

Table 26: Actions possible in the Main Dialog

Function	Condition(s)	Action
Move	-	Move the dialog to a new position
Select presentation	-	Presentation mode
Reset Min value	Authority level ≥ 1	Reset: Minimum value
Reset Max value	Authority level ≥ 1	Reset: Maximum value
Reset Frozen value	Authority level ≥ 1	Reset: Frozen value
Object picture	-	Display object picture
Acknowledge alarms	Authority level ≥ 1	Display acknowledge alarm picture
Blockings	Function is not occupied by other user	Display blockings picture
Edit limits	Function is not occupied by other user	Display edit limits picture
Close	-	Erase the main dialog and any sub-dialog (except the object picture)
Help	-	Display help viewer with help about the HV Measurement main dialog

If no action is performed within a certain time-out, then the dialog window, with exception of object picture, is closed. The dialogs window are also closed if any other function is selected on the MicroSCADA screen.

5.2.5

Object Picture

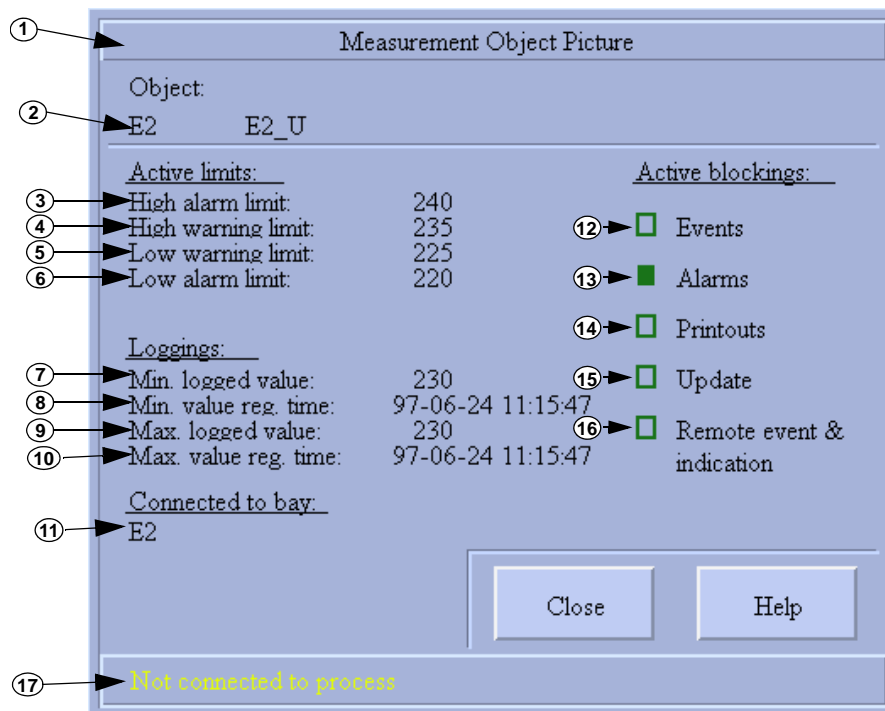


Figure 15: Object picture for HV Measurement.

The following information is displayed in the Object Picture:

- Measurement name in textual form - OI attribute of process object 10..49, depending on which measurement is configured and which is selected for presentation in main dialog.
- Measurement status according to “*Measurement status*” on page 69.
- Bay, to which the measurement is connected (logical name of the bay)
- Warning and alarm limits (not for pulse counters)
- Minimum logged value (not for pulse counters)
- Minimum logged value registration time (not for pulse counters)
- Maximum logged value (not for pulse counters)
- Maximum logged value registration time (not for pulse counters)

Measurement status for the following individual signals:

- Event block
- Alarm block
- Printout block

- Update block
- Remote events and indications block

The presentation below is, for each item, given in priority order. E.g. will always an alarm be shown before a blocking.

Table 27: Object picture representation

Description	Presentation	Color	Expression ^a
1. Move box	Unset function key	Function key ("M",2)	Not selected
	Set function key	Set color ("M",7)	Selected
2. Object name	Text	Black	LN:POI(x-y)
3. Active limit - High alarm	Text	Black "?" (Magenta) "-" (Black)	PO's <> PC's Check HI attribute
4. Active limit - High warning	Text	Black "?" (Magenta) "-" (Black)	PO's <> PC's Check HW attribute
5. Active limit - Low warning	Text	Black "?" (Magenta) "-" (Black)	PO's <> PC's Check LW attribute
6. Active limit - Low alarm	Text	Black "?" (Magenta) "-" (Black)	PO's <> PC's Check LI attribute
7. Min. logged value	Text	Black "?" (Magenta) "-" (Black)	PO's <> PC's Check MV attribute
8. Min. logged value reg. time	Text	Black "?" (Magenta) "-" (Black)	PO's <> PC's Check MT attribute
9. Max. logged value	Text	Black "?" (Magenta) "-" (Black)	PO's <> PC's Check XV attribute

Table 27: Object picture representation (Continued)

Description	Presentation	Color	Expression ^a
10. Max. logged value reg. time	Text	Black “?” (Magenta) “-” (Black)	PO's <> PC's Check XT attribute
11. Connected to bay	Text	Black	'ID' :VBAY_NAME
12. Event blocking	See “Object picture” on page 43	See “Object picture” on page 43	'LN':P240
13. Alarm blocking	See “Object picture” on page 43	See “Object picture” on page 43	'LN':P241
14. Printout blocking	See “Object picture” on page 43	See “Object picture” on page 43	'LN':P242
15. Update blocking	See “Object picture” on page 43	See “Object picture” on page 43	'LN':P245
16. Remote event and indication blocking	See “Object picture” on page 43	See “Object picture” on page 43	'LN':P244
17. Status information	Text	Yellow	LN:POS(x-y)=10 LN:PSS(x-y)=1

a. 'LN' is the logical name of the process objects.

The following actions can be performed from the Object Picture:

Table 28: Actions possible in the Object Picture

Function	Condition(s)	Action
Move	-	Move the object picture to a new position
Close	-	Erase the object picture
Help	-	Display help viewer with help about the object picture

5.2.6

Edit limits dialog

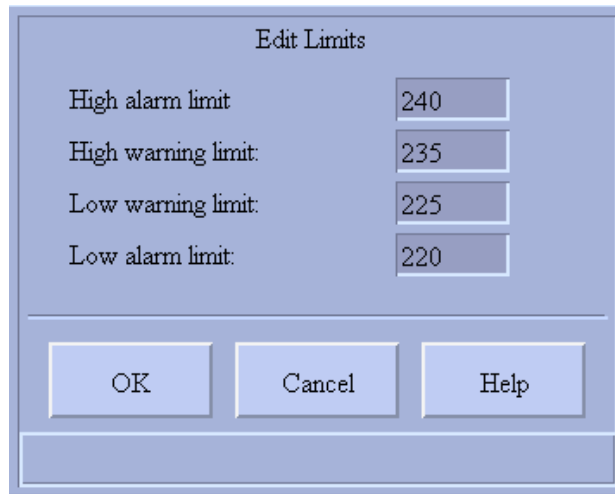


Figure 16: HV Measurement Edit limits dialog

Following information is displayed in the Edit limits dialog:

- Object name in textual form - OI attribute of process object 240 (displayed in the Main dialog).
- Switch Device status.
- Measurement limits: High alarm limit, High warning limit, Low warning limit and Low alarm limit.

The following actions can be performed from the Edit limits Dialog:

Table 29: Actions possible in the Edit limits dialog

Function	Condition	Action
Move	-	Movement is made by moving the main dialog.
Enter new High alarm limit	Authority level >= 1	Enter new value for the High alarm limit
Enter new High warning limit	Authority level >= 1	Enter new value for the High warning limit
Enter new Low warning limit	Authority level >= 1	Enter new value for the Low warning limit
Enter new Low alarm limit	Authority level >= 1	Enter new value for the Low alarm limit
OK	Authority level >= 1	Change the limits in the MicroSCADA database and send limit change command to the terminal. Return to the main dialog
Cancel	-	Erase the Edit limits dialog and return to the main dialog, without changing the limits.

Table 29: Actions possible in the Edit limits dialog (Continued)

Function	Condition	Action
Help	-	Display help viewer with help about the HV Measurement Edit limits dialog

If no action is performed within a certain time-out, then the dialogs (except the object picture) are erased. The dialogs are also be erased if any other function is selected in the process picture.

5.2.7 Acknowledge alarm

See “Alarm acknowledgment” on page 39.

5.2.8 Blocking dialog

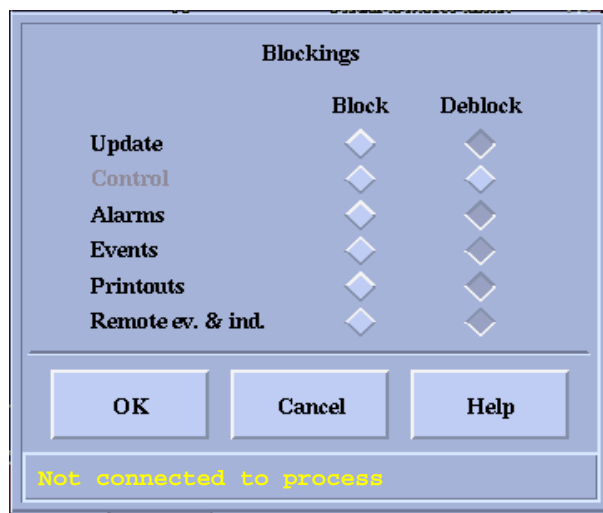


Figure 17: HV Measurement Blockings dialog

Following information is displayed in the Blocking dialog:

- Object name in textual form - OI attribute of process object 10..49, depending on which measurement is configured and which is selected for presentation in main dialog (displayed in the Main dialog).
- Measurement status according to “Measurement status” on page 69.
- Measurement blocking state: Events, Alarms, Printout, Update, Remote event and indication.

The following actions can be performed from the Blockings Dialog:

Table 30: Actions possible in the Blockings Dialog

Function	Condition	Action
Move		Move the dialog.
Update block/deblock	Authority level ≥ 1	Set UB =1 for PT =4 ^a Set index 245 to1 ^a Set UB =0 for PT =4 ^a Set index 245 = 0 ^a
Event block/deblock	Authority level ≥ 1	Set HB =1 for PT =4 ^a Set index 240 to1 ^a Set HB=0 for PT=4 ^a Set index 240 = 0 ^a
Alarm block/deblock	Authority level ≥ 1	Set AB =1 for PT =4 ^a Set index 241=1 ^a Set AB=0 for PT=4 ^a Set index 241 = 0 ^a
Printout block/deblock	Authority level ≥ 1	Set PB =1 for PT =4 ^a Set index 242=1 ^a Set PB=0 for PT=4 ^a Set index 242 = 0 ^a
Remote and events indication	Authority level ≥ 1	Set XB =1 for PT =4 ^a Set index 245=1 ^a Set XB=0 for PT=4 ^a Set index 245 = 0 ^a
Ok	Authority level ≥ 1	Execute the command and set the modified values in MS database
Cancel		Close the dialog without modify the MS database
Help		Display help dialog

a. No action is performed until the 'OK' button is pressed.

If no action is performed within a certain time-out, then the dialogs (except the object picture) are erased. The dialogs are also be erased if any other function is selected in the process picture.

6 HV Supervision

Below is a description of the functionality of the HV Supervision.

6.1 General functionality

In this section a more general description of the functionality and performance is described.

6.1.1 History registrations

Always when the process objects 60-95 and gets a new value, provided that no blocking is prevailing. Events are also generated when blocking (index 240-242,244-245) is performed.

