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SACO 16D_ modules

for SMS 010
User's Guide
SMS 010 SACO library

Data subject to change without prior notice

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1. INTRODUCTION

1.1 What is a SACO unit?

Names of the format "SACO module' are abbreviations of annunciator unit or module names starting with the letters SACO, e.g. SACO 16D1. In this User's Guide, an annunciator unit will be presented as it occurs in the SMS-BASE program. The other SACO modules or units have almost the same menu structure in SMS-BASE as SACO 16D1, what is said in this User's Guide is generally applicable to all SACO products except for SACO 16A3. For the details and technical data of a particular relay, please refer to its specific user's guide.

When you need to add the SACO 16D1 unit to your SMS 010 system, please read section 2.1.2 in the SM/SACO User's Guide. Sections 2.1.1 and 2.1.3 in the same user's guide are describing what to do if the default SACO installation isn't matching your configuration or if the "genuine" SACO 16D1 or SACO 16D2 modules are to be installed.

Most of the user operations are illustrated in this guide by pictures of the screens on the PC. This enables the procedures described in the guide to be tried out and followed simultaneously on the PC screen.

Note that the screen contents can always be printed for reference using <PrintScrn> or the 'F7 Report mode'.

1.2 Man-machine communication conventions

The screen layout and the use of some of the keys have been largely standardized. Some of the most common ones are listed below:

Key	Function
Guidance	All the SMS-BASE screens provide guidance for the operator.
Key	Available keys and their functions are stated at the bottom of the screen.
Selection	A selection from a menu is made using an <arrow key> and confirmed by pressing <Enter>.
Undo	<Esc>
Help	is displayed at the bottom of the screen.
New screen	Scroll between consecutive screens using <PgUp> and <PgDn>.

2.   THE MAIN MENU

The following procedure starts the SMS-BASE program assuming that it is already installed on the system:

```
C - C:\>
U - C:\>cd SMS\BASE  <Enter>                          Change to the SMS-BASE directory

C - C:\SMS\BASE>
U - C:\SMS\BASE\SMSBASE  <Enter>                      Start the program SMS-BASE
```

2.1   Working procedure

SMS-BASE in conjunction with a SM/SACO product enables the user to collect and view the data of SPACOM annunciator units and modules, to edit settings and download the new settings to the annunciator. Each of these operations are carried out according to a given procedure presented in this Section.

The connection and use of a modem is described in the SMS-BASE User's Guide and therefore this manual assumes that the communication between the annunciator and the PC takes place in the station with the PC connected directly to the annunciator.

When using SMS-BASE with a SM/SACO product, the procedure for collecting and viewing SACO 16D1 data by making selections from the menus is:

1. Select 'Organisation' and 'Station'.
2. Select 'Object/Bay', e.g. the switchgear bay of a protected line.
3. Select 'Unit', i.e. one of the units in the 'Object/Bay', e.g. SACO 16D1.
4. Acquire the desired data by selecting 'Receive parameters'.
5. View the data by selecting 'Edit parameters../Monitor...'.

Omit step 4, if you only wish to view data which has already been acquired.

Steps 1 to 4 are the same for loading and viewing the settings of a SACO 16D1 annunciator. The menu item selected for step 5 becomes 'Edit parameters/Select block to be edited'. 'Select block to be edited' provides a choice of a block for '..setting..' or 'Configuration..'

The description of the procedure for editing settings is a continuation of the procedure for viewing settings with the exception that editing is done in the part of the screen marked 'New values' instead of 'Present values'. After the new settings have been saved, they have to be downloaded to the annunciator by selecting 'Send and receive parameters'.

2.2   Selecting the annunciator unit or module

Every data handling operation starts by selecting an annunciator unit or module, the actual procedure depending on the number of levels in the application structure:

In Brief

The standard procedure for selecting an annunciator is:
1. Select 'Organisation' and 'Station'.
2. Select 'Object/Bay', e.g. the switchgear bay of a protected line.
3. Select 'Annunciator unit', i.e. one of the annunciators in the 'Object/Bay'.
4 Select 'Module/Part', i.e. a module in the annunciator unit.
- Undo by pressing <Esc>.

The following screen appears upon starting SMS-BASE:

```
     PARAMETERS          UTILITIES          ABOUT          SETUP




                                                       Enter      Sec
                                                       SELECT     EXIT
```

Fig. 2.2.A   Basic menu for selecting an annunciator (SMS-BASE main menu)

The system proposes the 'Parameters' option on the top line.

1. Select 'Organisation' and 'Station'

  - Confirm the selection of the 'Organisation' and 'Station' by pressing <Enter>.
  - The display changes to:

```
 ┌─Select Station─┐
 │ Vaasa          │
 │ Västerås       │
 └════════════════┘








Organiz:   ABB Network Partner



              F4      F5                            Enter      Esc
              REPORT  DR-COM                        SELECT     EXIT
```

Fig. 2.2.B   'Organisation' and 'Station' are selected.

2. Select 'Object/Bay', e.g. the switchgear bay of a protected line.

- A further box appears on the screen:

```
┌=Select Station=
│ Vaa┌========Select Object/Bay========┐
│ Väs│ Series 100   SPACOM protections │
└====│ Series 100   SPACOM protections │
     │ Series 300   SPACOM protections │
     │ Series 300   SPACOM protections │
     │ Series 500   SPACOM protections │
     │ Series 600   SPACOM protections │
     │ Series 900   SPACOM protections │
     │ Series SACO  Annunciator unit   │
     │ MODEM PhNo: 0 W (012) 987 - 654 │
     │ OTHER        Non-spa protections│
     └=================================┘


 Organiz:   ABB Network Partner
 Station:   Vaasa



                                        Enter     Esc
                                        SELECT    EXIT
```

Fig. 2.2.C   'Organisation', 'Station' and 'Object/Bay' are selected.

The names of the bays can be given to suit the application. They are edited by selecting 'UTILITIES' / 'Alter application structure'. The corresponding procedure is explained in the SMS-BASE User's Guide. Relay units are selected among the installed units that are listed in the box using <uparrow> and <downarrow>.

- Confirm the selection of 'Series SACO ...' by pressing <Enter>.

3. Select 'Annunciator unit', i.e. one of the annunciators in the 'Object/Bay'.

- A further box appears on the screen:

```
┌=Select Station=┐
│ Vaa┌========Select Object/Bay========┐
│ Väs│ Ser┌================Select Unit==================┐
└====│ Ser│ SACO 16D1  Annunciator unit                │
     │ Ser│ SACO 16D2  Annunciator unit                │
     │ Ser│ SACO 16D2B Annunciator unit                │
     │ Ser│ SACO 16D3  Annunciator unit                │
     │ Ser│ SACO 64D4  Annunciator unit                │
     │ Ser│ SACO 148D4 Control data communicator and event ann│
     │ Ser│ SACO 16A3  Analogue input annunciator unit │
     │ MOD└============================================┘
     │ OTHER        Non-spa protections │
     └=================================┘


 Organiz:   ABB Network Partner
 Station:   Vaasa
 Obj/Bay:   Serie SACO  Annunciator unit


                                        Enter     Esc
                                        SELECT    EXIT
```

Fig. 2.2.D   'Organisation', 'Station', 'Object/Bay' and 'Annunciator unit' are selected.

- Confirm the selection of annunciator unit 'SACO 16D1 ...' by pressing <Enter>.

4. Select 'Module/Part', i.e. a module in the annunciator unit

 - Yet another box is added to the screen:

```
┌=Select Station=┐
│ Vaa┌========Select Object/Bay=======┐
│ Väs│ Ser┌=============Select Unit==================┐
└====│ Ser│ SACO 16D1  Annunciator unit            │
     │ Ser│ SACO 16D2  Annunciator unit            │
     │ Ser│ SACO 16D2B Annu┌=======Select function========┐
     │ Ser│ SACO 16D3  Annun│ Edit parameters and monitor data │
     │ Ser│ SACO 64D4  Annun│ Send and receive parameters      │
     │ Ser│ SACO 148D4 Cont │ Receive parameters               │
     │ Ser│ SACO 16A3  Analo│ Print parameters                 │
     │ MOD└================└==================================┘
     │ OTHER       Non-spa protections │
     └=================================┘



 Organiz:   ABB Network Partner
 Station:   Vaasa
 Obj/Bay:   Serie SACO  Annunciator unit
 Unit:      SACO 16D1  Annunciator unit
 Mod/Part:  SACO 16D1B  Alarm module [1]

            F3              F5           F8    Enter    Esc
            MODEM           PASSWORD     DOS   SELECT   EXIT
```

Fig. 2.2.E   Organisation, Station, Object/Bay, Annunciator unit and Module are selected.

The alarm module 'SACO 16D1B...' is automatically selected, because the annunciator unit 'SACO 16D1...' has only a single alarm module. Four different operations can be selected from the 'Select function' menu, of which the one at the head of the list 'Edit parameters and monitor data' will be explained first. On the screen shown in Fig. 2.2.E, 'Mod/Part: SACO 16D1B Alarm module [1]' is in the lower half. The number 'l' is the slave number installed for the module. Refer to the SMS-BASE User's Guide for the procedure for changing the slave number.

2.3 Viewing measured and recorded data

Before using the viewing operation for the first time, it is recommended to first read the 'General notes'. The SACO 16D1B..' screen shows:

```
 ╔═ SACO 16D1B ════════════════════════════════════Screen 1 of 1═╗
 ║║ GENERAL NOTES                                                  ║
 ║║ ┌──────────────────────────────┐ ┌──────────────────────────────┐ ║
 ║║ │                              │ │                              │ ║
 ║║ │ Present values = values read from │ │ Module version = program version of │ ║
 ║║ │  a file VALUES.INS. This file is  │ │  the module e.g. SACO 16D1B. The │ ║
 ║║ │  updated with the values of the   │ │  number of your module version is │ ║
 ║║ │  module when executing commands   │ │  updated to SMS 010 by executing the │ ║
 ║║ │  'Receive' and 'Send' parameters. │ │  command 'Receive parameters'. │ ║
 ║║ │                              │ │                              │ ║
 ║║ │ New values = values read from a   │ │                              │ ║
 ║║ │  file VALUES.VAL. These values    │ │                              │ ║
 ║║ │  can be edited and are then       │ │                              │ ║
 ║║ │  temporary stored in the 'Edit    │ │                              │ ║
 ║║ │  buffer'. The file is updated when │ │                              │ ║
 ║║ │  the SMS 010 editor is finished.  │ │                              │ ║
 ║║ └──────────────────────────────┘ └──────────────────────────────┘ ║
 ║╚═══════════════════════════════════════════════════════════════╝║
 ║ PgDn  PgUp                            F7        Enter   Esc        ║
 ║ NEXT  PREV                          REPORT      CHANGE  EXIT       ║
 ╚═══════════════════════════════════════════════════════════════════╝
```

Fig. 2.3.A   General information on 'SACO 16D1B...'

