

User's Manual

HV/Control*2.5



This manual belongs to:

Chapter	Page
About this manual	5
Introduction	7
Instructions	11
Technical descriptions	49
Appendix	109
Customer feedback report	143
Software Registration Form	145
Index	147

This is a User's manual for HV/Control*2.5

Document number: 1MRK 511 118-UEN

Revision: B

Issue date: March 2005

Data subject to change without notice

We reserve all rights to this document, even in the event that a patent is issued and a different commercial proprietary right is registered. Improper use, in particular reproduction and dissemination to third parties, is not permitted.

This document has been carefully checked. If the user nevertheless detects any errors, he is asked to notify us as soon as possible.

The data contained in this manual is intended solely for the product description and is not to be deemed to be a statement of guaranteed properties. In the interests of our customers, we constantly seek to ensure that our products are developed to the latest technological standards.

As a result, it is possible that there may be some differences between the HW/SW product and this information product.

Author's address:

ABB Automation Technologies 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

© Copyright 2005 ABB. All rights reserved.

The chapter “Introduction”

This chapter introduces you to the HV/Control software.

Introduction	9
Preface.....	9
Abbreviations and definitions	9
Font conventions.....	10

1 Introduction

1.1 Preface

Welcome to the HV/Control User's Manual. This document will provide you with the necessary information to install, configure and modify the different parts in the HV/Control 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 Automation 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
COE	Centre of Excellence
FIMIT	ABB Transmit Oy, Finland
FMOD	FIMIT modules
HV	High voltage
hv/control	The program package for the high voltage control functions part of LIB520.
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
SLib	Help tool for development of dialog pictures.
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 software and how to perform some typical tasks when to use the software.

System requirements	15
Terminal end	15
LON/SPA Gateway	15
The MicroSCADA PC.....	15
The HV/Control package.....	15
Installation	16
Installation of MicroSCADA software	16
Installation of the HV/Control software package	16
Readme file	17
Location of the HVLib functions	18
Overview of the standard functions	18
HV General bay	19
Description	19
Target systems	19
Communication support	20
Features	20
Process commands	20
HV Breaker	20
Description	21
Target systems	21
Communication support	21
Features/Options	21
Not supported features	21
Process commands	21
HV Disconnecter	22
Description	22
Target systems	22
Communication support	22
Features/Options	22
Not supported features	22
Process commands	23
HV Earthing switch.....	23
Description	23
Target systems	23
Communication support	23
Features/Options	23
Not supported features	24
Process commands	24
HV Overview Bay	24

Description	24
Target systems	24
Communication support	25
Features	25
Process commands	25
HV Measurement	25
Description	25
Target systems	25
Communication support	25
Features	26
Process commands	26
REX5XX Supervision function.....	26
Description	26
Target systems	27
Communication support	27
Features	27
Process commands	27
Creating and preparing an application	28
Station type	28
Object identifier	28
OI parameter setting	29
Installing and configuring HV/Control functions	30
Installation Tool	31
Standard Configuration Tool (SCT).....	31
Process Object Tool.....	32
Representation Tool.....	32
Color Tool.....	32
How to change a color	33
General bay function	33
Installation process	35
Delete process	36
Breaker, Disconnecter and Earth switch function	36
Installation process	39
Delete process	39
Overview bay function.....	39
Installation process	39
Delete process	40
Measurement function.....	40
Installation process	43
Delete process	43
REX5XX supervision function	43
Installation process	47
Delete process	47
Additional application engineering	47
Switch state.....	47

Addressing the process objects	48
Remaining tasks	48

1 System requirements

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

1.1 Terminal end

Remote SPA-bus communication or LON-bus communication (REL 531 and REC 561, direct and others via SPA-LON gateway) option installed in the terminals, which are used for process communication in HV/Control. The following terminals are supported:

- REL 501*1.2¹
- REL 511*1.2¹
- REL 521*1.2¹
- REL 551*1.2¹
- REL 561*1.2¹
- REL 531*1.0²
- REB 551*1.2¹
- REC 561*1.1²
- REx 5xx*2.0³ or later
- REO 517*2.1 or later
- RET 521*2.1 or later

1.2 LON/SPA Gateway

When a LON/SPA Gateway is used, the following version is required:

- SPA-ZC 100, RS 951 022-AA, DA. Date 970513 or later

1.3 The MicroSCADA PC

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

1.4 The HV/Control package

- 3,5 MB disk space

1. Bus connection unit SPA-ZC 21 (ABB Automation Technology Products AB ordering number 1MRK 000 194-AA, BA, CA or DA depending on glass or plastic. Note that this unit is different from the SPA-ZC21 ordered from FIMIT) is used for connection to fibre optic SPA-bus. Bus connection unit SPA-ZC 100 is used for connection to LON-bus.

2. The built-in connectors for SPA or LON are used. Make sure you include them when ordering the terminal.

3. Comprises versions of REL 501, -511, -521, -531, -551, -561, REB 551 and REC 561.

2 Installation

Before start using the HV/Control 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 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 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 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 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 Follow the instructions on the screen.

The HV/Control 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 17.

5 Start the MicroSCADA.

The software is now installed in the following directories:

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

The following files are also added by the installation:

```
[drive]:\SC\LIB4\BASE\BBONE\USE\PATH4_S1.TXT  
[drive]:\SC\LIB4\BASE\BBONE\INST\INDEX4_S1.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:

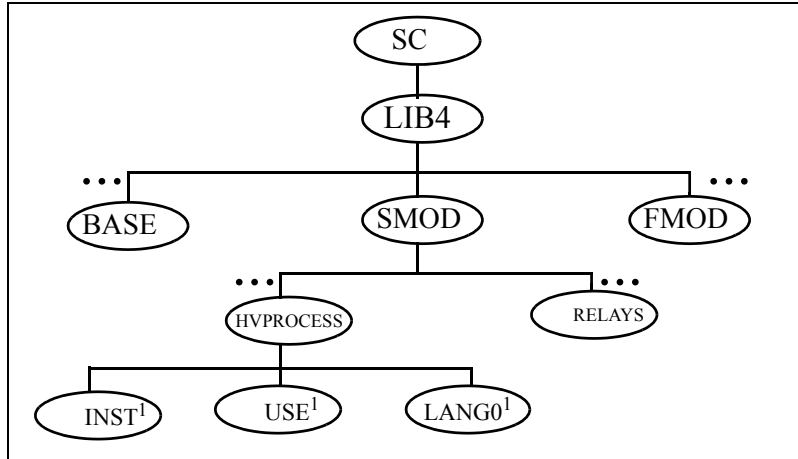


Figure 1: HVLib directory structure.

1. These directories are mostly used with their logical path names S_INST, S_USE and S_LANG defined in file PATH4_S1.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

SPI_GBAY	HV General Bay. Full bay control for REC561 (SPANET and direct LON) or reduced bay control, when REB551 (SPANET and LON/SPA Gateway) is used as target system.
SPI_B001, 002, 003	Breaker function with semigraphic size 1x1 (SPI_B001), 2x2 (SPI_B002), 3x3 (SPI_B003). Full apparatus control for REC 561 (SPANET and direct LON) or reduced apparatus control for REB551 (SPANET and LON/SPA Gateway)
SPI_D001, 002, 003	Disconnecter function with semigraphic size 1x1 (SPI_D001), 2x2 (SPI_D002), 3x3 (SPI_D003). Full apparatus control for REC 561 (SPANET and direct LON) or reduced apparatus control for REB551 (SPANET and LON/SPA Gateway)

Table 1: Functions included in the HVLlib (Continued)

SPI_E001, 002, 003	Earth switch function with semigraphic size 1x1 (SPI_E001), 2x2 (SPI_E002), 3x3 (SPI_E003). Full apparatus control for REC 561 (SPANET and direct LON) or reduced apparatus control for REB551 (SPANET and LON/SPA Gateway)
SPI_OB001, 002, 003	Overview Bay function.
SPI_M001, 002, 003	Measurement function with semigraphic size of selection button 1x1 (SPI_M001), 2x2 (SPI_M002), 3x3 (SPI_M003). General measurement for REX5xx (SPANET, LON/SPA Gateway and direct LON).
SPI_S0001, 02, 03	REX5XX supervision function with semigraphic size of selection button 1x1 (SPI_X5XX01), 2x2 (SPI_X5XX02), 3x3 (SPI_X5XX03)(SPANET and direct LON). REX5XX is aimed for REB 551, REL 501/511/521/531/551/561 or REC561.

4.1 HV General bay

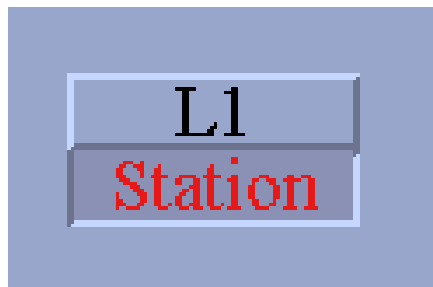


Figure 2: General bay process symbols

File name: SPI_GBAY.PIC

File location in package: HVPROCESS/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

- REC 561 (interfacing a bay control module)
- REB 551 (interfacing a reduced bay control module)

4.1.3 Communication support

- SPA
- LON

4.1.4 Features

- Blocking/Deblocking of alarms, events, printout and remote events & indications
- Blocking/Deblocking of process update
- Blocking/Deblocking of operation
- Acknowledge alarms
- Help in all dialogs
- Single, double and 1½ breaker arrangements supported
- The SPA tool configuration pictures can be activated from the bay dialog
- Up to 2 configurable bay alarms can be included
- Apparatus 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

4.1.5 Process commands

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

4.2 HV Breaker

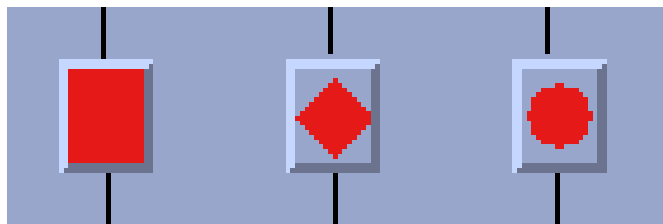


Figure 3: Breaker process symbols.

Function name: SPI_B001.PIC, SPI_B002.PIC, SPI_B003.PIC

File location in package: HVPROCESS/INST

-
- 4.2.1 Description**
This function is used for control and supervision of a breaker regarding:
- Position indication
 - Operation
 - Interlock bypass
 - Synchrocheck bypass
 - Breaker status information
- 4.2.2 Target systems**
- REC 561 (interfacing the bay control module)
 - REB 551 (interfacing a reduced bay control module)
- 4.2.3 Communication support**
- SPA
 - LON
- 4.2.4 Features/Options**
- Blocking/Deblocking of alarms, events, printout and remote events & indications
 - Acknowledge alarms
 - Help in all dialogs
 - Operable or non-operable breaker
 - Breaker presented with or without function key
 - Semigraphical size of the breakers symbol is 1x1, 2x2, 3x3 without suffix
 - Free choice of symbol (square, diamond or circle) for presentation of the breakers.
- 4.2.5 Not supported features**
- Operation of several breakers at a time is not supported
 - “Stand-alone” breaker
- 4.2.6 Process commands**
- On/off operation of a breaker
 - Interlock bypass
 - Synchrocheck bypass
 - Blocking/Deblocking of process update
 - Blocking/Deblocking of operation
 - Setting of manual position

4.3 HV Disconnecter

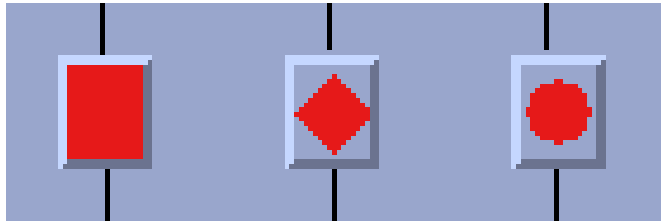


Figure 4: Disconnecter process symbols.

Function name: SPI_D001.PIC, SPI_D002.PIC, SPI_D003.PIC

File location in package: HVPROCESS/INST

4.3.1 Description

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

- Position indication
- Operation
- Interlock bypass

4.3.2 Target systems

- REC 561 (interfacing the bay control module)
- REB 551 (interfacing a reduced bay control module)

4.3.3 Communication support

- SPA
- LON

4.3.4 Features/Options

- Blocking/Deblocking of alarms, events, printout and remote events & indications
- Acknowledge alarms
- Help in all dialogs
- Operable or non-operable disconnecter
- Disconnecter presented with or without function key
- Semigraphical size of the disconnecters symbol is 1x1, 2x2, 3x3 without suffix
- Free choice of symbol (square, diamond or circle) for presentation of the disconnectors.

4.3.5 Not supported features

- Operation of several disconnectors at a time is not supported
- “Stand-alone” disconnecter

4.3.6**Process commands**

- On/off operation of a disconnecter
- Interlock bypass
- Blocking/Deblocking of process update
- Blocking/Deblocking of operation
- Setting of manual position

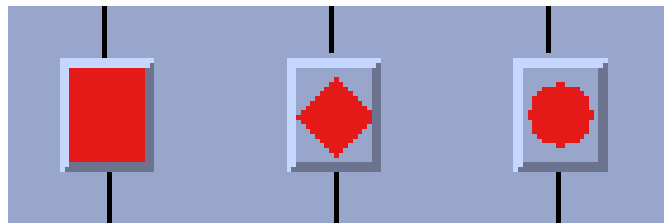
4.4**HV Earthing switch**

Figure 5: Earthing switch process symbols.

Function name: SPI_E001.PIC, SPI_E002.PIC, SPI_E003.PIC

File location in package: HVPROCESS/INST

4.4.1**Description**

This function is used for control and supervision of an earth switch regarding:

- Position indication
- Operation
- Interlock bypass

4.4.2**Target systems**

- REC 561 (interfacing the bay control module)
- REB 551 (interfacing a reduced bay control module)

4.4.3**Communication support**

- SPA
- LON

4.4.4**Features/Options**

- Blocking/Deblocking of alarms, events, printout and remote events & indications
- Acknowledge alarms
- Help in all dialogs
- Operable or non-operable earth switch

- Earth switch presented with or without function key
- Semigraphical size of the earth switches symbol is 1x1, 2x2, 3x3 without suffix
- Free choice of symbol (square, diamond or circle) for presentation of the earth switches.

4.4.5 Not supported features

- Operation of several earth switches at a time is not supported
- “Stand-alone” earth switch

4.4.6 Process commands

- On/off operation of an earth switch
- Interlock bypass
- Blocking/Deblocking of process update
- Blocking/Deblocking of operation
- Setting of manual position

4.5 HV Overview Bay

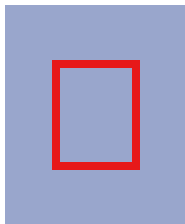


Figure 6: Overview bay process symbol.

Function name: SPI_OB001, SPI_OB002, SPI_OB003.PIC

File location in package: HVPROCESS/INST

4.5.1 Description

This function is used for supervision of a bay or section of a bay in an overview picture regarding:

- Abnormal status (logic programmable in the REC)
- Bay section connected or disconnected (logic programmable in the REC)

4.5.2 Target systems

- REC 561
- REB 551 (interfacing a reduced bay control module)

4.5.3 Communication support

- SPA
- LON

4.5.4 Features

- Presentation of bay abnormal status
- Shape configurable to be square, diamond or circle
- Can be used for Bay section A, B or C in a breaker and a half arrangement

4.5.5 Process commands

No process commands are possible for the HV Overview bay

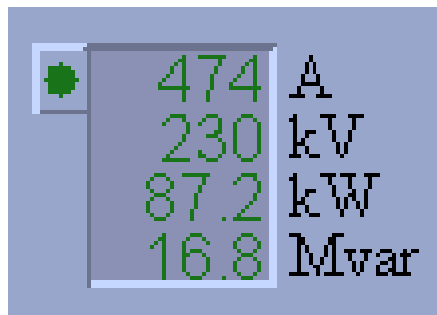
4.6 HV Measurement

Figure 7: Measurement process symbols

Function name: SPI_M001.PIC, SPI_M002.PIC, SPI_M003.PIC

File location in package: HVPROCESS/INST

4.6.1 Description

This function is used for:

- Measurement monitoring
- Displaying and editing alarm and warning limits

4.6.2 Target systems

- REC 561
- REB 551
- REL 501/511/521/531/551/561

4.6.3 Communication support

- SPA
- LON

4.6.4**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/Erase Measurements
- Configurable number of decimals: 0, 1 or 2
- Configurable type of measurement: Current, Voltage, Active Power, Reactive Power, Frequency or Temperature, COS φ
- 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

4.6.5**Process commands**

Following process commands can be performed:

- Editing limits

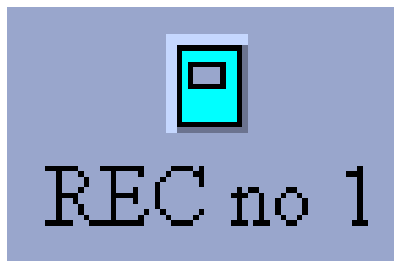
4.7**REX5XX Supervision function**

Figure 8: REX 5XX Supervision process symbol.

File name: SPI_S0001.PIC, SPI_S0002.PIC, SPI_S0003.PIC

File location in package: HVPROCESS/INST

4.7.1**Description**

This function is used for monitoring a REX 5XX terminal regarding:

- Internal Fail

-
- Warning
 - CPU Fail
 - CPU Warning
 - ADC Module
 - I/O Diff
 - Diff Comm
 - Settings changed
 - Clear LEDs
 - MIM Boards
 - I/O Boards

4.7.2**Target systems**

- REB 551
- REC 561
- REL 501/511/521/531/551/561
- RET 521

4.7.3**Communication support**

- SPA
- LON

4.7.4**Features**

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

4.7.5**Process commands**

No process commands are possible for the REX 5XX 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 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.

See “*Object identifier*” on page 28.

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

Functions (HV Apparatus 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 analog 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.

5.1 Station type

The default value when configuring the objects is LON (station type REX). The SPA type can optionally be selected. If LON is selected, the process objects are created without bit numbers.

5.2 Object identifier

Before installation the use of the attribute OI (Object Identifier) must be decided. In the system configuration file SYS_BASCON.COM locate the following section:

```
.*****
;
;
;      APPLICATIONS
;The usage of OI & OX -attributes (required by LIB 500)
@SV(15) = LIST(-
          Process_Objects=LIST(-
```

