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This is a User's Manual for SM/RET 521*2.1

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

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The chapter "Introduction"

This chapter introduces you to the product SM/RET 521 version 2.1.

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Introduction

Welcome to the SM/RET 521*2.1 User's manual.

SM/RET 521*2.1, is intended for parameter setting and supervision of the corresponding terminal RET 521, * 2.1. The software runs on a PC system using the DOS operating system.

For communication with a RET 521 terminal, the corresponding SM/RET 521 software module is required, i.e. it is not possible to communicate with a RET 521 terminal using another SM/ product software module.

When a REx 5xx terminal is mentioned in this User's manual, it is understood as any of the terminal types:

- RET 521 Transformer protection terminal
- REx 500 Multi functional terminal
- REL 501 Line distance protection terminal
- REL 511 Line distance protection terminal
- REL 521 Line distance protection terminal
- REL 531 Line high speed distance protection terminal
- REL 551 Line differential protection terminal
- REL 561 Line differential and distance protection terminal
- REB 551 Breaker protection terminal
- REC 561 Control terminal

The SM/RET 521 software module is part of SMS 010, hereafter simply denoted SMS (Station Monitoring System)

SMS consists of four functions:

- Parameter setting and supervision
- Disturbance recording evaluation
- Event handling
- Time synchronization

To run SM/RET 521 and other SM/... software modules, the platform program SMS-BASE is always required. Before SM/RET 521 can be used, the platform program SMS-BASE must be installed in the PC system. When SM/RET 521 is installed, it is integrated in the SMS-BASE software structure. The SM/RET 521 software module forms the library files required for SMS-BASE to communicate with RET 521.

If SMS is to be used for event and alarm handling on station level, the REPORT program must also be installed.

To fully understand the instructions given in this document, the user should be familiar with SMS-BASE. For more information regarding SMS-BASE functions, please refer to the SMS-BASE User's Guide (see Ref. 2 in chapter 4: "References").

The SM/RET 521 software module is developed and manufactured by ABB Automation Products AB, Västerås, Sweden.

0.1 Terminal parameter setting and supervision

Terminal parameter setting and supervision, sometimes also called protection/control monitoring, is a meaning for getting the same information on a PC as that available on the built-in HMI (Human-Machine-Interface) on the front of the terminal. In this case, even more information is available through the PC. This means that the SM/RET 521 program is a way to access information stored in the terminal that is not available on the built-in HMI of the terminal, e.g. time tagged disturbance report and event function settings.

0.2 Product overview

The ABB Automation Products PANORAMA concept contains a full range of flexible and functional systems for monitoring, protection, and control of all parts in the power system.

The terminals in the REx 5xx-series consist of several numerical high-performance terminals for medium and high voltage applications. Almost all information and settings available in the terminals can also be made available in a PC equipped with SMS programs. For RET 521, the CAP 531 configuration tool is also required. Since SMS supports communication via telephone modems, SMS provides a way to travel to the station over a communication link, making physical presence in the station unnecessary.

Besides the SM/RET 521 software module, there are other programs available for efficient use of the information stored in the terminals.

0.2.1**SMS software available for RET 521 terminal**

- SMS-BASE - Platform program for all SMS applications.
- REPORT - Event and alarm handling program. The program is integrated with SMS-BASE.
- SM/RET 521- Software module for setting and monitoring of the RET 521 terminal. The included FrontRECOM, which contains a part of RECOM, enables manual collection of disturbance recordings via the front port of the terminal.
- RECOM - Program for manual or automatic collection of disturbance recordings.
- REVAL - Program for manual evaluation of disturbances.

The chapter "Instructions"

*This chapter instructs the user how to install the software SM/RET 521 * 2.1 on a personal computer and how to perform some typical task when using SM/RET 521 * 2.1.*

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RET 521Installation

Before using SM/RET 521 the software has to be installed on the hard disk on a PC.

1 Introduction

1.1 About the product

SM/RET 521 is a software module used for parameter setting and supervision of the corresponding terminal RET 521. The program is delivered on two diskettes. One diskette contains the SM/RET 521 software module including specific description files for communication with RET 521, and the other diskette contains FrontRECOM for manual disturbance collection via the front port.

Note!



SM/RET 521 can only be used to communicate with the corresponding RET 521 terminal. This means that it is not possible to communicate with another type of terminal using SM/RET 521. The FrontRECOM program, however, can communicate with all existing REx 5xx terminals.

The SM/RET 521 diskette contains the following files:

INSTALL.EXE	Installation program
INSTALL.LAN	Language file for the installation
PKUNZIP.EXE	Expansion software for MODULES.ZIP
DEVICES	Additional file section to DEVICES already installed
MODULES	Empty file required by the installation program
MODULES.ZIP	Compressed configuration files
FUNCTION.ZIP	Compressed files for auxiliary functions
README.TXT	Latest information

The FrontRECOM diskette contains the following files:

INSTALL.EXE	Installation program
FONTINS.EXE	Compressed program files
README.TXT	Latest information

1.2 System requirements

The requirements specified in the following must be fulfilled for the SM/RET 521 software module to operate correctly (see also Ref. 2: SMS-BASE User's Guide in chapter 4: "References").

1.2.1 At the RET 521 terminal end:

Alternative 1; Remote and/or local SPA-bus communication:

- Terminal RET 521 with the option 'Remote communication SPA' installed.
- Optical fibre SPA-bus with opto/electrical converter.

Alternative 2; Front communication:

- Terminal RET 521.
- Front connection cable for the REx 5xx terminals.

The SM/RET 521 software module enables either reading and setting of individual parameters, or switching between preset groups of parameters in one or several RET 521 terminals. The access rights for remote setting are set via the built-in HMI of the terminal.

1.2.2 At the PC end:

- Computer: 100% IBM compatible PC
- Hard disk space: 10 Mbyte + 8 Mbyte/terminal
- Serial port (RS232): 1 port, COM1 or COM2
- Parallel port: 1 port for the printer, LPT1, LPT2, or LPT3
- Diskette drive: 1 drive, 3.5" HD-type (1.44 Mbyte)
- Work memory: 500 kbyte unused
- Operating system: DOS 6.0 or higher
- Base program: SMS-BASE, version 2.1 or higher.
- If the REPORT program is used, the version must be 2.0 or higher (used for event and alarm handling in SMS)

A PC equipped with a 386 processor is sufficient for this type of SMS application. However, for better performance a more powerful PC is recommended.

1.2.3 For communication via telephone modems:

(see Ref 2. in chapter 4: "References", SMS-BASE User's Guide, Appendix C)

- Public telephone network according to CCITT.
- Hayes compatible telephone modems that understand AT commands.

For more details on building up the hardware, see Ref. 1 in chapter 4: “References”).

SMS communication with a RET 521 terminal does not delay the protection/control function. The only effect the communication has on the protection functions is when new parameter settings are transmitted to the terminal. When new parameter settings (Settings, Configuration, Test, Event Masks) are downloaded, or when the active parameter setting group is changed, the terminal will be blocked for typically 45 seconds. This will occur each time a data part containing settable parameters is transmitted to the terminal.

1.3

The README file

The SM/RET 521 diskette and the FrontRECOM diskette include one README.TXT file each. These files contain last minute news to be added to the User’s manual, i.e. improvements made after the User’s manual was printed. The README files are delivered in uncompressed format and should both be read prior to installation.