Once the annunciator module has been selected, its data can be viewed by selecting 'Monitor recorded and measured data'. The procedure for the acquisition of data from the annunciator will be presented later.

In Brief

The procedure for viewing annunciator data is:

1. Select 'Edit parameters and monitor data'.
2. Select 'Monitor measured data' and wait 5-20 s for calculation.
   - Browse through the screens using the <PgUp> and <PgDn> keys.
3. Exit by pressing <Esc>.

---

1. Select 'Edit parameters and monitor data'.

- Select 'Edit parameters and monitor data' and confirm by pressing <Enter>.
  The operations being carried out by the PC can be followed on the third line from the bottom of the screen. Normally these messages only inform the user that the computer is working. Note that an AT type PC will take approx. 10 s to start the 'Select block to be edited' activity.
- The screen now changes to:

```
SELECT          UTILITIES        ABOUT           SETUP
┌──────Select Organization──────┐
│ABB┌─Select Station─┐ Protection│
└───│ Vaa┌────────Select Object/Bay────────┐
    │ Väs│ Ser┌──────────────Select Unit──────────────┐
    └────│ Ser│ SAC┌═Select Module/Part of Unit═┐tor unit │
         │ Ser│ SAC│ SAC┌──────Select function──────┐       │
         │ Ser│ SAC└═══│ Edi┌═════Select block to be edited═════┐
         │ Ser│ SACO 16D│ Sen│ General notes                     │
         │ Ser│ SACO 16D│ Rec│ General setting parameters        │
         │ Ser│ SACO 148│ Pri│ Settings for alarm channels       │
         │ Ser│ SACO 64D└═══│ Settings for channels interlockings │
         │ MOD└═════════════│ Settings for output relays         │
         │ OTHER      Non-sp│ Monitor measured data             │
         └──────────────────└───────────────────────────────────┘

Organiz:  ABB Network Partner
Station:  Vaasa
Obj/Bay:  Serie SACO  Annunciator unit
Unit:     SACO 16D1   Annunciator unit
Mod/Part: SACO 16D1B  Alarm module [1]

 PgDn  PgUp                              Enter   Esc
 NEXT  PREV                              CHANGE  EXIT
```

Fig. 2.3.A   'Edit parameters and monitor data' is selected.

2. Select 'Monitor measured data' from the 'Select block to be edited' menu

- Select 'Monitor measured data'.

- The operations being carried out by the PC can be followed on the third line from the bottom of the screen. Normally these messages only inform the user that the computer is working. Note that an AT type PC will take approx. 10 sec. to start the 'Monitor measured data' activity.

- For each of the six data blocks, (Fig. 2.3.A), the 'Select block to be edited' activity starts with a list of contents, (Fig. 2.3.B).

- The screen contents for 'Monitor measured data', the sixth item in the 'Select block to be edited' menu are now listed:

```
╓═ SACO 16D1B ════════════════════════════════════════════Screen 1 of 4═╖
║ ┌ MONITOR RECORDED AND MEASURED DATA                                  │ ║
║ │                                                                     │ ║
║ │ CONTENTS                                                            │ ║
║ │ Screen                                                             │ ║
║ │   2    Monitor measured data - I1..I8, V1, C, O1, O2              │ ║
║ │   3    Monitor recorded data - 1/16I1, 1/16V5                     │ ║
║ │   4    Explanation of abbreviations                              │ ║
║ │                                                                     │ ║
║ │                                                                     │ ║
║ │                                                                     │ ║
║ │  ┌ N O T E !─────────────────────────────────────────────────┐   │ ║
║ │  │ The  measured data is offline !                            │   │ ║
║ │  └────────────────────────────────────────────────────────────┘   │ ║
║ ╘═════════════════════════════════════════════════════════════════════╛ ║
║ Station:    Vaasa                                                        ║
║ Obj/Bay:    Serie SACO   Annunciator unit                               ║
║ Unit:       SACO 16D1    Annunciator unit                               ║
║ Mod/Part:   SACO 16D1B   Alarm module [1]                               ║
║                                                                          ║
║ PgDn    PgUp                                    F7          Enter    Esc  ║
║ NEXT    PREV                                    REPORT      CHANGE   EXIT ║
╙──────────────────────────────────────────────────────────────────────────╜
```

Fig. 2.3.B   Screen 1 of 4 showing the contents for 'Monitor measured data', the sixth item in the 'Select block to be edited' menu

Explanations to the screens 1 to 4, figures 2.3.A - 2.3.D:

Once all the settings have been send over from SMS-BASE by 'Send and Receive parameters', the annunciator unit SACO 16D1 stores them in a parameter memory in a single uninterrupted operation. This has to be done before alarm data can be stored in the sequential event register.
The digital alarm events are displayed on screen 2, but in the examples are no events detected.
The annunciator continuously compares the incoming channel data with the data previously stored. Screen 3 provides facility for recording and viewing the data which are displayed in the 'Measured data' section of the screen.
The abbreviations used on screens 1 to 3 are explained on screen 4.

CAUTION! When the annunciator is switched to the programming mode, the data in the event register is automatically deleted.

Screen 2 shows the eight internal interlock lines. Each channel can receive signals from two interlock lines or transmit one interlock signal and receive one interlock signal. The states of reflash output relays 1 and 2 for the group alarms and the 'Local/remote' input are displayed on the right of the screen. The state of the module is shown against code C.

```
╔═ SACO 16D1B ══════════════════════════════════════════Screen 2 of 4═╗
║   Monitor measured data - I1..I8, V1, C, O1, O2                      ║
║  ┌Monitor───────────────────────────┐┌Monitor──────────────────────┐║
║  ┌Measured data────────Explanation─┐ ┌Measured data─────────Explanation─┐
║   I1 = Not active      Int. line 1   O1  = Not operating   Out. relay  1 │
║   I2 = Not active      Int. line 2   O2  = Not operating   Out. relay  2 │
║   I3 = Not active      Int. line 3                                      │
║   I4 = Not active      Int. line 4   V1 =   Local/remote    Cntr. mode   │
║   I5 = Not active      Int. line 5                                      │
║   I6 = Not active      Int. line 6   C   =   Normal state   Module state │
║   I7 = Not active      Int. line 7                                      │
║   I8 = Not active      Int. line 8                                      │
║                                                                        │
║                                                                        │
║                                                                        │
║                                                                        │
║                                                                        │
║══════════════════════════════════════════════════════════════════════║
║  PgDn   PgUp                                    F7          Enter   Esc ║
║  NEXT   PREV                                    REPORT      CHANGE  EXIT║
╚════════════════════════════════════════════════════════════════════════╝
```

Fig. 2.3.C   Summary of internal Interlocking lines, group alarms, the 'Local/remote' input and the state of the module

After the occurrence of a fault, the operation of the alarm channels can be viewed on screen 3. The signals are displayed in chronological order with a time marker having a resolution better than 5 ms. Both active alarms and alarms which have reset, or the first alarm to occur after the last reset are displayed. The last nine events are always stored in chronological order starting with the newest. The operation of supervised field contacts, i.e. pulsating inputs (field contact pumping) for each of the alarm channels is also presented.

```
╔═ SACO 16D1B ══════════════════════════════════════════Screen 3 of 4═╗
║   Monitor recorded data - 1/16I1, 1/16V5                             ║
║  ┌Measured data────────Explanation──────┐┌Measured data─────────Explanation───┐
║                                          ┌───────────────────Pulse counter─┐
║     1I1 = Not active   Alarm channel  1    1V5 = 0            Channel   1   │
║     2I1 = Not active   Alarm channel  2    2V5 = 0            Channel   2   │
║     3I1 = Not active   Alarm channel  3    3V5 = 0            Channel   3   │
║     4I1 = Not active   Alarm channel  4    4V5 = 0            Channel   4   │
║     5I1 = Not active   Alarm channel  5    5V5 = 0            Channel   5   │
║     6I1 = Not active   Alarm channel  6    6V5 = 0            Channel   6   │
║     7I1 = Not active   Alarm channel  7    7V5 = 0            Channel   7   │
║     8I1 = Not active   Alarm channel  8    8V5 = 0            Channel   8   │
║     9I1 = Not active   Alarm channel  9    9V5 = 0            Channel   9   │
║    10I1 = Not active   Alarm channel 10   10V5 = 0            Channel  10   │
║    11I1 = Not active   Alarm channel 11   11V5 = 0            Channel  11   │
║    12I1 = Not active   Alarm channel 12   12V5 = 0            Channel  12   │
║    13I1 = Not active   Alarm channel 13   13V5 = 0            Channel  13   │
║    14I1 = Not active   Alarm channel 14   14V5 = 0            Channel  14   │
║    15I1 = Not active   Alarm channel 15   15V5 = 0            Channel  15   │
║    16I1 = Not active   Alarm channel 16   16V5 = 0            Channel  16   │
║══════════════════════════════════════════════════════════════════════║
║  PgDn   PgUp                                    F7          Enter   Esc ║
║  NEXT   PREV                                    REPORT      CHANGE  EXIT║
╚════════════════════════════════════════════════════════════════════════╝
```

Fig. 2.3.D   Summary of the most recent alarms in chronological order and data recorded by the field contact supervision function