```

OI=LIST(-
  Title1=VECTOR("Substation"),-
  Title2=VECTOR("Bay"),-
  Title3=VECTOR("Device"),-
  Title4=VECTOR(""),-
  Title5=VECTOR(""),-
  Length1=10,-
  Length2=15,-
  Length3=5,-
  Length4=0,-
  Length5=0,-
  Field1=VECTOR("STA"),-
  Field2=VECTOR("BAY"),-
  Field3=VECTOR("DEV"),-
  Field4=VECTOR(""),-
  Field5=VECTOR("")),-
OX=LIST(-
  Title1=VECTOR("Object text"),-
  Length1=30))

```

5.2.1

OI parameter setting

The parameters `Length1`, `Length2` and `Length3` must now be set as follows.

The `Length1` is definition of the *Substation name* (minimum length is 2), `Length2` is the definition of *Bay name* (minimum length is 2) and `Length3` is the definition of the *Device (Object) name*. The sum of these 3 values must not exceed 63, however 30 characters is recommended for e.g. Event list, Alarm list and printer. For `Length1` and `Length2` 1 character is used for space (between *Station name/Bay name* and *Bay name/Device name*).

Two optional parts, *Special_Identifier_1* and *Special_Identifier_2* can be added to the above described *Station-/Bay-/Device name*. Still the maximum length is 63 characters. They can be used as additional identification of the objects and their signals. Lets assume that *Special_Identifier 1*, which is reflecting the Voltage level of a station, is added. The definition in the `SYS_BASCON.COM` shall look like this,

```

@SV(15) = LIST(-
  Process_Objects=LIST(-
    OI=LIST(-
      Title1=VECTOR("Substation"),-
      Title2=VECTOR("Voltage Level"),-
      Title3=VECTOR("Bay"),-
      Title4=VECTOR("Device"),-
      Title5=VECTOR(""),-
      Length1=10,-
      Length2=3,-

```