2 Installation procedures

Installation of the SM/RET 521 and FrontRECOM programs is done by decompressing and copying files from the diskettes to the hard disk. This is normally designated 'C', but other disks can also be used. From here on, the installation procedure is assumed to be carried out from disk drive 'A:', but any other drive can of course be used instead.

To avoid any problems, installation of these DOS-based programs is to be made directly in DOS, and not via MS Windows. It is also recommended not to have shell programs like Norton Commander active during the installation.

When starting SMS-BASE and SM/RET 521 for the first time after the installation, follow the instructions in chapter "Overview" on page 31 and "General handling of SM/RET 521" on page 33.

2.1 Installing SMS-BASE

Before installation of SM/RET 521 can start, the user must make sure that SMS-BASE is installed on the PC. SMS-BASE is delivered as a separate program and the installation is described in Ref. 2.

2.2 Installing SM/RET 521

Follow the steps below to install from drive A to hard disk (C):

1 Insert the SM/RET 521 diskette into drive A.

Change the command line directory to drive A by typing a: and press <Enter>.

2 At the command line, type install and press <Enter>.

Generally <F1> can be pressed in order to present a help text, and <Esc> to exit the installation procedure.

The path of the SMS-BASE system is presented. This path can be edited. Note that the path is the location of the SMS-BASE system and not the position of the modules within the system. If the default path is to be used, just press <Enter>.

3 Press <Enter> once more to confirm the path when the cursor is placed on Yes.

The next screen displays the available unit on the diskette, i.e. the RET 521 terminal. This unit is selected by pressing <Space> or <Enter> and is then marked with an X. Press <F2> to continue the installation procedure.

- 4 Press <Enter> once more to confirm the selected unit when the cursor is placed on Yes.
- 5 When the installation is completed (and the next diskette is to be asked for), press <Esc> to exit the installation procedure.

SM/RET 521 is now properly installed on the hard disk of the PC.

After the installation, the hard drive should have the following directory structure:

```
C:\SMS\BASE\ Home directory of the system
  SUPPORT\ Support programs for SMS
  MODULES\ Descriptions
    RET521B\ Description of RET 521 parts
```

2.2.1

The SMS directory structure

SM/RET 521 is a part of the SMS software structure. It consists of a number of files and directories which are added to the SMS structure. The following file types are added into the directory C:\SMS\BASE\MODULES\RET521B:

- **.SUP** - Support files defining the programs to be called for a certain action.
- **.CNF** - Configuration files defining all terminal parameters and data types.
- **.DEF** - Initial values for terminal parameters.

2.3

Installing FrontRECOM

A diskette called FrontRECOM is included in the SM/RET 521 package. It contains a part of RECOM, which enables manual collection of disturbance recordings via the front port of the terminal.

Note!

FrontRECOM is to be installed before SM/RET 521 is used to add application elements in the SMS-BASE application structure.



Note!

Installing FrontRECOM is only required if RECOM is not installed on the PC. If RECOM is to be installed on the PC, it must always be installed as the last diskette. This means that the installation must take place in the following order:

- 1 SM/RET 521
- 2 FrontRECOM. Not necessary if RECOM is to be installed.
- 3 RECOM



2.3.1

Installation procedures

Follow the steps below to install from drive A to the hard disk (C):

1 Insert the FrontRECOM diskette into drive A.

Change the command line directory to drive A by typing **a:** and press **<Enter>**.

2 At the command line, type install and press <Enter>.

If the SMS path is C:\SMS, this is the default path. If another path is used, type **install C:\realpath** and press **<Enter>**.

If a previous version of FrontRECOM exists, the installation program shows 'An old installation of RECOM has been found on directory C:....' and abort. To install the new version of FrontRECOM, the previous version must first be uninstalled. See below. The same is valid if RECOM already is installed on the PC.

3 Press <Any key> to confirm that the installation is to continue, or press <Ctrl> and <Break> to quit.**4 When the installation is completed, press <Any key> to continue.**

The temporary directory \recomtmp which was created during the installation will now be deleted.

FrontRECOM is now properly installed on the hard disk of the PC.

Uninstallation of a previously installed version of the FrontRECOM program

A previously installed version of the FrontRECOM program can be uninstalled through the 'uninstall' command. All RECOM files are removed and the initialisation files in SMS-BASE are reset to original.

Do as follows to uninstall the program :

1 Position to the RECOM directory by typing c: and press <Enter>, then type cd\sms\recom and press <Enter>.**2 Type uninstall and press <Enter>.**

The FrontRECOM program is now being uninstalled.

Note!

Follow the same procedure as described above if the FrontRECOM version 1.4 is to be installed. This is also necessary if RECOM is to be installed on the PC.



2.6**Starting the SM/RET 521 program**

Follow the steps below to start SMS and SM/RET 521 from DOS:

- 1 Change the command line directory to C:\SMS\BASE by typing c: and then press <Enter>, type cd\sms\base and then press <Enter>.**
- 2 Type smsbase and press <Enter> to start the program.**

In order to start the program from an MS Windows icon, please refer to “Handling SMS under MS Windows” on page 75

3 Basic operation

In this chapter the work flow for some typical tasks when using SM/REx 5xx, are described.

3.1 Changing settings in a terminal



Note!

When changing parameter settings (Settings, Configuration, Test and Event Masks) or when changing active parameter setting group, the terminal will be blocked for typically 45 seconds.

3.1.1 Presenting options

The terminals consist of many different functions, of which some are basic and some are options. After having installed a new RET 521 terminal in the 'Application structure' in SMS-BASE, it will be shown as if **all** options available for the terminal type are installed. However, after having communicated with the terminal once (twice is needed in some cases), the screens will automatically be corrected to show only the functions that are currently installed. If you have prepared settings in advance, you must write them to the terminal first.

Some parts of SM/RET 521 only contain information belonging to one specific option. The first screen on such part will give information whether the option is installed or not. If not, it is recommended to remove the whole part, as described in paragraph "Removing Parts of Unit from an installation" on page 74, since it does not contain any relevant information.

3.1.2 Reading or Writing multiple parameters to or from a terminal

All parameters for a Group (Disturbance Report, Service Report, Settings, Configuration and Event Masks) can be read or written to the terminal in one step. This will allow for monitoring or setting multiple parameters in several parts of SM/RET 521, by viewing and saving changes on the PC, instead of reading or writing data to or from the terminal each time a new part of SM/RET 521 is selected. This feature is especially valuable when setting a RET 521 terminal for the first time, since the multiple write command will confirm to the user that all settings prepared in advance are downloaded to the terminal.

The multiple read or write function is available for:

- **DRP--OVER** Reads all disturbance data (in parts DRP-INDC, DRP-EVEL, DRP-TRIP) from the terminal to the PC.
- **SRV--ALL** Reads all service values from the terminal to the PC.
- **SET--ALL** Reads or writes all settings from/to the terminal to/from the PC.
- **CNF--ALL** Reads or writes all configurations from/to the terminal to/from the PC.
- **MSK--ALL** Reads or writes all event masks from/to the terminal to/from the PC.

3.1.2.1

Example of reading all settings from/to the terminal

- 1 **Select the SET--ALL part under the group 'Settings'.**
- 2 **Select 'Read ALL settings' and press <Enter>**

Terminal data is now read to all SET-xxxx parts in the PC, in the same order as the parts are listed. The part currently executed is shown in the bottom left corner of the SMS-BASE screen.