Screen 4 displays the legend for the abbreviations used on the 'Monitor recorded and measured data' screens.

```
╔══════════════════════════════════════════════════════════════════════╗
║╔═ SACO 16D1B ═══════════════════════════════════════════Screen 4 of 4═╗║
║║  Explanation of abbreviations                                        ║║
║║──────────────────────────────────────────────────────────────────── ║║
║║ ┌──────────────────────────────┐ ┌──────────────────────────────┐   ║║
║║ │  ER.  = event register       │ │                              │   ║║
║║ │  res. = reset                │ │                              │   ║║
║║ │  ov.  = overflow             │ │                              │   ║║
║║ │  int. = interlocking         │ │                              │   ║║
║║ │  out. = output               │ │                              │   ║║
║║ │  Cntr. = control             │ │                              │   ║║
║║ │                              │ │                              │   ║║
║║ │                              │ │                              │   ║║
║║ │                              │ │                              │   ║║
║║ │                              │ │                              │   ║║
║║ │                              │ │                              │   ║║
║║ │                              │ │                              │   ║║
║║ └──────────────────────────────┘ └──────────────────────────────┘   ║║
║╚══════════════════════════════════════════════════════════════════════╝║
║                                                                        ║
║  PgDn    PgUp                                F7          Enter    Esc   ║
║  NEXT    PREV                               REPORT       CHANGE   EXIT  ║
╚══════════════════════════════════════════════════════════════════════╝
```
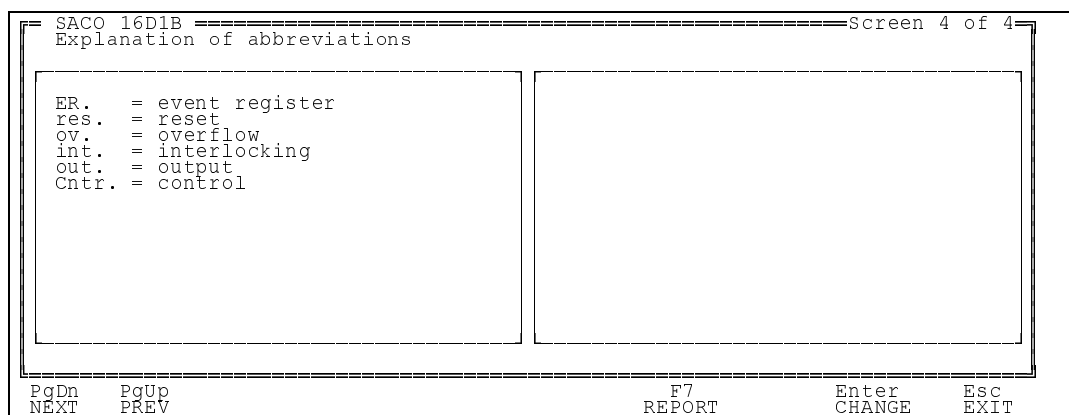
Fig. 2.3.E   Legend for the abbreviations used on the 'Monitor recorded and measured data' screens

3. Exit by pressing <Esc>

   - Upon pressing <Esc> the screen changes to:

```
SELECT            UTILITIES          ABOUT            SETUP
┌══════Select Organization═══════┐
│ ABB┌═Select Station═┐ Protection │
└════ Vaa┌════════Select Object/Bay════════┐
         Väs│ Ser┌══════════════════Select Unit═══════════════┐
         └══ │ Ser│ SAC┌═Select Module/Part of Unit═┐tor unit │
             │ Ser│ SAC│ SAC┌═══════════Select function═══════┐
             │ Ser│ SAC═══│ Edi┌═══════Select block to be edited═══════┐
             │ Ser│ SACO 16D│ Sen│ General notes                  │
             │ Ser│ SACO 16D│ Rec│ General setting parameters     │
             │ Ser│ SACO 148│ Pri│ Settings for alarm channels    │
             │ Ser│ SACO 64D═══│ Settings for channels interlockings│
             │ MOD└══════════════│ Settings for output relays     │
             │ OTHER       Non-sp│ Monitor measured data          │
             └══════════════════└════════════════════════════════┘


Organiz:   ABB Network Partner
Station:   Vaasa
Obj/Bay:   Serie SACO  Annunciator uni
Unit:      SACO 16D1   Annunciator uni
Mod/Part:  SACO 16D1B  Alarm module [1

 PgDn   PgUp                                    Enter    Esc
 NEXT   PREV                                    CHANGE   EXIT
```

Fig. 2.3.F   List of the 'SACO 16D1B...' alarm module functions

2.4 Acquiring, viewing and editing settings

All the items except the first and last in the 'Select block to be edited' screen concern 'SACO 16D1B...' settings. There are thus many settings to be handled by the communication functions and all these settings are transferred by every 'Send and receive Parameters' to make sure that settings always belong to the same setting and are received by the alarm module to which they are addressed. This is necessary, because many of these settings are related. The following sections are dealing with the acquisition, viewing and editing of annunciator settings. The procedure is the same as for Section 2.3 'Monitoring measured and recorded data".

2.4.1 General settings

'General setting parameters' on screen 2 shows the settings for the standard operating procedures and active channel outputs. The first screen lists the contents of 'General setting parameters'. It also gives the version of the alarm module, which corresponds to your module after executing the command 'Receive parameters' for the first time.

```
╔═ SACO 16D1B ════════════════════════════════════════════════Screen 1 of 3═╗
║   GENERAL SETTING PARAMETERS                                               ║
║                                                      ┌─────────────────────┐
║   CONTENTS                                           │ Module version: 036 E│
║  Screen                                              └─────────────────────┘
║     2   General setting parameters     - S17, S18                          ║
║     3   Explanation of abbreviations                                       ║
║                                                                            ║
║                                                                            ║
║                                                                            ║
║                                                                            ║
║                                                                            ║
╠════════════════════════════════════════════════════════════════════════════╣
 Station:   Vaasa
 Obj/Bay:   Serie SACO   Annunciator unit
 Unit:      SACO 16D1    Annunciator unit
 Mod/Part:  SACO 16D1B   Alarm module [1]

 PgDn   PgUp                                     F7            Enter      Esc
 NEXT   PREV                                     REPORT        CHANGE     EXIT
```

Fig. 2.4.1.A   Contents of the 'General setting parameters' screens

SMS-BASE displays the version of the 'SACO 16D1' module software, Fig 2.4.1.A.

The last set of settings acquired (Present values) is shown in the centre of screen 2 and the edited set on the right (Fig. 2.4.1.B). An explanation of the selected parameter is given on the left. Use the arrow keys to move the cursor up and down the list in the "New values" box on the right of the screen.

```
╔═ SACO 16D1B ════════════════════════════════════════════════Screen 2 of 3═╗
║   General setting parameters - S17, S18                                    ║
║  ┌Explanation──────────────────┐  ┌Present values─┐  ┌New values──────┐    ║
║  │ Annunciator flashing sequence│  │ ISA R-1       │  │ ISA R-1        │    ║
║  │                              │  │               │  │                │    ║
║  │ Active alarm listing via SPA-bus│ Alarm and status│ Alarm and status│   ║
║  │                              │  │               │  │                │    ║
║  │                              │  │               │  │                │    ║
║  │                              │  │               │  │                │    ║
║  │                              │  │               │  │                │    ║
║  │                              │  │               │  │                │    ║
║  └──────────────────────────────┘  └───────────────┘  └────────────────┘    ║
║   S17 - Annunciator sequences.                                             ║
╠════════════════════════════════════════════════════════════════════════════╣
 PgDn   PgUp                                     F7            Enter      Esc
 NEXT   PREV                                     REPORT        CHANGE     EXIT
```

Fig. 2.4.1.B   General setting parameters for the alarm module 'SACO 16D1B...'

Explanations of the 'General setting parameters' screens are given on screen 3.

```
╔═ SACO 16D1B ════════════════════════════════════════Screen 3 of 3═╗
║  Explanation of abbreviations                                     ║
║ ----------------------------------------------------------------  ║
║  .............................    .............................   ║
║  : ISA A =   Automatic channel reset :  :                     :   ║
║  : ISA A-1 = Automatic channel reset, :  :                    :   ║
║  :           manual audible reset    :  :                      :   ║
║  : ISA M-1 = Manual channel reset,   :  :                      :   ║
║  :           manual audible reset    :  :                      :   ║
║  : ISA R-1 = Manual channel reset,   :  :                      :   ║
║  :           visual ringback,        :  :                      :   ║
║  :           manual audible reset    :  :                      :   ║
║  :                                   :  :                      :   ║
║  : DIN 19235 = Visual ringback,      :  :                      :   ║
║  :             manual audible reset  :  :                      :   ║
║  :                                   :  :                      :   ║
║  :                                   :  :                      :   ║
║  :.................................  :  :....................  :   ║
║ ════════════════════════════════════════════════════════════════  ║
║ PgDn   PgUp                              F7        Enter      Esc   ║
║ NEXT   PREV                              REPORT    CHANGE     EXIT  ║
╚════════════════════════════════════════════════════════════════════╝
```
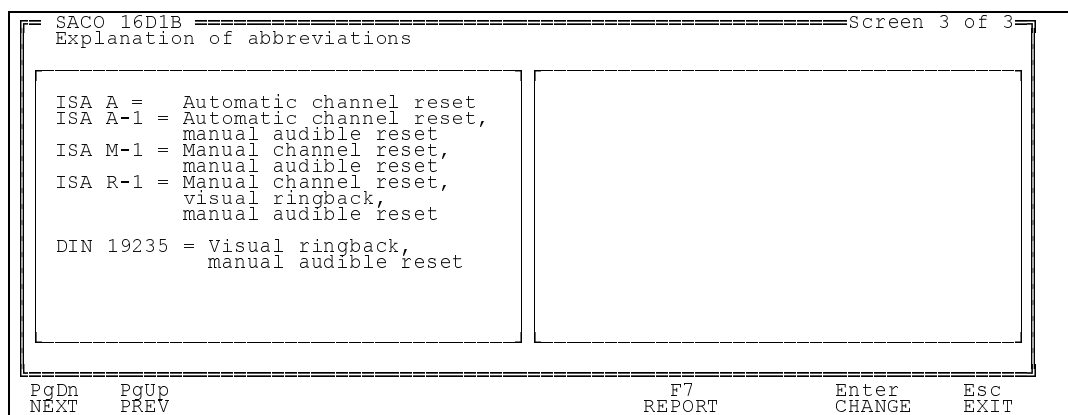
Fig. 2.4.1.C   Explanation of abbreviations used on screens 1 and 2