```

Length3=12,-
Length4=5,-
Length5=0,-
Field1=VECTOR("STA"),-
Field2=VECTOR(""),-
Field3=VECTOR("BAY"),-
Field4=VECTOR("DEV"),-
Field5=VECTOR(""),-
OX=LIST(-
Title1=VECTOR("Object text"),-
Length1=30))

```

Note:

*It is of **great importance** that this is made before configuration of the installed functions because the configuration process takes these values in account when creating the process database. If variable @OI_LENGTH is not defined in the configuration file, then override value defined in standard function configuration file is valid, which means LENGTH1=2, LENGTH2=14 and LENGTH3=14. This may cause unexpected behavior in run-time, especially in the case where medium voltage and high voltage functions are installed in the same station picture.*

For the event list, it can be configured if 'Station_name', 'Bay_name' and 'Device_name' shall be shown (in the 'Object-ID' column of the event list). This is configured using the "Settings" tool (available under the 'Options' menu). Select 'Tools' and 'Show Object ID'. In the appearing dialog it is possible to configure if the 'Station_name', 'Bay_name' and 'Device_name' shall be shown in the event list.

6 Installing and configuring HV/Control 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.

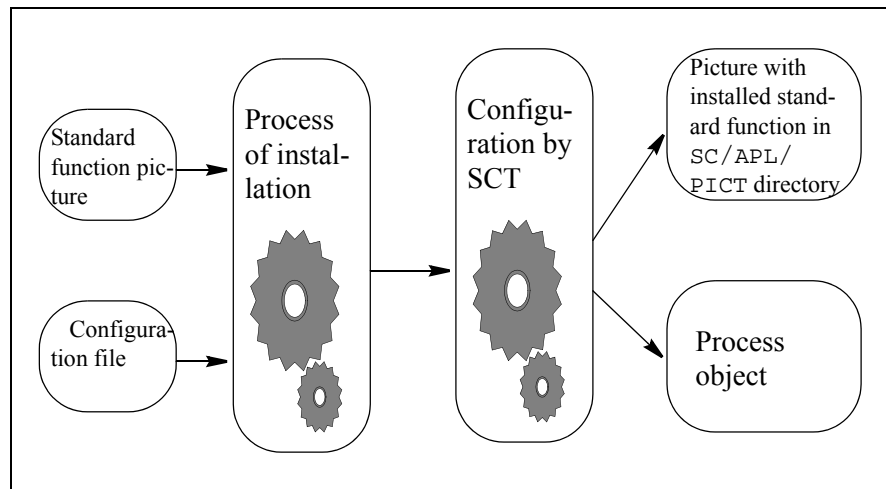


Figure 9: Process of the installation and configuration.

HVLib standard function pictures are stored in directory SC\LIB4\SMOD\HVPROCESS\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 Picture Functions | MicroLIB | LIB4. The installation tool will appear. In the directory structure, select LIB4 and after that HVPROCESS to bring up the HV/Control 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 button “Tools”. This tool is used whenever a representation need to be selected or modified, which means that the tool is not visible for all functions, but just for those ones that have possibility of changing of presentation symbol like the apparatus.

6.5 Color Tool

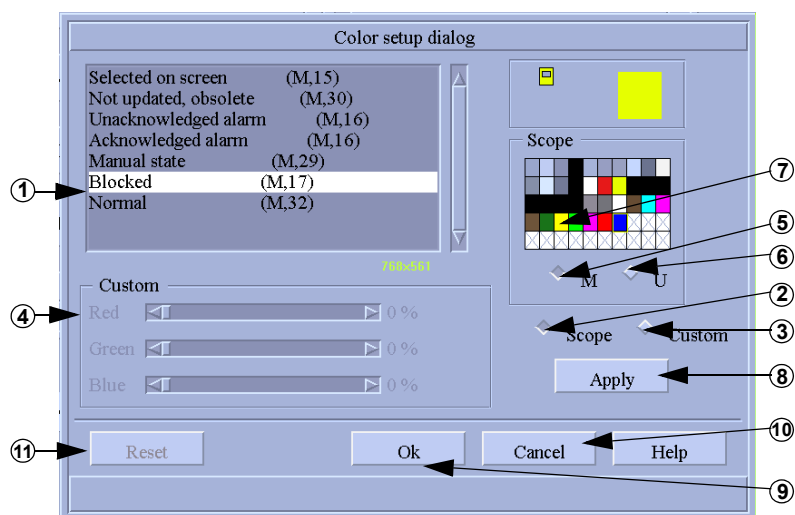


Figure 10: The color tool

The color tool is also accessible from the SCT, by pushing of the button “Tools”. This tool is used if a different color scheme, than that presented in “Color coding” on page 53 is desired.

6.5.1

How to change a color

Follow these steps when you want to change a color of a status marker:

- 1 **Select the status, which you want to give a new color (1).**
- 2 **Select Scope (2), for using a standard color or Custom (3) to mix your own color using the RGB-mixer (4).**

If Scope (2) is chosen, select either M=System colors (1) or U=User colors (6) and then click on the desired color (7). These colors are defined in the MicroSCADA standard color setting picture.

- 3 **Click Apply (8) to effectuate the change or Ok (9) to effectuate and close the dialog.**

The dialog can, at any time, be cancelled (10) or the colors reset to original (11).

6.6

General bay function

In the installation tool, choose LIB4/HVPROCESS/GENBAY. Point the GENBAY and click once by mouse. After the GENBAY 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:

Configurable	Choices
STATION_NAME	Name of the station the bay belongs to. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28.
BAY_NAME	Name of the bay. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28.
SPECIAL_IDENTIFIER_1	Additional identifier for object and signal grouping. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28. Note: The attribute is only visible in SCT if definition is made in the SYS_BASCON.COM
SPECIAL_IDENTIFIER_2	Additional identifier for object and signal grouping. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28. Note: The attribute is only visible in SCT if definition is made in the SYS_BASCON.COM
BAY_LABEL	Label to be shown in the process picture. By default the same as process object logical name.

Table 2: (Continued)

Configurable	Choices
P_OBJECT_LN	Process object logical name.
STATION_NUMBER	<p>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.</p> <p>The configurable EVENT_BLOCK is related to this configurable in that way, if the STATION_NUMBER is changed from default 0 the EVENT_BLOCK should have a selection earlier not used within the STATION_NUMBER.</p> <p>The STATION_NUMBER has callback function. STATION_NUMBER must be set before EVENT_BLOCK and COMMAND_BLOCK otherwise these configurable appears dimmed.</p>
DATA_ACQUISITION_UNIT	<p>An identifier for external engineering tool SigTool. The value is stored in the attribute RX. The possible selections are REB 551_? and REC 561_? Default is "Not defined"</p> <p>The configuration is made in two steps. First the terminal type e.g REC 561_?, is made. Secondly the "?" is changed to a number which is reflecting the number of the physical unit. If only one unit exists the second step can be excluded.</p>
EVENT_BLOCK	<p>String which defining the event block used in the target unit. The value is EV01 to EV44 (the number of selectable event block is depending on how many is available in the target unit). Default is "Not defined". The number is used to calculate the Object Address (OA) of the process objects.</p> <p>The calculation is targeted for the DEFAULT terminal configuration which means that the addresses are as follows:</p> <p>LON communication: EV01 -> 1024..1039 (16 signals) ... EV44 -> 1712..1727 (16 signals)</p> <p>SPA communication: EV01 -> 1^00..1^16 (16 signals) ... EV44 -> 44^00..44^16 (16 signals)</p>

Table 2: (Continued)

Configurable	Choices
COMMAND_BLOCK	String which defining the command block used in the target unit. The value is CM01 to CM80 (the number of selectable command block is depending on how many is available in the target unit). Default is "Not defined". 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: LON communication: CM01..80 -> 5001..5080 SPA communication: CM01..80 -> 1..80
STATION_TYPE	SPANET or LON. Default value is LON.
AUTHORIZATION_GROUP	Selects the authorization group among the ones defined in the User Management tool. Default value is GENERAL.
NO_OF_SECTIONS	One, two or three sections (e.g. for breaker and a half arrangements) can be included in one General bay function. Default value is one.
RELAY_INSTALLED	Is a possibility to enable or disable access to the relay tool. Note that the relays (or terminals) that shall be accessed must have been configured in the relay tool to be connected to this bay. Default value is disabled.
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

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 functions.

6.6.2

Delete process

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

6.7

Breaker, Disconnecter and Earth switch function

The function for breaker, disconnecter and earth switch are almost the same so they are described here as an apparatus. In the installation tool, choose LIB4/LIB520/HVPROCESS/BREAKER or DISCONNECTOR or EARTH SWITCH, then choose SMALL 1*1 or MEDIUM 2*2 or LARGE 3*3. Point the APPARATUS and click once by mouse. After the APPARATUS 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 3:

Configurable	Choices
STATION_NAME	Name of the station the apparatus belongs to. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28.
BAY_NAME	Name of the bay the apparatus is connected to. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28.
DEVICE_NAME	Name of the apparatus. By default the same as process object logical name. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28.
SPECIAL_IDENTIFIER_1	Additional identifier for object and signal grouping. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28 Note: Is only visible in SCT if definition is made in the SYS_BASCON.COM
SPECIAL_IDENTIFIER_2	Additional identifier for object and signal grouping. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28 Note: Is only visible in SCT if definition is made in the SYS_BASCON.COM
P_OBJECT_LN	Process object logical name.

Table 3: (Continued)

Configurable	Choices
STATION_NUMBER	<p>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.</p> <p>The STATION_NUMBER has callback function. STATION_NUMBER must be set before EVENT_BLOCK and COMMAND_BLOCK otherwise these configurable appears dimmed.</p>
DATA_ACQUISITION_UNIT	<p>An identifier for external engineering tool SigTool. The value is stored in the attribute RX. The possible selections are REB 551_? and REC 561_? Default is "Not defined"</p> <p>The configuration is made in two steps. First the terminal type e.g REC 561_?, is made. Secondly the "?" is changed to a number which is reflecting the number of the physical unit. If only one unit exists the second step can be excluded.</p>
EVENT_BLOCK	<p>String which defining the event block used in the target unit. The value is EV01 to EV44 (the number of selectable event block is depending on how many is available in the target unit). Default is "Not defined". The number is used to calculate the Object Address (OA) of the process objects.</p> <p>The calculation is targeted for the DEFAULT terminal configuration which means that the addresses are as follows:</p> <p><i>LON communication:</i></p> <p>EV01 -> 1024..1039 (16 signals)</p> <p>...</p> <p>EV44 -> 1712..1727 (16 signals)</p> <p><i>SPA communication:</i></p> <p>EV01 -> 1^00..1^16 (16 signals)</p> <p>...</p> <p>EV44 -> 44^00..44^16 (16 signals)</p>
COMMAND_BLOCK	<p>String which defining the command block used in the target unit. The value is CM01 to CM80 (the number of selectable command block is depending on how many is available in the target unit). Default is "Not defined". The number is used to calculate the Object Address (OA) of the process objects.</p> <p>The calculation is targeted for the DEFAULT terminal configuration which means that the addresses are as follows:</p> <p><i>LON communication:</i></p> <p>CM01..80 -> 5001..5080</p> <p><i>SPA communication:</i></p> <p>CM01..80 -> 1..80</p>

Table 3: (Continued)

Configurable	Choices
CONNECTED_TO_BAY	Choose the appropriate general bay function to which the apparatus is connected. The selector list shows the available choices. Note that the bay function hence need to be installed before the apparatus 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 apparatus 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	SPANET or LON. Default value is LON.
OPERABLE	Can be "True" or "False". This attribute will set the IU attribute of the process object with index 210 to 1 or 0. In the SCT, "True" means that it will be possible to send station orders, i.e manoeuvre the actual process. "False" means that the object only is updated on the screen but no station orders are sent. Default value is "True".
SENSITIVE	"True" or "False". "False" means that the apparatus is drawn without a push button and that the function key is disabled, i.e nothing happens when clicking on the apparatus. 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. Depending on the choice of apparatus, different indexes will be written to the database of the process object: 1,11 and 40 for breaker, 2,12, without 40 for disconnector and 3,13, without 40 for earthing switch. Before leaving the SCT, remember to save your changes by choosing OK or Apply.

Note:

*An apparatus **must** have a bay function to which it can be connected. For circuit breakers that do not belong to any physical bay, a dummy bay can be installed in the picture. The circuit breaker 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 an apparatus (or measurement) will be connected may be installed after the apparatus has been installed, but apparatus must be connected and configured properly, via SCT.*

6.7.1**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 functions.

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

6.7.2**Delete process**

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

6.8**Overview bay function**

In the installation tool, choose LIB4/HVPROCESS/OVERVIEW_BAY. With OVERVIEW_BAY 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 4:

Configurable	Choices
CONNECTED_TO_BAY	Choose the appropriate general bay function from which the overview bay should collect the information. The selector list shows the available choices. Note that the bay function hence need to be installed before the apparatus function. This attribute does not have a default value.
BAY_SECTION	The section for which the information is shown. Possible choices are section A, B or C. Default is bay section A.

No process objects are created for the overview bay function since all information is collected from the General Bay function.

6.8.1**Installation process**

Nothing specifically for the HV Overview Bay function.

6.8.2

Delete process

Nothing specifically for the HV Overview Bay function.

6.9

Measurement function

In the installation tool, choose LIB4/HVPROCESS/MEASUREMENT. With MEASUREMENT 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.

Table 5:

Configurable	Choices
STATION_NAME	Text string defining the station name. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28. Default is “ ”.
BAY_NAME	Text string defining the bay name. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28. Default is “ ”.
DEVICE_NAME	Text string defining the device name. Max length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28. Default is “ ”. 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. Max length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28. Default is “ ”. 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.
LIMITS_SUPERVISED_BY	Decides weather the limits are supervised by MicroSCADA or the terminal. TERMINAL or SCADA are selectable, default is TERMINAL.

Table 5: (Continued)

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	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 MEAS_X_EVENT_BLOCK otherwise MEAS_X_EVENT_BLOCK appears dimmed.
STATION_TYPE	SPANET or LON. Default value is LON.
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
TYPE_MEAS_X (X => 1 - 4)	Is the type of measurement. Current (A and kA), Voltage (kV), Active and Reactive power (kW, MW, kVar, MVar), Power angle ($\cos \gamma$), Frequency (Hz), Temperature ($^{\circ}\text{C}$, $^{\circ}\text{F}$) and Energy (kWh, MWh, GWh, kVarh, MVarh, GVarh). The TYPE_MEAS_X has callback function. TYPE_MEAS_X must be set before MEAS_X_DEVICE_NAME, DATA_ACQUISITION_UNIT_X, FOLDER_X_TITLE, MEAS_X_DECIMALS, MEAS_X_SIGN_POLICY, SHOW_MEAS_X SHOW_MEAS_X_AS_BAR and SHOW_MEAS_X_UNIT otherwise these configurable appears dimmed.

Table 5: (Continued)

<p>DATA_ACQUISITION_UNIT_X (X => 1 - 4)</p>	<p>An identifier for external engineering tool SigTool. The value is stored in the attribute RX. The possible selections are REB 551_?, REC 561_? REL 501_?/511_?/521_?/531_?/551_?/561_?/REO 517_?/RET 521_?</p> <p>Default is "Not defined"</p> <p>The configuration is made in two steps. First the terminal type e.g REC 561_?, is made. Secondly the "?" is changed to a number which is reflecting the number of the physical unit. If only one unit exists the second step can be excluded.</p>
<p>MEAS_X_EVENT_BLOCK (X => 1 - 4)</p>	<p>String which defining the event block used in the target unit. The value is:</p> <ul style="list-style-type: none"> DA01-15 DAI function MI11-66 mA board (6 boards with 6 inputs/board) PC01-12 Pulse counter values <p>The number of selectable event block is depending on how many is available in the target unit).</p> <p>Default is "Not defined". The number is used to calculate the Object Address (OA) of the process objects.</p> <p>The calculation is targeted for the DEFAULT terminal configuration which means that the addresses are as follows:</p> <p><i>LON communication:</i></p> <ul style="list-style-type: none"> DA01..15 -> 2181..2195 (U1,U2,U3,U4,U5,I1,I2,I3,I4,I5,U,I,P,Q,f) MI11..16 -> 2111..2116 MIM board 1 MI21..26 -> 2121..2126 MIM board 2 MI31..36 -> 2131..2136 MIM board 3 MI41..46 -> 2141..2146 MIM board 4 MI51..56 -> 2151..2156 MIM board 5 MI61..66 -> 2161..2166 MIM board 5 PC01..12 -> 2001..2112 Pulse counter 1 - 12 <p><i>SPA communication:</i></p> <ul style="list-style-type: none"> DA01..15 -> 1..15 (U1,U2,U3,U4,U5,I1,I2,I3,I4,I5,U,I,P,Q,f) MI11..16 -> 111..116 MIM board 1 MI21..26 -> 121..126 MIM board 2 MI31..36 -> 131..136 MIM board 3 MI41..46 -> 141..146 MIM board 4 MI51..56 -> 151..156 MIM board 5 MI61..66 -> 161..166 MIM board 5 PC01..12 -> 201..212 Pulse counter 1 - 12
<p>FOLDER_X_TITLE (X => 1 - 4)</p>	<p>Texts string defining which title each folder shall have in the main dialog. Default is " ".</p>

Table 5: (Continued)

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.

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.

6.9.1**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 functions.

6.9.2**Delete process**

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

6.10**REX5XX supervision function**

In the installation tool, choose LIB4/LIB 520/SUPERVISION/REX 5XX. 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 6:

Configurable	Choices
STATION_NAME	Text string defining the station name. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28. Default is “ ”.
BAY_NAME	Text string defining the bay name. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28. Default is “ ”.
DEVICE_NAME	Text string defining the device name. Maximum length is defined in the APL:BSV15 variable, see <i>“Creating and preparing an application”</i> on page 28. Default is “ ”.
P_OBJECT_LN	The name of the process objects. Default is the same as the installed library function name
STATION_NUMBER	<p>Any number between 0 and 2 000. Default value is 0. This number is the UN attribute of the process objects. If the base system configuration is missing the STA object equal to this number or having the wrong station type, the installation process will either create or alter this STA definition. The base system update will only be valid until the next system restart. The action is prompted during the installation.</p> <p>The configurable attribute <code>EVENT_BLOCK</code> is related to this configurable on the following way: if the <code>STATION_NUMBER</code> is changed from default 0 the event block should have a selection earlier not used within the <code>STATION_NUMBER</code>.</p> <p>The <code>STATION_NUMBER</code> has callback function. <code>STATION_NUMBER</code> must be set before <code>EVENT_BLOCK</code> and <code>COMMAND_BLOCK</code>, otherwise these configurable appears dimmed.</p>
DATA_ACQUISITION_UNIT	Type of device. Default is “Not defined”. Identifier for Sig Tool Engineering Tool. This attribute is configured in two steps: First select the type in the list and secondly edit the selected type by altering “?” to a number. E.g. REC 561-2 “xx-?” or “xx_” is treated as REC 561_1 which means that if one unit is used the second step is not necessary.

Table 6: (Continued)

EVENT_BLOCK	<p>Is the corresponding event block in the terminal where the signals are connected to. Possible selections are EV01 to EV 44. Default value is "Not defined".</p> <p>The selected EVENT BLOCK number is the base for calculating the address (OA attribute) for the process objects. The calculation is targeted for the DEFAULT terminal configuration which means that the addresses are as follows:</p> <p><i>LON communication:</i></p> <p>EV01 -> 1024..1039 (16 signals)</p> <p>.</p> <p>.</p> <p>EV44 -> 1712..1727 (16 signals)</p> <p><i>SPA communication:</i></p> <p>EV01 -> 1^00..1^16 (16 signals)</p> <p>.</p> <p>.</p> <p>EV44 -> 44^00..44^16 (16 signals)</p> <p>This functions all signals are divided on two event blocks, which means that the second EVENT BLOCK will be selected consecutively, e.g if EV34 is chosen EV35 will be reserved as block 2. This means also that the last EVENT BLOCK which can be selected is EV43.</p> <p>Check the Users Guide for HV/Control for information about the signal grouping.</p> <p>The configurable attribute STATION_NUMBER is related to this configurable attribute in that way, if the EVENT_BLOCK is changed from default "Not defined" the STATION_NUMBER must have an appropriate number, see Note at end of table.</p>