When the communication information box in the middle of the screen has disappeared and no current part is shown in the bottom left corner, all settings have been read and stored on the PC. Now, all settings in each SET-xxxx part can be viewed by selecting '**Monitor PC-file information**' for each data part

- 1 **Select the SET-xxxx part containing the settings to be viewed.**
- 2 **Select 'Monitor PC-file information' and press <Enter>.**

3.1.2.2

Example of writing all settings to the terminal

As the command 'Write ALL settings' writes all settings from the PC to the terminal, all settings in each SET-xxxx part should first be changed to the desired value. If the settings stored in the terminal are to be modified, read first all settings to the PC as described in the previous section.

- 1 **Select the SET-xxxx part containing the settings to be modified.**
Select '**Monitor PC-file information**' and press <Enter>. Change the settings, press <Esc> to leave the SET-xxxx part and press <Enter> twice to save the new settings. As all changes will be written to the terminal from the SET--ALL, it is not necessary to write the settings to the terminal, press <Esc>

- 2 Repeat the previous step for all SET-xxxx parts in which the settings are to be modified.
- 3 Select the SET--ALL part.
- 4 Select the 'Write ALL settings'

You will now be asked if you want to write the selected group to the terminal. Press <Y> and then <Enter>.

The PC-file information for all SET-xxxx parts is now written to the terminal in the same order as the parts are listed. The part currently executed is shown in the bottom left corner of the SMS-BASE screen. When the communication information box in the middle of the screen has disappeared and no current part is shown in the bottom left corner, all settings have been written to and stored in the terminal.

The settings will be automatically read back to the PC for each SET-xxxx part, after the settings have been stored in the terminal. You can now verify the downloaded settings by selecting '**Monitoring PC-file information**' for each SET-xxxx part and check that the '**Present values**' stored in the terminal are the same as the '**New values**' that was entered in the PC.

Note!



The write command that downloads ALL data parts is NOT password protected. Delete the xxx--ALL parts from the application structure if the ability to write ALL data parts without password is to be omitted. To uninstall the parts, see paragraph "Removing Parts of Unit from an installation" on page 74

3.2

Alternating between setting groups

- 1 Select the 'SET-ACTI Change Active SetGroup' part.
- 2 Select 'Read present group No. to PC-file' to check which setting group is currently active.
- 3 Select 'Enter new group No.' to monitor the active setting group and to enter the new one.

On the top, the 'Remote change' shows 'OPEN' if change of active group is possible from SMS.

- 4 Select 'New group - Active setting group' by pressing <Enter>, selecting the new group and the press <Enter> again.

When the new group is entered, leave the editor by <Esc> and answer yes <Y> to the following questions by pressing <Enter> twice.

- 5 Select 'Write new group No. to terminal' and press <Enter>.
- 6 Enter the correct password and press <Enter>.
- 7 Press <Enter> again to proceed.

When the active setting group is changed, the terminal will be blocked for typically 45 seconds.

3.3

Setting RET 521 terminal time

The terminal has an internal real time clock including full-time, i.e. date and time. The clock can be checked, and set from SM/RET 521 on a minute basis. The setting of the terminal time is not affected by the setting restrictions ('OPEN'/'BLOCKED') in the terminal. The format of the time is YY-MM-DD HH.MM:SS.

Use the following work flow to check and, if necessary, set the RET 521 terminal time:

- 1 Check and set the date and time of the PC (if necessary).
- 2 Read the internal time of the terminal by means of 'SET-TIME'.
Select 'Read terminal time to PC-file' followed by 'Enter new time setting'.
- 3 Compare the 'Terminal Time' on screen 1 with the 'PC-file Time' to check if the terminal time should be corrected.
- 4 Enter the full date and time.

Add a few minutes to the time entry, e.g., if the time is 10.44 when the string is entered, set the 'Terminal Time' to 10.46.

-
- 5** When the new time is entered, leave the monitor mode immediately by pressing <Esc> and answer yes (Y) to the following questions by pressing <Enter> twice.
 - 6** Select 'Write new time setting to terminal'.
 - 7** Enter the correct password and press <Enter>.
Wait until 10.45.58.
 - 8** Press <Enter> to leave the password function and to start the communication process.
 - 9** Check the new RET 521 terminal time by means of 'SET-TIME'.
Select 'Read terminal time to PC-file' followed by 'Enter new time setting'. Compare the read Terminal Time with the PC-file Time.

For accurate setting of the terminal time it is recommended to utilise the local HMI, since the communication procedure in SMS makes accurate setting of time difficult.

3.4

Storing disturbance data

The easiest way to store disturbance data is to use the report facility and store the screens either on paper or in a text file. This facility is useful since only one disturbance at a time can be selected in the DRP-OVER part for detailed information in the other DRP-... parts.

Follow this procedure when storing information in a file :

- 1 **Select one of the 10 disturbances in the DRP-OVER part for more detailed information.**

See also paragraph "DRP-OVER Disturbance Overview" on page 54.

- 2 **Select, for example, the DRP-INDC part for information regarding the indications during the selected disturbance.**
- 3 **Select 'Read terminal data to PC-file' and then 'Monitor PC-file information'.**
- 4 **The selection 'F7 REPORT' is given at the bottom of the screen.**

Press <F7> to display a selection list as shown in the following figure.



Fig. 1 Selection list obtained by pressing <F7>.

- 5 **Select 'Report all screens to file'.**

All the information on the screens in the current Part of Unit will now be stored in a file given a name set by the date of the PC, and the extension .SRP.

- 6 **By selecting 'Start DOS-shell at file directory', the path to the directory where the file is stored is given.**

Information on the file can be accessed using, for example, the 'DOS-Edit' editor, i.e. by typing 'edit 940904_0.SRP' at the DOS-prompt.

For more information regarding these facilities, refer to the SMS-BASE User's Guide (see Ref. 2 in chapter 4: "References").

3.5 Using REPORT with SM/RET 521

The REPORT program is used for event, alarm and log reporting on station level. The REPORT program is integrated with SMS-BASE and polls up to 16 defined stations in the application structure for events, alarms and log values. The result is presented to the user in form of logging files and screens.

A complete REPORT system for an application comprises protection relays/terminals, a SRIO 500/1000 M data communicator, or SACO annunciator unit a PC with SMS-BASE installed, REPORT and SM/... product/-s. REPORT communicates with the relays/terminals via the SRIO/SACO unit. REPORT synchronises the operation of the entire system.

To use the REPORT program for a RET 521 terminal, the corresponding software module SM/RET 521 and SMS-BASE must be installed. SM/RET 521 contains the necessary event, alarm and logging parameter tables for the RET 521 terminal for handling REPORT data in the REPORT station.

Only the parts that are specific for using SM/RET 521 together with REPORT is described in this User's Guide. For installation, configuration and general use of the REPORT program, refer to the REPORT User's Guide (see Ref. 4 in chapter 4: "References").

3.5.1 Configuring Event and Alarm tables

To configuring event, alarm and log handling for SM/RET 521, select '**Alter additional configurations**' in the '**UTILITIES**' menu.

- 1 Select the 'Organization', 'Station', 'Object' and then the 'Unit' to configure. Press <Enter>.
- 2 Select 'Event/Alarm Tables', and press <Enter>.