2.4.2   Alarm channel settings

The main settings for all the alarm channels in an SACO 16D1 annunciator unit are shown on screens 2 to 9. The contents of all the 'Settings for alarm channels' screens are listed on the first screen as shown below.

```
╔═ SACO 16D1B ════════════════════════════════════════Screen 1 of 10═╗
║  SETTINGS FOR ALARM CHANNELS                                       ║
║                                                                    ║
║   CONTENTS                                                         ║
║  Screen                                                            ║
║    2   Settings for channels 1..2      - 1/2S1..1/2S4,  1/2S11,  1/2V5     ║
║    3   Settings for channels 3..4      - 3/4S1..3/4S4,  3/4S11,  3/4V5     ║
║    4   Settings for channels 5..6      - 5/6S1..5/6S4,  5/6S11,  5/6V5     ║
║    5   Settings for channels 7..8      - 7/8S1..7/8S4,  7/8S11,  7/8V5     ║
║    6   Settings for channels 9..10     - 9/10S1..9/10S4, 9/10S11, 9/10V5   ║
║    7   Settings for channels 11..12    - 11/12S1..11/12S4, 11/12S11, 11/12V5 ║
║    8   Settings for channels 13..14    - 13/14S1..13/14S4, 13/14S11, 13/14V5 ║
║    9   Settings for channels 15..16    - 15/16S1..15/16S4, 15/16S11, 15/16V5 ║
║   10   Explanation of abbreviations                                ║
║                                                                    ║
║ ════════════════════════════════════════════════════════════════  ║
║ Station:    Vaasa                                                  ║
║ Obj/Bay:    Serie SACO  Annunciator unit                          ║
║ Unit:       SACO 16D1  Annunciator unit                           ║
║ Mod/Part:   SACO 16D1B  Alarm module [1]                          ║
║                                                                    ║
║ PgDn   PgUp                              F7        Enter      Esc   ║
║ NEXT   PREV                              REPORT    CHANGE     EXIT  ║
╚════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.2.A   Contents of the 'Settings for alarm channels' screens

The last set of settings acquired (Present values) is shown in the centre of screens 2 to 9 and the edited set on the right (Fig. 2.4.2.B to I). An explanation of the selected parameter is given on the left. Use the arrow keys to move the cursor up and down the list in the "New values" box on the right of the screen.
Use the PgDn and PgUp keys to move from one screen to another.

The settings for alarm channels 1 and 2 appear on screen 2.

```
╔═ SACO 16D1B ════════════════════════════════════════Screen 2 of 10═╗
║  Settings for channels 1..2 - 1/2S1..1/2S4, 1/2S11, 1/2V5           ║
║ ┌Explanation─────────────────────┐ ┌Present values┐ ┌New values──────┐║
║ │                                │ │              │ │                │║
║ │ Input delay for channel 1      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Reset delay for channel 1      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Contact type for channel 1     │ │ Normal open  │ │ Normal open    │║
║ │ Indicator mode for channel 1   │ │ Normal       │ │ Normal         │║
║ │ Pumping supervision for channel 1│ 0            │ │ 0              │║
║ │ Pulse counter for channel 1    │ │ 0            │ │ 0              │║
║ │                                │ │              │ │                │║
║ │ Input delay for channel 2      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Reset delay for channel 2      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Contact type for channel 2     │ │ Normal open  │ │ Normal open    │║
║ │ Indicator mode for channel 2   │ │ Normal       │ │ Normal         │║
║ │ Pumping supervision for channel 2│ 0            │ │ 0              │║
║ │ Pulse counter for channel 2    │ │ 0            │ │ 0              │║
║ └────────────────────────────────┘ └──────────────┘ └────────────────┘║
║  1S1 - Input delay, channel 1 (step 0.005 s). Range: 0.005..160.0 s ║
╠════════════════════════════════════════════════════════════════════╣
║ PgDn   PgUp                              F7          Enter     Esc   ║
║ NEXT   PREV                              REPORT      CHANGE    EXIT  ║
╚════════════════════════════════════════════════════════════════════╝
```
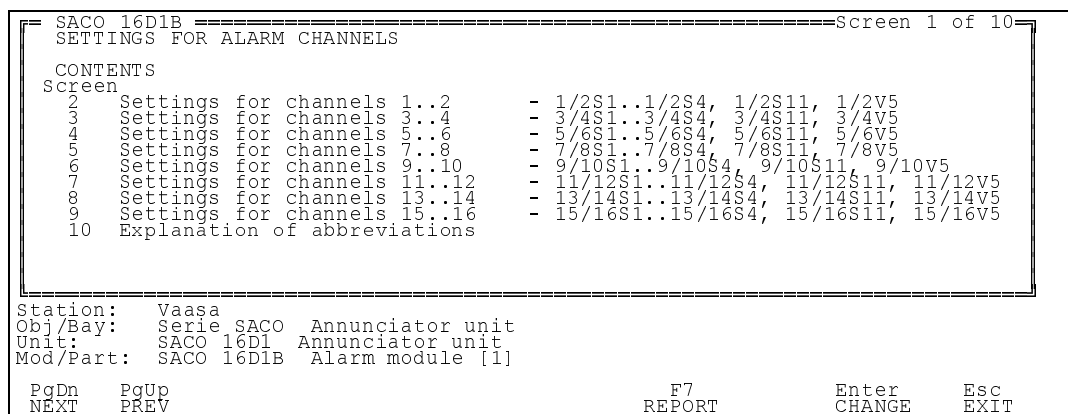
Fig. 2.4.2.B   Main settings for channels 1 and 2 of alarm module SACO 16D1B

The settings for alarm channels 3 and 4 appear on screen 3.

```
╔═ SACO 16D1B ════════════════════════════════════════Screen 3 of 10═╗
║  Settings for channels 3..4 - 3/4S1..3/4S4, 3/4S11, 3/4V5          ║
║ ┌Explanation─────────────────────┐ ┌Present values┐ ┌New values──────┐║
║ │                                │ │              │ │                │║
║ │ Input delay for channel 3      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Reset delay for channel 3      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Contact type for channel 3     │ │ Normal open  │ │ Normal open    │║
║ │ Indicator mode for channel 3   │ │ Normal       │ │ Normal         │║
║ │ Pumping supervision for channel 3│ 0            │ │ 0              │║
║ │ Pulse counter for channel 3    │ │ 0            │ │ 0              │║
║ │                                │ │              │ │                │║
║ │ Input delay for channel 4      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Reset delay for channel 4      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Contact type for channel 4     │ │ Normal open  │ │ Normal open    │║
║ │ Indicator mode for channel 4   │ │ Normal       │ │ Normal         │║
║ │ Pumping supervision for channel 4│ 0            │ │ 0              │║
║ │ Pulse counter for channel 4    │ │ 0            │ │ 0              │║
║ └────────────────────────────────┘ └──────────────┘ └────────────────┘║
║  3S1 - Input delay, channel 3 (step 0.005 s). Range: 0.005..160.0 s ║
╠════════════════════════════════════════════════════════════════════╣
║ PgDn   PgUp                              F7          Enter     Esc   ║
║ NEXT   PREV                              REPORT      CHANGE    EXIT  ║
╚════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.2.C   Main settings for channels 3 and 4 of alarm module SACO 16D1B

The settings for alarm channels 5 and 6 appear on screen 4.

```
╔═ SACO 16D1B ════════════════════════════════════════Screen 4 of 10═╗
║  Settings for channels 5..6 - 5/6S1..5/6S4, 5/6S11, 5/6V5          ║
║ ┌Explanation─────────────────────┐ ┌Present values┐ ┌New values──────┐║
║ │                                │ │              │ │                │║
║ │ Input delay for channel 5      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Reset delay for channel 5      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Contact type for channel 5     │ │ Normal open  │ │ Normal open    │║
║ │ Indicator mode for channel 5   │ │ Normal       │ │ Normal         │║
║ │ Pumping supervision for channel 5│ 0            │ │ 0              │║
║ │ Pulse counter for channel 5    │ │ 0            │ │ 0              │║
║ │                                │ │              │ │                │║
║ │ Input delay for channel 6      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Reset delay for channel 6      │ │ 0.020 s      │ │ 0.020 s        │║
║ │ Contact type for channel 6     │ │ Normal open  │ │ Normal open    │║
║ │ Indicator mode for channel 6   │ │ Normal       │ │ Normal         │║
║ │ Pumping supervision for channel 6│ 0            │ │ 0              │║
║ │ Pulse counter for channel 6    │ │ 0            │ │ 0              │║
║ └────────────────────────────────┘ └──────────────┘ └────────────────┘║
║  5S1 - Input delay, channel 5 (step 0.005 s). Range: 0.005..160.0 s ║
╠════════════════════════════════════════════════════════════════════╣
║ PgDn   PgUp                              F7          Enter     Esc   ║
║ NEXT   PREV                              REPORT      CHANGE    EXIT  ║
╚════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.2.D   Main settings for channels 5 and 6 of alarm module SACO 16D1B

The settings for alarm channels 7 and 8 appear on screen 5.

```
╔═ SACO 16D1B ═══════════════════════════════════════Screen 5 of 10═╗
║  Settings for channels 7..8 - 7/8S1..7/8S4, 7/8S11, 7/8V5          ║
║ ┌Explanation──────────────────────┐ ┌Present values─┐ ┌New values──────┐ ║
║ │ Input delay for channel 7       │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 7       │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 7      │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 7    │ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 7│ │ 0            │ │ 0              │ ║
║ │ Pulse counter for channel 7     │ │ 0             │ │ 0              │ ║
║ │                                 │ │               │ │                │ ║
║ │ Input delay for channel 8       │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 8       │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 8      │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 8    │ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 8│ │ 0            │ │ 0              │ ║
║ │ Pulse counter for channel 8     │ │ 0             │ │ 0              │ ║
║ └─────────────────────────────────┘ └───────────────┘ └────────────────┘ ║
║  7S1 - Input delay, channel 7 (step 0.005 s). Range: 0.005..160.0 s ║
╠═══════════════════════════════════════════════════════════════════╣
║ PgDn   PgUp                              F7          Enter      Esc ║
║ NEXT   PREV                              REPORT      CHANGE     EXIT║
╚═══════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.2.E   Main settings for channels 7 and 8 of alarm module SACO 16D1B

The settings for alarm channels 9 and 10 appear on screen 6.

```
╔═ SACO 16D1B ═══════════════════════════════════════Screen 6 of 10═╗
║  Settings for channels 9..10 - 9/10S1..9/10S4, 9/10S11, 9/10V5     ║
║ ┌Explanation──────────────────────┐ ┌Present values─┐ ┌New values──────┐ ║
║ │ Input delay for channel 9       │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 9       │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 9      │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 9    │ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 9│ │ 0            │ │ 0              │ ║
║ │ Pulse counter for channel 9     │ │ 0             │ │ 0              │ ║
║ │                                 │ │               │ │                │ ║
║ │ Input delay for channel 10      │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 10      │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 10     │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 10   │ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 10│ │ 0           │ │ 0              │ ║
║ │ Pulse counter for channel 10    │ │ 0             │ │ 0              │ ║
║ └─────────────────────────────────┘ └───────────────┘ └────────────────┘ ║
║  9S1 - Input delay, channel 9 (step 0.005 s). Range: 0.005..160.0 s ║
╠═══════════════════════════════════════════════════════════════════╣
║ PgDn   PgUp                              F7          Enter      Esc ║
║ NEXT   PREV                              REPORT      CHANGE     EXIT║
╚═══════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.2.F   Main settings for channels 9 and 10 of alarm module SACO 16D1B

The settings for alarm channels 11 and 12 appear on screen 7.