6.1.2 Blockings

Process signals 60-95 can be blocked from the blockings dialog (events, alarms, print-out or remote events and indications). Other control system signals are not blocked by this facility.

6.1.3 Alarm generation

When any of the process objects 67-95 except from the indexes (index 60-66 change of active setting group does not generate alarm) gets the value 1.

6.1.4 System start-up

The process objects 60-95 are updated at system start up.

6.1.5 Process commands

There are no process commands.

6.1.6 Internal (MicroSCADA) commands

Internal (MicroSCADA) commands can be issued for:

- Block/Deblock Alarms
- Block/Deblock Events
- Block/Deblock Printouts
- Block/deblock Update
- Block/Deblock Remote events and indications

Authority level 1 or greater is required in order to issue the above commands.

The above commands affects all the process object of the Supervision function.

Note that these blockings are set within the SCADA database. No external blockings available for this function.

6.2 Graphical representation

In this section details about the presentation, actions and conditions are described.

6.2.1

Dialog structure

The dialog structure is as follows:

Process Picture Function Key

Main Dialog

Option button

Acknowledge alarms

Blockings dialog

Object Picture (general part)

Object Picture (I/O part)

Device information

Close push button

Help button

Help viewer

6.2.2

Process presentation

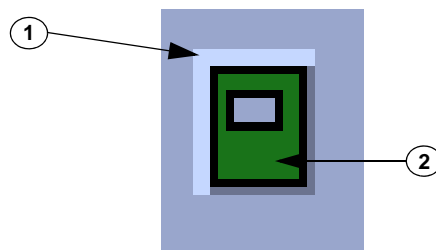


Figure 18: Process representation for HV Supervision.

The following information is displayed in the process picture:

- 670 series status as summary color information. (alarms, blockings, uncertain value etc.

The presentation below is, for each item, given in priority order. E.g. an alarm will always be shown before a blocking.

Table 31: Process picture representation for HV Supervision

Description	Presentation	Color	Expression ^a
1. Select area	Unset Function key	according to the color definition for push buttons	'ID':VARMED = FALSE
	Set Function key	according to the color definition for push buttons	'ID':VARMED = TRUE
2. Status	Filled box	b	b

a. 'ID' is the ID given during installation of the picture function extended by `_PICTURE_FUNCTION_CONF` (i.e. 'ID' above for a picture function installed as "L1Q0" would be "L1Q0__PICTURE_FUNCTION_CONF").

b. See "Attribute expressions for color definitions" on page 38. All process objects of the standard function (which are in use) are used to calculate the color.

The following actions can be performed from the process presentation:

Table 32: Actions possible from process presentation

Function	Condition(s)	Action
1. Selection	-	Present main dialog

6.2.3

670 series Supervision Status

Status is presented on the status bar for each dialog. Status messages in falling priority for the 670 series Supervision are:

- Not connected to process
- Blocking/deblocking, Please Wait.

6.2.4

Main dialog

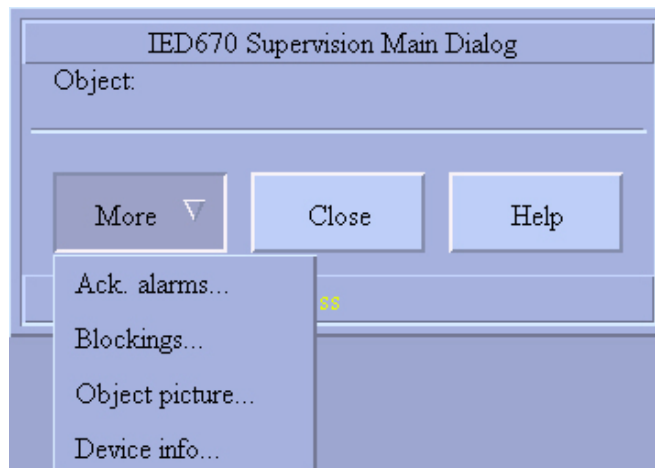


Figure 19: Supervision Main Dialog

The following information is displayed in the Main Dialog:

- Object name in textual form. The name presented is the OI attribute of process object 240
- Status according to "670 series Supervision Status" in table Process picture representation for 670 series Supervision table

The following actions can be performed from the Main Dialog:

Table 33: Actions possible in the Main Dialog

Function	Condition(s)	Action
Move	-	Move the dialog to a new position
Acknowledge alarms	Authority level \geq 1	Display acknowledge alarm picture
Blockings	-	Display blockings picture
Object picture	-	Display the object picture
Device information	-	Display device information
Close	-	Erase the main dialog and any sub-dialog (except the object picture)
Help	-	Display help viewer with help about the main dialog

If no action is performed within a certain time-out, then the dialogs (except the object pictures) are erased. The dialogs are also erased if any other function is selected on the MicroSCADA screen.

6.2.5

Object Picture

The following information is displayed in the Object Picture:

- Bay name in textual form. The bay name presents the OI attribute of process object 240.
- Status in the "670 series Supervision Status" in table Process picture representation for 670 series Supervision is shown in *table 34, "Process objects for supervision function"* on page 84.

Status for the following individual signals:

- Internal Fail
- Warning
- CPU Fail
- CPU Warning
- LDCMs comm. fail
- SGs Active
- TRMs staus
- IO-board status
- Internal blocking signals

For more detailed information of which signal is included in which folder, see *table 34, "Process objects for supervision function"* on page 84.

The folder General is shown in *figure 20*.

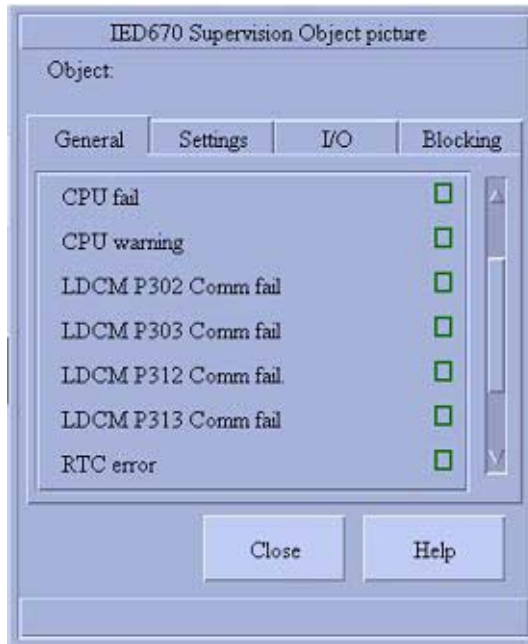


Figure 20: The folder General

The folder Settings is shown in *figure 21*.

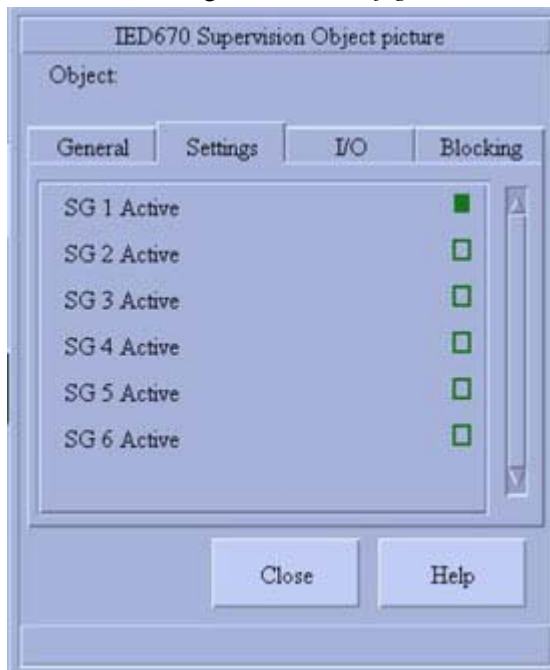


Figure 21: The folder Settings

The folder I/O is shown in *figure 22*.



Figure 22: The folder I/O

The folder Blocking is shown in *figure 23*.



Figure 23: The folder Blocking

Information in the Object picture is presented in 4 folders. In the table below it all process objects for this function is listed. It is also stated in if the process object is included in a folder or not (in case not, N/A is typed in column folder). The table also tells which folder the process object belongs to. The alarm class is also stated.

The name of signal presented in the list on the picture is the OX attribute from the process database. If a process object is set as out of use (IU = 0) the signal will not be presented in the list. Symbol presentation has always square form, but color presentation follows standard as described in “*Color coding*” on page 37. The the color of folder name e.g. “General” follows the same principle. E.g. if any signal from the list has activated alarm, the text “General” will be red. If the symbol is on the bottom of the list and not visible in the window the alarm state will be thus indicated. In order to make the symbol visible, scroll down the list.

Table 34: Process objects for supervision function

Index	Folder	Object text	Alarm/Event
60	N/A	Setting changed	Event
61	Settings	SG 1 Active	Event
62	Settings	SG 2 Active	Event
63	Settings	SG 3 Active	Event
64	Settings	SG 4 Active	Event
65	Settings	SG 5 Active	Event
66	Settings	SG 6 Active	Event
67	General	Internal fail	Alarm & Event
68	General	Warning	Alarm & Event
69	General	CPU fail	Alarm & Event
70	General	CPU warning	Alarm & Event
71	General	LDCM P302 Comm fail	Alarm & Event
72	General	LDCM P303 Comm fail	Alarm & Event
73	General	LDCM P312 Comm fail	Alarm & Event
74	General	LDCM P313 Comm fail	Alarm & Event
75	I/O	TRM P31	Alarm & Event
76	I/O	TRM P32	Alarm & Event
77	General	Spare	Alarm & Event
78	General	Spare	Alarm & Event
79	I/O	I/O board P3	Alarm & Event
80	I/O	I/O board P4	Alarm & Event
81	I/O	I/O board P5	Alarm & Event
82	I/O	I/O board P6	Alarm & Event
83	I/O	I/O board P7	Alarm & Event
84	I/O	I/O board P8	Alarm & Event
85	I/O	I/O board P9	Alarm & Event

Table 34: Process objects for supervision function (Continued)

Index	Folder	Object text	Alarm/Event
86	I/O	I/O board P10	Alarm & Event
87	I/O	I/O board P11	Alarm & Event
88	I/O	I/O board P12	Alarm & Event
89	I/O	I/O board P13	Alarm & Event
90	I/O	I/O board P14	Alarm & Event
91	I/O	I/O board P15	Alarm & Event
92	I/O	I/O board P16	Alarm & Event
93	General	RTC error	Alarm & Event
94	General	Time synchronization error	Alarm & Event
95	General	Spare	Alarm & Event
240	Blocking	Events	Event
241	Blocking	Alarms	Event
242	Blocking	Printout	Event
243	Blocking	System object, NEVER edit	Event
244	Blocking	Rem. events and ind.	N/A
245	Blocking	Update	Event

6.2.6**Acknowledge alarm**

See “*Alarm acknowledgment*” on page 39.

6.2.7**Blocking dialog**

Following information is displayed in the Blocking dialog:

- Object name in textual form - OI attribute of process object 240 (displayed in the Main dialog).
- IED supervision status according to table 4
- IED supervision blocking state: Events, Alarms, Printout, Update, Remote event and indication.