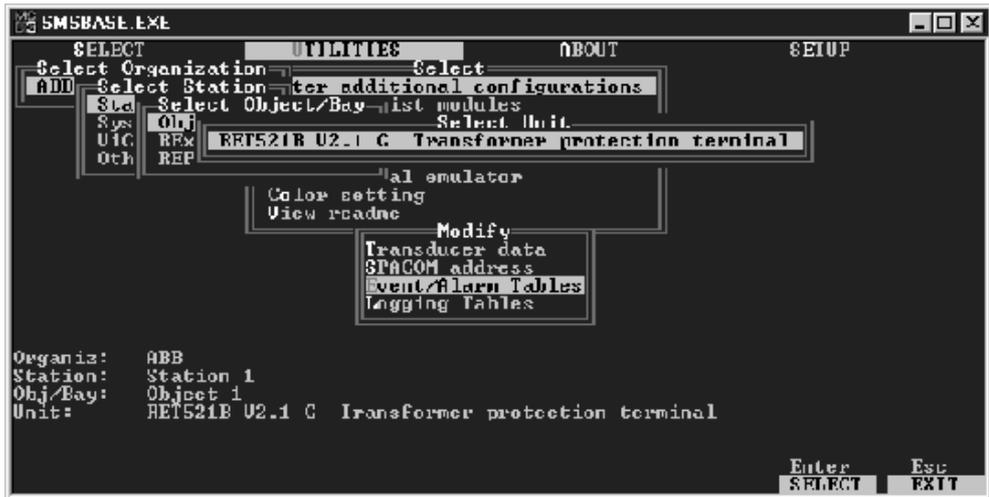


Fig. 2 Selection of Event/Alarm Tables.

- 3 Select the first Part of Unit, 'TRM-OVER Terminal Overview', and press <Enter>. The following screen will appear:



Fig. 3 Event/Alarm Tables for RET 521.

The following events and alarms for the RET 521 terminal can be configured in these 31 screens.

- Special SPA Events.
- All single events and double indications for Event Functions 01-06 (i.e. Event Function 07-12 cannot be used together with the REPORT program).

The settings in the event/alarm parameter table determine which events should be reported, which events are defined as alarms, should audible alarms be given and should SACO annunciators be reset. The event/alarm texts as well as the channel description can also be edited.

Refer to the 'REPORT User's Guide' (see Ref. 4 in chapter 4: "References") for further information.

3.5.2

Configuring Logging Tables

To configure the logging handling, enter the 'Logging Tables' for the selected unit.

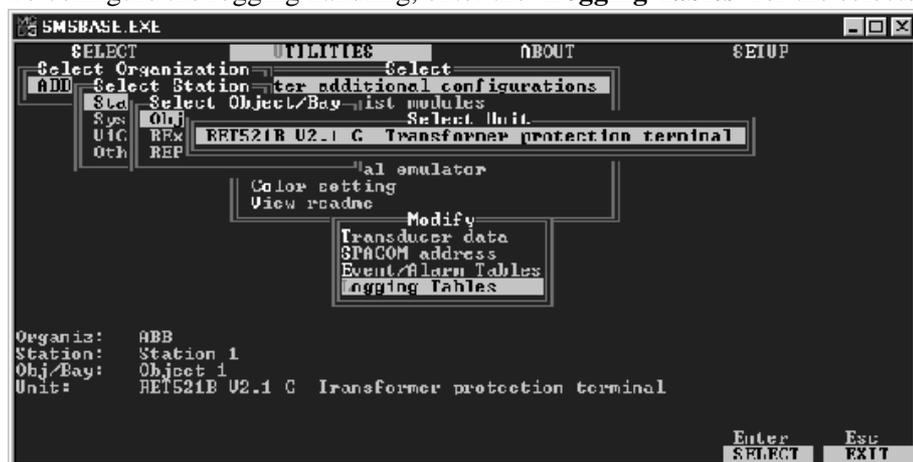


Fig. 4 Selection of Logging Tables.

- 1 Select the first Part of Unit, 'TRM-OVER Terminal Overview', and press <Enter>. The following screen will appear:

Code	Addr	Parameter description	Show Logging
0F	1	SPABUS slave type	Yes
0V200	1	SPABUS slave number	Yes
7I201	1	OVEX - V/Hz	No
7I210	1	FRME - f	No
7I213	1	REF1 - Idiff	No
7I214	1	REF1 - Tbias	No
7I217	1	REF2 - Idiff	No
7I218	1	REF2 - Tbias	No
7I221	1	REF3 - Idiff	No
7I222	1	REF3 - Tbias	No
7I225	1	DIFP - Tbias	No
7I226	1	DIFP - IdiffL1	No
7I227	1	DIFP - IdiffL2	No
7I228	1	DIFP - IdiffL3	No
7I231	1	THOL - I measured	No

Mod/Part: RL1521B TRM-OVLR Terminal overview [1]

PgDn PgUp Space F7
PREV NEXT TOGGLE REPORT

Fig. 5 Logging Tables.

The following logging values for the RET 521 terminal can be selected to be logged on these 8 screens. (Note that the logging parameter description cannot be edited.)

- SPABUS slave type and number.
- Analog input phasors.
- mA input values.
- Analog values

Refer to the 'REPORT User's Guide' (see Ref. 4 in chapter 4: "References") for further information.

The chapter "Technical description"

*This chapter describes the possibilities the SM/RET 521 * 2.1 gives.*

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Extensive Operation

This chapter presents all possibilities offered by the functions in SM/RET 521. The menus that form the SM/RET 521 user interface are presented with an explanation of the contents and how to operate them.

1

Overview

The following activities are typical when using SM/RET 521:

The user:

- Creates and maintains an application structure.
- Establishes communication contact via telephone modems or direct connection.
- Selects from the application structure the terminal to work with.
- Orders data to be sent from the terminal to the PC, by selecting '**Read terminal data to PC-file**'.
- Observes the presented data by selecting '**Monitor PC-file information**', or reads the information sent from the terminal.
- Orders new data to be sent from the PC to the terminal by selecting '**Write PC-file settings to terminal**'. The 'write' procedure is automatically followed by a verification procedure, so that the settings are changed correctly.

The SMS-BASE program is a standard DOS application consisting of the following parts:

1 Function keys:

- <Esc>EXIT from current menu.
- <F7>REPORT generation, i.e. printing of screens.
- <F8>Start a DOS window.
- <PgDn>Display NEXT screen.
- <PgUp>Display PREVIOUS screen.
- <Enter>CHANGE value.

2 Menu items:

The menus offer a number of functions which are explained in the SMS-BASE User's Guide (see Ref. 2 in chapter 4: References).

When a terminal is selected on the unit level, a list of functional groups is shown. Each group contains the different parts of the terminal. The user selects group by pressing <Enter> and the parts within the group are shown. The user can then select any of the parts by pressing <Enter> and perform actions in order to display or modify information related to the selected part.

The user can:

- Read settings and information from the terminal.
- Monitor settings and information stored in the PC.
- Write settings to the terminal.
- Generate and print reports.

When data is written to the terminal, a password has to be entered by the user. The password check assumes one password common to all the units in one station. Communication to the terminals is performed through the SPA-bus protocol.