```
╔═ SACO 16D1B ═══════════════════════════════════════Screen 7 of 10═╗
║  Settings for channels 11..12 - 11/12S1..11/12S4, 11/12S11, 11/12V5║
║ ┌Explanation──────────────────────┐ ┌Present values─┐ ┌New values──────┐ ║
║ │ Input delay for channel 11      │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 11      │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 11     │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 11   │ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 11│ │ 0           │ │ 0              │ ║
║ │ Pulse counter for channel 11    │ │ 0             │ │ 0              │ ║
║ │                                 │ │               │ │                │ ║
║ │ Input delay for channel 12      │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 12      │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 12     │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 12   │ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 12│ │ 0           │ │ 0              │ ║
║ │ Pulse counter for channel 12    │ │ 0             │ │ 0              │ ║
║ └─────────────────────────────────┘ └───────────────┘ └────────────────┘ ║
║  11S1 - Input delay, channel 11 (step 0.005 s). Range: 0.005..160.0 s ║
╠═══════════════════════════════════════════════════════════════════╣
║ PgDn   PgUp                              F7          Enter      Esc ║
║ NEXT   PREV                              REPORT      CHANGE     EXIT║
╚═══════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.2.G   Main settings for channels 11 and 12 of alarm module SACO 16D1B

The settings for alarm channels 13 and 14 appear on screen 8.

```
╔═ SACO 16D1B ═══════════════════════════════════════Screen 8 of 10═╗
║ ║ Settings for channels 13..14 - 13/14S1..13/14S4, 13/14S11, 13/14V5  ║║
║ ╭Explanation──────────────────╮ ╭Present values─╮ ╭New values──────╮ ║
║ │                             │ │               │ │                │ ║
║ │ Input delay for channel 13  │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 13  │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 13 │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 13│ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 13│ │ 0       │ │ 0              │ ║
║ │ Pulse counter for channel 13│ │ 0             │ │ 0              │ ║
║ │                             │ │               │ │                │ ║
║ │ Input delay for channel 14  │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 14  │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 14 │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 14│ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 14│ │ 0       │ │ 0              │ ║
║ │ Pulse counter for channel 14│ │ 0             │ │ 0              │ ║
║ │                             │ ╰───────────────╯ ╰────────────────╯ ║
║ ╰─────────────────────────────╯                                     ║
║ ╭──────────────────────────────────────────────────────────────────╮ ║
║ │ 13S1 - Input delay, channel 13 (step 0.005 s). Range: 0.005..160.0 s│ ║
║ ╰──────────────────────────────────────────────────────────────────╯ ║
║ PgDn   PgUp                              F7          Enter     Esc    ║
║ NEXT   PREV                              REPORT      CHANGE    EXIT   ║
╚══════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.2.H   Main settings for channels 13 and 14 of alarm module SACO 16D1B

The settings for alarm channels 15 and 16 appear on screen 9.

```
╔═ SACO 16D1B ═══════════════════════════════════════Screen 9 of 10═╗
║ ║ Settings for channels 15..16 - 15/16S1..15/16S4, 15/16S11, 15/16V5  ║║
║ ╭Explanation──────────────────╮ ╭Present values─╮ ╭New values──────╮ ║
║ │                             │ │               │ │                │ ║
║ │ Input delay for channel 15  │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 15  │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 15 │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 15│ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 15│ │ 0       │ │ 0              │ ║
║ │ Pulse counter for channel 15│ │ 0             │ │ 0              │ ║
║ │                             │ │               │ │                │ ║
║ │ Input delay for channel 16  │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Reset delay for channel 16  │ │ 0.020 s       │ │ 0.020 s        │ ║
║ │ Contact type for channel 16 │ │ Normal open   │ │ Normal open    │ ║
║ │ Indicator mode for channel 16│ │ Normal        │ │ Normal         │ ║
║ │ Pumping supervision for channel 16│ │ 0       │ │ 0              │ ║
║ │ Pulse counter for channel 16│ │ 0             │ │ 0              │ ║
║ │                             │ ╰───────────────╯ ╰────────────────╯ ║
║ ╰─────────────────────────────╯                                     ║
║ ╭──────────────────────────────────────────────────────────────────╮ ║
║ │ 15S1 - Input delay, channel 15 (step 0.005 s). Range: 0.005..160.0 s│ ║
║ ╰──────────────────────────────────────────────────────────────────╯ ║
║ PgDn   PgUp                              F7          Enter     Esc    ║
║ NEXT   PREV                              REPORT      CHANGE    EXIT   ║
╚══════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.2.I   Main settings for channels 15 and 16 of alarm module SACO 16D1B

Explanations of the 'Settings for channels ...' screens are given on screen 10.

```
╔═ SACO 16D1B ═══════════════════════════════════════Screen 10 of 10═╗
║ ║ Explanation of abbreviations                                       ║║
║ ╭─────────────────────────────╮ ╭──────────────────────────────────╮ ║
║ │                             │ │                                  │ ║
║ │ +    = opening              │ │                                  │ ║
║ │ -    = closing              │ │                                  │ ║
║ │ ±    = both closing and opening│ │                               │ ║
║ │ aud. = audible              │ │                                  │ ║
║ │ sign. = signal              │ │                                  │ ║
║ │                             │ │                                  │ ║
║ │                             │ │                                  │ ║
║ │                             │ │                                  │ ║
║ │                             │ │                                  │ ║
║ │                             │ │                                  │ ║
║ │                             │ │                                  │ ║
║ ╰─────────────────────────────╯ ╰──────────────────────────────────╯ ║
║ PgDn   PgUp                              F7          Enter     Esc    ║
║ NEXT   PREV                              REPORT      CHANGE    EXIT   ║
╚══════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.2.J   Explanation of abbreviations used on screens 1 to 9

2.4.3 Configuring channel interlocks

'Configuration of interlockings for channels 1...8, 9...16' on screens 2 and 3 displays the interlocking instructions for all alarm channels in the SACO 16D1 annunciator. The contents of all the 'Settings for channel interlockings' screens are listed on the first screen as shown below.

```
╔═ SACO 16D1B ═══════════════════════════════════════════════Screen 1 of 4═╗
║   SETTINGS FOR CHANNEL INTERLOCKINGS                                      ║
║                                                                           ║
║   CONTENTS                                                                ║
║  Screen                                                                   ║
║     2    Configuration of interlockings for channels 1..8  - 1/8S7..1/8S10║
║     3    Configuration of interlockings for channels 9..16 - 9/16S7..9/16S10║
║     4    Explanation of abbreviations                                     ║
║                                                                           ║
║                                                                           ║
║                                                                           ║
║     ┌NOTE !─────────────────────────────────────────────────────────────┐║
║     │ Interlock lines 1..4 can be shared with other SACO modules.        │║
║     └───────────────────────────────────────────────────────────────────┘║
╠═══════════════════════════════════════════════════════════════════════════╣
║ Station:   Vaasa                                                          ║
║ Obj/Bay:   Serie SACO  Annunciator unit                                   ║
║ Unit:      SACO 16D1  Annunciator unit                                    ║
║ Mod/Part:  SACO 16D1B  Alarm module [1]                                   ║
║                                                                           ║
║ PgDn   PgUp                                     F7          Enter     Esc  ║
║ NEXT   PREV                                     REPORT      CHANGE    EXIT ║
╚═══════════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.3.A   List of contents for 'Settings for channel interlockings' screens

The last set of settings acquired (Present values) is shown on the left of screens 2 and 3 and the edited set on the right (Fig. 2.4.2.B and C). Use the arrow keys to move the cursor up and down the list under "New values" on the right of the screen.
Use the PgDn and PgUp keys to move from one screen to another.

The configuration of the interlocks for alarm channels 1 to 8 appears on screen 2.

```
╔═ SACO 16D1B ═══════════════════════════════════════════════Screen 2 of 4═╗
║  Configuration of interlockings for channels 1..8  - 1/8S7..1/8S10        ║
║ ┌────────Present values────────────────────────New values──────────────┐ ║
║ │                    1 2 3 4 5 6 7 8                   1 2 3 4 5 6 7 8   │ ║
║ │  Ch.1  ───── 0 ───→                 Ch.1  ───── 0 ───→                │ ║
║ │        ───── 0 ───→                       ───── 0 ───→                │ ║
║ │  Ch.2  ───── 0 ───→                 Ch.2  ───── 0 ───→                │ ║
║ │        ───── 0 ───→                       ───── 0 ───→                │ ║
║ │  Ch.3  ───── 0 ───→                 Ch.3  ───── 0 ───→                │ ║
║ │        ───── 0 ───→                       ───── 0 ───→                │ ║
║ │  Ch.4  ───── 0 ───→                 Ch.4  ───── 0 ───→                │ ║
║ │        ───── 0 ───→                       ───── 0 ───→                │ ║
║ │  Ch.5  ───── 0 ───→                 Ch.5  ───── 0 ───→                │ ║
║ │        ───── 0 ───→                       ───── 0 ───→                │ ║
║ │  Ch.6  ───── 0 ───→                 Ch.6  ───── 0 ───→                │ ║
║ │        ───── 0 ───→                       ───── 0 ───→                │ ║
║ │  Ch.7  ───── 0 ───→                 Ch.7  ───── 0 ───→                │ ║
║ │        ───── 0 ───→                       ───── 0 ───→                │ ║
║ │  Ch.8  ───── 0 ───→                 Ch.8  ───── 0 ───→                │ ║
║ │        ───── 0 ───→                       ───── 0 ───→                │ ║
║ ├───────────────────────────────────────────────────────────────────────┤ ║
║   1S7 - Blocking function 1, channel 1.                                   ║
╠═══════════════════════════════════════════════════════════════════════════╣
║ PgDn   PgUp                                     F7          Enter     Esc  ║
║ NEXT   PREV                                     REPORT      CHANGE    EXIT ║
╚═══════════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.3.B   Configuration of interlocks for channels 1 to 8 of alarm module SACO 16D1B

The configuration of the interlocks for alarm channels 9 to 16 appears on screen 3.