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	SPANET or LON. Default value is LON.
AUTHORIZATION_GROUP	Selects the authorization group among the ones defined in the User Management tool. Default value is GENERAL.
SET_SWITCH_STATE_TO_AUTO	This switch tells the Process Object Tool to set the objects updating to AUTO. Default is FALSE (MANUAL state). It is only meaningful if the STATION NUMBER, EVENT-/COMMAND BLOCK is set.

Select the Process Object Tool under the “Tools” key in the SCT tool bar 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.

Note:

HV/Controls Supervision function is able to be configured by means of any EV-block number between 1-44. When an EV-block number is selected the configuration process automatically address the database points. This function is designed only for terminal type REC561 regarding to standard texts (OX attribute) and terminal standard configuration.

When the Supervision function is used for supervision of terminal type REX500 or RET521 it is recommended to configure the function in the following way: Install the Supervision function with the configurable STATION_NUMBER = 0 and EVENT_BLOCK = “None” and according to terminal-configuration, address the database objects manually and modify the standard texts (OX attribute).

If the Supervision function is used together with either HV/REX500 or HV/RET521 module some signals must be set to out of use in these modules according to the tables below to avoid address overlap in the database.

Signals related to the module HV/REX500 in the Supervision function (must be set out of use in HV/REX500 when these functions are used together)

Signal	Index	Event block
INTERNAL FAIL	177	EV12/1
INTERNAL WARNING	178	EV12/2
INTERNAL CPU FAIL	179	EV12/3
INTERNAL CPU WARN	180	EV12/4
A/D CONV FAIL	181	EV12/5
IO BOARD ERROR	185	EV12/9

Signals related to the module HV/RET521 in the Supervision function (must be set out of use in HV/RET521 when these functions are used together)

Signal	Index	Event block
INTERNAL FAIL	145	EV10/1
INTERNAL WARNING	146	EV10/2
INTERNAL CPU FAIL	147	EV10/3
INTERNAL CPU WARN	148	EV10/4
MIM BOARD ERROR	154	EV10/10
IO BOARD 1 ERROR	155	EV10/11
IO BOARD 2 ERROR	156	EV10/12

IO BOARD 3 ERROR	157	EV10/13
IO BOARD 4 ERROR	158	EV10/14

Note:

The Device information shall be entered into the user program "WRITE_DEVICE_INFO", accessible from the Configuration Tool.

6.10.1**Installation process**

The process database is updated with the process objects, 'P_OBJECT_LN' : P, created for the REC 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 functions.

6.10.2**Delete process**

When a REX 5XX 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-/COMMAND BLOCK 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), except 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 127, 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 RECs.
- configure the base system for communication with RECs
- configure LON HW and SW
- create and address process objects for signals that are not covered within the scope of HV/Control standard functions.

The chapter “Technical descriptions”

This chapter describes the HV/Control software and its functionality

General principles	55
Color coding	55
Color definitions	55
Attribute expressions for color definitions	56
Color definitions for measurement values.....	57
Selection	57
Alarm acknowledgment.....	57
Blockings.....	57
Common functions	58
Blockings.....	58
Update and control block	59
Screen functionality for blockings	59
Acknowledge alarms.....	61
Object picture	61
Representation file	62
Dialog closing.....	62
Dialog header presentation	63
HV General bay.....	63
General functionality	63
History registrations	63
Blockings.....	63
Alarm generation.....	63
System start-up.....	63
Process commands	63
Internal (MicroSCADA) commands.....	64
Fictitious commands	65
Graphical representation.....	66
Dialog structure.....	66
Process presentation	66
Bay Status.....	67
Main Dialog	68
Object picture.....	69
Process Blocking	72
Acknowledge alarms.....	74
Blockings dialog	74
Relay picture	74
HV Breaker, Disconnecter and Earth switch	75
General functionality	75
History registrations	75
Blockings.....	75

Alarm generation.....	75
System start-up.....	75
Process commands	75
Process commands for control via REB 551	76
Internal (MicroSCADA) commands.....	77
Fictitious commands	77
Graphical representation.....	77
Dialog structure.....	78
Process presentation	78
Apparatus status	81
Main dialog.....	82
Object picture	83
Bypass operation	86
Process blockings	87
Acknowledge alarm.....	88
Blocking dialog.....	88
Overview Bay	88
General functionality	88
History registration	88
Alarm generation.....	88
System start-up.....	89
Process commands	89
Fictitious commands	89
Graphical representation.....	89
Dialog structure.....	89
Process presentation	89
HV Measurement	90
General functionality	90
History registrations	90
Blockings.....	90
Alarm generation.....	90
System start-up.....	90
Process commands	91
Internal (MicroSCADA) commands.....	91
Fictitious commands	91
Graphical representation.....	91
Dialog structure.....	92
Process presentation	92
Measurement status	93
Main dialog.....	94
Object Picture	96
Edit limits dialog	99
Acknowledge alarm.....	100
Blocking dialog.....	100
HV REX 5XX Supervision	102

General functionality	102
History registrations	102
Blockings.....	102
Alarm generation.....	102
System start-up.....	102
Process commands	102
Internal (MicroSCADA) commands.....	102
Fictitious commands	102
Graphical representation.....	103
Dialog structure.....	103
Process presentation	103
REX 5XX Supervision Status.....	104
Main dialog.....	105
Object Picture	106
Acknowledge alarm.....	107
Blocking dialog.....	108
Device information dialog.....	109

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 have been changed by the Color Tool. See “Color Tool” on page 32.

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

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)

The color coding may have been changed by the Color Tool, see “*Color Tool*” on page 32.

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	BI	White flashing	Only for apparatuses
Selected on the Micro-SCADA screen	-	White	The variable <code>'CALL_ID':VARMED</code> 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	BI	Cyan	Only for bays and apparatus
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	BI	Brown	Only for bays and apparatus

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
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 59.

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

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 breaker.

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. See “*Object identifier*” on page 28.

Blocking of control and update is unique for General bay and Apparatus functions. See “*HV General bay*” on page 61 and “*HV Breaker, Disconnecter and Earth switch*” on page 112. 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 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 HVLlib functions

Library function	HV General-Bay	HV Apparatus	HV Measurement	HV REX 5XX Supervision
Events	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes

¹.Only possible for HV Measurement and HV REX5XX Supervision and is made in these functions blocking dialogs, not the HV General Bay dialogs.

Table 5: Blockings for HVLib functions (Continued)

Library function	HV General-Bay	HV Apparatus	HV Measurement	HV REX 5XX Supervision
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 Apparatus compared to HV Measurement/HV REC Supervision. For HV General Bay/HV Apparatus the blocking is carried out bay controller, while HV Measurement/HV REC 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

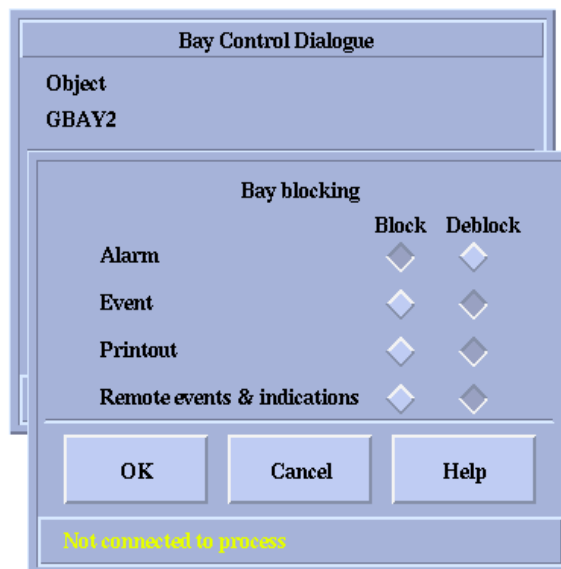


Figure 1: Blockings dialog for General Bay and Apparatus functions. For comparison see “HV Measurement Blockings dialog” on page 98 and “HV REX 5XX supervision Blockings dialog” on page 106.

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 53.

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, Apparatus, Signal, REC 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 ≥ 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 Remote events and indications	Authority level ≥ 1	- Set XB=1 for selected objects ^a - Set index 244 to 1 ^a
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

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

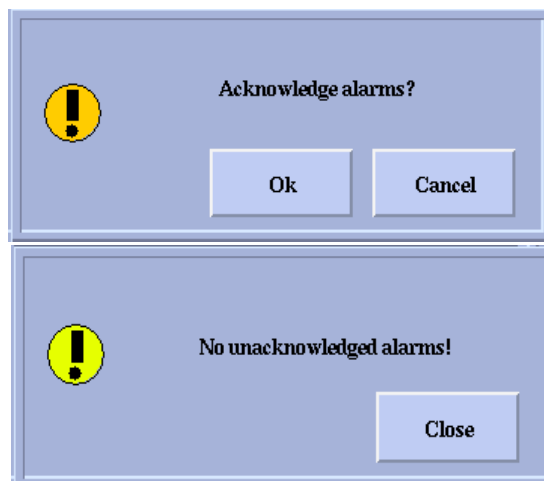


Figure 2: Acknowledge alarms pictures

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\HVPROCESS\USE\SR_LIBFGH.PIR.

2.6

Representation file

All representation symbols (process symbols and object picture symbols) are stored in S_USE\SR_LIBFGH.PIR file, where S_USE is logical path as it is defined in PATH4_S1.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*” on page 53.

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 whole 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 itself must 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. See “*Object identifier*” on page 28.

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..242, 244) gets a new value, provided that no blocking is prevailing.

3.1.2 Blockings

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

3.1.3 Alarm generation

When any of the process objects 30 or 40 gets the value “1”. Note that process objects 30 and 40 are normally out of use.

3.1.4 System start-up

The process objects (index 15..57) are updated at system start up.

3.1.5 Process commands

Process commands can be issued for:

- Station/Remote operator place for sections A, B and C
- Block/Deblock Control for section A

- Block/Deblock Control for section B
- Block/Deblock Control for section C
- Block/Deblock Update for section A
- Block/Deblock Update for section B
- Block/Deblock Update for section C

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

Below is a list of values to be issued for the different commands.

Table 8: Bay Control Commands (Process object 210)

Order	Bit	Value
Block operation for section A	0.	OV==1,
Block operation for section B	1.	OV==2,
Block operation for section C	2.	OV==4,
Deblock operation for section A	3.	OV==8,
Deblock operation for section B	4.	OV==16,
Deblock operation for section C	5.	OV==32,
Block update for section A	6.	OV==64,
Block update for section B	7.	OV==128,
Block update for section C	8.	OV==256,
Deblock update for section A	9.	OV==512,
Deblock update for section B	10.	OV==1024,
Deblock update for section C	11.	OV==2048,
Set Remote (A,B,C)	12.	OV==4096,
Set Station (A,B,C)	13.	OV==8192,
	14.	OV==16384,
	15.	OV==32768

If the bay is configured for REB 551 control, then no process commands are issued - all commands are performed as fictitious.

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 the specified process object of the General Bay function (See “*Blockings*” on page 61) plus the specified process objects of the picture functions connected to the bay (apparatuses and measurements). I.e. if e.g. Block Alarms is performed for the bay, then all the apparatus and measurements that are connected to it are also Alarm Blocked.

The total time for Blocking/Deblocking the bay (including up to 10 connected picture functions) is less than 3s.

3.1.7

Fictitious commands

Fictitious commands are issued if the process objects are set to MANUAL ($SS=1$), i.e. no communication to or from the process when yellow warning message “Not connected to the process” is displayed on the status bar of all dialogs.

The purpose of the fictitious commands is to make possible to show a demonstration of the functionality, without having a process connected. This is often the case in the beginning of an engineering process.

Fictitious commands can be issued for:

- Station/Remote operator place for sections A, B and C
- Block/Deblock Control for section A
- Block/Deblock Control for section B
- Block/Deblock Control for section C
- Block/Deblock Update for section A
- Block/Deblock Update for section B
- Block/Deblock Update for section C

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

When a fictitious command is issued, then the order is written directly to the corresponding back-indication process object (e.g. a command to Block Control for section A is written directly to process object 15).

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

Operator place push button “Set Remote”

Operator place push button “Set Station”

Option button “More”

Acknowledge Alarms

Blockings dialog

Object picture

Process blocking dialog

Relay picture (optional)

“Close” push button

Help button

3.2.2 Process presentation

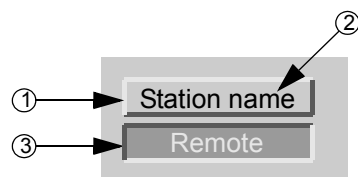


Figure 3: Process representation for HV General bay function

The following information is displayed in the process picture:

- Operator position in textual form - None, Local, Station, Remote, Error or ----- (if value is not sampled). Color of the text follows principles given in “General principles” on page 53.
- Bay name in textual form (configurable position). The bay name presented is the configurable attribute BAY_LABEL

Table 9: Process picture representation for General bay

Description	Presentation	Color	Expression ^a
1. Select area	Unset Function key	According to the color definition for push buttons	'ID':VARMED = FALSE

Table 9: Process picture representation for General bay (Continued)

Description	Presentation	Color	Expression ^a
	Set Function key	According to the color definition for push buttons	'ID':VARMED = TRUE
2. Object name	Text in lowered field	Black/White	'ID':VBAY_LABEL
3. Operator Place, Select area	Text	^b	Either of 'LN':PBI(55..57)==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 "Attribute expressions for color definitions" on page 54. Process objects 1..57 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 10: Actions possible in the process presentation

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

3.2.3

Bay 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

For control via REB 551 these messages are not given, as the general bay is then only working internally.

3.2.4

Main Dialog

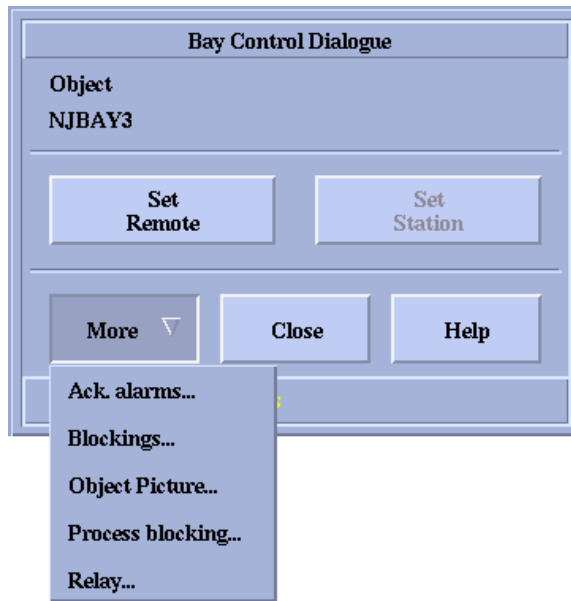


Figure 4: Main dialog for HV General bay function

The main dialog, is displayed when clicking on the Bay Function Key.

Position of buttons “Set Remote” and “Set Station” reflects setting of the bay. If the bay is in station mode, the button “Set Station” is dimmed and the button “Set Remote” is sensitive, and vice versa. In some cases both buttons can be insensitive:

- operator does not have required authority
- object status of the bay is > 0

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 Status” on page 65.

The following actions can be performed from the Main Dialog:

Table 11: Actions possible in the Main Dialog

Function	Condition(s)	Action
Move	-	Move the dialog to a new position
Set Remote	Authority level >= 1 Not Remote	Display Operator Change pop-up dialog for changing to Remote and change operator place to “Remote”

Table 11: Actions possible in the Main Dialog (Continued)

Function	Condition(s)	Action
Set Station	Authority level >= 1 Not Station	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 >= 1	Display acknowledge alarm picture
Relays ^a	Authority level >= 1 At least one relay connected to the bay	Display relay picture
Blockings	-	Display blockings picture
Process blocking	-	Display picture for process blockings (update and control)
Close	-	Erase the main dialog and any sub-dialog (except the object picture)
Help	-	Display help viewer with help about the bay main dialog

a. Configurable. May be omitted.

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

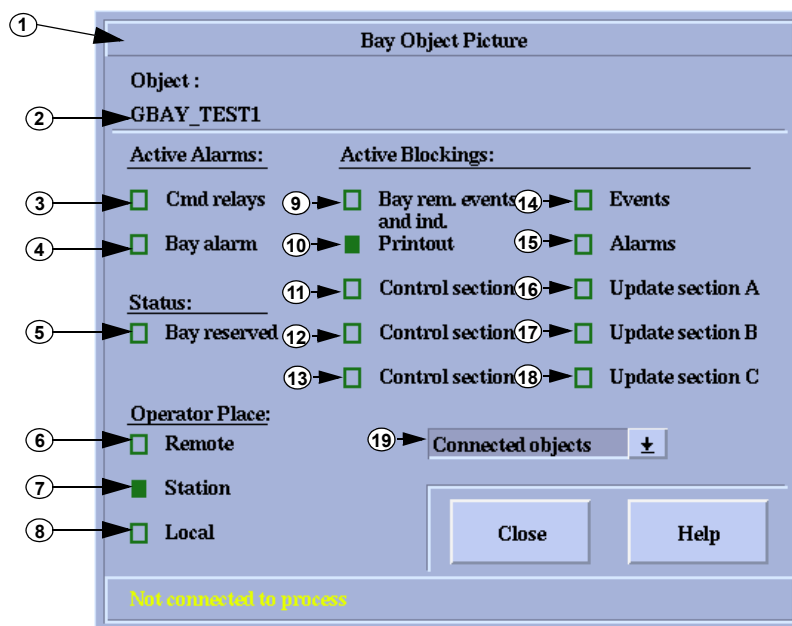


Figure 5: General bay object picture

The following information is displayed in the Object Picture:

- Bay name in textual form. The bay name presents the OI attribute of process object 240.
- Bay status in the to “*Bay Status*” on page 65.
- A list of the objects connected to the bay.

Bay status for the following individual signals:

- Command relays faulty
- Bay alarm
- Bay reserved
- Remote operator place
- Station operator place
- Local operator place
- Control section A blocked
- Control section B blocked
- Control section C blocked
- Update section A blocked
- Update section B blocked
- Update section C blocked
- Bay remote events and indications blocked
- Bay printout blocked
- Bay events blocked
- Bay alarms blocked

Information in the Object picture is displayed according to *table 12, “Graphical representation for General bay in the Object Picture”* .

Table 12: Graphical representation for General bay in the Object Picture

Description	Presentation	Color	Expression ^a
1. Move dialog box	Title bar button pushed down -		-
2. Object name	Text	Black	'LN':POI240
3. CMD Relays	b	b	'LN':P40
4. Bay Error	b	b	'LN':P30
5. Reserved	b	b	'LN':P150
6. Operator Place - Station	b	b	'LN':P56
7. Operator Place - Remote	b	b	'LN':P55
8. Operator Place - Local	b	b	'LN':P57

Table 12: Graphical representation for General bay in the Object Picture (*Contin-*

Description	Presentation	Color	Expression ^a
9. Bay remote events and indications blocked	b	b	'LN':P244
10. Bay printout blocked	b	b	'LN':P242
11. Control section A blocked	b	b	'LN':P15
12. Control section B blocked	b	b	'LN':P18
13. Control section C blocked	b	b	'LN':P20
14. Bay events blocked	b	b	'LN':P240
15. Bay alarms blocked	b	b	'LN':P241
16. Update section A blocked	b	b	'LN':P16
17. Update section A blocked	b	b	'LN':P19
18. Update section A blocked	b	b	'LN':P21
19. Connected objects	List of objects connected to the bay	Black	^c

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 "Object picture" on page 59

c. All devices having the same bay name definition in their OI-attribute will be presented. See "Object identifier" on page 28.

The following actions can be performed from the Object Picture:

Table 13: 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 59.

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

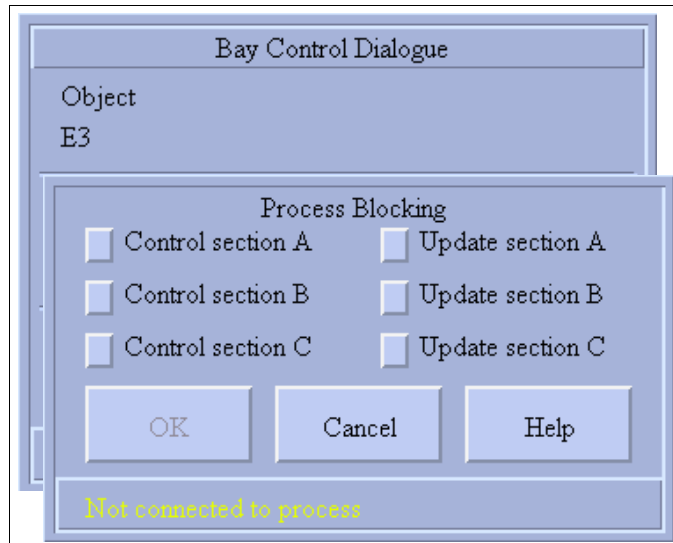


Figure 6: General bay Process blocking dialog

The following information is displayed in the Blockings dialog:

- Bay status in the status bar in falling priority according to “Bay Status” on page 65.
- Bay name in textual form. The bay name presents the OI attribute of process object 240 (displayed in the Main dialog).

The actual blocking status of the bay shall be possible to see, when the dialog is first displayed (e.g. by means of radio button positions).

The following actions can be performed from the Process Blockings dialog:

Table 14: Actions possible in the Process Blocking Dialog

Function	Condition	Action
Move	-	Move the picture to a new position
Update block Section A	Authority level >= 1	Set and display the desired status: Update Blocked Yes/No. The actual blocking status is not changed until “OK”.
Control block Section A	Authority level >= 1	Set and display the desired status: Control Blocked Yes/No. The actual blocking status is not changed until “OK”.

Table 14: Actions possible in the Process Blocking Dialog (Continued)

Function	Condition	Action
Update block Section B	Authority level \geq 1	Set and display the desired status: Update Blocked Yes/No. The actual blocking status is not changed until "OK". Only visible if NO_OF_SECTIONS \geq 2, See "General functionality" on page 61
Control block Section B	Authority level \geq 1	Set and display the desired status: Control Blocked Yes/No. The actual blocking status is not changed until "OK". Only visible if NO_OF_SECTIONS \geq 2, See "General functionality" on page 61
Update block Section C	Authority level \geq 1	Set and display the desired status: Update Blocked Yes/No. The actual blocking status is not changed until "OK" Only visible if NO_OF_SECTIONS=3, See "General functionality" on page 61
Control block Section C	Authority level \geq 1	Set and display the desired status: Control Blocked Yes/No. The actual blocking status is not changed until "OK" Only visible if NO_OF_SECTIONS=3, See "General functionality" on page 61