1.1

Navigating through the SMS structure

The 'SELECT' menu includes the application structure built with the 'Alter application structure' function or installed from a diskette. The application structure fulfils its task by means of mapping the real world hierarchy of 'Organization', 'Station', 'Object', 'Unit', 'Groups' and 'Part of Unit' into the directory structure. Use the <Arrow>, <Home>, <End>, <PgUp>, and <PgDn> keys to navigate through the application structure. Press <Enter> to select an item in the structure. Press <Esc> to return from a selected item in the structure.

1.2

Changing application structure

To change the application structure, select 'Application structure path' in the 'SETUP' menu. The path to the application structure is by default:

C:\SMS\DATA-EX.

1.3

Altering application structure

To work with the application structure, select 'Alter application structure' in the 'UTILITIES' menu. When SMS-BASE is taken into operation for the first time, a new application structure must be built.

2 General handling of SM/RET 521

In this section the general handling of SM/RET 521 is described.

2.1 Setting restrictions

Remote setting restrictions (i.e. via the rear ports) is set on the RET 521 built-in HMI, which may, or may not, disable the possibility to set parameters in the RET 521 terminal from SMS. However, parameters and information can always be read.

Setting of the access rights can only be done via the built-in HMI.

The access rights have the following alternatives:

Access rights on remote (rear) communication ports

Switching between setting groups	Open or Blocked Setting made under the <i>Configuration/SPA Comm/Rear</i> menu
Setting of individual parameters	Open or Blocked Setting made under the <i>Configuration/SPAComm/Rear</i> menu

No setting restrictions can be set for communication via the front port of the terminal. For instructions on how to communicate via the front port, see paragraph “Communicating via the RET 521 front port” on page 17.

Access rights on front communication port

Switching between setting groups	Always Open
Setting of individual parameters	Always Open

2.2

Password handling

A password must be entered as an introduction to each activity that can change the settings of the protection terminal. The password is the same for all terminals in one station. This means that if the password is changed during communication with one terminal, the new password is valid for all terminals in that station. Remote setting activities are allowed according to the setting restrictions set via the built-in HMI on the RET 521 terminal.

The default password for a new station is:

000

Only digits can be used.

Note!

The SET--ALL, CNF--ALL and MSK--ALL parts have no password handling. This means that these parts can write data to the terminal without entering any password. To inhibit this function, the SET--ALL, CNF--ALL and MSK--ALL parts should be removed from the structure as described in paragraph "Removing Parts of Unit from an installation" on page 74.



2.3

Configuring functions and logical elements

The terminal configuration of all application functions and logical elements is performed using the CAP 531 Configuration Tool (CAP/RET 521). No configuration of the application functions and logical elements is available in SM/RET 521.

3 Handling of 'Parts of Unit' in SM/RET 521

In this section an overview of all SM/RET 521 parts is given. Some data parts are described more thoroughly in the following sections.

Prior to the first communication session with the terminal, the information is presented as if all options are installed. The reason is that it must be possible to prepare all settings in advance. However, after having communicated once with the terminal the data entry fields belonging to options not installed are removed.

In the table below all '**Parts of Unit**' in SM/RET 521 are listed. For each data part a description together with the screen contents is presented.

References:

1MRK504 012-UEN, Technical descriptions manual RET 521*2.1.

3.1 Terminal Overview

This part contains basic information on the terminal. It gives the same overview of the terminal front panel that a visitor would get when visiting the station.

Screen contents	Description
TRM-OVER <ul style="list-style-type: none"> • Terminal overview - HMI LEDs, Modules • Communication, Analog Inputs • Installed Protection & Control Functions • Function Selectors and Transformer Side Configuration 	<p>This part gives the same overview of the terminal front panel that a visitor would get when visiting the station.</p> <p>See chapter "Terminal Overview" on page 49 in the chapter "Technical description".</p>

3.2

Disturbance Report

The disturbance report menu gives the user all information recorded by the terminal for the last ten disturbances after the last clearing of the disturbance recorder memory.

Screen contents	Description
DRP-OVER <ul style="list-style-type: none"> • Overview • Conditions 	<p>This part contains information about the last 10 disturbances stored in the terminal.</p> <p>See paragraph "DRP-OVER Disturbance Overview" on page 54 in the chapter "Technical description".</p>
DRP-INDC <ul style="list-style-type: none"> • Indications 	<p>Indications that appeared during the recorded disturbances, for each disturbance record separately. Indications recorded by the disturbance reporting unit are selectable during the configuration procedure.</p> <p>See paragraph "DRP-INDC Indications" on page 59 in the chapter "Technical description" for detailed information.</p>
DRP-EVEL <ul style="list-style-type: none"> • 150 Events list 	<p>Contains information on events during the disturbance selected in DRP-OVER.</p> <p>See paragraph "DRP-EVEL 150 Events List" on page 61 in the chapter "Technical description" for detailed information.</p>
DRP-TRIP <ul style="list-style-type: none"> • Trip values 	<p>Trip values are presented as phasors, value and phase angle of the currents and voltages, before and during the fault.</p> <p>See "DRP-TRIP Trip values" on page 63 in the chapter "Technical description" for detailed information.</p>
DRP-CLRS <ul style="list-style-type: none"> • Clears and Manual trig 	<p>Manual triggering of a disturbance recording is possible in this data part. Clears away all the disturbances in the terminal and LEDs.</p> <p>See paragraph "DRP-CLRS Clears and Manual trig" on page 65 in the chapter "Technical description" for detailed information.</p>
RECOM REX5XXV1 <ul style="list-style-type: none"> • Unit disturbance summary 	<p>This program makes it possible to collect the disturbance recordings stored in the terminal, in the PC. Contains the disturbance date and sequence number, the triggering signal and if it is also stored in the PC, or only in the terminal.</p> <p>See paragraph "RECOM REX5XXV1 Unit disturbance summary" on page 66 in the chapter "Technical description" for detailed information.</p>

3.3

Service Report

In this data part, information on the operating conditions in question for protected objects in the power system, as well as information on the terminal itself, is available. The service values are the currently measured values in the protection terminal at the time of communication with the terminal.

Screen contents	Description
SRV--ALL <ul style="list-style-type: none"> • Read ALL Service Values 	This part allows reading of all service reports data sequentially from the terminal.
SRV-ALOG <ul style="list-style-type: none"> • TransfDiff • Time OverCurrent • VoltageControl • Earth Fault • Restricted EF • Time OverVoltage • Time UnderVoltage • OverExcitation • ThermOverLoad • FreqMeasurement • Analog Inputs • Trig Status 	Contains the service values for the analog inputs and protection functions. Only the functions installed in the terminal are shown.
SRV-LGP1 <ul style="list-style-type: none"> • Logic Trip • TransfDiff • VoltageControl • Time OverCurrent 1..3 • Earth Fault 1..3 • Restricted EF 1..3 • Time UnderVoltage 1..3 	Contains the service values for the logical signals and protection functions. All signals that are active will be marked with a square. Only the functions installed in the terminal are shown.