```
╔═ SACO 16D1B ═══════════════════════════════════════════Screen 3 of 4═╗
║  Configuration of interlockings for channels 9..16 - 9/16S7..9/16S10  ║
║ ┌───────────Present values──────┐           ┌──────New values─────────┐
║              1 2 3 4 5 6 7 8                             1 2 3 4 5 6 7 8
║   Ch.9  ───── 0 ───→ │ │ │ │ │ │ │   Ch.9  ───── 0 ───→ │ │ │ │ │ │ │
║         ───── 0 ───→ │ │ │ │ │ │ │          ───── 0 ───→ │ │ │ │ │ │ │
║   Ch.10 ───── 0 ───→ │ │ │ │ │ │ │   Ch.10 ───── 0 ───→ │ │ │ │ │ │ │
║         ───── 0 ───→ │ │ │ │ │ │ │          ───── 0 ───→ │ │ │ │ │ │ │
║   Ch.11 ───── 0 ───→ │ │ │ │ │ │ │   Ch.11 ───── 0 ───→ │ │ │ │ │ │ │
║         ───── 0 ───→ │ │ │ │ │ │ │          ───── 0 ───→ │ │ │ │ │ │ │
║   Ch.12 ───── 0 ───→ │ │ │ │ │ │ │   Ch.12 ───── 0 ───→ │ │ │ │ │ │ │
║         ───── 0 ───→ │ │ │ │ │ │ │          ───── 0 ───→ │ │ │ │ │ │ │
║   Ch.13 ───── 0 ───→ │ │ │ │ │ │ │   Ch.13 ───── 0 ───→ │ │ │ │ │ │ │
║         ───── 0 ───→ │ │ │ │ │ │ │          ───── 0 ───→ │ │ │ │ │ │ │
║   Ch.14 ───── 0 ───→ │ │ │ │ │ │ │   Ch.14 ───── 0 ───→ │ │ │ │ │ │ │
║         ───── 0 ───→ │ │ │ │ │ │ │          ───── 0 ───→ │ │ │ │ │ │ │
║   Ch.15 ───── 0 ───→ │ │ │ │ │ │ │   Ch.15 ───── 0 ───→ │ │ │ │ │ │ │
║         ───── 0 ───→ │ │ │ │ │ │ │          ───── 0 ───→ │ │ │ │ │ │ │
║   Ch.16 ───── 0 ───→ │ │ │ │ │ │ │   Ch.16 ───── 0 ───→ │ │ │ │ │ │ │
║         ───── 0 ───→ │ │ │ │ │ │ │          ───── 0 ───→ │ │ │ │ │ │ │
║  9S7 - Blocking function 1, channel 9.                                ║
╠═══════════════════════════════════════════════════════════════════════╣
   PgDn   PgUp                              F7          Enter      Esc
   NEXT   PREV                              REPORT      CHANGE     EXIT
```

Fig. 2.4.3.C   Configuration of interlocks for channels 9 to 16 of alarm module SACO 16D1B

Explanations of the 'Settings for channel interlockings' screens are given on screen 4.

```
╔═ SACO 16D1B ═══════════════════════════════════════════Screen 4 of 4═╗
║  Explanation of abbreviations                                         ║
║ ┌──────────────────────────────┐  ┌──────────────────────────────────┐
║ │ 0 = Interlocking activated   │  │                                  │
║ │     by the channel.          │  │                                  │
║ │ 1 = Channel reflash A        │  │                                  │
║ │     interlocked.             │  │                                  │
║ │ 2 = Channel interlocked, return │                                  │
║ │     to normal as an acknowledged│                                  │
║ │     alarm.                   │  │                                  │
║ │ 3 = Channel interlocked, return │                                  │
║ │     to normal as a new alarm.│  │                                  │
║ │                              │  │                                  │
║ │                              │  │                                  │
║ │                              │  │                                  │
║ └──────────────────────────────┘  └──────────────────────────────────┘
╠═══════════════════════════════════════════════════════════════════════╣
   PgDn   PgUp                              F7          Enter      Esc
   NEXT   PREV                              REPORT      CHANGE     EXIT
```

Fig. 2.4.3.D   Explanation of abbreviations used on screens 1 to 3

2.4.4 Configuring the output relays

'Settings for output relays' on screens 2 to 7 displays the configuration of the output relays in the annunciator. The contents of all the 'Settings for ...' screens are listed on the first screen as shown below.

```
╔═ SACO 16D1B ═══════════════════════════════════════════════════Screen 1 of 8═╗
║   SETTINGS FOR OUTPUT RELAYS                                                   ║
║                                                                               ║
║    CONTENTS                                                                    ║
║   Screen                                                                       ║
║     2    Settings for connection of pumping supervision     - S19             ║
║     3    Settings for alarm reflash for channels 1..8       - 1/8S5..1/8S6    ║
║     4    Settings for alarm reflash for channels 9..16      - 9/16S5..9/16S6  ║
║     5    Settings for allowance of output relay via SPA-bus - S33, S34        ║
║     6    Settings for function modes for output relays      - S1, S2          ║
║     7    Settings for pulse lengths for output relays       - S49, S50        ║
║     8    Explanations of abbreviations                                        ║
║                                                                               ║
║                                                                               ║
║                                                                               ║
║                                                                               ║
╠═══════════════════════════════════════════════════════════════════════════════╣
║ Station:   Vaasa                                                               ║
║ Obj/Bay:   Serie SACO   Annunciator unit                                      ║
║ Unit:      SACO 16D1    Annunciator unit                                      ║
║ Mod/Part:  SACO 16D1B   Alarm module [1]                                      ║
║                                                                               ║
║  PgDn   PgUp                              F7           Enter      Esc          ║
║  NEXT   PREV                              REPORT       CHANGE     EXIT         ║
╚═══════════════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.4.A   List of contents for 'Settings for output relays' screens.

The last set of settings acquired (Present values) is shown in the centre of screen 2 and the edited set on the right (Fig. 2.4.4.B). An explanation of the selected item is given on the left.
Use the PgDn and PgUp keys to move from one screen to another.

The connection of the pumping supervision function for the pulsating inputs appears on screen 2.

```
╔═ SACO 16D1B ═════════════════════════════════════════════════Screen 2 of 8═╗
║   Settings for connection of pumping supervision - S19                      ║
║  ┌Explanation──────────────────────┐ ┌Present values┐ ┌New values──────┐   ║
║  │                                  │ │              │ │                │   ║
║  │ Connection of pumping supervision│ │ no connection│ │ no connection  │   ║
║  │ to an output relay               │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  │                                  │ │              │ │                │   ║
║  └──────────────────────────────────┘ └──────────────┘ └────────────────┘   ║
║   S19 - Connection of pumping supervision to an output relay.               ║
╠═════════════════════════════════════════════════════════════════════════════╣
║  PgDn   PgUp                              F7           Enter      Esc        ║
║  NEXT   PREV                              REPORT       CHANGE     EXIT       ║
╚═════════════════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.4.B   Configuration of the pumping supervision connections on the alarm module SACO 16D1B.

The last set of settings acquired (Present values) for the alarm reflash relays of channels 1 to 8 is shown on the left of screens 3 and 4 and the edited set on the right (Fig. 2.4.4.C and D). Use the arrow keys to move the cursor up and down the list under "New values" on the right of the screen.
Use the PgDn and PgUp keys to move from one screen to another.

The configuration of the alarm reflash relays for channels 1 to 8 appears on screen 3.

```
╔═ SACO 16D1B ═══════════════════════════════════════Screen 3 of 8═╗
║   Settings for alarm reflash for channels 1..8 - 1/8S5..1/8S6     ║
║  ┌─Present values─────────────────┐ ┌─New values─────────────────┐║
║  │              Relay 1    2       │ │             Relay 1    2   │║
║  │   Channel  1  A ────            │ │  Channel  1  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel  2  A ────            │ │  Channel  2  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel  3  A ────            │ │  Channel  3  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel  4  A ────            │ │  Channel  4  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel  5  A ────            │ │  Channel  5  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel  6  A ────            │ │  Channel  6  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel  7  A ────            │ │  Channel  7  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel  8  A ────            │ │  Channel  8  A ────        │║
║  │               B ────            │ │              B ────        │║
║  └────────────────────────────────┘ └────────────────────────────┘║
║   1S5 - Reflash A, channel 1.                                     ║
╠═══════════════════════════════════════════════════════════════════╣
║ PgDn   PgUp                              F7          Enter    Esc  ║
║ NEXT   PREV                              REPORT      CHANGE   EXIT ║
╚═══════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.4.C   Configuration of the alarm reflash relays for channels 1 to 8 of the alarm module SACO 16D1B.

The configuration of the alarm reflash relays for channels 9 to 16 appears on screen 4.

```
╔═ SACO 16D1B ═══════════════════════════════════════Screen 4 of 8═╗
║   Settings for alarm reflash for channels 9..16 - 9/16S5..9/16S6  ║
║  ┌─Present values─────────────────┐ ┌─New values─────────────────┐║
║  │              Relay 1    2       │ │             Relay 1    2   │║
║  │   Channel  9  A ────            │ │  Channel  9  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel 10  A ────            │ │  Channel 10  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel 11  A ────            │ │  Channel 11  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel 12  A ────            │ │  Channel 12  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel 13  A ────            │ │  Channel 13  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel 14  A ────            │ │  Channel 14  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel 15  A ────            │ │  Channel 15  A ────        │║
║  │               B ────            │ │              B ────        │║
║  │   Channel 16  A ────            │ │  Channel 16  A ────        │║
║  │               B ────            │ │              B ────        │║
║  └────────────────────────────────┘ └────────────────────────────┘║
║   9S5 - Reflash A, channel 9.                                     ║
╠═══════════════════════════════════════════════════════════════════╣
║ PgDn   PgUp                              F7          Enter    Esc  ║
║ NEXT   PREV                              REPORT      CHANGE   EXIT ║
╚═══════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.4.D   Configuration of the alarm reflash relays for channels 9 to 16 of the alarm module SACO 16D1B.

The last set of settings acquired (Present values) for the output relays is shown in the centre of screens 5 and 7 and the edited set on the right (Fig. 2.4.4.E to G). An explanation of the selected item is given on the left. Use the PgDn and PgUp keys to move from one screen to another.

The settings for enabling output relays via the SPA bus appear on screen 5.