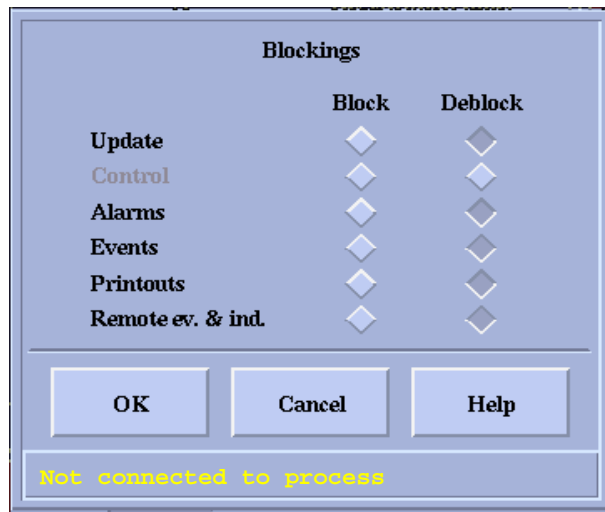


Figure 24: HV supervision Blockings dialog

The following actions can be performed from the Blockings Dialog:

Table 35: Actions possible in the Blockings dialog

Function	Condition	Action
Move	-	Movement is made by moving the main dialog.
Block events	Authority level >= 1	- Set HB=1 for selected objects ^a - Set index 240 to 1 ^a
Deblock events	Authority level >= 1	- Set HB=0 for selected objects ^a - Set index 240 to 0 ^a
Block alarms	Authority level >= 1	- Set AB=1 for selected objects ^a - Set index 241 to 1 ^a
Deblock alarms	Authority level >= 1	- Set AB=0 for selected objects ^a - Set index 241 to 0 ^a
Block printout	Authority level >= 1	- Set PB=1 for selected objects ^a - Set index 242 to 1 ^a
Deblock printout	Authority level >= 1	- Set PB=0 for selected objects ^a - Set index 242 to 0 ^a
Block update	Authority level >= 1	- Set UB=1 for selected objects ^a - Set index 245 to 1 ^a
Deblock update	Authority level >= 1	- Set UB=0 for selected objects ^a - Set index 245 to 0 and trig SPU_UPDATE:C. ^a
Block Remote events and indications	Authority level >= 1	- Set XB=1 for selected objects ^a - Set index 244 to 1 ^a

Table 35: Actions possible in the Blockings dialog (Continued)

Function	Condition	Action
Deblock Remote events and indications	Authority level ≥ 1	- Set XB=0 for selected objects ^a - Set index 244 to 0 ^a
OK	Authority level ≥ 1	Execute the blocking actions according to what is set by the buttons explained above. Return to the main dialog
Cancel	-	Erase the Blocking dialog and return to the main dialog, without changing the limits.
Help	-	Display help viewer with help about the HV Supervision blocking dialog

a. No action is performed until the 'OK' button is pressed.

6.2.8

Device information dialog

Following information is displayed in the device information dialog:

- Object name in textual form - OI attribute of process object 240 (displayed in the Main dialog).
- 670 series supervision status according to *table 34*.
- 670 series supervision device information (3 lines)

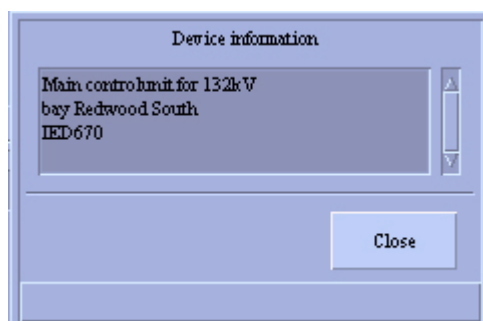


Figure 25: HV supervision Device information dialog

The following actions can be performed from the Device information dialog:

Table 36: Actions possible from the Device Information Dialog

Function	Condition	Action
Move	-	Movement is made by moving the main dialog.
Close	-	Erase the Device information dialog and return to the main dialog.

The chapter “Appendix A”

This chapter contains additional information for the use of the HV/Control 670 software module.

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1 Application engineering information

All files that are connected to the function are listed here, such as format pictures, dialog pictures, text files and help files.

1.1 HV General Bay

1.1.1 Process objects

The process objects related to this function are described in “*Process Objects*” on page 105.

1.1.2 Files

The files that are used for HV General bay are described below:

1.1.3 Format pictures

Format pictures used during runtime for event and alarm presentation.

Table 1:

Filename	Name	Location
FORM4S102.PIC	Process blockings	USE ^a
FORM4S103.PIC	Process alarms	USE ^a
FORM4S104.PIC	Operators place	USE ^a
FORM4S105.PIC	Process blockings	USE ^a
FORM4S106.PIC	Bay order events	USE ^a
FORM4S112.PIC	PSTO value	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.1.4 Dialog pictures

Files used during runtime in process pictures.

Table 2:

Filename	Name	Location
SQU_GBAYA.PIC	Main dialog	USE ^a
SQU_GBAYB.PIC	Bay blocking	USE ^a
SQU_GBAYC.PIC	Object picture	USE ^a
SQU_GBAYD.PIC	Process blocking	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.1.5**Configuration file**

Files used during installation and configuration of the function.

Table 3:

Filename	Name	Location
SQI_GBAY.DAT	Standard configuration data file	INST ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.1.6**Texts**

Text files which are language dependable used during installation/configuration and runtime.

Table 4:

Filename	Name	Location
GBAY1_SCT.HLP	Configuration tool help texts	LANG'L ^a
SQU_GBAYA.HLP	Main dialog help texts	LANG'L ^a
SQU_GBAYB.HLP	Bay blockings dialog help texts	LANG'L ^a
SQU_GBAYC.HLP	Object picture help texts	LANG'L ^a
SQU_GBAYD.HLP	Process blocking help texts	LANG'L ^a
SQI_G000.TXT	Process object texts (for OX attribute)	LANG'L ^a
SQU_GBAY.TXT	Operator dialog texts	LANG'L ^a

a. (L = is a value >= 0, depending on used language). In file structure: /SC/LIB4/SMOD/HVControl_670/

1.2**HV Switch Device****1.2.1****Process objects**

The process objects related to this function are described in “*Process Objects*” on page 105.

1.2.2**Format pictures**

Format pictures used during runtime for event and alarm presentation.

Table 5:

Filename	Description	Location
FORM4S102	Process blockings	USE ^a
FORM4S103	Process alarms	USE ^a
FORM4S104	Process on/off signals	USE ^a
FORM4S107	Process position indications	USE ^a
FORM4S110	Process position indications	USE ^a
FORM4S113	Select cmd	USE ^a
FORM4S114	Execute cmd	USE ^a

Table 5: (Continued)

Filename	Description	Location
FORM4S115	Cancel cmd	USE ^a
FORM4S116	Block cmd	USE ^a
FORM4S117	Block update	USE ^a
FORM4S118	Substitute disable/Enable	USE ^a
FORM4S119	Substitute Value	USE ^a
FORM4S120	Interlocked	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.2.3

Dialog pictures

Files used during runtime in process pictures.

Table 6:

Filename	Description	Location
SQU_APPA.PIC	Main dialog for IED v1.0, v1.B	USE ^a
SQU_APPA1.PIC	Main dialog for IED v1.1 or later, v1.B_01 or later	USE ^a
SQU_APPB.PIC	Switch Device blocking	USE ^a
SQU_APPC.PIC	Object Picture	USE ^a
SQU_APPD1.PIC	Forced operation dialog for IED v1.0, v1.B	USE ^a
SQU_APPD2.PIC	Forced operation dialog for IED v1.1 or later, v1.B_01 or later	USE ^a
SQU_APPE.PIC	Process blockings dialog	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.2.4

Configuration file

Files used during installation and configuration of the function.

Table 7:

Filename	Description	Location
SQI_B001.DAT	Switch Device, size 1*1	INST ^a
SQI_B002.DAT	Switch Device, size 2*2	
SQI_B003.DAT	Switch Device, size 3*3	

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.2.5**Texts**

Text files which are language dependable used during installation/configuration and runtime

Table 8:

Filename	Name	Location
APP1_SCT.HLP	Configuration tool help texts	LANG'L' ^a
SQU_APPA.HLP	Main dialog help texts	LANG'L' ^a
SQU_APPB.HLP	Blockings dialog help texts	LANG'L' ^a
SQU_APPC.HLP	Object picture help texts	LANG'L' ^a
SQU_APPD.HLP	Forced operation dialog help texts	LANG'L' ^a
SQU_APPE.HLP	Process blockings dialog help texts	LANG'L' ^a
SQI_A000.TXT	Process object texts (for OX attribute)	LANG'L' ^a
SQU_APP.TXT	Operator dialog texts and status texts	LANG'L' ^a

a. (L is a value >= 0, depending on used language). In file structure: /SC/LIB4/SMOD/HVControl_670/

1.3**HV Measurement****1.3.1****Process objects**

The process objects related to this function are described in “*Process Objects*” on page 105.

1.3.2**Format pictures**

Format pictures used during runtime for event and alarm presentation.

Table 9:

Filename	Description	Location
FORM4S102.PIC	Process blockings	USE ^a
FORM4S108.PIC	Process measurements	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.3.3**Dialog pictures**

Files used during runtime in process pictures.

Table 10:

Filename	Description	Location
SQU_M000A.PIC	Main dialog	USE ^a
SQU_M000B.PIC	Edit limits dialog	USE ^a
SQU_M000C.PIC	Object picture	USE ^a
SQU_M000D.PIC	Blockings dialog	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.3.4**Configuration file**

Files used during installation and configuration of the function.

Table 11:

Filename	Description	Location
SQI_M001.DAT	Size 1*1	INST ^a
SQI_M002.DAT	Size 2*2	INST ^a
SQI_M003.DAT	Size 3*3	INST ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.3.5**Texts**

Text files which are language dependable used during installation/configuration and runtime.

Table 12:

Filename	Description	Location
SQU_M000A.HLP	Main dialog help texts	LANG'L ^a
SQU_M000B.HLP	Edit limits dialog help texts	LANG'L ^a
SQU_M000C.HLP	Object picture help texts	LANG'L ^a
SQU_M000D.HLP	Blocking dialog help texts	LANG'L ^a
SQI_M000.HLP	Installation help text	LANG'L ^a
SQI_M000.TXT	Process object texts (for OX attribute)	LANG'L ^a
SQU_M000.TXT	Operator dialog texts	LANG'L ^a

a. (L = is a value >= 0). In file structure: /SC/LIB4/SMOD/HVControl_670/

1.3.6**Runtime files**

Text files containing SCIL code used during runtime.

Table 13:

Filename	Description	Location
SQU_UPDATE.TXT	Command file for force up value after Update deblock.	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.4**Supervision****1.4.1****Process objects**

The process objects related to this function are described in “*Process Objects*” on page 105

1.4.2**Format pictures**

Format pictures used during runtime for event and alarm presentation.

Table 14:

Filename	Description	Location
FORM4S101.PIC	Supervision alarms	USE ^a
FORM4S102.PIC	Blockings	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.4.3**Dialog pictures**

Files used during runtime in process pictures

Table 15:

Filename	Description	Location
SQU_S000A.PIC	Main dialog	USE ^a
SQU_S000B.PIC	Blockings dialog	USE ^a
SQU_S000C.PIC	Object picture	USE ^a
SQU_S000D.PIC	Information dialog	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.4.4**Configuration file**

Files used during installation and configuration of the function.

Table 16:

Filename	Description	Location
SQI_S0001.DAT	Size 1*1	INST ^a
SQI_S0002.DAT	Size 2*2	INST ^a
SQI_S0003.DAT	Size 3*3	INST ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

1.4.5**Texts**

Text files which are language dependable used during installation/configuration and runtime

Table 17:

Filename	Name	Location
SQI_S000.HLP	Configuration tool help texts	LANG 'L', ^a
SQU_S000A.HLP	Main dialog help texts	LANG 'L', ^a
SQU_S000B.HLP	Blocking dialog help file	LANG 'L', ^a
SQU_S000C.HLP	Object picture	LANG 'L', ^a
SQI_S000.TXT	Process object texts (for OX attribute)	LANG 'L', ^a
SQU_S000.TXT	Operator dialog texts	LANG 'L', ^a

a. (L = is a value >= 0). In file structure: /SC/LIB4/SMOD/HVControl_670/

1.4.6**Runtime files**

Text files containing SCIL code used during runtime.