<p>SRV-LGP2</p> <ul style="list-style-type: none"> • Time OverVoltage 1..6 • OverExcitation • DisturbRecorder • FreqMeasurement • ThermOverLoad • Time • Internal Signal • Fourier Filters • Binary Converter • Test 	<p>Contains the service values for the logical signals and protection functions. All signals that are active are marked with a square. Only the functions installed in the terminal are shown.</p>
<p>SRV-MIMV</p> <ul style="list-style-type: none"> • mA Input Values 	<p>Contains the service values for the "mA Input Module" installed in the terminal. If the module is not installed, the fields for the module are empty. For each module the slot position for where the module is installed is shown.</p>
<p>SRV-AIM2</p> <ul style="list-style-type: none"> • Analog Values AIM1 • Analog Values AIM2 	<p>Contains the service values for the analog I/O installed in the terminal, maximum 2 AIM modules. If a module is not installed, the fields for that module are empty.</p>
<p>SRV-IOn</p> <ul style="list-style-type: none"> • Binary I/On Inputs and Outputs 	<p>This part contains the service values for the input and output signals of the I/O modules, maximum 4 modules, including MIM. The modules must first be installed in the terminal.</p>

3.4

Settings

This data part is for setting of different parameters within the built-in protection and automation functions, as well as for those in the disturbance reporting unit.

Note!

If remote change of settings is blocked in the terminal, it is not possible to change any parameter from SMS, even if new settings are sent to the terminal. The terminal will not accept them.

Screen contents	Description
SET--ALL <ul style="list-style-type: none"> • Write-Read ALL Settings 	This part allows reading or writing of all settings to or from the terminal. The 'Read ALL settings' and 'Write ALL settings' do not include the SET-ACTI and SET-TIME parts.
SET-ACTI <ul style="list-style-type: none"> • Change Active Set-Group 	The Active Setting Group' shows which setting group is currently active in the terminal and when it was activated. An identification string for each of the 4 setting groups is shown along with the data when the setting group was stored in the terminal. The identification string is set in SET-GRnA Screen 1. If a new string is set in SET-GRnA, it cannot be read in the SET-ACTI until it is transmitted to the terminal and read back with SET-ACTI.
SET-COPY <ul style="list-style-type: none"> • Copy setting groups 	Copies all the defined settings from one group to the other. When several data parts exist for each setting group, all will be copied. This process does not include communication with the terminal, which means that to save this settings in the terminal, a "write" has to be performed. This can be done from the "SET--ALL" data part or from the "SET-GRn" data part to which the settings were copied.
SET-GRnA <ul style="list-style-type: none"> • Transformer Data • Transformer Differential • Voltage Control • Time Overcurrent 1..3 	All setting regarding the protective functions in the terminal is done in the SET-GRnX part.

<p>SET-GRnB</p> <ul style="list-style-type: none"> • Restricted Earth Fault 1..3 • Earth Fault 1..3 • Time OverVoltage 1..6 • Time UnderVoltage 1..3 • Thermal Overload • OverExcitation 	<p>All setting regarding the protective functions in the terminal is done in the SET-GRnX part.</p>
<p>SET-DREP</p> <ul style="list-style-type: none"> • Dist.Rep Unit, Sequence number, Sampling Rate, Recording times • Binary Signals - Input 1..12 • Binary Signals - Input 13..24 • Binary Signals - Input 25..36 • Binary Signals - Input 37..48 	<p>Settings of the basic disturbance reporting functions in the terminal are done in this part. By setting the operation equal to On or Off, the user can determine whether the disturbance reporting unit is to be active or not. Different recording times, e.g. pre-fault, post-fault and limit time, are settable in this submenu. The programming of the triggering functionality and the masking of the binary signals are to allow local man machine communication.</p>
<p>SET-ASIG</p> <p>Analog signal recording and triggering</p> <ul style="list-style-type: none"> • Name and Nominal value • Recording and Triggers • Frequency source 	<p>All settings of the analog signals in the Disturbance recorder function in the terminal are done in this part. This means that if the 'Disturbance recorder' function is not installed, the entire part can be removed. If necessary, the triggering mode (overfunction, underfunction and Off-mode) and the recording mode for up to ten analog signals can be selected.</p>

<p>SET-MIM 1</p> <p>mA Input Module 1</p> <ul style="list-style-type: none"> • Operation, Sampling Rate • Input 1 • Input 2 • Input 3 • Input 4 • Input 5 • Input 6 	<p>The settings of the 'mA Input Modules' are done in this part. The mA Input Module must be installed in the terminal. If not, the entire part can be removed as shown in paragraph "Removing Parts of Unit from an installation" on page 74 in the chapter "Technical description".</p>
<p>SET-TIME</p>	<p>The terminal has an internal real time clock including full-time, i.e., date and time. The clock can be checked, and set from SMS on a minute basis. The settings of the Terminal Time depends on the values of CoarseTimeSource. The Terminal Time can be set via SMS only when CoarseTimeSource=SPA. CoarseTimeSource can only be set via local HMI.</p>

3.5

Terminal Status

This menu gives the user information on the terminal itself.

Screen contents	Description
<p>TRM-STAT</p> <p>InternalEvents - SelfSuperv</p> <p>Terminal Status:</p> <ul style="list-style-type: none"> • Internal events - 1..40 • Observed modules - Article number, revision • Noted modules - Article number, revision • Users Notes • Self supervision information • Function Status 	<p>The self supervision facilities inform the user about faults detected in the terminal itself or within any of the built-in protection functions.</p> <p>The identity of the terminal consists of information on the terminal's serial number, ordering number and software and hardware versions of different software functions and hardware modules.</p> <p>See chapter "TRM-STAT InternalEvents - SelfSuperv" on page 69 in the chapter "Technical description" for detailed information.</p>

3.6

Configuration

This menu handles the user-specific configuration of a terminal.

Note!

The write command that downloads ALL configuration data parts is NOT password protected. Delete the CNF--ALL part from the application structure if the ability to write or read ALL data parts without password is to be omitted. To remove the part from the application structure see paragraph "Removing Parts of Unit from an installation" on page 74 in this chapter "Technical description".

Screen contents	Description
CNF--ALL Write-Read ALL Configurations Up/download routine.	This part allows reading or writing of all configuration data from or to the terminal.
CNF-ALOG Analog - I/O - Comm <ul style="list-style-type: none"> • Identifiers, Frequency Reference Channel • Analog I/O-Modules 1..2 • Binary I/O-Modules 1..4 • Time Synchronisation Source, SPABUS communication • LON communication 	The configuration regarding the analog inputs and I/O-modules is done in this part. Information about the communication and time synchronisation is also presented. The LON communication configuration and setting restrictions are shown in this data part.
CNF-BMMI Built-in HMI menus <ul style="list-style-type: none"> • Service Report menu • Disturbance Report and Settings menus • Terminal Status and Configuration menus • Command and Test menus 	The configuration of the menus of the built-in HMI of the terminal is done in the CNF-BMMI part.

3.7

Test

This menu is for testing purposes. The user can block the sending of alarm signals to the control centre during the testing activities. It is possible to block the operation of the disturbance reporting unit so as not to overload the memory with operations caused by the secondary injection testing.

Screen contents	Description
TST-MODE Test - Block functions <ul style="list-style-type: none">• Test• Block Functions	All settings regarding the Test function are done in the TST-MODE part: <ul style="list-style-type: none">• Set the terminal in test mode• Block selected functions during test mode• Set the Disturbance report to On or Off during test mode.

3.8

Event Masks

**Note!**

The write command that downloads ALL event mask data parts is NOT password protected. Delete the MSK--ALL part from the application structure if the ability to write or read ALL data parts without password is to be omitted. To remove the part from the application structure, see paragraph "Removing Parts of Unit from an installation" on page 74 in this chapter "Technical description".