OK	Authority level \geq 1	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.

3.2.7 Acknowledge alarms

Alarms handling is done according to the principle described in “*Alarm acknowledgment*” on page 55.

3.2.8 Blockings dialog

Refer to the general description for blockings. See “*Blockings*” on page 55.

3.2.9 Relay picture



Figure 7: Relay picture

This option is configurable. However, at least one relay must be installed and connected to the bay. For more details see [4] User’s Guide for HV/REx 500.

4 HV Breaker, Disconnecter and Earth switch

Below is a description of the functionality of the HV Breaker, Disconnecter and Earth switch. The functionality of the Breaker, Disconnecter and Earth switch are almost the same so they are described here as an apparatus.

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 11..242, 244) gets a new value, provided that no blocking 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 1..57) are updated at system start up.

4.1.5 Process commands

Process commands can be issued for:

- Block/Deblock Control
- Block/Deblock Update
- Set manual position indication
- Open/Close apparatus
- Interlock bypass
- Synchrocheck bypass (breakers only)

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

Below is a list of values to be issued for the different commands.

Table 15: Apparatus Control Commands, (Process object 210)

Order	Bit	Value
BLOCK CONTROL	0,	OV==1,
DEBLOCK CONTROL	1,	OV==2,
BLOCK UPDATE	2,	OV==4,
DEBLOCK UPDATE	3,	OV==8,
	4,	OV==16,
	5,	OV==32,
SET MANUALLY OPEN POS.	6,	OV==64,
SET MANUALLY CLOSED POS.	7,	OV==128,
OPERATION CANCEL	8,	OV==256,
SELECT OPEN OPERATION	9,	OV==512,
SELECT CLOSE OPERATION	10	OV==1024,
OPERATION EXECUTE	11,	OV==2048,
INTERLOCK BYPASS	12,	OV==4096,
SYNCROCHECK BYPASS	13,	OV==8192,
	14,	OV==16384,
	15	OV==32768,

4.1.6

Process commands for control via REB 551

In case of control via REB 551 then only open and close commands can be issued via process objects 211 and 212. The value 2 is assumed to be sent to an element “On-line control” in the REB 551. The value 2 generates a pulsed output from this element, which is used to open or close the apparatus (via some logic gates normally).

Below is a list of values to be issued for the different commands

Table 16: Apparatus Control Commands with REB 551 control, (Process object 211)

Order	Bit	Value
CLOSE COMMAND	1	OV==2

Table 17: Apparatus Control Commands with REB 551 control, (Process object 212)

Order	Bit	Value
OPEN COMMAND	1	OV==2

4.1.7

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 Apparatus function.

The total time for Blocking/Deblocking the apparatus is less than 1s.

4.1.8

Fictitious commands

Fictitious commands are issued if the process objects are set to MANUAL ($SS=1$), i.e. no communication to or from the process. The purpose of the fictitious commands is to be able to show a demonstration of the functionality, without having a process connected. This is often the case in the beginning of an engineering process.

Fictitious commands can be issued for:

- Block/Deblock Control
- Block/Deblock Update
- Set manual position indication
- Open/Close apparatus
- Interlock bypass
- Synchrocheck bypass (breakers only)

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

When a fictitious command is issued, then the order is written directly to the corresponding back-indication process object (e.g. a command to Block Control is written directly to process object 15).

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 button “More”

Acknowledge alarms

Blockings dialog

Bypassed operation

Object picture

Process blocking

Cancel push button

Help button

4.2.2

Process presentation

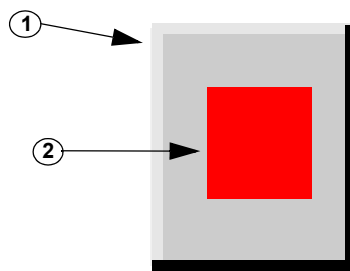


Figure 8: Process representation for HV Apparatus.

Symbols in the process picture for the apparatus follows choice of the symbol shape in the SCT, e.g. if symbol for the apparatus 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 18: 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			

Table 18: Process picture representation (Continued)

Description	Presentation	Color	Expression ^a
Not sampled	?	b	'LN':POS1>=10 ^c
Middle position (00)	Cross symbol	b	'LN':PDB1==0 ^c
Closed (01)	Filled symbol ^d	b	'LN':PDB1==1 ^c
Open (10)	Unfilled symbol ^d	b	'LN':PDB1==2 ^c
Error position (11)	Cross symbol	b	'LN':PDB1==3 ^c

- 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 54. All process objects of the standard function (which are in use) are used to calculate the color.
- c. Index 1 is for Breaker. Index 2 is used for Disconnecter and index 3 for Earth switch function.
- d. Symbol used is either square, diamond or circle according to selection made during configuration. See "Graphical representation" on page 75

Table 19: 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 apparatus and their corresponding selector value.



Figure 9: Symbol overview for HV Apparatus 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 ($S_APPC1, S_APPC2, S_APPC3$) and diamond symbols ($S_APPD1, S_APPD2, S_APPD3$) 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 20, "Representation symbols, HV Apparatus"*.

Table 20: Representation symbols, HV Apparatus

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
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
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

Table 20: Representation symbols, HV Apparatus *(Continued)*

Selector value	Description	Color
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
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
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**Apparatus status**

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

- Not connected to process
- Not updated
- Control blocked
- Interlock bypassed
- Synchrocheck bypassed
- Interlocked

4.2.4

Main dialog

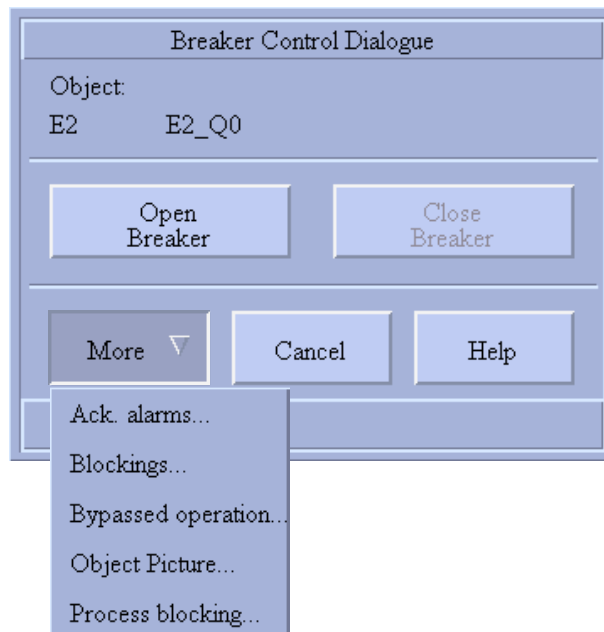


Figure 10: Main dialog for apparatus

The main dialog, see *figure 10*, is displayed after clicking on the apparatus function key.

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

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

The following information is displayed in the Main Dialog:

- Apparatus name in textual form - the OI attribute of process object 240
- Apparatus status according to “*Apparatus status*” on page 79.

If the apparatus is configured as OPERABLE - NO, then the open and close function keys are not present.

Table 21: Actions possible from Main dialog

Function	Condition(s)	Action
1. Move	-	Move the dialog to a new position
2. Open/Close the apparatus	Authority level >= 1	Open/Close the apparatus
3. Cancel	-	Cancel any selection and close the main control window
4. Help	-	Open help window
5. Acknowledge alarm	Authority level >= 1	Acknowledge active alarms for the apparatus
6. Blockings	-	Brings up blocking dialog
7. Bypassed operation	-	Brings up forced operation dialog
8. Object picture	-	Brings up object picture on the screen
9. Process blocking	-	Brings up process blocking dialog

4.2.5

Object picture

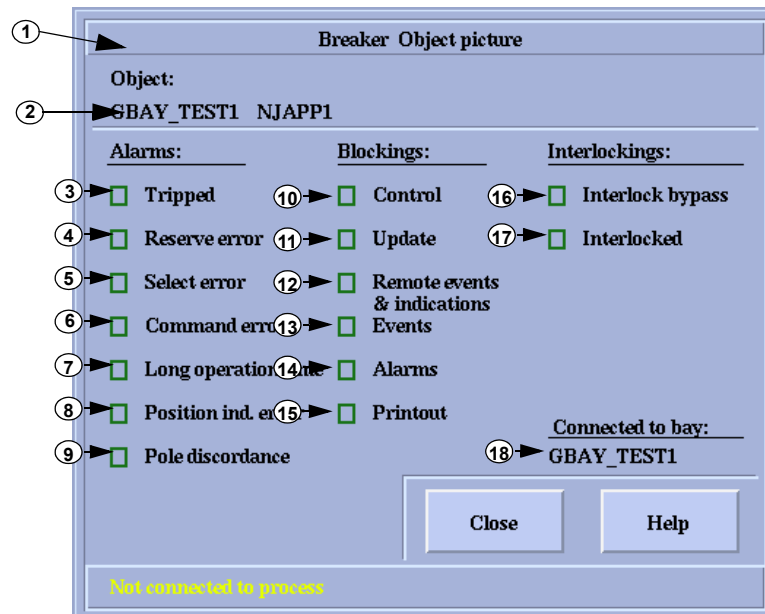


Figure 11: HV Apparatus Object picture

The following information are displayed in the Object Picture:

- Apparatus name in textual form - OI attribute of process object 240.
- Apparatus status according to “*Apparatus status*” on page 79.
- Bay, to which the apparatus is connected (logical name of the bay)

Apparatus status for the following individual signals:

- Control blocked
- Update blocked
- Tripped (only for breaker)
- Reserve error
- Select error
- Command error
- Long operation time
- Position indication error
- Pole discordance
- Interlock bypass
- Interlocked
- Event block
- Alarm block
- Printout block
- Remote events and indications block

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

Table 22: Apparatus 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
5. Select error	c	c	'LN':P42
6. Command error	c	c	'LN':P43
7. Long operation time	c	c	'LN':P44
8. Position indication error	c	c	'LN':P45

Table 22: Apparatus object picture (Continued)

Description	Presentation	Color	Expression ^a
9. Pole discordance	c	c	'LN':P46
10. Control blocking	c	c	'LN':P15
11. Update blocking	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
16. Interlock bypassed	c	c	'LN':P56
17. Interlocking	c	c	'LN':P57
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 59

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

Table 23: 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 apparatus object picture

4.2.6

Bypass operation

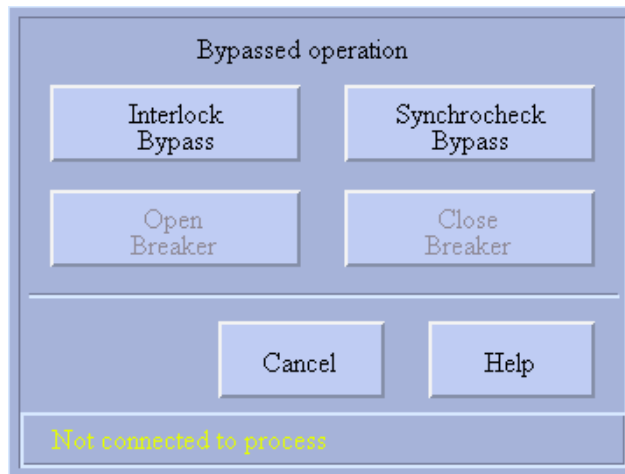


Figure 12: Bypass operation dialog

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. Button “Interlock Bypass” and “Synchrocheck Bypass” are presented as armed, after one of them is pushed down. Only one of these buttons can be pushed down at the time, which means that if one of the buttons is pushed down, the other one will push up previous selection. 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:

- Apparatus status according to “Apparatus status” on page 79.

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

Table 24: Actions possible from Bypassed Operation

Function	Condition(s)	Action
1. Move	-	Move the dialog to a new position
2. Interlock bypass	Authority level ≥ 2	Bypass interlocking
3. Synchrocheck bypass	Authority level ≥ 2	Bypass synchrocheck control
4. Open apparatus	Authority level ≥ 2 and Interlock bypassed or synchrocheck bypassed	Open the apparatus

Table 24: Actions possible from Bypassed Operation *(Continued)*

Function	Condition(s)	Action
5. Close apparatus	Authority level ≥ 2 and Interlock bypassed or synchrocheck bypassed	Close the apparatus
6. Cancel	-	Close dialog's window and cancel any selection made
7. Help	-	Open help window for apparatus object picture

4.2.7

Process blockings

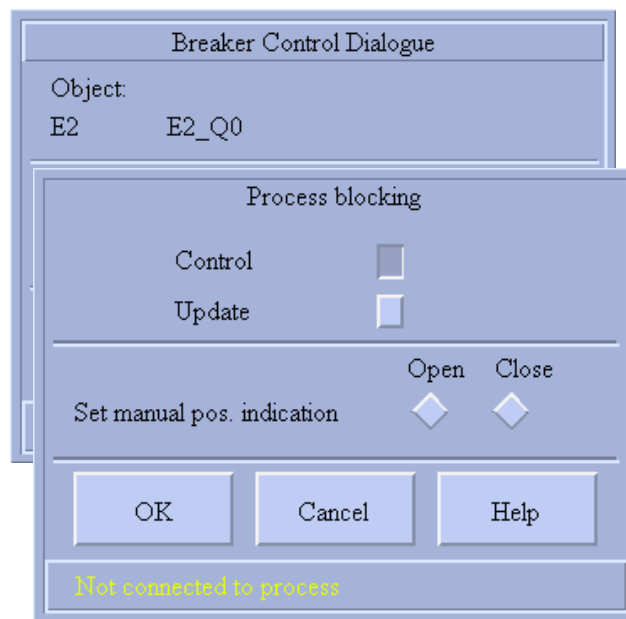


Figure 13: Process blocking dialog

When dialog window is opened, position of buttons shows setting in the selected apparatuses data base. Buttons “Execute” 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:

- Apparatus status according to “*Apparatus status*” on page 79.

Table 25: Actions possible from Process Blocking Dialog

Function	Condition(s)	Action
1. Move	-	Move the dialog to a new position
2. Control blocking	Authority level ≥ 1	Set/Unset control blocking choice
3. Update blocking	Authority level ≥ 1	Set/Unset update blocking choice
4. Manually open	Authority level ≥ 1 and update blocked and the apparatus closed	Open the apparatus
5. Manually close	Authority level ≥ 1 and update blocked and the apparatus closed	Close the apparatus
6. OK	Authority level ≥ 1 and any choice done	Execute done choices
6. Cancel	-	Cancel any selected choices and close the window
7. Help	-	Open help window for apparatus object picture

4.2.8**Acknowledge alarm**

See “*Alarm acknowledgment*” on page 55.

4.2.9**Blocking dialog**

See “*Blockings*” on page 55.

5**Overview Bay**

Below is a description of the functionality of the HV Overview Bay.

5.1**General functionality**

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

5.1.1**History registration**

There are no history registrations.

5.1.2**Alarm generation**

There are no alarm registrations.

5.1.3 System start-up

The process objects 147..149 and 151..153, which belongs to the General bay function, are updated at system start-up.

5.1.4 Process commands

There are no process commands.

5.1.5 Fictitious commands

There are no fictitious commands.

5.2 Graphical representation

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

5.2.1 Dialog structure

There are no dialogs for the HV Overview bay

5.2.2 Process presentation

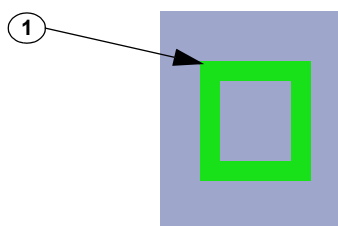


Figure 14: Process representation for HV Overview bay.

The presentation below is, for each item, given in priority order. E.g. “Not sampled” will be shown before “Connected”

Table 26: Process picture representation

Description	Presentation	Color	Expression ^a
1a. Position indication			
Not sampled	“?”	b	\LN' : POS' ix1' == 10 or \LN' : POS' ix2' == 10 ^{c,d}
Connected	Filled symbol ^e	b	\LN' : PBI' ix2' == 1 ^{c,d}
Disconnected	Unfilled symbol ^e	b	\LN' : PBI' ix2' == 0 ^{c,d}
1b. Status indication			
Not sampled or not updated	See 1a	b	LN' : POS' ix1' > 0 or \LN' : POS' ix2' > 0 ^{c,d}
Abnormal status	See 1a	Abnormal color ^f	\LN' : PBI' ix1' == 1 ^{c,d}

Table 26: Process picture representation (Continued)

Description	Presentation	Color	Expression ^a
Normal status	See 1a	b	Otherwise

- a. 'LN' is the logical name of the process objects.
- b. See "Color coding" on page 53
- c. ix1 = 147 for Bay section A, 148 for Bay section B and 149 for Bay section C
- d. ix2 = 151 for Bay section A, 152 for Bay section B and 153 for Bay section C
- e. Symbol is defined at installation time to be square, circle or diamond.
- f. Abnormal color is defined at installation time by the Color tool. See "Color Tool" on page 32. Default value is Red ("M",16).

6 HV Measurement

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

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 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.

6.1.2 Blockings

Process signals (index 10..49) 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.

6.1.3 Alarm generation

When any of the process objects 10..32 passes the alarm limit. Pulse counter object 33..49 do not have alarm registrations.

6.1.4 System start-up

The process objects (index 10..49) are updated at system start up.

6.1.5**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 sending of limit values is performed without the process database (no Analogue Out signals used). The installed library function must be configured as LON-NET station type and the terminal must supervise the limits.

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 Measurement function.

The total time for Blocking/Deblocking the Measurement is less than 1s.

6.1.7**Fictitious commands**

Fictitious commands can be issued for editing alarm and warning limits.

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**

Reset Min value

Reset Max value

Reset Frozen value

Option button

Acknowledge alarms

Blockings dialog

Edit limits dialog (not for pulse counters)

Object picture

Close push button

Help button

6.2.2

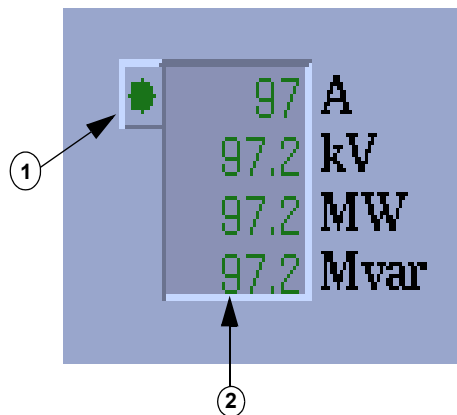
Process presentation

Figure 15: 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 27: 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 54. 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 55

The following actions can be performed from the process presentation:

Table 28: Actions possible from process presentation

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

6.2.3

Measurement status

Apparatus 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
- Blocking/deblocking, please wait.

6.2.4

Main dialog

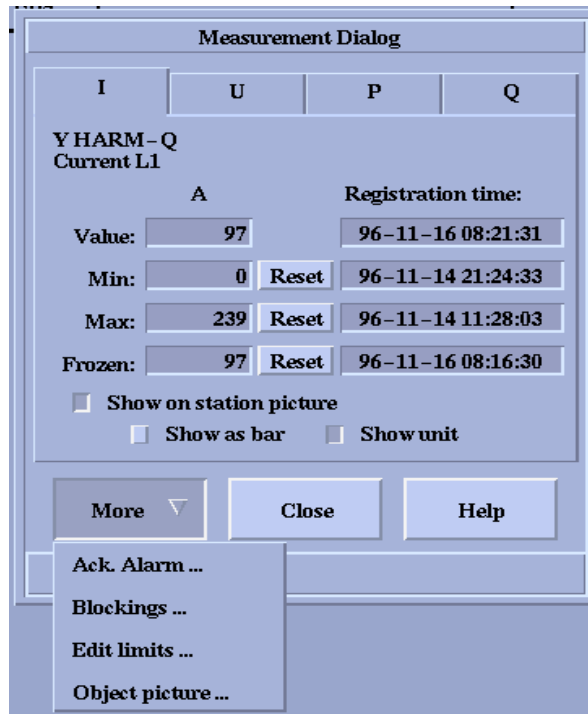


Figure 16: Main dialog for HV Measurement function

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

Object status according to “*Measurement status*” on page 91

The following actions can be performed from the Main Dialog:

Table 29: Actions possible in the Main Dialog

Function	Condition(s)	Action
Move	-	Move the dialog to a new position
Select presentation	-	Show the measurement either in presentation mode “None”, “Bar” or “No unit”
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.

6.2.5

Object Picture

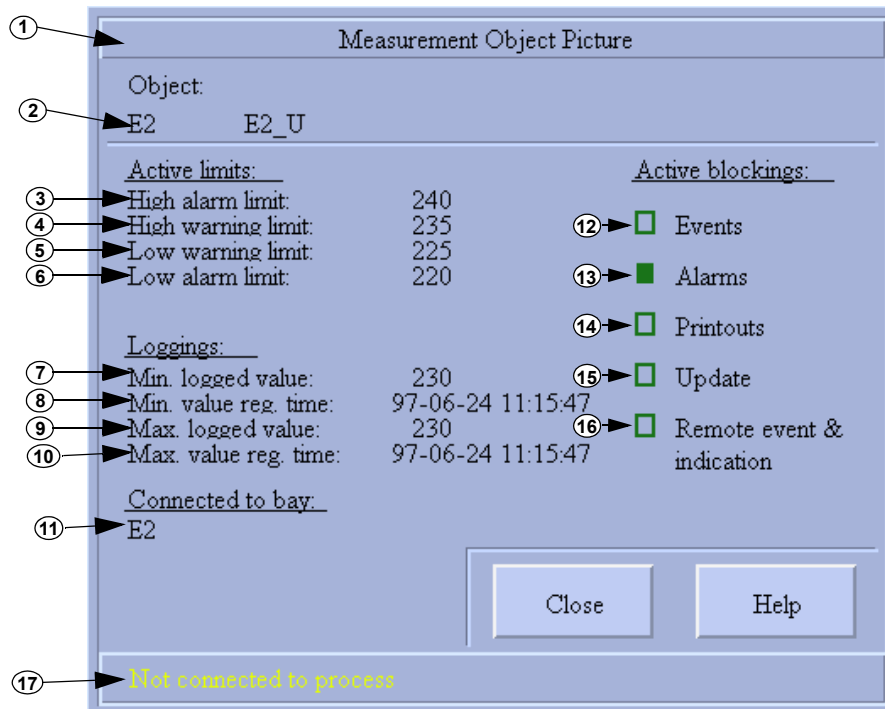


Figure 17: Object picture for HV Measurement.

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 91.
- 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 30: 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(10..49)
3. Active limit - High alarm	Text	Black	- 'LN':PHI (10..32)
		"?" (Magenta) "-" (Black)	- Fail _b
4. Active limit - High warning	Text	Black	- 'LN':PHW (10..32)
		"?" (Magenta) "-" (Black)	- Fail _b
5. Active limit - Low warning	Text	Black	- 'LN':PLW(10..32)
		"?" (Magenta) "-" (Black)	- Fail _b
6. Active limit - Low alarm	Text	Black	- 'LN':PLI(10..32)
		"?" (Magenta) "-" (Black)	- Fail _b
7. Min. logged value	Text	Black	- 'LN':PMV(10..32)
		"?" (Magenta) "-" (Black)	- OS = 10 - Fail _b
8. Min. logged value reg. time	Text	Black	- 'LN':PMT(10..32)
		"?" (Magenta) "-" (Black)	- OS = 10 - Fail _b

Table 30: Object picture representation (Continued)

Description	Presentation	Color	Expression ^a
9. Max. logged value	Text	Black “?” (Magenta) “-” (Black)	-‘LN’:PXV(10..32) - OS = 10 - Fail _b
10. Max. logged value reg. time	Text	Black “?” (Magenta) “-” (Black)	-‘LN’:PXT(10..32) - OS = 10 - Fail _b
11. Connected to bay	Text	Black	‘ID’ :VBAY_NAME
12. Event blocking	See “Object picture” on page 59	See “Object picture” on page 59	‘LN’:P240
13. Alarm blocking	See “Object picture” on page 59	See “Object picture” on page 59	‘LN’:P241
14. Printout blocking	See “Object picture” on page 59	See “Object picture” on page 59	‘LN’:P242
15. Update blocking	See “Object picture” on page 59	See “Object picture” on page 59	‘LN’:P245
16. Remote event and indication blocking	See “Object picture” on page 59	See “Object picture” on page 59	‘LN’:P244
17. Status information	Text	Yellow	‘LN’:POS(10..49) = 10 ‘LN’:PSS(10..49)= 1

a. ‘LN’ is the logical name of the process objects.

b. In case of communication disturbance or data type is pulse counter (IX=33..49, pulse counters do not have limit values).

The following actions can be performed from the Object Picture:

Table 31: 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

6.2.6

Edit limits dialog

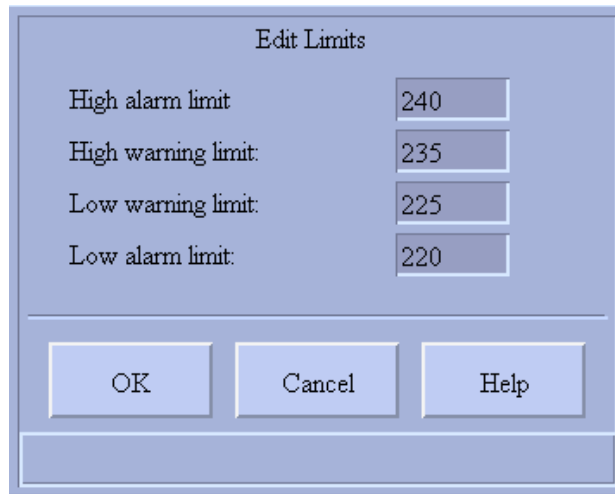


Figure 18: HV Measurement Edit limits dialog

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).
- Apparatus status according to “Measurement status” on page 91.
- 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 32: 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 \geq 1	Enter new value for the High alarm limit
Enter new High warning limit	Authority level \geq 1	Enter new value for the High warning limit
Enter new Low warning limit	Authority level \geq 1	Enter new value for the Low warning limit
Enter new Low alarm limit	Authority level \geq 1	Enter new value for the Low alarm limit
OK	Authority level \geq 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 32: 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.

6.2.7 Acknowledge alarm

See “Alarm acknowledgment” on page 55.

6.2.8 Blocking dialog

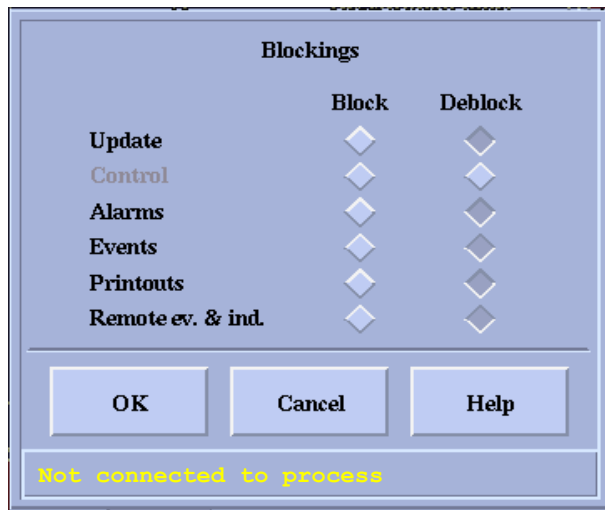


Figure 19: HV Measurement Blockings dialog

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 91.
- Measurement blocking state: Events, Alarms, Printout, Update, Remote event and indication.

The following actions can be performed from the Blockings Dialog:

Table 33: Actions possible in the Blockings 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 update	Authority level \geq 1	- Set UB=1 for selected objects ^a - Set index 245 to 1 ^a
Deblock update	Authority level \geq 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 \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
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.

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.

7 HV REX 5XX Supervision

Below is a description of the functionality of the HV REC 561 Supervision.

7.1 General functionality

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

7.1.1 History registrations

Always when the process objects 60..75 and 80..95 gets a new value, provided that no blocking is prevailing. Events are also generated when blocking (index 240..242, 244..245) is performed.

7.1.2 Blockings

Process signals 60..75 and 80..95 can be blocked from the blockings dialog (events, alarms, printout or remote events and indications). Other control system signals are not blocked by this facility.

7.1.3 Alarm generation

When any of the process objects 60..75 and 80..95 gets the value 1.

7.1.4 System start-up

The process objects 60..75 and 80..95 are updated at system start up.

7.1.5 Process commands

There are no process commands.