Table 18:

Filename	Description	Location
SPU_UPDATE.TXT	Command file for force up value after Update deblock.	USE ^a

a. In file structure: /SC/LIB4/SMOD/HVControl_670/

2**HV/Control 670 Files**

This appendix contains a complete list of all files included in HV/Control 670 package.

2.1**Installation files**

The following files are used during installation of the standard function and are located in the directory:

```
/sc/lib4/smod/HVControl_670/inst
```

Table 19:

File	Description
SQI_GBAY.PIC	General bay function picture
SQI_GBAY.DAT	Bay function installation setup file
SQI_B001.PIC	Breaker function picture, size 1*1
SQI_B001.DAT	Breaker function installation setup file, size 1*1

Table 19: (Continued)

SQI_B002.PIC	Breaker function picture, size 2*2
SQI_B002.DAT	Breaker function installation setup file, size 2*2
SQI_B003.PIC	Breaker function picture, size 3*3
SQI_B003.DAT	Breaker function installation setup file, size 3*3
SQI_M001.PIC	Measurement function picture, size 1*1
SQI_M001.DAT	Measurement function installation setup file, size 1*1
SQI_M002.PIC	Measurement function picture, size 2*2
SQI_M002.DAT	Measurement function installation setup file, size 2*2
SQI_M003.PIC	Measurement function picture, size 3*3
SQI_M003.DAT	Measurement function installation setup file, size 3*3
SQI_S0001.PIC	Supervision function picture, size 1*1
SQI_S0001.DAT	Supervision function installation setup file, size 1*1
SQI_S0002.PIC	Supervision function picture, size 2*2
SQI_S0002.DAT	Supervision function installation setup file, size 2*2
SQI_S0003.PIC	Supervision function picture, size 3*3
SQI_S0003.DAT	Supervision function installation setup file, size 3*3
SQI_ADDR.TXT	Text file containing terminal address data
SQI_UNITS.TXT	Text file containing terminal data
SQI_IBAYS.TXT	Text file containing program for scanning database for bay functions
HVQ_TOOLS.VSO	Visual SCIL picture container for new picture editor
SQI_VSTART.PIC	Interface file between Visual SCIL and "old" SCIL

2.2

Dialog files

The following files are used as dialogs of the standard function and are located in the directory:

```
/sc/lib4/smod/HVControl_670/use
```

Table 20:

File	Description
squ_gbaya.pic	Main dialog for the General bay function
squ_gbayb.pic	Blockings dialog for the General bay function
squ_gbayc.pic	Object picture for the General bay function
squ_gbayD.pic	Process blockings dialog for the General bay function
squ_appa.pic	Main dialog for the Switch Device function v1.0, v1.B
squ_appa1.pic	Main dialog for the Switch Device function v1.1
squ_appb.pic	Blockings dialog for the Switch Device function
squ_appc.pic	Object picture for the Switch Device function

Table 20: (Continued)

squ_appd1.pic	Forced operation dialog for the Switch Device function v1.0, v1.B
squ_appd2.pic	Forced operation dialog for the Switch Device function v1.1
squ_appc.pic	Process blockings dialog for the Switch Device function
squ_m000a.pic	Main dialog for the Measurement function
squ_m000b.pic	Edit limits dialog for the Measurement function
squ_m000c.pic	Object picture for the Measurement function
squ_m000D.pic	Blocking dialog for the Measurement function
squ_s000a.pic	Main dialog for the Supervision function
squ_s000b.pic	Blockings dialog for the Supervision function
squ_s000c.pic	Object picture for the Supervision function
squ_s000d.pic	Information dialog for the Supervision function
sgu_info5.pic	Information dialog - one button
sgu_info6.pic	Information dialog - two buttons
sgu_info7.pic	Information dialog - two buttons and reset monitor function block possibility
sgu_s1315.pic	Copy of SLIB picture SLIB_S1315.PIC used in squ_gbayc.pic

2.3

Format picture files

The following files are used as format pictures of the standard function and are located in the directory:

```
/sc/lib4/smod/hvcontrol_670/use
```

Table 21:

File	Description
form4s101.pic	Supervision events
form4s102.pic	Blocking events
form4s103.pic	Alarm events
form4s104.pic	On/Off signal events
form4s105.pic	Blocking events
form4s106.pic	Bay order events
form4s107.pic	Position indication events
form4s108.pic	Measurement events
form4S110.pic	Position indication events
form4s112.pic	Switch Device PSTO events
form4s113.pic	Select for Switch Device
form4s114.pic	Execute for Switch Device
form4s115.pic	Cancel for Switch Device
form4s116.pic	Command Block for Switch Device

Table 21: (Continued)

form4s117.pic	Update Block for Switch Device
form4s118.pic	Sub Enable for Switch Device
form4s119.pic	Sub Value for Switch Device
form4s120.pic	Interlocked for Switch Device

2.4

Run time command files

The following files are used during run-time and are located in the directory:

```
/sc/lib4/smod/HVControl_670/use
```

Table 22:

File	Description
spu_UPDATE.TXT	Force up values after Update deblock for HV Measurement and HV Supervision

2.5

Run time text files

The following files are used during run time for text presentation and are located in the directory:

```
/sc/lib4/smod/HVControl_670/lang0
```

Table 23:

File	Description
form4s101.txt	Texts for format picture form4s101
form4s102.txt	Texts for format picture form4s102
form4s103.txt	Texts for format picture form4s103
form4s104.txt	Texts for format picture form4s104
form4s105.txt	Texts for format picture form4s105
form4s106.txt	Texts for format picture form4s106
form4s107.txt	Texts for format picture form4s107
form4s108.txt	Texts for format picture form4s108
form4s112.txt	Texts for format picture form4s112
form4s113.txt	Texts for format picture form4s113
form4s114.txt	Texts for format picture form4s114
form4s115.txt	Texts for format picture form4s115
form4s116.txt	Texts for format picture form4s116
form4s117.txt	Texts for format picture form4s117
form4s118.txt	Texts for format picture form4s118
form4s119.txt	Texts for format picture form4s119

Table 23: (Continued)

form4s120.txt	Texts for format picture form4s120
squ_gbay.txt	Dialog texts for the General Bay function
squ_app.txt	Dialog texts for the Switch Device function
squ_m000.txt	Dialog texts for the Measurement function
squ_s000.txt	Dialog texts for the Supervision function
sgu_info5.txt	Dialog texts for the SGU_INFO5 dialog
sgu_info6.txt	Dialog texts for the SGU_INFO6 dialog
sgu_info7.txt	Dialog texts for the SGU_INFO7 dialog

2.6

Installation text files

The following files are used during installation for generation of object texts (OX attributes of the process objects) and are located in the directory:

```
/sc/lib4/smod/HVControl_670/lang0
```

Table 24:

File	Description
sqi_g000.txt	Process object texts (for OX attribute) for the General bay function
sqi_a000.txt	Process object texts (for OX attribute) for the Switch Device function
sqi_m000.txt	Process object texts (for OX attribute) for the Measurement function
sqi_s000.txt	Process object texts (for OX attribute) for the Supervision function

2.7

Help files

The following files are used in the help dialogs and are located in the directory:

```
/sc/lib4/smod/HVControl_670/lang0
```

Table 25:

File	Description
GBAY_SCT.hlp	Help for the Configuration tool for the General bay function
squ_gbaya.hlp	Help for the main dialog for the General bay function
squ_gbayb.hlp	Help for the general bay blocking dialog for the General bay function
squ_gbayc.hlp	Help for the object picture for the General bay function
squ_gbayD.hlp	Help for the process blocking dialog for the General bay function
APP1_SCT.hlp	Help for the Configuration tool for the Switch Device function
squ_appa.hlp	Help for the main dialog for the Switch Device function
squ_appb.hlp	Help for the blockings dialog for the Switch Device function
squ_appc.hlp	Help for the object picture for the Switch Device function

Table 25: (Continued)

squ_appd.hlp	Help for the forced operation dialog for the Switch Device function
squ_app.e.hlp	Help for the process blockings dialog for the Switch Device function
sqi_m000.hlp	Help for the configuration tool for the Measurement function
squ_m000a.hlp	Help for the main dialog for the Measurement function
squ_m000b.hlp	Help for the edit limits dialog for the Measurement function
squ_m000c.hlp	Help for the object picture for the Measurement function
squ_m000d.hlp	Help for Blocking dialog for the Measurement function
sqi_s000.hlp	Help for configuration tool for the Supervision function
squ_s000a.hlp	Help for the main dialog for the Supervision function
squ_s000b.hlp	Help for Blocking dialog for the Supervision function
squ_s000c.hlp	Help for the object picture - general part for the Supervision function
squ_s000d.hlp	Help for the object picture - I/O part for the Supervision function
squ_c561F.hlp	Help for Blocking dialog for the Supervision function

2.8

Representation files

The following files are used to store representations and are located in the directory:

```
/sc/lib4/smod/HVControl_670/use
```

Table 26:

File	Description
sr_LIB670.pir	HV window representation file
slib.pir	SLIB representation file

3

Window representations for HV/Control 670

The HV/Control 670 representations are stored in the file,

```
/sc/lib4/smod/HVControl_670/use/sr_lib670.pir,
```

according to below:

Table 27:

Name	Description
SQ_APPC1	Switch Device; Process picture representation; Circle, size 1*1
SQ_APPC2	Switch Device; Process picture representation; Circle, size 2*2
SQ_APPC3	Switch Device; Process picture representation; Circle, size 3*3
SQ_APPD1	Switch Device; Process picture representation; Diamond, size 1*1

Table 27: (Continued)

SQ_APPD2	Switch Device; Process picture representation; Diamond, size 2*2
SQ_APPD3	Switch Device; Process picture representation; Diamond, size 3*3
SQ_APPS1	Switch Device; Process picture representation; Square, size 1*1
SQ_APPS2	Switch Device; Process picture representation; Square, size 2*2
SQ_APPS3	Switch Device; Process picture representation; Square, size 3*3
SQ_C561_1	Supervision; Process picture representation, size 1*1
SQ_C561_2	Supervision; Process picture representation, size 2*2
SQ_C561_3	Supervision; Process picture representation, size 3*3
SQ_MEAS1_1	Measurement; Process picture presentation “dot” symbol, size 1*1
SQ_MEAS1_2	Measurement; Process picture presentation, horizontal 2 winding VT symbol, size 1*1
SQ_MEAS1_3	Measurement; Process picture presentation, vertical 2 winding VT symbol, size 1*1
SQ_MEAS1_4	Measurement; Process picture presentation, top connected VT symbol, size 1*1
SQ_MEAS1_5	Measurement; Process picture presentation, bottom connected VT symbol, size 1*1
SQ_MEAS1_6	Measurement; Process picture presentation, left connected VT symbol, size 1*1
SQ_MEAS1_7	Measurement; Process picture presentation, right connected VT symbol, size 1*1
SQ_MEAS1_8	Measurement; Process picture presentation, label “I”, size 1*1
SQ_MEAS1_9	Measurement; Process picture presentation, label “U”, size 1*1
SQ_MEAS1_10	Measurement; Process picture presentation, label “P”, size 1*1
SQ_MEAS1_11	Measurement; Process picture presentation, label “Q”, size 1*1
SQ_MEAS1_12	Measurement; Process picture presentation, vertical CT symbol, size 1*1
SQ_MEAS1_13	Measurement; Process picture presentation, horizontal CT symbol, size 1*1
SQ_MEAS1_14	Measurement; Process picture presentation, label “T”, size 1*1
SQ_MEAS1_15	Measurement; Process picture presentation, label “f”, size 1*1
SQ_MEAS2_1	Measurement; Process picture presentation “dot” symbol, size 2*2
SQ_MEAS2_2	Measurement; Process picture presentation, horizontal 2 winding VT symbol, size 2*2
SQ_MEAS2_3	Measurement; Process picture presentation, vertical 2 winding VT symbol, size 2*2
SQ_MEAS2_4	Measurement; Process picture presentation, top connected VT symbol, size 2*2
SQ_MEAS2_5	Measurement; Process picture presentation, bottom connected VT symbol, size 2*2
SQ_MEAS2_6	Measurement; Process picture presentation, left connected VT symbol, size 2*2