```
╔═ SACO 16D1B ══════════════════════════════════════Screen 5 of 8═╗
║  Settings for allowance of output relay via SPA-bus - S33, S34   ║
║ ┌Explanation────────────────────┐ ┌Present values┐ ┌New values───┐
║ │                               │ │              │ │             │
║ │ Allowance of output relay 1   │ │activation block│ │activation block│
║ │ Allowance of output relay 2   │ │activation block│ │activation block│
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ └───────────────────────────────┘ └──────────────┘ └─────────────┘
║  S33 - Activation allowance of output relay 1 via SPA-bus.       ║
╚══════════════════════════════════════════════════════════════════╝
  PgDn   PgUp                              F7           Enter     Esc
  NEXT   PREV                              REPORT       CHANGE    EXIT
```

Fig. 2.4.4.E   Settings for enabling output relays via the SPA bus on the alarm module SACO 16D1B.

Settings for the operating mode of the output relays appear on screen 6.

```
╔═ SACO 16D1B ══════════════════════════════════════Screen 6 of 8═╗
║  Settings for function mode for output relays - S1, S2           ║
║ ┌Explanation────────────────────┐ ┌Present values┐ ┌New values───┐
║ │                               │ │              │ │             │
║ │ Output relay  1, function mode│ │FCFR          │ │FCFR         │
║ │ Output relay  2, function mode│ │FCFR          │ │FCFR         │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ └───────────────────────────────┘ └──────────────┘ └─────────────┘
║  S1 - Output relay 1, function mode.                             ║
╚══════════════════════════════════════════════════════════════════╝
  PgDn   PgUp                              F7           Enter     Esc
  NEXT   PREV                              REPORT       CHANGE    EXIT
```

Fig. 2.4.4.F   Settings for the operating mode of the output relays on the alarm module SACO 16D1B.

Settings for determining the time an output relay is energised (pulse length) appear on screen 7.

```
╔═ SACO 16D1B ══════════════════════════════════════Screen 7 of 8═╗
║  Settings for pulse lengths for output relays - S49, S50         ║
║ ┌Explanation────────────────────┐ ┌Present values┐ ┌New values───┐
║ │                               │ │              │ │             │
║ │ Output relay  1, pulse length │ │0.3 s         │ │0.3 s        │
║ │ Output relay  2, pulse length │ │0.3 s         │ │0.3 s        │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ │                               │ │              │ │             │
║ └───────────────────────────────┘ └──────────────┘ └─────────────┘
║  S49 - Pulse length, output relay  1. Range: 0.3..25.5 s         ║
╚══════════════════════════════════════════════════════════════════╝
  PgDn   PgUp                              F7           Enter     Esc
  NEXT   PREV                              REPORT       CHANGE    EXIT
```

Fig. 2.4.4.G   Setting the times output relays are energised (pulse length) on the alarm module SACO 16D1B.

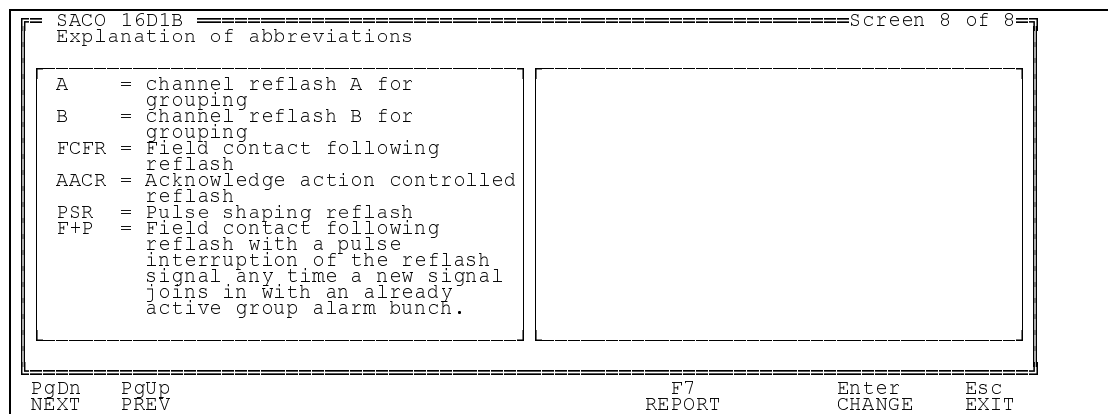Explanations of the 'Settings for output relays' screens are given on screen 8.

```
┌═ SACO 16D1B ═══════════════════════════════════════════════Screen 8 of 8═┐
│║ Explanation of abbreviations                                            ║│
│║ ┌────────────────────────────────────┐ ┌────────────────────────────┐  ║│
│║ │ A    = channel reflash A for       │ │                            │  ║│
│║ │         grouping                   │ │                            │  ║│
│║ │ B    = channel reflash B for       │ │                            │  ║│
│║ │         grouping                   │ │                            │  ║│
│║ │ FCFR = Field contact following     │ │                            │  ║│
│║ │         reflash                    │ │                            │  ║│
│║ │ AACR = Acknowledge action controlled│ │                           │  ║│
│║ │         reflash                    │ │                            │  ║│
│║ │ PSR  = Pulse shaping reflash       │ │                            │  ║│
│║ │ F+P  = Field contact following     │ │                            │  ║│
│║ │         reflash with a pulse       │ │                            │  ║│
│║ │         interruption of the reflash│ │                            │  ║│
│║ │         signal any time a new signal│ │                           │  ║│
│║ │         joins in with an already   │ │                            │  ║│
│║ │         active group alarm bunch.  │ │                            │  ║│
│║ └────────────────────────────────────┘ └────────────────────────────┘  ║│
│║                                                                         ║│
│╠═════════════════════════════════════════════════════════════════════════╣│
│  PgDn   PgUp                               F7          Enter      Esc     │
│  NEXT   PREV                               REPORT      CHANGE     EXIT    │
└───────────────────────────────────────────────────────────────────────────┘
```

Fig. 2.4.4.F   Explanation of abbreviations used on screens 1 to 7

2.4.5   Data acquisition

The data acquisition procedure is the same with a direct connection to the SPA loop as when using a phone modem. Start with a direct connection and add the extra functions for operation via a modem later on. Refer to Appendix C of the SMS-BASE User's Guide for details of connecting a modem.

In Brief:

The data acquisition procedure is:

1   Select 'Organisation' and 'Station'.
2   Select 'Object/Bay', e.g. the switchgear bay of a protected line.
3   Select 'Annunciator unit', i.e. one of the annunciator units in the 'Object/Bay'.
4   Select 'SACO 16D1...', e.g. the module.
5   Select 'Receive parameters' to collect data, after which the PC:
    5.1   makes a list of variables to collect.
    5.2   verifies that the right alarm module replies.
    5.3   collects one variable at a time.
    5.4   stores the values in the file 'VALUES.INS'. Operations 1 to 4 were explained earlier in this document.

---

1. Select 'Organisation' and 'Station'.
2. Select 'Object/Bay', e.g. the switchgear by of a protected line.
3. Select 'Annunciator unit', i.e. one of the annunciator units in the 'Object/Bay'.
4. Select 'SACO 16D1...', e.g. the module and confirm the selection with <Enter>.

- The screen now appears as follows:

```
┌=Select Station=┐
│ Vaa┌========Select Object/Bay========┐
│ Väs│ Ser┌========================Select Unit================┐
└====│ Ser│ SACO 16D1  Annunciator unit                        │
     │ Ser│ SACO 16D2  Annunciator unit                        │
     │ Ser│ SACO 16D2B Annu┌========Select function========┐   │
     │ Ser│ SACO 16D3  Annun│ Edit parameters and monitor data│ │
     │ Ser│ SACO 64D4  Annun│ Send and receive parameters     │ │
     │ Ser│ SACO 148D4 Cont │ Receive parameters              │ │
     │ Ser│ SACO 16A3  Analo│ Print parameters                │ │
     │ MOD└================│=================================┘ │
     │ OTHER      Non-spa protections │                          │
     └================================┘


Organiz:   ABB Network Partner
Station:   Vaasa
Obj/Bay:   Serie SACO  Annunciator unit
Unit:      SACO 16D1  Annunciator unit
Mod/Part:  SACO 16D1B  Alarm module [1]
           F3                    F5                F8    Enter   Esc
           MODEM                 PASSWORD          DOS   SELECT  EXIT
```

Fig. 2.4.5A   'Organisation', 'Station', 'Object/Bay', 'Annunciator unit' and 'Module' are selected.

5. Select 'Receive parameters' to collect data.

  - Select 'Receive parameters' and confirm by pressing <Enter>.
  - An automatic sequence starts which can be followed in a window on the screen.

5.1 The PC makes a list of variables to collect.

  - The message 'Reading module configuration file' is displayed while the PC compiles the list.

5.2 The PC verifies that the right alarm module replies.

  - The message 'Asking from module it's type' ('Requesting module type') is displayed while the PC waits for the module to reply.
  - This is the first time that the communication link has had to operate in this Section. Should no communication be possible, refer to the SMS-BASE User's Guide for a step by step description of how to test the link to the relay module.

  The 'Timeout box is only displayed when the connection is out of order:

```
╔═══════════════════════════════════════════════════════════════════╗
║ Timeout when waiting the slave to answer                          ║
║ Retry or quit (R/Q) ?                                             ║
╚═══════════════════════════════════════════════════════════════════╝
```

Fig. 2.4.5.B   The connection is not properly configured or wrong slave address is given.