7.1.6 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 REC 561 Supervision function.

The total time for Blocking/Deblocking the REC 561 Supervision is less than 2s.

7.1.7 Fictitious commands

There are no fictitious commands.

7.2 Graphical representation

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

7.2.1 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

7.2.2 Process presentation

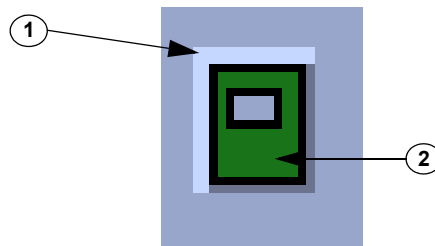


Figure 20: Process representation for HV REX 5XX Supervision.

The following information is be displayed in the process picture:

- REC 561 status as summary color information. (alarms, blockings, uncertain value etc. See “General principles” on page 53)

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

Table 34: Process picture representation for REX 5XX 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 54. 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 35: Actions possible from process presentation

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

7.2.3

REX 5XX Supervision Status

Status is presented on the status bar for each dialog. Status messages in falling priority for the REX 5XX Supervision are:

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

7.2.4

Main dialog

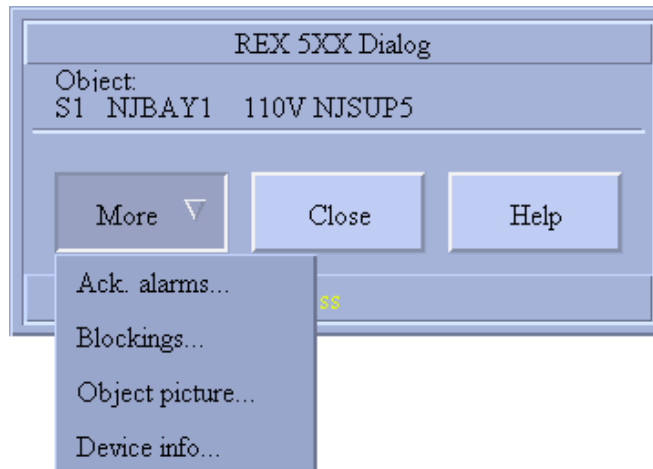


Figure 21: REX 5XX Supervision Main Dialog

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 “*REX 5XX Supervision Status*” on page 102.

The following actions can be performed from the Main Dialog:

Table 36: 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.

7.2.5

Object Picture

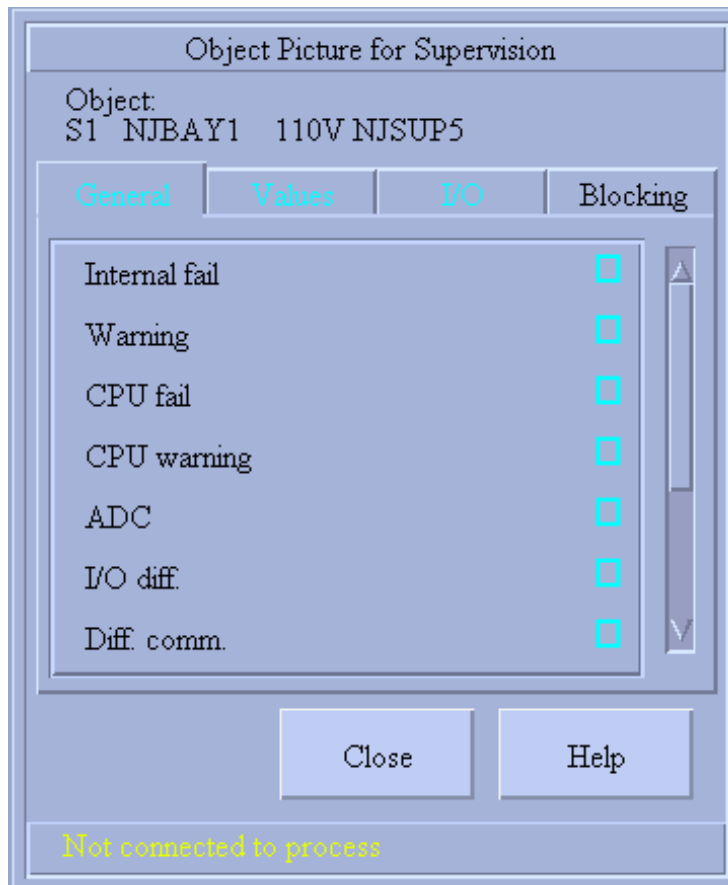


Figure 22: REX 5XX Object Picture

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 to “*REX 5XX Supervision Status*” on page 102.

REX 5XX Status for the following individual signals:

- Internal Fail
- Warning
- CPU Fail
- CPU Warning
- ADC Status
- I/O Diff
- Diff Comm

- Settings changed
- Clear LEDs
- Event block
- Alarm block
- Printout block
- Update block
- Remote event and indication
- 4 x Spare (only shown if this process object is in use - by default not)

Information in the Object picture is presented in 4 folders. Signals are presented according following principle:

Folder 1: Signals addressed to the process objects 60, 61, 62, 63, 64, 65, 66, 67,68,93 and 94. These signals have general purpose and in standard configuration stands for Internal fail, Warning, CPU fail, CPU warning, ADC, I/O diff, Diff. comm, Settings change, Clear LEDs, RTC Error and TimeSynch Error.

Folder 2: Signals addressed to the process objects 69, 70, 71, 72, 73 and 74. These signals in standard configuration stands for MIM boards 1-6.

Folder 3: Signals addressed to the process objects 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91 and 92. These signals in standard configuration presents I/O boards 1-13.

Folder 4: Signals addressed to the process objects 240, 241, 242, 244 and 245, which are standard signals for presentation of the blockings e.g. events, alarms, printout, remote events and indications and update.

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 53. 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.

7.2.6

Acknowledge alarm

See “*Alarm acknowledgment*” on page 55.

7.2.7

Blocking dialog

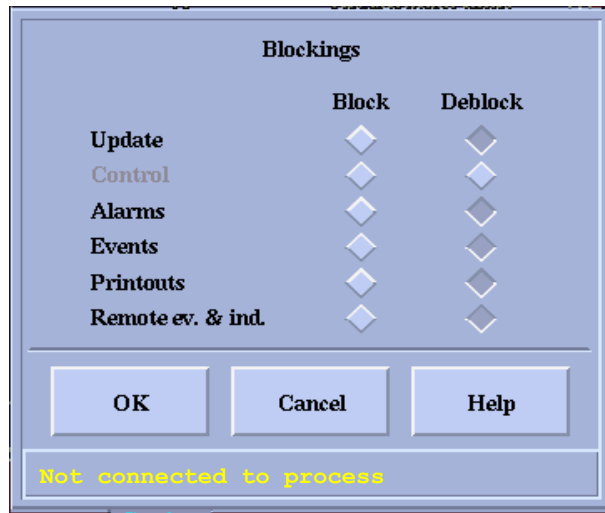


Figure 23: HV REX 5XX supervision Blockings dialog

Following information is displayed in the Blocking dialog:

- Object name in textual form - OI attribute of process object 240 (displayed in the Main dialog).
- REX supervision status according to “REX 5XX Supervision Status” on page 102.
- REX supervision blocking state: Events, Alarms, Printout, Update, Remote event and indication.

The following actions can be performed from the Blockings Dialog:

Table 37: 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

Table 37: Actions possible in the Blockings dialog (Continued)

Function	Condition	Action
Deblock printout	Authority level \geq 1	- Set PB=0 for selected objects ^a - Set index 242 to 0 ^a
Block update	Authority level \geq 1	- Set UB=1 for selected objects ^a - Set index 245 to 1 ^a
Deblock update	Authority level \geq 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 \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
Cancel	-	Erase the Blocking dialog and return to the main dialog, without changing the limits.
Help	-	Display help viewer with help about the HV REX 5XX Supervision blocking dialog

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

7.2.8

Device information dialog

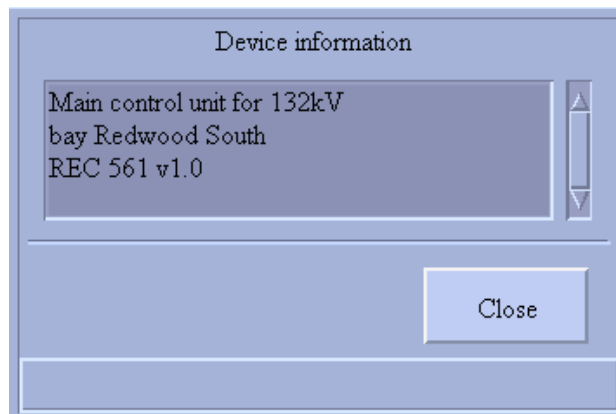


Figure 24: HV REX 5XX supervision Device information dialog

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).

-
- REX supervision status according to “*REX 5XX Supervision Status*” on page 102.
 - REX supervision device information (3 lines)

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

Table 38: 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”

This chapter contains additional information for the use of the hv/control software module.

Application engineering information	113
HV General Bay	113
Process objects.....	113
Files	113
Format pictures	113
Dialog pictures	113
Configuration file	114
Texts	114
HV Breaker, Disconnecter and Earth switch	114
Process objects.....	114
Format pictures	114
Dialog pictures	115
Configuration file	115
Texts	116
HV Overview bay	116
Process objects.....	116
Format pictures	117
Dialog pictures	117
Configuration file	117
Texts	117
HV Measurement	117
Process objects.....	117
Format pictures	117
Dialog pictures	118
Configuration file	118
Texts	118
Runtime files	119
REX5XX Supervision	119
Process objects.....	119
Format pictures	119
Dialog pictures	119
Configuration file	120
Texts	120
Runtime files	120
HV/Control Files	120
Installation files	121
Dialog files	122
Format picture files	123
Run time command files	124
Run time text files	124
Installation text files.....	125

Help files	125
Representation files	126
Window representations for HV/Control	126
Process Objects	129
Type definitions	129
HV General Bay	136
HV Breaker, Disconnecter and Earth switch	137
HV Measurement	138
REX 5XX Supervision	140
Object list	141
Command procedures	141
Datalog objects	142
Scale objects	142
Event channels	142
Time channels	142
Format pictures and status texts	142
Updated files	144
PATH4_S1.TXT	144
INDEX4_S1.TXT	144

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 127.

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
FORM4S002.PIC	Process blockings	USE ^a
FORM4S003.PIC	Process alarms	USE ^a
FORM4S004.PIC	Operators place	USE ^a
FORM4S006.PIC	Process station orders	USE ^a

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

1.1.4 Dialog pictures

Files used during runtime in process pictures.

Table 2:

Filename	Name	Location
SPU_GBAYA.PIC	Main dialog	USE ^a
SPU_GBAYB.PIC	Bay blocking	USE ^a
SPU_GBAYC.PIC	Object picture	USE ^a
SPU_GBAYD.PIC	Process blocking	USE ^a
SPU_GBAYE.PIC	Relay picture	USE ^a
SGU_INFO.PIC	Information dialog	USE ^a
SGU_INFO2.PIC	Additional question dialog	USE ^a

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

1.1.5**Configuration file**

Files used during installation and configuration of the function.

Table 3:

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

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

1.1.6**Texts**

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

Table 4:

Filename	Name	Location
GBAY_SCT.HLP	Configuration tool help texts	LANG'L ^a
SPU_GBAYA.HLP	Main dialog help texts	LANG'L ^a
SPU_GBAYB.HLP	Bay blockings dialog help texts	LANG'L ^a
SPU_GBAYC.HLP	Object picture help texts	LANG'L ^a
SPU_GBAYD.HLP	Process blocking help texts	LANG'L ^a
SPU_GBAYE.HLP	Relay picture help texts	LANG'L ^a
SPI_G000.TXT	Process object texts (for OX attribute)	LANG'L ^a
SPU_GBAY.TXT	Operator dialog texts	LANG'L ^a

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

1.2**HV Breaker, Disconnecter and Earth switch****1.2.1****Process objects**

The process objects related to this function are described in “*Process Objects*” on page 127.

1.2.2**Format pictures**

Format pictures used during runtime for event and alarm presentation.

Table 5:

Filename	Description	Location
FORM4S002	Process station orders	USE ^a
FORM4S002	Process blockings	USE ^a
FORM4S003	Process alarms	USE ^a
FORM4S004	Process on/off signals	USE ^a
FORM4S007	Process position indications	USE ^a
FORM4S010	Process station orders (REB 551 control)	USE ^a

Table 5: (Continued)

Filename	Description	Location
FORM4S011	Process station orders (REB 551 control)	USE ^a
FORM4S012	Process station orders	USE ^a

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

1.2.3

Dialog pictures

Files used during runtime in process pictures.

Table 6:

Filename	Description	Location
SPU_APPA.PIC	Main dialog	USE ^a
SPU_APPB.PIC	Apparatus blocking	USE ^a
SPU_APPC.PIC	Object Picture	USE ^a
SPU_APPD1.PIC	Breaker, Forced operation dialog	USE ^a
SPU_APPD2.PIC	Disconnecter and earth switch, Forced operation dialog	USE ^a
SPU_APPE.PIC	Process blockings dialog	USE ^a

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

1.2.4

Configuration file

Files used during installation and configuration of the function.

Table 7:

Filename	Description	Location
SPI_B001.DAT	Breaker, size 1*1	INST ^a
SPI_B002.DAT	Breaker, size 2*2	
SPI_B003.DAT	Breaker, size 3*3	
SPI_D001.DAT	Disconnecter, size 1*1	
SPI_D002.DAT	Disconnecter, size 2*2	
SPI_D003.DAT	Disconnecter, size 3*3	
SPI_E001.DAT	Earthing switch, size 1*1	
SPI_E002.DAT	Earthing switch, size 2*2	
SPI_E003.DAT	Earthing switch, size 3*3	

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

1.2.5**Texts**

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

Table 8:

Filename	Name	Location
APP_SCT.HLP	Configuration tool help texts	LANG' L' ^a
SPU_APPA.HLP	Main dialog help texts	LANG' L' ^a
SPU_APPB.HLP	Blockings dialog help texts	LANG' L' ^a
SPU_APPC.HLP	Object picture help texts	LANG' L' ^a
SPU_APPD.HLP	Forced operation dialog help texts	LANG' L' ^a
SPU_APPE.HLP	Process blockings dialog help texts	LANG' L' ^a
SPI_A000.TXT	Process object texts (for OX attribute)	LANG' L' ^a
SPU_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/HVPROCESS/

1.3**HV Overview bay**

The HV Overview bay is a summarized presentation of a HV General bay. The HV Overview bay contains no own process objects, but collect its information from a HV General bay, which MUST be installed first.

The information to the HV Overview bay is assumed to be collected from a PC program in a REC.

1.3.1**Process objects**

The HV Overview bay contains no own process objects, but collect its information from a HV General bay.

The following process objects from the HV General Bay are, however, use by the function.

Table 9:

Index	Type	Bit	Description
247 ^a	BI	3	Bay section A abnormal status
248 ^a	BI	4	Bay section B abnormal status
249 ^a	BI	5	Bay section C abnormal status
251 ^a	BI	0	Bay section A connected
252 ^a	BI	1	Bay section B connected
253 ^a	BI	2	Bay section C connected

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

1.3.2**Format pictures**

As there are no history registrations, no format pictures are used.

1.3.3**Dialog pictures**

There are no dialogs for the HV Overview bay.

1.3.4**Configuration file**

Files used during installation and configuration of the function.

Table 10:

Filename	Description	Location
SPI_OB001.DAT	Size 1*1	INST ^a
SPI_OB002.DAT	Size 2*2	
SPI_OB003.DAT	Size 3*3	

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

1.3.5**Texts**

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

Table 11:

Filename	Name	Location
SPI_OBAY.HLP	Configuration tool help texts	LANG' L' ^a

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

1.4**HV Measurement****1.4.1****Process objects**

The process objects related to this function are described in “*Process Objects*” on page 127.

1.4.2**Format pictures**

Format pictures used during runtime for event and alarm presentation.

Table 12:

Filename	Description	Location
FORM4S002.PIC	Process blockings	USE ^a
FORM4S008.PIC	Process measurements	USE ^a

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

1.4.3

Dialog pictures

Files used during runtime in process pictures.

Table 13:

Filename	Description	Location
SPU_M000A.PIC	Main dialog	USE ^a
SPU_M000B.PIC	Edit limits dialog	USE ^a
SPU_M000C.PIC	Object picture	USE ^a
SPU_M000D.PIC	Blockings dialog	USE ^a

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

1.4.4

Configuration file

Files used during installation and configuration of the function.

Table 14:

Filename	Description	Location
SPI_M001.DAT	Size 1*1	INST ^a
SPI_M002.DAT	Size 2*2	
SPI_M003.DAT	Size 3*3	

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

1.4.5

Texts

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

Table 15:

Filename	Description	Location
SPU_M000A.HLP	Main dialog help texts	LANG' L' ^a
SPU_M000B.HLP	Edit limits dialog help texts	LANG' L' ^a
SPU_M000C.HLP	Object picture help texts	LANG' L' ^a
SPU_M000D.HLP	Blocking dialog help texts	LANG' L' ^a
SPI_M000.HLP	Installation help text	LANG' L' ^a
SPI_M000.TXT	Process object texts (for OX attribute)	LANG' L' ^a
SPU_M000.TXT	Operator dialog texts	LANG' L' ^a

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

1.4.6 Runtime files

Text files containing SCIL code used during runtime.

Table 16:

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

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

1.5 REX5XX Supervision**1.5.1 Process objects**

The process objects related to this function are described in “*Process Objects*” on page 127

1.5.2 Format pictures

Format pictures used during runtime for event and alarm presentation.

Table 17:

Filename	Description	Location
FORM4S001.PIC	Supervision alarms	USE ^a
FORM4S002.PIC	Blockings	USE ^a

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

1.5.3 Dialog pictures

Files used during runtime in process pictures

Table 18:

Filename	Description	Location
SPU_S001A.PIC	Main dialog	USE ^a
SPU_S001C.PIC	Object picture - general part	USE ^a
SPU_C561D.PIC	Object picture - I/O part	USE ^a
SPU_C561E.PIC	Help picture for Object picture presentation	USE ^a
SPU_C561F.PIC	Blocking dialog	USE ^a
SPU_C561G.PIC	Device information dialog	USE ^a

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

1.5.4**Configuration file**

Files used during installation and configuration of the function.

Table 19:

Filename	Description	Location
SPI_S0001.DAT	Size 1*1	INST ^a
SPI_S0002.DAT	Size 2*2	
SPI_S0003.DAT	Size 3*3	

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

1.5.5**Texts**

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

Table 20:

Filename	Name	Location
SPI_C561.HLP	Configuration tool help texts	LANG' L' ^a
SPU_C561A.HLP	Main dialog help texts	LANG' L' ^a
SPU_C561C.HLP	Object picture - general part help texts	LANG' L' ^a
SPU_C561D.HLP	Object picture - I/O part help texts	LANG' L' ^a
SPU_C561F.HLP	Blocking dialog help file	LANG' L' ^a
SPI_C561.TXT	Process object texts (for OX attribute)	LANG' L' ^a
SPU_C561.TXT	Operator dialog texts	LANG' L' ^a

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

1.5.6**Runtime files**

Text files containing SCIL code used during runtime.

Table 21:

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

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

2**HV/Control Files**

This appendix contains a complete list of all files included in HV/Control 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/hvprocess/inst

Table 22:

File	Description
SPI_GBAY.PIC	General bay function picture
SPI_GBAY.DAT	Bay function installation setup file
SPI_B001.PIC	Breaker function picture, size 1*1
SPI_B001.DAT	Breaker function installation setup file, size 1*1
SPI_B002.PIC	Breaker function picture, size 2*2
SPI_B002.DAT	Breaker function installation setup file, size 2*2
SPI_B003.PIC	Breaker function picture, size 3*3
SPI_B003.DAT	Breaker function installation setup file, size 3*3
SPI_D001.PIC	Diconnector function picture, size 1*1
SPI_D001.DAT	Diconnector function installation setup file, size 1*1
SPI_D002.PIC	Diconnector function picture, size 2*2
SPI_D002.DAT	Diconnector function installation setup file, size 2*2
SPI_D003.PIC	Diconnector function picture, size 3*3
SPI_D003.DAT	Diconnector function installation setup file, size 3*3
SPI_E001.PIC	Earthing switch function picture, size 1*1
SPI_E001.DAT	Earthing switch function installation setup file, size 1*1
SPI_E002.PIC	Earthing switch function picture, size 2*2
SPI_E002.DAT	Earthing switch function installation setup file, size 2*2
SPI_E003.PIC	Earthing switch function picture, size 3*3
SPI_E003.DAT	Earthing switch function installation setup file, size 3*3
SPI_OB001.PIC	Overview bay function picture, size 1*1
SPI_OB001.DAT	Overview bay function installation setup file, size 1*1
SPI_OB002.PIC	Overview bay function picture, size 2*2
SPI_OB002.DAT	Overview bay function installation setup file, size 2*2
SPI_OB003.PIC	Overview bay function picture, size 3*3
SPI_OB003.DAT	Overview bay function installation setup file, size 3*3
SPI_M001.PIC	Measurement function picture, size 1*1
SPI_M001.DAT	Measurement function installation setup file, size 1*1
SPI_M002.PIC	Measurement function picture, size 2*2
SPI_M002.DAT	Measurement function installation setup file, size 2*2
SPI_M003.PIC	Measurement function picture, size 3*3
SPI_M003.DAT	Measurement function installation setup file, size 3*3

Table 22: (Continued)

SPI_X5XX01.PIC	REX 5XX Supervision function picture, size 1*1
SPI_X5XX01.DAT	REX 5XX Supervision function installation setup file, size 1*1
SPI_X5XX02.PIC	REX 5XX Supervision function picture, size 2*2
SPI_X5XX02.DAT	REX 5XX Supervision function installation setup file, size 2*2
SPI_X5XX03.PIC	REX 5XX Supervision function picture, size 3*3
SPI_X5XX03.DAT	REX 5XX Supervision function installation setup file, size 3*3
SPI_COLS.PIC	Color tool
SPI_ADDR.TXT	Text file containing terminal address data
SPI_UNITS.TXT	Text file containing terminal data
SPI_IBAYS.TXT	Text file containing program for scanning database for bay functions
HV_TOOLS.VSO	Visual SCIL picture container for new picture editor
SPI_VSTART.PIC	Interface file between Visual SCIL and "old" SCIL
SPI_COLS.TXT	Color data for all functions

2.2

Dialog files

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

`/sc/lib4/smod/hvprocess/use`

Table 23:

File	Description
spu_gbaya.pic	Main dialog for the General bay function
spu_gbayb.pic	Blockings dialog for the General bay function
spu_gbayc.pic	Object picture for the General bay function
spu_gbayD.pic	Process blockings dialog for the General bay function
spu_gbayE.pic	Dialog used for direct access from general bay main dialog to the relay tool
spu_appa.pic	Main dialog for the Apparatus function
spu_appb.pic	Blockings dialog for the Apparatus function
spu_appc.pic	Object picture for the Apparatus function
spu_appd1.pic	Forced operation dialog for the Breaker function
spu_appd2.pic	Forced operation dialog for the Disconnecter and Earthing switch functions
spu_appE.pic	Process blockings dialog for the Apparatus function
spu_m000a.pic	Main dialog for the Measurement function
spu_m000b.pic	Edit limits dialog for the Measurement function
spu_m000c.pic	Object picture for the Measurement function
spu_m000D.pic	Blocking dialog for the Measurement function

Table 23: (Continued)

spu_c561a.pic	Main dialog for the REX 5XX Supervision function
spu_c561c.pic	Object picture - General part for the REX 5XX Supervision function
spu_c561d.pic	Object picture - I/O part for the REX 5XX Supervision function
spu_c561e.pic	Object pictures presentation picture for the REX 5XX Supervision function
spu_c561F.pic	Blocking dialog for the REX 5XX Supervision function
spu_c561G.pic	Device information dialog for the REX 5XX Supervision function
sgu_info.pic	Information dialog - one button
sgu_info2.pic	Information dialog - two buttons
sgu_info3.pic	Information dialog - two buttons and reset monitor function block possibility
sgu_s1305.pic	Copy of SLIB picture SLIB_S1305.PIC used in spu_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/hvprocess/use
```