Table 27: (Continued)

SQ_MEAS2_7	Measurement; Process picture presentation, right connected VT symbol, size 2*2
SQ_MEAS2_8	Measurement; Process picture presentation, label “I”, size 2*2
SQ_MEAS2_9	Measurement; Process picture presentation, label “U”, size 2*2
SQ_MEAS2_10	Measurement; Process picture presentation, label “P”, size 2*2
SQ_MEAS2_11	Measurement; Process picture presentation, label “Q”, size 2*2
SQ_MEAS2_12	Measurement; Process picture presentation, vertical CT symbol, size 2*2
SQ_MEAS2_13	Measurement; Process picture presentation, horizontal CT symbol, size 2*2
SQ_MEAS2_14	Measurement; Process picture presentation, label “T”, size 2*2
SQ_MEAS2_15	Measurement; Process picture presentation, label “f”, size 2*2
SQ_MEAS3_1	Measurement; Process picture presentation “dot” symbol, size 3*3
SQ_MEAS3_2	Measurement; Process picture presentation, horizontal 2 winding VT symbol, size 3*3
SQ_MEAS3_3	Measurement; Process picture presentation, vertical 2 winding VT symbol, size 3*3
SQ_MEAS3_4	Measurement; Process picture presentation, top connected VT symbol, size 3*3
SQ_MEAS3_5	Measurement; Process picture presentation, bottom connected VT symbol, size 3*3
SQ_MEAS3_6	Measurement; Process picture presentation, left connected VT symbol, size 3*3
SQ_MEAS3_7	Measurement; Process picture presentation, right connected VT symbol, size 3*3
SQ_MEAS3_8	Measurement; Process picture presentation, label “I”, size 3*3
SQ_MEAS3_9	Measurement; Process picture presentation, label “U”, size 3*3
SQ_MEAS3_10	Measurement; Process picture presentation, label “P”, size 3*3
SQ_MEAS3_11	Measurement; Process picture presentation, label “Q”, size 3*3
SQ_MEAS3_12	Measurement; Process picture presentation, vertical CT symbol, size 3*3
SQ_MEAS3_13	Measurement; Process picture presentation, horizontal CT symbol, size 3*3
SQ_MEAS3_14	Measurement; Process picture presentation, label “T”, size 3*3
SQ_MEAS3_15	Measurement; Process picture presentation, label “f”, size 3*3
SRQ_OBJPIC	Object picture representations

4 Process Objects

In this section the process objects belonging to the different standard functions are described. First are the different types stated.

4.1 HV General Bay

The following process object types are defined for the General Bay function.

Table 28: Process object type 1 (BI)

Attribute List	General Alarm with event handling via SPA	Description
DX	X7S	Directive text
PT	BI (3)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	Yes	History enable
HA	New value	History activation
HF	No	History at first update
HL	32768	History log number
BI	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	1	Alarm class
PI	""	Alarm picture
AG	1	Alarm generation
PD	0	Monitor number
PA	New value	Printout activation
PU	No	Printout at first update
AD	0	Alarm delay
LD	6	Listing device number

Table 29: Process object type 3 (BI)

Attribute List	General Indications with event handling via SPA	Description
DX	X7S	Directive text
PT	BI (3)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	Yes	History enable
HA	New value	History activation
HF	No	History at first update
HL	32768	History log number
BI	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	0	Alarm class
PI	""	Alarm picture
AG	1	Alarm generation
PD	0	Monitor number
PA	New value	Printout activation
PU	No	Printout at first update
AD	0	Alarm delay
LD	6	Listing device number

Table 30: Process object type 7 (BI)

Attribute List	MicroSCADA Internal Indication without event handling	Description
PT	BI (3)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	Yes	History enable
BI	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	0	Alarm class
PI	""	Alarm picture
PD	0	Monitor number
PA	New value	Printout activation
PU	Yes	Printout at first update
AD	0	Alarm delay
LD	1,2	Listing device number

Table 31: Process object type 8 (BI)

Attribute List	General Indication without event handling via SPA	Description
DX	X7S	Directive text
PT	BI (3)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	No	History enable
HA	0	History activation
HF	No	History at first update
HL	0	History log number
BI	0	Analog input value

Table 31: Process object type 8 (BI) (Continued)

Attribute List	General Indication without event handling via SPA	Description
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	0	Alarm class
PI	""	Alarm picture
AG	1	Alarm generation
PD	0	Monitor number
PA	New value	Printout activation
PU	Yes	Printout at first update
AD	0	Alarm delay
LD	0	Listing device number

Table 32: Process object type 9 (BI)

Attribute	Default value	Description
DX	X7S	Directive text
PT	BI (3)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	Yes	History enable
HA	New value	History activation
HF	No	History at first update
HL	32768	History log number
BI	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	0	Alarm class
PI	""	Alarm picture
AG	1	Alarm generation
PD	0	Monitor number
PA	New value	Printout activation
PU	No	Printout at first update
AD	0	Alarm delay
LD	6	Listing device number

Table 33: Process object type 4 (AI)

Attribute List	General Double Indication without event handling via SPA	Description
DX	X6	Directive text
PT	BI (9)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	Yes	History enable
HA	New value	History activation
HF	No	History at first update
HL	32768	History log number
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	0	Alarm class
AE	0	Action Enabled
AA	0	Action Activation
AF	0	Action at First update
AH	0	Action on History
PI	""	Alarm picture
PD	0	Monitor number
PA	New value	Printout activation
PU	No	Printout at first update
AD	0	Alarm delay
LD	6	Listing device number
SN	"1_1"	

Table 34: Process object type 5 (BO)

Attribute List	General Double Indication with event handling via SPA	Description
DX	X1	Directive text
PT	BO (5)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	YES	History enable
HA	Update	History activation
HF	NO	History at first update
HL	32768	History log number
BO	0	Binary output value
RC	YES	Acknowledge of alarm required
AB	NO	Alarm blocked
AC	0	Alarm class
PI	""	Alarm picture
PD	0	Monitor number
PA	Update	Printout activation
PU	No	Printout at first update
AD	0	Alarm delay
LD	6	Listing device number

Table 35: Process object type 10 (DI)

Attribute List	Digital input for internal function block	Description
PT	DI (6)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	2	Switch state
EE	No	Event enable
HE	No	History enable
DI	9	Digital input value
RC	No	Acknowledge of alarm required
AB	No	Alarm blocked
AC	0	Alarm class
LD	0	Listing device number

The following process objects are defined for the General Bay

Table 36: Process object for HV General Bay

Index	PO Type	Description (OX)	Format Picture	ObjType	RX attribute
15 ^a	BI	Command Block Ind.	FORM4S102	3	SQABAYILRS
16 ^a	BI	Update Block Ind.	FORM4S102	3	SQABAYILRS
30 ^{ab}	BI	Bay Alarm	FORM4S103	1	SQABAYILRS
54 ^a	AI	PSTO	FORM4S112	4	SQABAYILRS
55	BI	Remote	FORM4S104	9	SQABAYILRS
56	BI	Station	FORM4S104	9	SQABAYILRS
57	BI	Local	FORM4S104	9	SQABAYILRS
58	BI	Off	FORM4S104	9	SQABAYILRS
147 ^a	BI	Bay Abnormal Status	FORM4S104	8	SQABAYILRS
150 ^a	BI	Bay Reserved	FORM4S104	8	SQABAYILRS
210 ^a	BO	Command Block	FORM4S106	5	SQABAYILRS
211 ^a	BO	Update Block	FORM4S105	5	SQABAYILRS
240	BI	Bay Events	FORM4S102	7	SQQBAYXLRS
241	BI	Bay Alarms	FORM4S102	7	SQABAYXLRS
242	BI	Bay Printout	FORM4S102	7	SQABAYXLRS
243	DI	Function occ. By other monitor		10	SSESYSXMSC

Table 36: Process object for HV General Bay (Continued)

Index	PO Type	Description (OX)	Format Picture	ObjType	RX attribute
244	BI	Bay Rem. Events and ind.	FORM4S102	7	SQABAYXLRS
245	BI	Measurement Update	FORM4S102	7	SQABAYXLRS

a. Must be set to Switch State AUTO (SS=2) before commissioning.

b. Optional alarm: this process objects is out of use(IU=0)as default. Activation is made by setting IU=1.

4.2

HV Switch Device

The following process object types are defined for the Switch Device function.

Table 37: Process object type 4 (DB)

Attribute List	General Double Indication without event handling via SPA	Description
DX	X7D	Directive text
PT	DB (12)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	No	History enable
DB	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	0	Alarm class
PI	""	Alarm picture
PD	0	Monitor number
PA	New value	Printout activation
PU	Yes	Printout at first update
AD	0	Alarm delay
LD	0	Listing device number

Table 38: Process object type 3 (BI)

Attribute List	General Indications with event handling via SPA	Description
DX	X7S	Directive text
PT	BI (3)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	Yes	History enable
HA	New value	History activation
HF	No	History at first update
HL	32768	History log number
BI	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	0	Alarm class
PI	""	Alarm picture
PD	0	Monitor number
PA	New value	Printout activation
PU	Yes	Printout at first update
AD	0	Alarm delay
LD	1,2	Listing device number

Table 39: Process object type 1 (BI)

Attribute List	General Alarm with event handling via SPA	Description
DX	X7S	Directive text
PT	BI (3)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	Yes	History enable
HA	New value	History activation
HF	No	History at first update
HL	32768	History log number

Table 39: Process object type 1 (BI) (Continued)

Attribute List	General Alarm with event handling via SPA	Description
BI	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	1	Alarm class
PI	""	Alarm picture
AG	1	Alarm generation
PD	0	Monitor number
PA	New value	Printout activation
PU	No	Printout at first update
AD	0	Alarm delay
LD	1,2	Listing device number

Table 40: Process object type 2 (AI)

Attribute List	Default value	Description
DX	X6	Directive text
PT	BI (9)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	No	History enable
HA	New value	History activation
HF	No	History at first update
HL	32768	History log number
BI	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	0	Alarm class
AE	1	Action Enabled
AN	"L_CAUSE	"Action Name

Table 40: Process object type 2 (AI) (Continued)

Attribute List	Default value	Description
AA	2	Action Activation
AF	1	Action at First update
AH	1	Action on History
PI	""	Alarm picture
PD	0	Monitor number
PA	New value	Printout activation
PU	No	Printout at first update
AD	0	Alarm delay
LD	6	Listing device number
SN	"1_1"	

Table 41: Process object type 22 (BI)

Attribute List	Default value	Description
DX	X7S	Directive text
PT	BI (3)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	Yes	History enable
HA	New value	History activation
HF	No	History at first update
HL	32768	History log number
BI	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	1	Alarm class