Screen contents	Description
MSK--ALL Write-Read ALL Event Masks <ul style="list-style-type: none"> • Up/download routine. 	The part MSK--ALL allows reading or writing all 'Events Masks' from or to the terminal.
MSK-EV03 Event function 1..3 - Report <ul style="list-style-type: none"> • Set Event Functions reporting • Event Function 1 • Event Function 2 • Event Function 3 	The 'Event function reporting' and the masking of 'Event functions' for the SPA events polled by SCS and REPORT in SMS are done in the MSK-EV nn part The setting in the MSK-EV nn part is only valid for the SPA events and will therefore not affect the events in disturbance recording presented in the DRP-EVEL part.
MSK-EVnn Event function $nn..nn$ <ul style="list-style-type: none"> • Event Function n 	
MSK-ANEV Event Mask for Analog Events <ul style="list-style-type: none"> • mA Input Module 1-Voltage Control 	The masking of 'Analog Events' for the SPA events used by SCS (Station Control System) is done in the MSK-ANEV part.

4 General Display Layout

4.1 Screen layout for settable quantities

All the layouts of screens with settable quantities are designed similarly. They have four columns, the parameter name, 'Present values', 'New values' and 'Unit'.

The 'Present values' column shows the actual settings of the RET 521 terminal at the time of the last reading from the terminal. The date and time stamp shows when the 'Present values' were transmitted to the PC.

The 'New values' are the modifiable values. The user can change the values and send them to the terminal. The 'PC-file' date and time stamp shows when the settings were last stored in the PC.

The representation of time and date, i.e. 'PC-file time', depends on the specified country code in the CONFIG.SYS file in the PC.

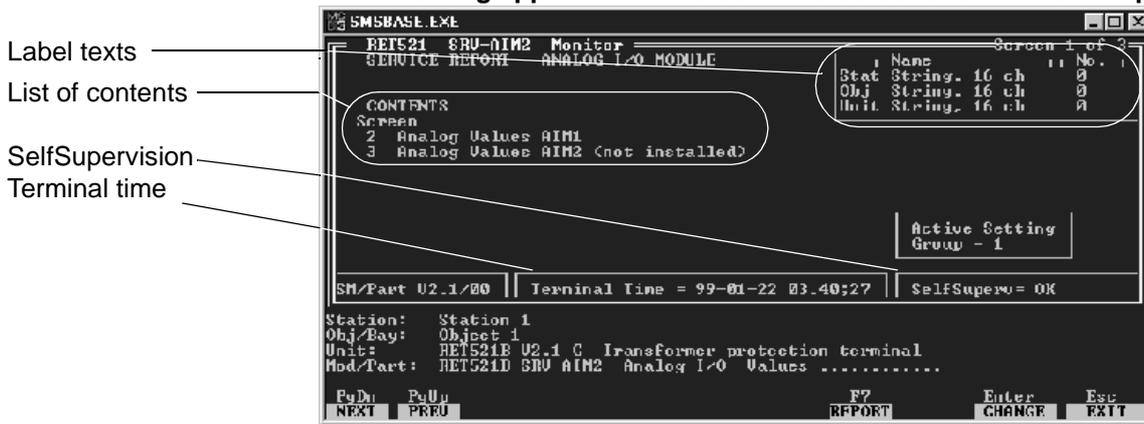
For most settable parameters, a help text is displayed at the bottom line of the screen. The help text gives the user a more detailed description of the parameter along with the setting range, if applicable. The text is displayed when the user positions the cursor to the parameter field which has a defined text. The help text changes with the cursor positioning.

A warning text can be displayed in the first screen, the contents screen, for some data parts. The warning text appears at the left top area of the screen giving information about errors and actual conditions in the terminal.

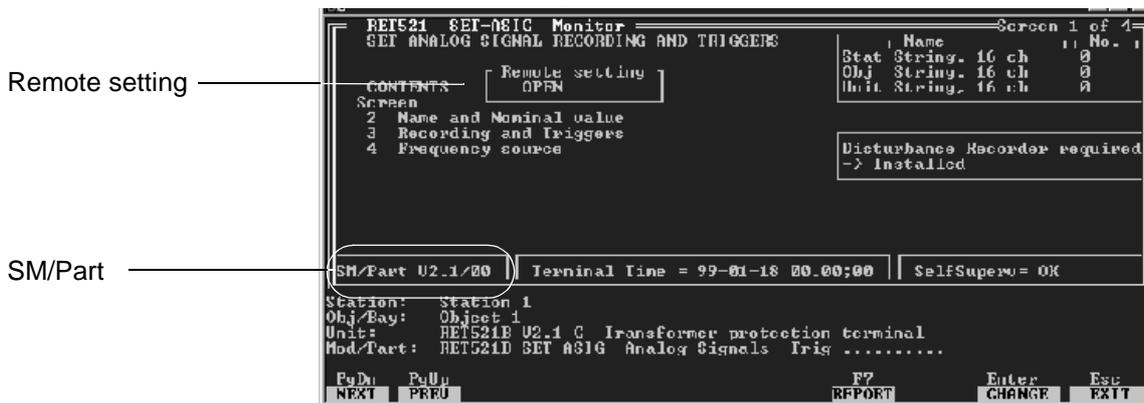
If the 'Remote setting restrictions' is selected to be blocked in the terminal, it is only possible to monitor the settings from SMS. If the user tries to transfer new parameters to the terminal when remote settings are blocked, the terminal will not accept them. In each part where settings can be made, it is shown whether remote setting is 'OPEN' or 'BLOCKED'. Commands like 'Clear Disturbance Reports' and 'Clear Counters' are not affected by the 'Remote setting restrictions', i.e. they can always be executed.

4.2 Contents Screens

The following applies to all the contents screens for all the data parts:



- If the terminal is in test mode, this will be indicated with the text 'WARNING TESTMODE ACTIVE'.
- In the first line the name of the terminal, the name of the data part and the performed function (read, monitor) are shown.
- A list of contents is presented to inform about the contents on the following screens.
- 'Stat', 'Obj' and 'Unit' shows the station, object and unit numbers and associated label texts.
- 'Terminal Time' shows the real time clock value of the terminal at the end of the last terminal reading of this data part. The format of the time is YY-MM-DD HH.MM:SS.
- 'SelfSuperv' presents a summarised status of the terminal. Normally it should indicate 'OK', but if the self supervision has detected any fault, 'WARNING' or 'FAIL' will be shown.



- In the upper part of the screen 'Remote setting' indicates whether remote change of the parameters is allowed ('OPEN') or not ('BLOCKED') in the connected terminal. The restriction is set with the built-in HMI on the terminal and cannot be changed from SMS.
- 'SM/Part' shows the file version number.

4.3 Other examples

Terminal time

Installed modules

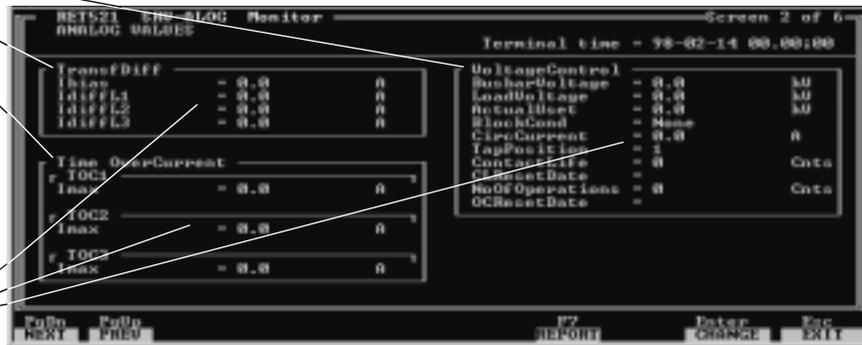
- Only the functions installed in the terminal will be shown.