Table 24:

File	Description
form4s001.pic	Supervision events
form4s002.pic	Blocking events
form4s003.pic	Alarm events
form4s004.pic	On/Off signal events
form4s006.pic	Bay order events
form4s007.pic	Position indication events
form4s008.pic	Measurement events
form4s009.pic	Supervision blockings events
form4s010.pic	Close command for control via REB 551 events
form4s011.pic	Open command for control via REB 551 events
form4s012.pic	Apparatus order events

2.4

Run time command files

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

/sc/lib4/smod/hvprocess/use

Table 25:

File	Description
spu_UPDATE.TXT	Force up values after Update deblock for HV Measurement and HV REX5XX 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/hvprocess/lang0

Table 26:

File	Description
form4s001.txt	Texts for format picture form4s001
form4s002.txt	Texts for format picture form4s002
form4s003.txt	Texts for format picture form4s003
form4s004.txt	Texts for format picture form4s004
form4s006.txt	Texts for format picture form4s006
form4s007a.txt	Texts for format picture form4s007 - Circuit breaker position indication
form4s007b.txt	Texts for format picture form4s007 - Disconnecter position indication
form4s007c.txt	Texts for format picture form4s007 - Earthing switch position indication
form4s008.txt	Texts for format picture form4s008
form4s009.txt	Texts for format picture form4s009
form4s010.txt	Texts for format picture form4s010
form4s011.txt	Texts for format picture form4s011
form4s012.txt	Texts for format picture form4s012
spu_gbay.txt	Dialog texts for the General Bay function
spu_app.txt	Dialog texts for the Apparatus function
spu_m000.txt	Dialog texts for the Measurement function
spu_c561.txt	Dialog texts for the REX 5XX Supervision function
sgu_info.txt	Dialog texts for the SGU_INFO dialog
sgu_info2.txt	Dialog texts for the SGU_INFO2 dialog
sgu_info3.txt	Dialog texts for the SGU_INFO3 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/hvprocess/lang0`

Table 27:

File	Description
spi_g000.txt	Process object texts (for OX attribute) for the General bay function
spi_a000.txt	Process object texts (for OX attribute) for the Apparatus function
spi_m000.txt	Process object texts (for OX attribute) for the Measurement function
spi_c561.txt	Process object texts (for OX attribute) for the REX 5XX Supervision function

2.7

Help files

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

`/sc/lib4/smod/hvprocess/lang0`

Table 28:

File	Description
GBAY_SCT.hlp	Help for the Configuration tool for the General bay function
spu_gbaya.hlp	Help for the main dialog for the General bay function
spu_gbayb.hlp	Help for the general bay blocking dialog for the General bay function
spu_gbayc.hlp	Help for the object picture for the General bay function
spu_gbayD.hlp	Help for the process blocking dialog for the General bay function
spu_gbayE.hlp	Help for the General bay relay selection dialog
spi_obay.hlp	Help for configuration tool for the HV Overview bay function
APP_SCT.hlp	Help for the Configuration tool for the Apparatus function
spu_appa.hlp	Help for the main dialog for the Apparatus function
spu_appb.hlp	Help for the blockings dialog for the Apparatus function
spu_appc.hlp	Help for the object picture for the Apparatus function
spu_appd.hlp	Help for the forced operation dialog for the Apparatus function
spu_appE.hlp	Help for the process blockings dialog for the Apparatus function
spi_m000.hlp	Help for the configuration tool for the Measurement function
spu_m000a.hlp	Help for the main dialog for the Measurement function
spu_m000b.hlp	Help for the edit limits dialog for the Measurement function
spu_m000c.hlp	Help for the object picture for the Measurement function
spu_m000D.hlp	Help for Blocking dialog for the Measurement function
spi_C561.hlp	Help for configuration tool for the REX 5XX Supervision function

Table 28: (Continued)

spu_c561a.hlp	Help for the main dialog for the REX 5XX Supervision function
spu_c561c.hlp	Help for the object picture - general part for the REX 5XX Supervision function
spu_c561d.hlp	Help for the object picture - I/O part for the REX 5XX Supervision function
spu_c561F.hlp	Help for Blocking dialog for the REX 5XX Supervision function
SPI_COL.S.hlp	Help for the Color tool

2.8

Representation files

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

```
/sc/lib4/smod/hvprocess/use
```

Table 29:

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

3

Window representations for HV/Control

The HV/Control representations are stored in the file,

```
/sc/lib4/smod/hvprocess/use/sr_libfgh.pir,
```

according to below:

Table 30:

Name	Description
S_APPC1	Apparatus; Process picture representation; Circle, size 1*1
S_APPC2	Apparatus; Process picture representation; Circle, size 2*2
S_APPC3	Apparatus; Process picture representation; Circle, size 3*3
S_APPD1	Apparatus; Process picture representation; Diamond, size 1*1
S_APPD2	Apparatus; Process picture representation; Diamond, size 2*2
S_APPD3	Apparatus; Process picture representation; Diamond, size 3*3
S_APPS1	Apparatus; Process picture representation; Square, size 1*1
S_APPS2	Apparatus; Process picture representation; Square, size 2*2
S_APPS3	Apparatus; Process picture representation; Square, size 3*3
S_C561_1	REX 5XX Supervision; Process picture representation, size 1*1
S_C561_2	REX 5XX Supervision; Process picture representation, size 2*2

Table 30: (Continued)

S_C561_3	REX 5XX Supervision; Process picture representation, size 3*3
S_MEAS1_1	Measurement; Process picture presentation “dot” symbol, size 1*1
S_MEAS1_2	Measurement; Process picture presentation, horizontal 2 winding VT symbol, size 1*1
S_MEAS1_3	Measurement; Process picture presentation, vertical 2 winding VT symbol, size 1*1
S_MEAS1_4	Measurement; Process picture presentation, top connected VT symbol, size 1*1
S_MEAS1_5	Measurement; Process picture presentation, bottom connected VT symbol, size 1*1
S_MEAS1_6	Measurement; Process picture presentation, left connected VT symbol, size 1*1
S_MEAS1_7	Measurement; Process picture presentation, right connected VT symbol, size 1*1
S_MEAS1_8	Measurement; Process picture presentation, label “I”, size 1*1
S_MEAS1_9	Measurement; Process picture presentation, label “U”, size 1*1
S_MEAS1_10	Measurement; Process picture presentation, label “P”, size 1*1
S_MEAS1_11	Measurement; Process picture presentation, label “Q”, size 1*1
S_MEAS1_12	Measurement; Process picture presentation, vertical CT symbol, size 1*1
S_MEAS1_13	Measurement; Process picture presentation, horizontal CT symbol, size 1*1
S_MEAS1_14	Measurement; Process picture presentation, label “T”, size 1*1
S_MEAS1_15	Measurement; Process picture presentation, label “F”, size 1*1
S_MEAS2_1	Measurement; Process picture presentation “dot” symbol, size 2*2
S_MEAS2_2	Measurement; Process picture presentation, horizontal 2 winding VT symbol, size 2*2
S_MEAS2_3	Measurement; Process picture presentation, vertical 2 winding VT symbol, size 2*2
S_MEAS2_4	Measurement; Process picture presentation, top connected VT symbol, size 2*2
S_MEAS2_5	Measurement; Process picture presentation, bottom connected VT symbol, size 2*2
S_MEAS2_6	Measurement; Process picture presentation, left connected VT symbol, size 2*2
S_MEAS2_7	Measurement; Process picture presentation, right connected VT symbol, size 2*2
S_MEAS2_8	Measurement; Process picture presentation, label “I”, size 2*2
S_MEAS2_9	Measurement; Process picture presentation, label “U”, size 2*2
S_MEAS2_10	Measurement; Process picture presentation, label “P”, size 2*2
S_MEAS2_11	Measurement; Process picture presentation, label “Q”, size 2*2

Table 30: (Continued)

S_MEAS2_12	Measurement; Process picture presentation, vertical CT symbol, size 2*2
S_MEAS2_13	Measurement; Process picture presentation, horizontal CT symbol, size 2*2
S_MEAS2_14	Measurement; Process picture presentation, label "T", size 2*2
S_MEAS2_15	Measurement; Process picture presentation, label "f", size 2*2
S_MEAS3_1	Measurement; Process picture presentation "dot" symbol, size 3*3
S_MEAS3_2	Measurement; Process picture presentation, horizontal 2 winding VT symbol, size 3*3
S_MEAS3_3	Measurement; Process picture presentation, vertical 2 winding VT symbol, size 3*3
S_MEAS3_4	Measurement; Process picture presentation, top connected VT symbol, size 3*3
S_MEAS3_5	Measurement; Process picture presentation, bottom connected VT symbol, size 3*3
S_MEAS3_6	Measurement; Process picture presentation, left connected VT symbol, size 3*3
S_MEAS3_7	Measurement; Process picture presentation, right connected VT symbol, size 3*3
S_MEAS3_8	Measurement; Process picture presentation, label "I", size 3*3
S_MEAS3_9	Measurement; Process picture presentation, label "U", size 3*3
S_MEAS3_10	Measurement; Process picture presentation, label "P", size 3*3
S_MEAS3_11	Measurement; Process picture presentation, label "Q", size 3*3
S_MEAS3_12	Measurement; Process picture presentation, vertical CT symbol, size 3*3
S_MEAS3_13	Measurement; Process picture presentation, horizontal CT symbol, size 3*3
S_MEAS3_14	Measurement; Process picture presentation, label "T", size 3*3
S_MEAS3_15	Measurement; Process picture presentation, label "f", size 3*3
S_OBAYC1	Overview bay; Process picture representation, Circle, size 1*1
S_OBAYC2	Overview bay; Process picture representation, Circle, size 2*2
S_OBAYC3	Overview bay; Process picture representation, Circle, size 3*3
S_OBAYD1	Overview bay; Process picture representation, Diamond, size 1*1
S_OBAYD2	Overview bay; Process picture representation, Diamond, size 2*2
S_OBAYD3	Overview bay; Process picture representation, Diamond, size 3*3
S_OBAYS1	Overview bay; Process picture representation, Square, size 1*1
S_OBAYS2	Overview bay; Process picture representation, Square, size 2*2
S_OBAYS3	Overview bay; Process picture representation, Square, size 3*3
SR_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 Type definitions

The following basic types of process objects are defined for the HVLlib. In the tables below “SPA” type objects are defined. For “LON” type objects (Station type “REX”), the DX attributes all start with X instead of N, e.g. X7S instead of N7S

Table 31: Process object type 1

Attribute List	General Alarm with event handling via SPA	Description
DX	N7S	Directive Text
PT	BI	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	YES	History enabled
HA	NEW VALUE	History activation
HF	NO	History at first update
HL	32768	History log number
BI	0	Binary 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 activated at
PU	NO	Printout at first update
AD	0	Alarm delay
LD	1, 2	Listing device number

Table 32: Process object type 2

Attribute List	MicroSCADA Internal Indication with event handling	Description
PT	BI	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	YES	History enabled
HA	NEW VALUE	History activation
HF	YES	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 activated at
PU	YES	Printout at first update
AD	0	Alarm delay
LD	1, 2	Listing device number

Table 33: Process object type 3

Attribute List	General Indications with event handling via SPA	Description
DX	N7S	Directive Text
PT	BI	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	YES	History enabled
HA	NEW VALUE	History activation
HF	NO	History at first update
HL	32768	History log number

Table 33: Process object type 3 (Continued)

Attribute List	General Indications with event handling via SPA	Description
DX	N7S	Directive Text
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 activated at
PU	YES	Printout at first update
AD	0	Alarm delay
LD	1,2	Listing device number

Table 34: Process object type 4

Attribute List	General Double Indication without event handling via SPA	Description
DX	N7D	Directive Text
PT	DB	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	NO	History enabled
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 activated at
PU	YES	Printout at first update
AD	0	Alarm delay
LD	0	Listing device number

Table 35: Process object type 5

Attribute List	General Double Indication with event handling via SPA	Description
DX	N7D	Directive Text
PT	DB	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	YES	History enabled
HA	UPDATE	History activation
HF	NO	History at first update
HL	32768	History log number
DB	0	Binary input value
RC	YES	Acknowledge required
AB	NO	Alarms blocked
AC	0	Alarm class
PI	“ “	Alarm picture
PD	0	Monitor number
PA	UPDATE	Printout activated at
PU	NO	Printout at first update
AD	0	Alarm delay
LD	1, 2	Listing device number

Table 36: Process object type 6

Attribute List	General Process orders with event handling via SPA	Description
DX	N4	Directive Text
PT	AO	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	YES	History enabled
HA	UPDATE	History activation
HF	YES	History at first update

Table 36: Process object type 6 (Continued)

HL	32768	History log number
AO	0.0	Analogue output value
RC	YES	Acknowledge required
AB	NO	Alarms blocked
AC	0	Alarm class
PI	“ “	Alarm picture
PD	0	Monitor number
PA	UPDATE	Printout activated at
PU	YES	Printout at first update
AD	0	Alarm delay
LD	1, 2	Listing device number
SN	1_1	Scale

Table 37: Process object type 7

Attribute List	MicroSCADA Internal Indication without event handling	Description
PT	BI	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	NO	History enabled
BI	0	Binary 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 activated at
PU	NO	Printout at first update
AD	0	Alarm delay

Table 38: Process object type 8

Attribute List	General Indication without event handling via SPA	Description
DX	N7S	Directive Text
PT	BI	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	NO	History enabled
BI	0	Binary 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 activated at
PU	NO	Printout at first update
AD	0	Alarm delay

Table 39: Process object type 9

	AI with event handling via SPA	Description
DX	N6	Directive Text
PT	AI	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	YES	History enabled
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

Table 39: Process object type 9 (Continued)

	AI with event handling via SPA	Description
DX	N6	Directive Text
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	Limits supervised by
RC	YES	Acknowledge required
AB	NO	Alarms blocked
AC	1	Alarm class
PI	“ “	Alarm picture
PD	0	Monitor number
PA	WARNING	Printout activated at
PU	YES	Printout at first update
AD	0	Alarm delay
LD	1, 2	Listing device number

Table 40: Process object type 10

Attribute List	Digital input for internal function block	Description
PT	DI	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	AUTO	Switch state
EE	NO	Event enable
HE	NO	History enabled
DI	0	Digital input value
RC	NO	Acknowledge required
AB	NO	Alarms blocked
AC	0	Alarm class
LD	0	Listing device number

Table 41: Process object type 11

Attribute List	Pulse counter with event handling via SPA	Description
DX	N8	Directive Text
PT	PC	Process Object Type
OT	DEC	Output type
IU	YES	In Use
SS	MAN	Switch state
EE	YES	Event enable
HE	YES	History enabled
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 required
AB	NO	Alarms blocked
AC	1	Alarm class
PI	ALARMS	Alarm picture
PD	1, 2, 3, 4, 5	Monitor number
PA	WARNING	Printout activated at
PU	YES	Printout at first update
AD	0	Alarm delay
LD	1, 2	Listing device number

4.2

HV General Bay

Table 42: Process object for HV General Bay

IX	Type	OB	Description (OX)	Format picture	RX (10 last characters)
15 ^a	3	6	Control section A	form4s002	SPABAYILRS
16 ^a	3	9	Update section A	form4s002	SPABAYILRS
18 ^a	3	7	Control section B	form4s002	SPABAYILRS
19 ^a	3	10	Update section B	form4s002	SPABAYILRS
20 ^a	3	8	Control section C	form4s002	SPABAYILRS
21 ^a	3	11	Update section C	form4s002	SPABAYILRS
30 ^b	1	-	Bay alarm	form4s003	SPABAYILRS
40 ^b	1	-	Cmd relays	form4s003	SPABAYILRS

Table 42: Process object for HV General Bay (Continued)

IX	Type	OB	Description (OX)	Format picture	RX (10 last characters)
55 ^a	3	12	Remote	form4s004	SPABAYILRS
56 ^a	3	13	Station	form4s004	SPABAYILRS
57 ^a	3	14	Local	form4s004	SPABAYILRS
147 ^a	8	3	Abnormal status A	-	SPABAYILRS
148 ^a	8	4	Abnormal status B	-	SPABAYILRS
149 ^a	8	5	Abnormal status C	-	SPABAYILRS
150 ^a	8	15	Bay reserved	-	SPABAYILRS
151 ^a	8	0	Sect. A connected	-	SPABAYILRS
152 ^a	8	1	Sect. B connected	-	SPABAYILRS
153 ^a	8	2	Sect. C connected	-	SPABAYILRS
210 ^a	6	-	Bay command	form4s006	SPABAYILRS
240	2	-	Bay events	form4s002	SPABAYX-LRS
241	2	-	Bay alarms	form4s002	SPABAYX-LRS
242	2	-	Bay printout	form4s002	SPABAYX-LRS
243	10	-	Function occ. by other monitor	-	SPABAYX-LRS
244	2	-	Bay rem. events and ind.	form4s002	SPABAYX-LRS
245	2	-	Bay measurement Update	form4s002	SPABAYILRS

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.