Table 41: Process object type 22 (BI) (Continued)

Attribute List	Default value	Description
NV	0	
AG	1	Alarm Generation
RC	0	ReCeipt
PI	""	Alarm picture
PD	0	Monitor number
PA	New value	Printout activation
PU	No	Printout at first update
AD	0	Alarm delay
LD	6	Listing device number
SN	"1_1"	

Table 42: Process object type 7 (BI)

Attribute List	MicroSCADA Internal Indication without event handling	Description
PT	BI (3)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	No	History enable
BI	0	Analog input value
RC	YES	Acknowledge required
AB	No	Alarms blocked
AC	0	Alarm class
PI	""	Alarm picture
PD	0	Monitor number
PA	New value	Printout activation
PU	No	Printout at first update
AD	0	Alarm delay
LD	1,2	Listing device number

Table 43: Process object type 6 (AO)

Attribute List	Default value	Description
DX	X4	Directive text
PT	AO (11)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	YES	History enable
HA	Update	History activation
HF	YES	History at first update
HL	32768	History log number
AO	0.0	Analogue input value
RC	YES	Acknowledge of alarm required
AB	NO	Alarm blocked
AC	0	Alarm class
PI	""	Alarm picture
PD	0	Monitor number
PA	Update	Printout activation
PU	Yes	Printout at first update
AD	0	Alarm delay
LD	1,2	Listing device number
SN	1_1	Scale

Table 44: Process object type 8 (BO)

Attribute List	General Indication without event handling via SPA	Description
DX	X1	Directive text
PT	BO (5)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	YES	History enable
HA	Update	History activation
HF	YES	History at first update
HL	32768	History log number
BO	0	Binary output value

Table 44: Process object type 8 (BO) (Continued)

Attribute List	General Indication without event handling via SPA	Description
RC	YES	Acknowledge of alarm required
AB	NO	Alarm blocked
AC	0	Alarm class
PI	""	Alarm picture
PD	0	Monitor number
PA	Update	Printout activation
PU	Yes	Printout at first update
AD	0	Alarm delay
LD	6	Listing device number
SN	1_1	Scale

Table 45: Process object type 10 (DI)

Attribute	Digital input for internal function block	Description
PT	DI (6)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	No	Event enable
HE	No	History enable
DI	0	Digital input value
RC	No	Acknowledge of alarm required
AB	No	Alarm blocked
AC	0	Alarm class
LD	0	Listing device number

The following process objects are defined for the Switch Device.

Table 46: Process object type for Switch Device function

Index	PO Type	Description (OX)	Format Picture	ObjType	RX Attribute
1 ^a	DB	Position	Form4s107	4	SQQB01IPOS
15 ^a	BI	Command block Ind	Form4s102	3	SQQB01IPOS
16 ^a	BI	Update block Ind	Form4s102	3	SQQB01IPOS
20 ^a	BI	Substituted	Form4s104	3	SQQB01IPOS

Table 46: Process object type for Switch Device function (Continued)

Index	PO Type	Description (OX)	Format Picture	ObjType	RX Attribute
40 ^{ab}	BI	Tripped (only for breaker)	Form4s103	1	SQQB01IPOS
41 ^a	AI	Last Cause		2	SQQB01IPOS
141	BI	Last Cause	Form4s120	22	SQQB01IPOS
46 ^a	BI	Pole discordance	Form4s103	1	SQQB01IPOS
52 ^{ab}	BI	SynchroCheckOK (only for breaker)	Form4s104	1	SQQB01IPOS
53 ^a	BI	Enable Open	Form4s104	3	SQQB01IPOS
54 ^a	BI	Enable Close	Form4s104	3	SQQB01IPOS
55 ^a	BI	Selected	Form4s104	3	SQQB01IPOS
155	BI	Selected in MSCADA	Form4s102	7	SQXX01XPOS
210 ^a	AO	Select	Form4s113	6	SQQB01IPOS
211 ^a	AO	Execute	Form4s114	6	SQQB01IPOS
212 ^a	BO	Cancel	Form4s115	8	SQQB01IPOS
213 ^a	BO	Command Block	Form4s116	8	SQQB01IPOS
214 ^a	BO	Update Block	Form4s117	8	SQQB01IPOS
217 ^a	BO	Sub Enable	Form4s118	8	SQQB01IPOS
218 ^a	AO	Sub Value	Form4s119	6	SQQB01IPOS
240	BI	Events	Form4s102	7	SQQB01XPOS
241	BI	Alarms	Form4s102	7	SQQB01XPOS
242	BI	Printout	Form4s102	7	SQQB01XPOS
243	DI	Function occ. By other monitor		10	SSESYSXMSC
244	BI	Rem. Events and ind.	Form4s102	7	SQQB01XPOS

a. Must be set to Switch State AUTO (SS=2) before commissioning.

b. Index 40 and 52 are as default not in use (IU=0).

4.3

HV Measurement

Table 47: Process object type 4 (AI)

Attribute List	General Double Indication without event handling via SPA	Description
DX	X6	Directive text
PT	AI (9)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	YES	History enable
HA	WARNING	History activation
HF	YES	History at first update
HL	32768	History log number
AI	0.0	Analogue input value
HI	0.0	High alarm limit
HW	0.0	High warning limit
LW	0.0	Low warning limit
LI	0.0	Low alarm limit
SN	1_1	Scale name
SZ	SCADA	Supervised by SCADA or RELAY
RC	YES	Acknowledge of alarm required
AB	NO	Alarm blocked
AC	1	Alarm class
PI	""	Alarm picture
PD	0	Monitor number
PA	Warning	Printout activation
PU	Yes	Printout at first update
AD	0	Alarm delay
LD	1,2	Listing device number
ST	""	Unit for the PO

Table 48: Process object type 13 (PC)

Attribute List	Default value	Description
DX	X8	Directive text
PT	PC (13)	Process Object Type
OT	DEC	Output type
IU	YES	In use
SS	Manual state (1)	Switch state
EE	YES	Event enable
HE	YES	History enable
HA	WARNING	History activation
HF	YES	History at first update
HL	32768	History log number
BC	16	Bit counter
SC	1	Scaling
RC	YES	Acknowledge of alarm required
AB	NO	Alarm blocked
AC	1	Alarm class
PI	" "	Alarm picture
PD	1,2,3,4,5	Monitor number
PA	Warning	Printout activation
PU	Yes	Printout at first update
AD	0	Alarm delay
LD	1,2	Listing device number
ST	To be decided	Unit for the PO

The following process objects are defined for the Measurement function

Table 49: Process object type for Measurement function

Index	PO Type	Description (OX)	Format Picture	ObjType	RX attribute
10 ^a	AI	Index 10 (AI)	Form4s108	4	SQPMEAMXXX
11 ^a	AI	Index 11 (AI)	Form4s108	4	SQPMEAMXXX
12 ^a	AI	Index 12 (AI)	Form4s108	4	SQPMEAMXXX
13 ^a	AI	Index 13 (AI)	Form4s108	4	SQPMEAMXXX
14 ^a	AI	Index 14 (AI)	Form4s108	4	SQPMEAMXXX
15 ^a	AI	Index 15 (AI)	Form4s108	4	SQPMEAMXXX
16 ^a	AI	Index 16 (AI)	Form4s108	4	SQPMEAMXXX
17 ^a	AI	Index 17 (AI)	Form4s108	4	SQPMEAMXXX
18 ^a	AI	Index 18 (AI)	Form4s108	4	SQPMEAMXXX

Table 49: Process object type for Measurement function (Continued)

Index	PO Type	Description (OX)	Format Picture	ObjType	RX attribute
19 ^a	AI	Index 19 (AI)	Form4s108	4	SQPMEAMXXX
20 ^a	AI	Index 20 (AI)	Form4s108	4	SQPMEAMXXX
21 ^a	AI	Index 21 (AI)	Form4s108	4	SQPMEAMXXX
22 ^a	AI	Index 22 (AI)	Form4s108	4	SQPMEAMXXX
23 ^a	AI	Index 23 (AI)	Form4s108	4	SQPMEAMXXX
24 ^a	AI	Index 24 (AI)	Form4s108	4	SQPMEAMXXX
25 ^a	AI	Index 25 (AI)	Form4s108	4	SQPMEAMXXX
26 ^a	AI	Index 26 (AI)	Form4s108	4	SQPMEAMXXX
27 ^a	AI	Index 27 (AI)	Form4s108	4	SQPMEAMXXX
28 ^a	AI	Index 28 (AI)	Form4s108	4	SQPMEAMXXX
29 ^a	AI	Index 29 (AI)	Form4s108	4	SQPMEAMXXX
30 ^a	AI	Index 30 (AI)	Form4s108	4	SQPMEAMXXX
31 ^a	AI	Index 31 (AI)	Form4s108	4	SQPMEAMXXX
32 ^a	PC	Index 32 (AI)	Form4s108	13	SQPMEAMXXX
33 ^a	PC	Index 33 (PC)	Form4s108	13	SQPMEAMXXX
34 ^a	PC	Index 34 (PC)	Form4s108	13	SQPMEAMXXX
35 ^a	PC	Index 35 (PC)	Form4s108	13	SQPMEAMXXX
36 ^a	PC	Index 36 (PC)	Form4s108	13	SQPMEAMXXX
37 ^a	PC	Index 37 (PC)	Form4s108	13	SQPMEAMXXX
38 ^a	PC	Index 38 (PC)	Form4s108	13	SQPMEAMXXX
39 ^a	PC	Index 39 (PC)	Form4s108	13	SQPMEAMXXX
40 ^a	PC	Index 40 (PC)	Form4s108	13	SQPMEAMXXX
41 ^a	PC	Index 41 (PC)	Form4s108	13	SQPMEAMXXX
42 ^a	PC	Index 42 (PC)	Form4s108	13	SQPMEAMXXX
43 ^a	PC	Index 43 (PC)	Form4s108	13	SQPMEAMXXX
44 ^a	PC	Index 44 (PC)	Form4s108	13	SQPMEAMXXX
45 ^a	PC	Index 45 (PC)	Form4s108	13	SQPMEAMXXX
46 ^a	PC	Index 46 (PC)	Form4s108	13	SQPMEAMXXX
47 ^a	PC	Index 47 (PC)	Form4s108	13	SQPMEAMXXX
48 ^a	PC	Index 48 (PC)	Form4s108	13	SQPMEAMXXX
49 ^a	PC	Index 49 (PC)	Form4s108	13	SQPMEAMXXX
240	BI	Events	Form4s102	2	SSESYSXMSC
241	BI	Alarms	Form4s102	2	SSESYSXMSC
242	BI	Printout	Form4s102	2	SSESYSXMSC
243	DI	Function occupied by other monitor		10	SSESYSXMSC

Table 49: Process object type for Measurement function (Continued)