```
┌═Select Station═┐
│ Vaa┌════════Select Object/Bay════════┐
│ Väs│ Ser┌════════════════Select Unit═══════════════════┐
└════│ Ser│ SACO 16D1  Annunciator unit                   │
     │ Ser│ SACO 16D2  Annunciator unit                   │
     │ Ser│ SACO 16D2B Annu┌═══════════Select function════════┐
     │ Ser│ SACO 16D3  Annun│ Edit parameters and monitor data │
     │ Ser│ SACO 64D4  Annun│ Send and receive parameters      │
     │ Ser│ SACO 14        ││                                  │
     │ Ser│ SACO 16 │Copying values from module to file        │
     │ MOD└═════════│                                      ═══┘
     │ OTHER        │Asking from module it's type              │
     └══════════════│                                          │
                    │                                          │
                    └══════════════════════════════════════════┘

Mod/Part:  SACO 16D1B  Alarm module [1]

                                            F8     Enter      Esc
                                            DOS    SELECT     EXIT
```

Fig. 2.4.5.C   'Asking from module it´s type'.

5.3 The PC collects one variable at a time.

  - The PC displays the information on the data acquisition procedure:

```
╔════════════════════════════════════╗
║Copying values from module to file  ║
║                                    ║
║Copying now:   S49                  ║
║Messages sent: 15    Retries: 0     ║
╚════════════════════════════════════╝
```

Fig 5.3.A   Copying parameter values from the module to file on the hard disk.

The SPA identity for every variable is displayed, e.g. S49, the number of messages that have been sent and the number of retries so far. At a data transfer rate of 2400 Baud, approx. 7 telegrams per second are transferred. The number of 'Retries' indicates the quality of the link. The PC makes three attempts to transfer a telegram and then presents the user with the following alternatives:

- **'Skip'** Omit this variable. Select this alternative if the protection does not support a variable for some reason.
- **'Retry'** Make three more attempts.
- **'Quit'** Discontinue the operation. Select this alternative if the link does not function.

5.4 The PC stores the values in the file 'VALUES.INS'.

- When the list is complete, the user is requested to either update (default when pressing <Enter>) or compare the
  values of the variables with the data in the 'VALUES.INS' file.

```
╔══════════════════════════════Select══════════════════════════════╗
║                                                                   ║
║  Update data base with the received values . . . . . . . . . 1   ║
║  Compare received values and data base values. . . . . . . . 2   ║
║  Compare received values and update data base. . . . . . . . 3   ║
║  Update data base but not edit values. . . . . . . . . . . . 4   ║
║  Exit without updating or comparing values . . . . . . . . . 5   ║
║                                                                   ║
║  Select action (1/2/3/4/5): 1                                     ║
║                                                                   ║
╚═══════════════════════════════════════════════════════════════════╝
```

Fig. 5.4.A   Contents of the 'Select' window

When alternatives 1 and 3 are selected, the values of all the variables from the relay are stored in the files
'VALUES.INS' and 'VALUES.VAL'. Alternative 4 only stores them in the file 'VALUES.INS'. Since there is
only one of these files for the data belonging to each relay, the existing data are overwritten by the new data.

If the user chooses to compare the data base values with the values from the relay, a list of values is displayed on
screen 2 which can be scrolled if necessary.

```
╔COMPARISON OF VALUES═══════════════════════════════════════════════╗
║                                                    Received   Edited      ║
║ F          Type designation of the module          SACO 16D1B  SACO 16D1B║
║ V205       Firmware version                        036 E       036 E     ║
║ S17        Annunciator flashing sequence           ISA R-1     ISA R-1   ║
║ S18        Active alarm listing via SPA-bus        1           1         ║
║ 1/S1       Input delay for channel 1               0.02        0.02      ║
║ 1/S2       Reset delay for channel 1               0.10        0.10      ║
║ 1/S3       Contact type for channel 1              Normal open Normal open║
║ 1/S4       Indicator mode for channel 1            Normal      Normal    ║
║ 1/S11      Pumping supervision for channel 1       0           0         ║
║ 1/V5       Pulse counter for channel 1             0           0         ║
║ 2/S1       Input delay for channel 2               0.10        0.10      ║
║ 2/S2       Reset delay for channel 2               0.10        0.10      ║
║ 2/S3       Contact type for channel 2              Normal open Normal open║
║ 2/S4       Indicator mode for channel 2            Normal      Normal    ║
║ 2/S11      Pumping supervision for channel 2       0           0         ║
║ 2/V5       Pulse counter for channel 2             0           0         ║
║                                                                   ║
║                                                                   ║
║ Press space bar to continue, Esc = Quit                           ║
╚═══════════════════════════════════════════════════════════════════╝
```

Fig. 5.4.B   The 'Comparison of values' screen

This completes the acquisition of the 'SACO 16D1B...' module data, which can be viewed in the 'VALUES.INS'
file as described earlier in this Section.

2.4.6   Editing and transferring data

Settings of the 'SACO 16D1B' module can be changed from a remote location using SMS-BASE. This function
can be used, for example, to change protection settings without having to travel to the station concerned or to
prepare a set of new settings, which only takes a short time to download to the protection during a visit to the
station.

Settings are edited in the right-hand half of the screens and correspond to the values in the 'VALUES.VAL' file.

In Brief

The procedure for editing and transferring data is:

    1.   Select 'Edit parameters and monitor data' to change settings.
    2.   Select 'Send and receive parameters' to transfer new settings to the annunciator.
    3.   Enter the station password, after which the PC
        3.1   makes a list of variables to edit.
        3.2   verifies that the right relay replies.
        3.3   transfers one variable at a time from the 'VALUES.VAL' file.
        3.4   collects one variable at a time.
        3.5   stores the values in the 'VALUES.INS' file.

---

1. Select 'Edit parameters and monitor data' to change settings.

  - Select 'Edit parameters'.
  - Select the appropriate screen and the desired variable in the right-hand half using the arrow keys.
  - Start and terminate editing a value by pressing <Enter>. Press <Esc> to reject an edited value.
  - Use the numerical keys to enter values and <.> as a decimal point. Confirm by pressing <Enter>.
  - The permissible range is displayed on the comment line at the bottom of the screen. Values outside this range will not be accepted.
  - Exit 'Edit parameters'.

2. Select 'Send and receive parameters' to transfer new settings to the annunciator.

  - Select 'Send and receive parameters'.
  - Enter the station password.

```
== SMSBASE  SET Password ================================================
   PASSWORD CHECK BEFORE SETTING OF PROTECTION

   1  Selection   - Station    : Vaasa

   2  Please, enter the password




                                                      ┌─ Version ──
                                                      │PSWMCK P2.2
================================================================
Station:    Vaasa
Obj/Bay:    Serie 100     SPACOM protections
Unit:       SPAJ 140   Phase and neutral overcurrent relay
Mod/Part:   SPCJ 4D29  Overcurrent and earth-fault module [31]
Spawning SEND-2 (C:\SMS\BASE\SUPPORT\PSWMCK.EXE)...
                                                F8      Enter     Esc
                                                DOS     SELECT    EXIT
```

Fig. 2.4.6.A   The SMS-BASE 'Set Password' screen

  - Enter the password of the alarm module.

  - Steps 3.1 to 3.4 are the same as for data acquisition and are performed automatically. The PC displays 'Copying values from file to module' while transmitting data and 'Copying values from module to file' while receiving data.

2.4.7   Setting slave address and baudrate

The settings for slave address and baudrate can be set from the front of the SPACOM relays, although SMS-BASE does not consider them as parameters to be set. This is a deliberate restriction to prevent communication parameters from being changed by mistake. When they are changed, they have to be changed in the PC as well in the module before any communication can take place.

SMS-BASE provides three possibilities of changing the slave address:

The first is to change the address in the address register of the relay module from the module front panel by the push buttons. Then you will also have to change the address of the slave in the SMS-BASE application structure at the module level by 'UTILITIES'/'Alter application structure'.

The second is to select 'UTILITIES/'Alter additional configurations'/'SPACOM address' which enables both the current address and the new address to be entered, (described thoroughly in the SMS-BASE User's Guide). By using 'Receive parameters' or 'Send and receive parameters' will the changing of slave address take place, as well as in the module as in the SMS-BASE application structure.

The third is to set the address by selecting a terminal emulator or the SPA-terminal emulator from the 'UTILITIES' menu. In this case, the procedure is as follows.

The terminal emulators available in SMS-BASE can also be used to change the slave address and baudrate. The corresponding SPA telegrams are written manually using the emulator.

Change only one parameter at a time and check that the communication can be re-established.

In Brief:
The procedure for changing the communication parameters is:
  1   Go to the SMS-BASE main menu.
  2   Select 'UTILITIES'.
  3   Select 'Terminal emulator'.
  3.1 Set the parameters for communicating with the terminal.
  3.2 Verify that the right relay replies.
  4   Change the slave address parameter, (V200).
  4.1 Check if you can establish contact to the new address.
  5   Change the baudrate parameter, (V201).
  5.1 Check the new baudrate.
  6   Change the communication parameters in the application structure.

Steps 1, 2 and 3 are described in the SMS-BASE User's Guide.

The example below assumes that the following changes have to be made:

	BEFORE	AFTER	"SPA identity"
Slave address	31	17	V200
Baudrate	9600	4800	V201

The format of SPA telegrams is given in the SMS-BASE User's Guide.

4 Change the slave address parameter

  - Set the terminal emulator to 'string mode'.
  - Press <F3> to change the mode.

- Write	">31WV200:17:XX"	and send it with <Enter>
		Notice that the quotation marks should not be included. They are just string delimiters.
- Receive	'>31WV200:17:XX'	The command sent
	'<31A:XX'	'A' in reply for 'Acknowledge'

4.1 Check that the new address functions.

- Request the relay type as a precaution.

- Write	">17RF:XX"	Press <Enter> to send.
- Receive	'>17RF:XX'	The instruction sent.
	'<17D:SPCJ 4D29:XX'	'D' in reply for 'data'

5 Change the baudrate

  - Set the terminal emulator to 'string mode'.
  - Press <F3> to change the mode.

- Write	">17WV201:4800:XX"	Press <Enter> to send.
- Receive	'>17WV201:4800:XX'	The instruction sent.
	'<17A:XX'	'A' in reply for 'acknowledgment'

5.1 Check that the new baud rate functions.

- Set the terminal emulator to 4800 Baud.
- Set the terminal emulator to 'string mode'.
- Press <F3> to change the mode.

- Request the relay type as a precaution.

- Write	">17RF:XX"	and send it with <Enter>
- Receive	'>17RF:XX'	The command sent
	'<17D:SPCJ 4D29:XX'	'D' in reply for 'Data'

6 Change the communication parameters in the application structure.

  - Change the slave address of the module and the baudrate setting in the communication parameter settings, ('Alter application structure'/'<C>' at station level), in order to make the relay module in the application structure to agree with the settings in the relay.