4.3

HV Breaker, Disconnecter and Earth switch

Table 43: Process object for Apparatus function

IX	Type	OB	Description (OX)	Format pict.	RX (10 last characters)
1 ^a	4	0,1	Breaker pos.	-	SPQx01IPOS ^b
2 ^a	4	0,1	Disconnecter pos.	-	SPQx01IPOS ^b
3 ^a	4	0,1	Earthing switch pos.	-	SPQx01IPOS ^b
11 ^a	5	2,3	Breaker pos.	form4s007	SPQx01IPOS ^b
12 ^a	5	2,3	Disconnecter pos.	form4s007	SPQx01IPOS ^b
13 ^a	5	2,3	Earthing switch pos.	form4s007	SPQx01IPOS ^b
15 ^a	3	4	Control	form4s002	SPQx01IPOS ^b

Table 43: Process object for Apparatus function (Continued)

IX	Type	OB	Description (OX)	Format pact.	RX (10 last characters)
16 ^a	3	5	Update	form4s002	SPQx01IPOS ^b
40 ^a	1	6	Tripped	form4s003	SPQx01IPOS ^b
41 ^a	1	10	Reserve error	form4s003	SPQx01IPOS ^b
42 ^a	1	11	Select error	form4s003	SPQx01IPOS ^b
43 ^a	1	12	Command error	form4s003	SPQx01IPOS ^b
44 ^a	1	13	Long operation time	form4s003	SPQx01IPOS ^b
45 ^a	1	14	Position ind. error	form4s003	SPQQQIPOS ^b
46 ^a	1	15	Pole discordance	form4s003	SPQx01IPOS ^b
55 ^a	3	7	Selected	form4s004	SPQx01IPOS ^b
56 ^a	3	8	Interlock bypass	form4s004	SPQx01IPOS ^b
57 ^a	3	9	Interlocked	form4s004	SPQx01IPOS ^b
58 ^a	3	- ^c	Synchrocheck bypass	form4s004	SPQx01IPOS ^b
155	7	-	Selected in MSCADA	-	SPQX01XPOS ^b
210 ^a	6	-	App. command	form4s012	-
211 ^a	6	-	App. command	form4s010	-
212 ^a	6	-	App. command	form4s011	-
240	2	-	Events	form4s002	SPQX01XPOS ^b
241	2	-	Alarms	form4s002	SPQX01XPOS ^b
242	2	-	Printout	form4s002	SPQX01XPOS ^b
243	10	-	Function occ. by other monitor	-	SPQX01XPOS ^b
244	2	-	Rem. events and ind.	form4s002	SPQX01XPOS ^b

a. Must be set to Switch State AUTO (SS=2) before commissioning. Index 211 is used for close commands (used for REB 551 control) and 212 for open commands (used for REB 551 control). By default HF and PU attributes are configured to NOT activate history/printout update at start of MicroSCADA. If update on start is desired, these attributes must be set to YES.

Either index 1&11, 2&12 or 3&13 are created.

Index 40 is only regarding Breaker function.

Index 40 and 46 is as default not in use (IU=0).

b. Qx01 where x replaces with B for breaker, with D for Disconnecter and with E for Earthing switch.

c. Synchrocheck does not have own byte position, but has to be configured for each project.

4.4

HV Measurement

Table 44: Process object for Measurement function

IX	Type	OB	Description (OX)	Format picture.	RX (10 last characters)
10 ^a	9	-	Current L1	form4s008	SPPMEAMCUR
11 ^a	9	-	Current L2	form4s008	SPPMEAMCUR

Table 44: Process object for Measurement function (Continued)

IX	Type	OB	Description (OX)	Format picture.	RX (10 last characters)
12 ^a	9	-	Current L3	form4s008	SPPMEAMCUR
13 ^a	9	-	Neutral current I_0	form4s008	SPPMEAMNCU
14 ^a	9	-	Directional neutral current, I_j	form4s008	SPPMEAMDNC
15 ^a	9	-	Maximum demand I_{15min}	form4s008	SPPMEAMMDC
16 ^a	9	-	Voltage U_{12}	form4s008	SPPMEAMVOL
17 ^a	9	-	Voltage U_{23}	form4s008	SPPMEAMVOL
18 ^a	9	-	Voltage U_{31}	form4s008	SPPMEAMVOL
19 ^a	9	-	Residual voltage U_0	form4s008	SPPMEAMRVL
20 ^a	9	-	Active Power P	form4s008	SPPMEAMAPW
21 ^a	9	-	Reactive power Q	form4s008	SPPMEAMRPW
22 ^a	9	-	Apparent power S	form4s008	SPPMEAMAPP
23 ^a	9	-	Power factor COSfi	form4s008	SPPMEAMCOS
24 ^a	9	-	Frequency f	form4s008	SPPMEAMFRQ
25 ^a	9	-	Harmonic distortion	form4s008	SPPMEAMHDS
26 ^a	9	-	Temperature	form4s008	SPPMEAMTMP
27 ^a	9	-	Temperature	form4s008	SPPMEAMTMP
28 ^a	9	-	Current L1	form4s008	SPPMEAMCUR
29 ^a	9	-	Current L2	form4s008	SPPMEAMCUR
30 ^a	9	-	Current L3	form4s008	SPPMEAMCUR
31 ^a	9	-	Active power P	form4s008	SPPMEAMAPW
32 ^a	9	-	Reactive power Q	form4s008	SPPMEAMRPW
33 ^a	11	-	User defined pulse counter	form4s008	SPPMEAMXXX
34 ^a	11	-	User defined pulse counter	form4s008	SPPMEAMXXX
35 ^a	11	-	User defined pulse counter	form4s008	SPPMEAMXXX
36 ^a	11	-	User defined pulse counter	form4s008	SPPMEAMXXX
37 ^a	11	-	User defined pulse counter	form4s008	SPPMEAMXXX
38 ^a	11	-	Active energy E (kWh)	form4s008	SPPMEAMAEN
39 ^a	11	-	Active energy E (MWh)	form4s008	SPPMEAMAEN
40 ^a	11	-	Active energy E (GWh)	form4s008	SPPMEAMAEN
41 ^a	11	-	Active energy E (kWh) - Reversed	form4s008	SPPMEAMAEN
42 ^a	11	-	Active energy E (MWh) - Reversed	form4s008	SPPMEAMAEN
43 ^a	11	-	Active energy E (GWh) - Reversed	form4s008	SPPMEAMAEN
44 ^a	11	-	Reactive energy E (kVarh)	form4s008	SPPMEAMREN
45 ^a	11	-	Reactive energy E (MVarh)	form4s008	SPPMEAMREN
46 ^a	11	-	Reactive energy E (GVarh)	form4s008	SPPMEAMREN
47 ^a	11	-	Reactive energy E (kVarh) - Reversed	form4s008	SPPMEAMREN

Table 44: Process object for Measurement function (Continued)

IX	Type	OB	Description (OX)	Format picture.	RX (10 last characters)
48 ^a	11	-	Reactive energy E (MVarh) - Reversed	form4s008	SPPMEAMREN
49 ^a	11	-	Reactive energy E (GVarh) - Reversed	form4s008	SPPMEAMREN
240	2	-	Events	form4s002	SSESYSXMSC
241	2	-	Alarms	form4s002	SSESYSXMSC
242	2	-	Printout	form4s002	SSESYSXMSC
243	10	-	Function occ. by other monitor	-	SSESYSXMSC
244	2	-	Rem. events and ind.	form4s002	SSESYSXMSC
245	2	-	Update	form4s002	SSESYSXMSC

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

4.5

REX 5XX Supervision

Table 45: Process object for REX 5xx Supervision function

IX	Type	OB	Description (OX)	Format picture	RX (10 last characters)
60 ^a	1	0	Internal fail	form4s001	SSWM00ITES
61 ^a	1	1	Warning	form4s001	SSWM00ITES
62 ^a	1	2	CPU fail	form4s001	SSWM00ITES
63 ^a	1	3	CPU warning	form4s001	SSWM00ITES
64 ^a	1	4	A/D converter	form4s001	SSWM00ITES
65 ^a	1	5	I/O diff.	form4s001	SSWM00ITES
66 ^a	1	6	Diff. comm.	form4s001	SSWM00ITES
67 ^a	1	7	Settings changed	form4s001	SSWM00ITES
68 ^a	1	8	Clear LEDs	form4s001	SSWM00ITES
69 ^a	1	9	MIM board 1	form4s001	SSWM00ITES
70 ^a	1	10	MIM board 2	form4s001	SSWM00ITES
71 ^a	1	11	MIM board 3	form4s001	SSWM00ITES
72 ^a	1	12	MIM board 4	form4s001	SSWM00ITES
73 ^a	1	13	MIM board 5	form4s001	SSWM00ITES
74 ^a	1	14	MIM board 6	form4s001	SSWM00ITES
75 ^b	1	15	Spare	form4s001	SSWM00ITES
80 ^a	1	0	I/O board 1	form4s001	SSWM00ITES
81 ^a	1	1	I/O board 2	form4s001	SSWM00ITES
82 ^a	1	2	I/O board 3	form4s001	SSWM00ITES
83 ^a	1	3	I/O board 4	form4s001	SSWM00ITES

Table 45: Process object for REx 5xx Supervision function (Continued)

IX	Type	OB	Description (OX)	Format picture	RX (10 last characters)
84 ^a	1	4	I/O board 5	form4s001	SSWM00ITES
85 ^a	1	5	I/O board 6	form4s001	SSWM00ITES
86 ^a	1	6	I/O board 7	form4s001	SSWM00ITES
87 ^a	1	7	I/O board 8	form4s001	SSWM00ITES
88 ^a	1	8	I/O board 9	form4s001	SSWM00ITES
89 ^a	1	9	I/O board 10	form4s001	SSWM00ITES
90 ^a	1	10	I/O board 11	form4s001	SSWM00ITES
91 ^a	1	11	I/O board 12	form4s001	SSWM00ITES
92 ^a	1	12	I/O board 13	form4s001	SSWM00ITES
93 ^b	1	13	RTC Error	form4s001	SSWM00ITES
94 ^b	1	14	TimeSynch Error	form4s001	SSWM00ITES
95 ^b	1	15	Spare	form4s001	SSWM00ITES
240	2	-	Events	form4s009	SSESYSXMSC
241	2	-	Alarms	form4s009	SSESYSXMSC
242	2	-	Printout	form4s009	SSESYSXMSC
243	10	-	Function occ. by other monitor	-	SSESYSXMSC
244	2	-	Rem. events and ind.	form4s009	SSESYSXMSC
245	2	-	Update	form4s009	SSESYSXMSC

a. Must be set to Switch State AUTO (SS=2) before commissioning. By default HF and PU attributes are configured to NOT activate history/printout update at start of MicroSCADA. If update on start is desired, these attributes must be set to YES.

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

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 package after installation of the package. The below is thus created in addition to the files included in the package - See "*HV/Control Files*" on page 118

5.1 Command procedures

The following command procedures are created and used.

Table 46:

Command procedure	Description
SPU_UPDATE	Fetch values from REC after Update deblock

5.2 Datalog objects

The following datalog objects are created and used.

Table 47:

Datalog object	Description
A_HTIMEOUT	Dialog time-out

5.3 Scale objects

The following scale objects are created and used.

Table 48:

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 49:

Event channel	Description

5.5 Time channels

The following time channels are created and used.

Table 50:

Time channel	Description

6 Format pictures and status texts

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

Table 51: Format pictures and status texts

Format picture	Value	Status text
form4s001	1	Faulty
	0	Normal
form4s002	1	Blocked

Table 51: Format pictures and status texts (Continued)

Format picture	Value	Status text
	0	Deblocked
form4s003	1	Alarm
	0	Normal
form4s004	1	On
	0	Off
form4s006	1	Block control for A
	2	Block control for B
	4	Block control for C
	8	Deblock control for A
	16	Deblock control for B
	32	Deblock control for C
	64	Block update for A
	128	Block update for B
	256	Block update for C
	512	Deblock update for A
	1024	Deblock update for B
	2048	Deblock update for C
	4096	Set Remote
	8192	Set Station
form4s007	0	Middle position (00)
(for Circuit breaker index=11)	1	On
	2	Off
	3	Error position (11)
form4s007	0	Middle position (00)
(for Disconnecter index=12)	1	Closed
	2	Open
	3	Error position (11)
form4s007	0	Middle position (00)
(for Earthing switch index=13)	1	Closed
	2	Open
	3	Error position (11)
form4s008	>=HI	High alarm H2
	>=HW & <HI	High warning H1
	>LW & <HW	Normal value
	>=LW & <LI	Low warning L1
	>=LI	Low alarm L2
form4s009	1	Blocked

Table 51: Format pictures and status texts *(Continued)*

Format picture	Value	Status text
	0	Deblocked
form4s010	2	Close command
form4s011	2	Open command
form4s012	1	Block control
	2	Deblock control
	4	Block update
	8	Deblock update
	16	-
	32	-
	64	Set man. open pos.
	128	Set man. closed pos.
	256	Operation cancel
	512	Select open oper.
	1024	Select close oper.
	2048	Operation execute
	4096	Interlock bypass
	8192	Synchrocheck bypass

7 Updated files

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

7.1 PATH4_S1.TXT

During start-up after installation the file the contents of the file `path4_s1.txt` is added to the file `[drive]:\sc\lib4\base\bbone\use\path4.txt`.

7.2 INDEX4_S1.TXT

During start-up after installation the file the contents of the file `index4_s1.txt` is added to the file `[drive]:\sc\lib4\base\bbone\inst\mlib_index.txt`.

Customer feedback report

Product:

ABB Automation Technologies AB would appreciate your comments on this product. Please grade the following questions by selecting one alternative per category. Your answer will enable us to improve our products.

How do you grade the quality of the product?

	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:

Adress:

City:

State:

Zip:

Phone:

Date of receival of the program:

Program serial Nr:

Fascimile:

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

Remove from binder

Place
Postage
Here

**ABB Automation Technologies AB
Substation Automation Products
ATCF/SA, Support Line
SE-721 59 Västerås
Sweden**

To be folded

Remove from binder

Tape here

A

Acknowledge alarms 20, 21, 22, 23, 26, 27, 60, 67, 72, 76, 90, 93, 101, 103

Addressing 48

Authority 58, 62, 63, 66, 70, 73, 75, 80, 84, 86, 89, 93, 97, 99, 100, 103, 106, 107

B

Blockings 19, 53, 61, 64, 67, 70, 72, 73, 76, 85, 88, 100, 120

Blockings dialogue 90

C

Colour coding 53

D

Dialogue closing 60

Dialogue header presentation 61

E

Edit limits dialogue 90

F

Fibre optic 15

Format picture files 121, 140

FTP 15

I

Installing the library function 16

Installing the software 16

Interlock bypass 21, 22, 23, 24, 73, 75, 79, 82, 83, 84

L

LIB520 9

Limit supervision 28

LON 15, 18, 20, 21, 22, 23, 25, 27, 28, 35, 38, 41, 45, 48, 127

M

MicroLIBRARY 15

MicroNET 15

MicroSCADA 16, 28

MicroSYS 15

mllib_index.txt 17

O

Object picture 81, 83, 90, 94, 104

Obsolete value 60

Option button 90

P

PATH4.TXT 17, 18, 60, 142

Process update 20, 21, 23, 24

R

Readme file 16, 17

REB 551 15, 19, 21, 22, 23, 24, 25

REC 561 15, 18, 19, 21, 22, 23, 24, 25, 26, 100

Remaining tasks 48

S

Selected object 53, 54, 58, 59, 99, 106

Selection 55

SPA 15, 18, 20, 21, 22, 23, 25, 27, 28, 35, 38, 41, 45, 127

communication support 20

Status information 21

Switch state 47

Synchrocheck bypass 21, 79, 84

SYS_BASCON.COM 28

T

Terminal 15

Time-out 60

U

Unacknowledged alarm 53, 60, 78



ABB Automation Technologies AB

License Agreement

IMPORTANT - READ CAREFULLY BEFORE OPENING

This legal document is an agreement between You, the user, and ABB Automation Technologies AB, Västerås, SWEDEN. **By opening the diskette package You indicate your acceptance of the terms and conditions of this agreement.** If You do not agree to the terms of this agreement, promptly return the unopened diskette package and other items which are part of the product for a full refund. Your product is a single user version unless you have a written agreement with ABB Automation Technologies AB.

SOFTWARE LICENSE

- 1. Grant of License**
 - This ABB Automation Technologies AB License Agreement ("License") grants you the nonexclusive right to use one copy of the enclosed software program ("SOFTWARE") on a single computer (i.e., with a single CPU) at a single location at any time. If you have multiple Licenses for the SOFTWARE you may have as many copies of the SOFTWARE in use as you have Licenses.
- 2. Copyright**
 - The software is owned by ABB Automation Technologies AB or its suppliers and is protected by Swedish copyright laws, international treaty provisions, and all other applicable national laws. Therefore you must treat the SOFTWARE as any other copyrighted material (e.g., a book or musical recording) except that if the software is not copy protected you may either (a) make a copy of the SOFTWARE solely for backup or archival purposes, or (b) transfer the SOFTWARE to a single hard disk provided you keep the original solely for backup or archival purposes. You may not copy the Documentation accompanying the SOFTWARE.
- 3. Term**
 - The License is effective until terminated. This License will terminate automatically without notice from ABB Automation Technologies AB if you fail to comply with any provision of this License. Upon termination you shall return the diskettes containing the SOFTWARE and all Documentation to ABB Automation Technologies AB and destroy any copies of the SOFTWARE or any portions of it which has not been returned to ABB Automation Technologies AB, including copies resident in computer memory.
- 4. Other Restrictions**
 - You may not rent, lease, lend, sell or give away the SOFTWARE, but you may transfer your rights under this ABB Automation Technologies AB License Agreement on a permanent basis provided you transfer all copies of the SOFTWARE and all written materials, and the recipient agrees to the terms of this Agreement. You may not modify, adapt, translate, reverse engineer, decompile, disassemble, or create derivative works based on the SOFTWARE. You may not modify, adapt, translate or create derivative works based on the written materials.

LIMITED WARRANTY

- Limited Warranty** • ABB Automation Technologies AB warrants that the software will perform substantially in accordance with the accompanying Product Manual(s) for a period of 1 year from the date of delivery from ABB Automation Technologies AB, Västerås. ABB Automation Technologies AB does not warrant that the SOFTWARE is free from coding errors.
- Customer Remedies** • ABB Automation Technologies AB's entire liability and your exclusive remedy shall be, at ABB Automation Technologies AB's option, either (a) return of the price paid or (b) repair or replacement of the SOFTWARE that does not meet ABB Automation Technologies AB's Limited Warranty and which is returned to ABB Automation 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 Automation 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 Automation 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 Automation Technologies AB has been advised of the possibility of such damages. In any case, ABB Automation 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 Automation Technologies 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 511 118-UEN/2.5