Index	PO Type	Description (OX)	Format Picture	ObjType	RX attribute
244	BI	Remote events and indications	Form4s102	2	SQESYSXMSC
245	BI	Update	Form4s102	2	SQESYSXMSC

a. Must be set to Switch State AUTO (SS=2) before commissioning

4.4 Supervision

The following process objects are defined for the Supervision function

Table 50: Process object for Supervision function

Index	PT	SS	UN	OA	AC	IU	Description (OX)	Format Picture	RX
60 ^a	3	1	0	0	0	1	Setting changed	Form4s102	SQWM00ITES
61 ^a	3	1	0	0	0	1	SG 1 Active	Form4s102	SQWM00ITES
62 ^a	3	1	0	0	0	1	SG 2 Active	Form4s102	SQWM00ITES
63 ^a	3	1	0	0	0	1	SG 3 Active	Form4s102	SQWM00ITES
64 ^a	3	1	0	0	0	1	SG 4 Active	Form4s102	SQWM00ITES
65 ^a	3	1	0	0	0	1	SG 5 Active	Form4s102	SQWM00ITES
66 ^a	3	1	0	0	0	1	SG 6 Active	Form4s102	SQWM00ITES
67 ^a	3	1	0	0	1	1	Internal fail	Form4s101	SQWM00ITES
68 ^a	3	1	0	0	1	1	Warning	Form4s101	SQWM00ITES
69 ^a	3	1	0	0	1	1	CPU fail	Form4s101	SQWM00ITES
70 ^a	3	1	0	0	1	1	CPU warning	Form4s101	SQWM00ITES
71 ^a	3	1	0	0	1	1	LDCM P302 Com fail	Form4s101	SQWM00ITES
72 ^a	3	1	0	0	1	1	LDCM P303 Com fail	Form4s101	SQWM00ITES
73 ^a	3	1	0	0	1	1	LDCM P312 Com fail	Form4s101	SQWM00ITES
74 ^a	3	1	0	0	1	1	LDCM P313 Com fail	Form4s101	SQWM00ITES
75 ^a	3	1	0	0	1	1	TRM P31	Form4s101	SQWM00ITES
76 ^a	3	1	0	0	1	1	TRM P32	Form4s101	SQWM00ITES
77 ^a	3	1	0	0	1	0	Spare	Form4s101	SQWM00ITES
78 ^a	3	1	0	0	1	0	Spare	Form4s101	SQWM00ITES
79 ^a	3	1	0	0	1	1	I/O board P3	Form4s101	SQWM00ITES
80 ^a	3	1	0	0	1	1	I/O board P4	Form4s101	SQWM00ITES
81 ^a	3	1	0	0	1	1	I/O board P5	Form4s101	SQWM00ITES
82 ^a	3	1	0	0	1	1	I/O board P6	Form4s101	SQWM00ITES

Table 50: Process object for Supervision function (Continued)

Index	PT	SS	UN	OA	AC	IU	Description (OX)	Format Picture	RX
83 ^a	3	1	0	0	1	1	I/O board P7	Form4s101	SQWM00ITES
84 ^a	3	1	0	0	1	1	I/O board P8	Form4s101	SQWM00ITES
85 ^a	3	1	0	0	1	1	I/O board P9	Form4s101	SQWM00ITES
86 ^a	3	1	0	0	1	1	I/O board P10	Form4s101	SQWM00ITES
87 ^a	3	1	0	0	1	1	I/O board P11	Form4s101	SQWM00ITES
88 ^a	3	1	0	0	1	1	I/O board P12	Form4s101	SQWM00ITES
89 ^a	3	1	0	0	1	1	I/O board P13	Form4s101	SQWM00ITES
90 ^a	3	1	0	0	1	1	I/O board P14	Form4s101	SQWM00ITES
91 ^a	3	1	0	0	1	1	I/O board P15	Form4s101	SQWM00ITES
92 ^a	3	1	0	0	1	1	I/O board P16	Form4s101	SQWM00ITES
93 ^a	3	1	0	0	1	1	RTC error	Form4s101	SQWM00ITES
94 ^a	3	1	0	0	1	1	Time synch error	Form4s101	SQWM00ITES
95 ^a	3	1	0	0	1	0	Spare	Form4s101	SQWM00ITES
240	3	1			0	1	Events	Form4s101	SSESYSXMSC
241	3	1			0	1	Alarms	Form4s101	SSESYSXMSC
242	3	1			0	1	Printout	Form4s101	SSESYSXMSC
243	6	2			0	1	System object, NEVER edit	N/A	SSESYSXMSC
244	3	1			0	1	Rem. events and ind.	Form4s101	SSESYSXMSC
245	3	1			0	1	Update	Form4s101	SSESYSXMSC

a. Must be set to Swicht State Auto (SS =2) before commissioning.

5 Object list

This chapter gives a description of all the MicroSCADA objects (command procedures, event channels, datalog objects etc.) which are created and used by the HV/Control 670 package after installation of the package. The below is thus created in addition to the files included in the package - See “*HV/Control 670 Files*” on page 97

5.1 Command procedures

The following command procedures are created and used.

Table 51:

Command procedure	Description
SPU_UPDATE	Fetch values from 670 series products after Update deblock

5.2 Datalog objects

The following datalog objects are created and used.

Table 52:

Datalog object	Description
A_HTIMEOUT	Dialog time-out

5.3 Scale objects

The following scale objects are created and used.

Table 53:

Scale object	Description
1_1	Standard scale - created only if it does not exist previously

5.4 Event channels

The following event channels are created and used.

Table 54:

Event channel	Description

5.5 Time channels

The following time channels are created and used.

Table 55:

Time channel	Description

6 Format pictures and status texts

The following format pictures are included and used by HV/Control:

Table 56: Format pictures and status texts

Format picture	Value	Status text
form4s101	1	Faulty
	0	Normal
form4s102	1	Blocked

Table 56: Format pictures and status texts (Continued)

Format picture	Value	Status text
	0	Deblocked
form4s103	1	Alarm
	0	Normal
form4s104	1	On
	0	Off
form4s105	1	Blocked
	0	Deblocked
form4s106	1	Blocked
		Deblocked
form4s107	0	Middle position (00)
	1	Open
	2	Closed
	3	Error position (11)
form4s108	0	Normal
	1	Low alarm
	2	High alarm
	3	Low warning
	4	High warning
form4s112	0	Off
	1	Local
	2	Remote
	3	Error
	4	Error
	5	All
form4s113	0	Sel Open
	1	Sel close
	10	Sel Open & ILO
	11	Sel Close & ILO
	20	Sel Open & SCO
	21	Sel Close & SCO
	30	Sel Open, ILO & SCO
	31	Sel Close, ILO & SCO
form4s114	0	Exc Open
	1	Exc Close
	10	Exc Open & ILO
	11	Exc Close & ILO
	20	Exc Open & SCO

Table 56: Format pictures and status texts *(Continued)*

Format picture	Value	Status text
	21	Exc Close & SCO
	30	Exc Open, ILO & SCO
	31	Exc Close, ILO & SCO
form4s115	1	Operation cancel
form4s116	1	Block command
	0	Deblock command
form4s117	1	Block update
	0	Deblock update
form4s118	1	Sub Enable
	0	Sub Disable
form4s119	0	Sub to intermediate
	1	Sub to open
	2	Sub to close
	3	Sub to bad state
form4s120	1	Interlocked

7

Updated files

In this section the updating made to dedicated files during installation is described.

7.1

PATH4_S67.TXT

During start-up after installation the file the contents of the file `path4_s67.txt` is added to the file `[drive]:\sc\lib4\base\bbone\use\path4.txt`.

7.2

INDEX4_S6.TXT

During start-up after installation the file the contents of the file `index4_s6.txt` is added to the file `[drive]:\sc\lib4\base\bbone\inst\mlib_index.txt`.

The chapter "Appendix B"

This chapter contains additional information for Busbar coloring.

Busbar coloring	131
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1 Busbar coloring

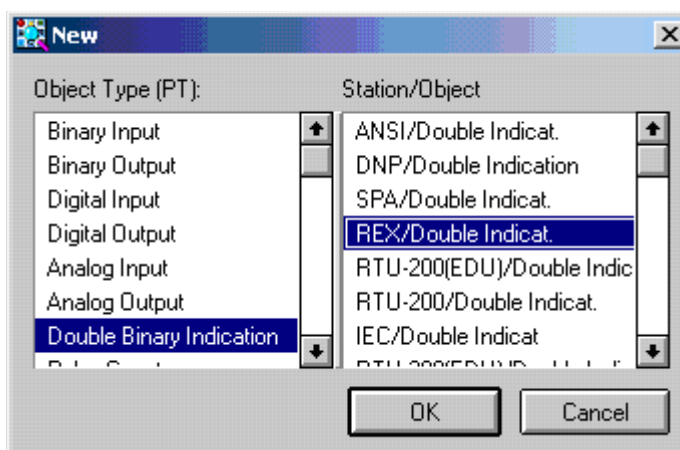
For 670 series version 1.0 and 1.B we have to create a new PO (101) because we have open=1 and close =2.

1.1 Create a new PO101

Chose Object navigator/Process Objects.

Write LN= ="LNName of the SwitchDevice" in the filter to get the Switch Device to add the PO. Make select on a index nr.

Make New, write name and chose object type and Station/Object:



Put the IX=In use and SS=Manual State:

TEST1 [1] / SWD1(101) - Process Object

Identification

Comment Text (CX):

Object Text (OX):

Object Identifier (OI):

OPC Item Name (ON):

Operation State

In Use (IU) Switch State (SS)

Process Object Type

Station/Object:

Post-processing

Post-processing based on Object Value only (PO)

Configurable | Dynamic | All Attributes

Addresses | Alarm Generation | Alarm Handling | **Events** | History | Printouts | Miscellaneous

Event Channel

Action Enabled (AE)

Action Name (AN):

Action Activation (AA):

Action at First Update(AF)

Action on History Values (AH)

Event Object Enabled (EE)

Modification Time (ZT):

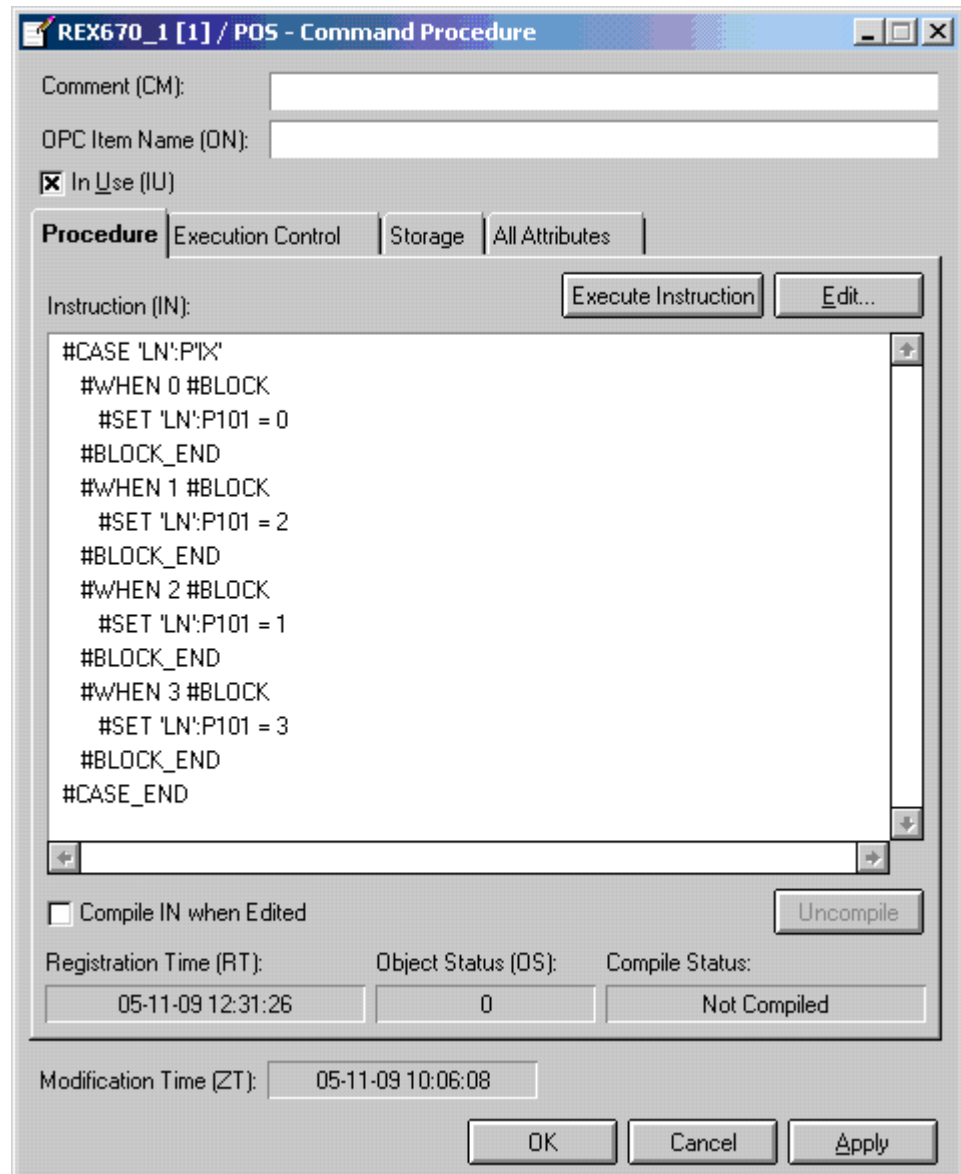
Index (IX): Group (LN):

1.2

Create a Command Procedure

Chose Object navigator/Command Procedures.

Make New, write name (Pos). Edit the Command Procedure, In Use=1 and write Instruction:

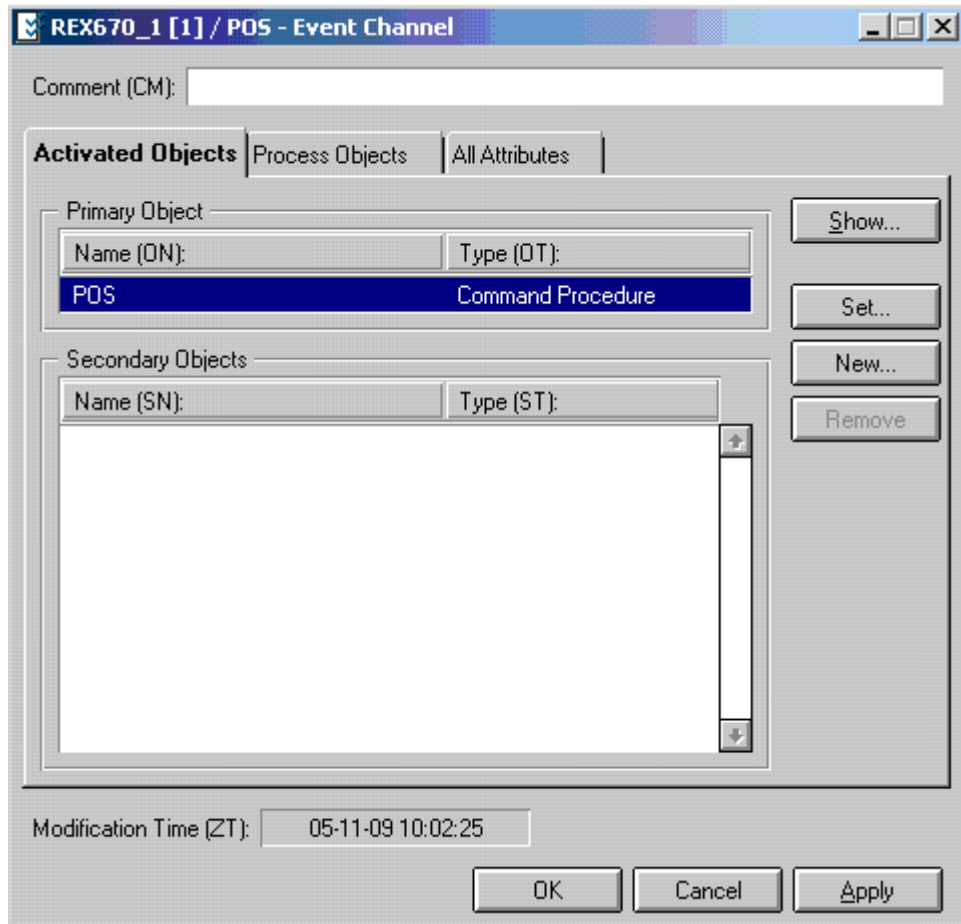


1.3

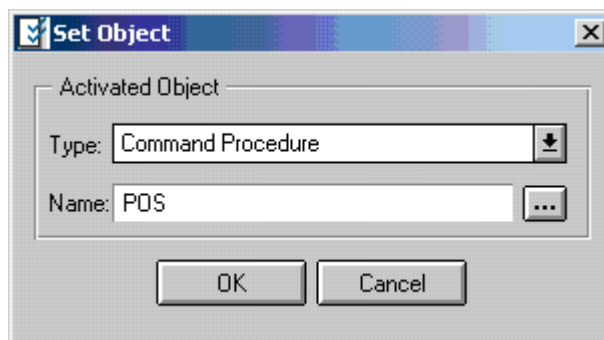
Create an Event Channel

Chose Object navigator/Event Channels.

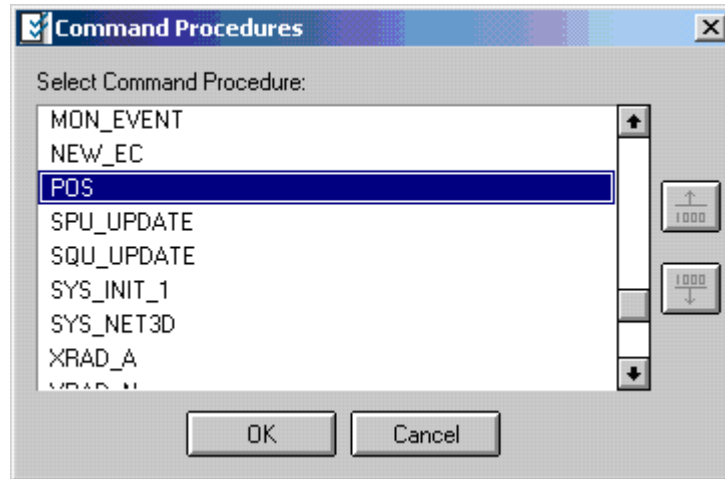
Make New, write name (Pos), should be the same as Command Procedure name. Edit the Event Channel:



Make Set:



Change name to the created Command Procedure:



Then OK, OK Apply, OK.

1.4

Changes in PO index 1

Chose Object navigator/Process Objects. Chose index 1. Make changes, Action enabled, Action at First Update, Action on History Values, Action Activation (AA)=1, Action Name=POS, Event Object Enabled:

TEST1 [1] / SWD1(1) - Process Object

Identification

Comment Text (CX):

Object Text (OX):

Object Identifier (OI):

OPC Item Name (ON):

Operation State

In Use (IU) Switch State (SS)

Process Object Type

Station/Object:

Post-processing

Post-processing based on Object Value only (PO)

Configurable | Dynamic | All Attributes

Addresses | Alarm Generation | Alarm Handling | **Events** | History | Printouts | Miscellaneous

Event Channel

Action Enabled (AE)

Action Name (AN): ...

Action Activation (AA):

Action at First Update (AF)

Action on History Values (AH)

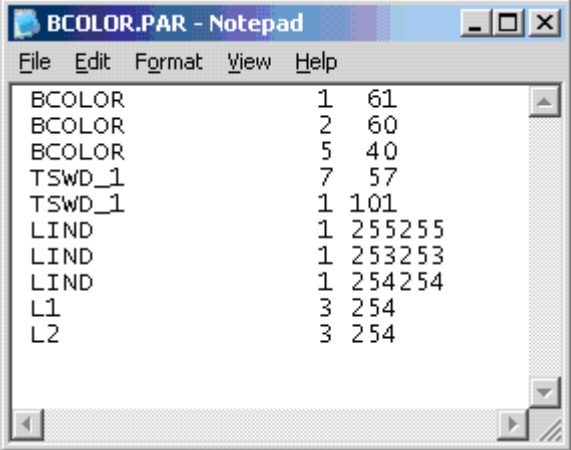
Event Object Enabled (EE)

Modification Time (ZT):

Index (IX): Group (LN):

1.5**Changes in BCOLOR.PAR**

Open in explorer: C:\sc\apl\"application name"\PICT\TOPOLOGY file
BCOLOR.PAR in NotePad and change the TSWD_1 1 1-> 1 101 as below (TSWD_1
is the name of the breaker PO):



```
BCOLOR.PAR - Notepad
File Edit Format View Help
BCOLOR      1  61
BCOLOR      2  60
BCOLOR      5  40
TSWD_1      7  57
TSWD_1      1 101
LIND        1 255255
LIND        1 253253
LIND        1 254254
L1          3  254
L2          3  254
```


Customer feedback report

Product:

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	Excellent				Poor
Total impression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Usability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Functionality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Human-man interface	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

How do you grade the quality of the documentation?

	Excellent				Poor
Total impression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Layout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Illustrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Readability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to find	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Content structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____

Software Registration Form

Program:

This card registers your program and makes you eligible to receive information about future updates.

Name:

Title:

Company:

Dept.

Address:

City:

State:

Zip:

Phone:

Fax:

Program supplied by:

Address:

City:

State:

Zip:

Phone:

Date of receipt of the program:

Program serial Nr:

Fascimile:

Please send this registration card to ABB AB, Substation Automation Products, Support Line
(+46 (0) 21 14 69 18)

Remove from binder

Place
Postage
Here

ABB AB
Substation Automation Products
PTSX/TP, Support Line
SE-721 59 Västerås
Sweden

To be folded

Remove from binder

Tape here

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- ABB Power Technologies AB's entire liability and your exclusive remedy shall be, at ABB Power Technologies AB's option, either (a) return of the price paid or (b) repair or replacement of the SOFTWARE that does not meet ABB Power Technologies AB's Limited Warranty and which is returned to ABB Power Technologies AB with a copy of your receipt. This Limited Warranty is void if failure of the SOFTWARE has resulted from accident, abuse, or misapplication. Any replacement SOFTWARE will be warranted for the remainder of the original warranty period or 30 days, whichever is longer.
- No Other Warranties**
- ABB Power Technologies AB disclaims all other warranties, either express or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the SOFTWARE, accompanying Product Manual(s) and written materials. This warranty gives you specific legal rights.
- No Liability for Consequential Damages**
- Neither ABB Power Technologies AB nor anyone else who has been involved in the creation, production or delivery of this product shall be liable for any direct, indirect, consequential or incidental damages (including damages for loss of business profits, business interruption, loss of business information, and the like) arising out of the use or inability to use such product even if ABB Power Technologies AB has been advised of the possibility of such damages. In any case, ABB Power Technologies AB's entire liability under any provision of this agreement shall be limited to the amount actually paid by you for the software.

ACKNOWLEDGEMENT

By opening the diskette package you acknowledge that you have read this agreement, understand it, and agree to be bound by its terms and conditions. You also agree that it is the complete and exclusive statement of the agreement between the parties and supersedes all proposals or prior agreement, oral or written, and any other communications between the parties relating to the subject matter of the licence or limited warranty.

This Agreement is governed in all aspects by Swedish law. If any provisions of this Agreement are invalid or unenforceable, all others will remain in effect.



ABB AB
Substation Automation Products
SE-721 59 Västerås
Sweden
Telephone: +46 (0) 21 34 20 00
Facsimile: +46 (0) 21 14 69 18
Internet: www.abb.com/substationautomation

1MRK 511 180-UEN

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