- Additional information, like Module type and Status are shown in another box.
- 'Terminal' shows the real time clock value of the terminal at the end of the last terminal reading of this data part. The format of the time is YY-MM-DD HH.MM:SS.

Functions

Values for the displayed functions



- The information is grouped in different functions.
- The information presented is the values that were valid at the moment of reading from the terminal.



- ‘Terminal’ is the time of last change when saving information in the terminal.
- ‘PC file time’ is the time of the last saving of new values in the PC.
- Positioning the cursor in the new values of a parameter shows a help line related with that parameter.

5 Terminal Overview

5.1 TRM-OVER Terminal overview

The part TRM-OVER contains basic information on the terminal. This part gives the same overview of the terminal front panel that a visitor would get when visiting the station. Since the amount of information being transferred from the terminal is limited, reading the terminal overview can be used as a fast check to verify that the communication with the terminal is working correctly. Note that it is not possible to set any parameter in the TRM-OVER part.



Fig. 1 TRM-OVER Screen 1

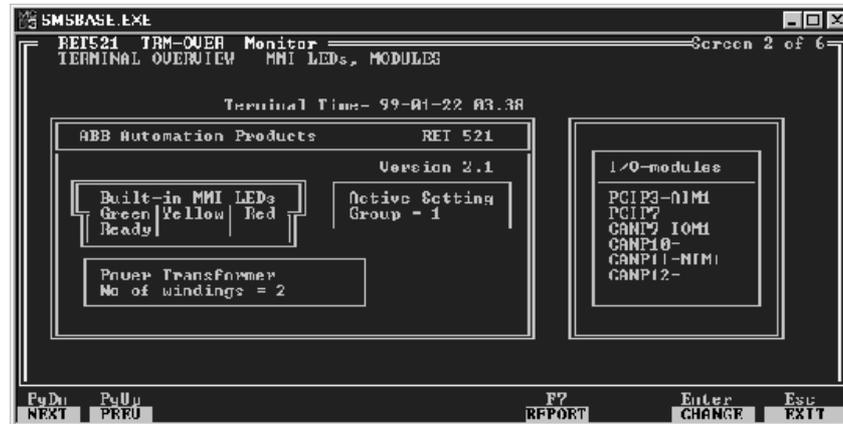


Fig. 2 TRM-OVER Screen 2

Screen 2 - Information presented

- The product name 'RET 521' and the version number 'Version 2.1' are displayed together with the information on which setting group is active in the terminal.
- 'Built-in MMI LEDs' shows the status of the three LEDs on the built-in HMI of the terminal.
- The 'Green' LED signifies:
'Ready' which means that the terminal is in operation, or
'Fail' if the internal fail signal is activated.
- The 'Yellow' LED signifies:
'Start' Disturbance Report triggered,
'Test' if the terminal is put in test mode, and
'-' otherwise.
- The 'Red' LED signifies:
'Trip' Trip command issued from a protection function,
'Conf' if the terminal is in configuration mode, and
'-' otherwise.
- If the terminal is in test mode, this will be indicated with the text 'WARNING TESTMODE ACTIVE'.
- 'I/O-Modules' shows a list of hardware slots and the installed I/O-module in each slot.

```

RETS21 TRM-OVER Monitor                               Screen 3 of 6
TERMINAL OVERVIEW - COMMUNICATION, ANALOG INPUTS      Terminal Time= 98-02-14 00.00

TIME SYNCH SOURCE                                     FRONT COMMUNICATION                                     REAR COMMUNICATION
Fine = None                                           r SPA                                                    r SPA
Coarse = None                                         Slave No = 1                                             Slave No = 1
Status = OK                                           BaudRate = 9600 b/s                                     BaudRate = 9600 b/s

AIM1 VALUES                                         AIM2 VALUES                                             r LON
AIM1-CH01 = 0 a                                       AIM2-CH01 = 0 a                                         DomainID = 0
AIM1-CH02 = 0 a                                       AIM2-CH02 = 0 a                                         SubnetID = 0
AIM1-CH03 = 0 a                                       AIM2-CH03 = 0 a                                         NodeID = 0
AIM1-CH04 = 0 a                                       AIM2-CH04 = 0 a                                         Neuron = Not loaded
AIM1-CH05 = 0 a                                       AIM2-CH05 = 0 a                                         Location = No
AIM1-CH06 = 0 a                                       AIM2-CH06 = 0 a
AIM1-CH07 = 0 a                                       AIM2-CH07 = 0 a
AIM1-CH08 = 0.0 kU                                     AIM2-CH08 = 0.0 kU
AIM1-CH09 = 0.0 kU                                     AIM2-CH09 = 0.0 kU
AIM1-CH10 = 0.0 kU                                    AIM2-CH10 = 0.0 kU
                                                         r Setting Restrict
                                                         Active Grp = BLOCKED
                                                         Settings = OPEN

PgDn PgUp F7 Enter Esc
NEXT PREU REPORT CHANGE EXIT

```

Fig. 3 TRM-OVER Screen 3

Screen 3 - Information presented

- ‘Terminal Time’ shows the real time clock value of the terminal at the end of the last terminal reading of this data part. The format of the time is YY-MM-DD HH.MM:SS.
- ‘FRONT COMMUNICATION’ shows the ‘SPA’ configuration, i.e. slave number and baud rate of the front port on the terminal.
- ‘REAR COMMUNICATION’ shows the ‘SPA’ configuration, i.e. slave number and baud rate of the rear SPA port on the terminal. The ‘LON’ configuration is also shown, i.e. domain Id, subnet Id, node Id, neuron load status and location configuration.
‘Setting Restrict’ ‘OPEN’ = remote setting allowed, and ‘BLOCKED’ = remote setting not allowed. These setting restrictions can only be set on the built-in HMI and are valid for both rear ports of the terminal.
- ‘TIME SYNCHRONISATION SOURCE’ shows if ‘LON’ or ‘SPA’ is selected for synchronisation of the internal real time clock. Alternatively, the time synchronisation can be performed via a minute-pulse to a binary input of the terminal. The status of the time synchronisation source is shown and should indicate ‘OK’.

Note!

If any function is not installed in the terminal, the corresponding part of the screen will be empty or show ‘Not installed’.



```

RET521 TRM-OVER Monitor                               Screen 4 of 6
TERMINAL OVERVIEW - INSTALLED FUNCTIONS                Terminal Time= 98-02-14 00.00

  Installed Protection & Control Functions
  -----
  DIPP-Transformer Differential
  UCTR-Voltage Control, Single
  TOC1-Time OverCurrent 1, Dir
  TOC2-Time OverCurrent 2, Dir
  TOC3-Time OverCurrent 3, Dir
  REF1-Restricted Earth Fault 1
  REF2-Restricted Earth Fault 2
  REF3-Restricted Earth Fault 3
  TEF1-Earth Fault 1, Dir
  TEF2-Earth Fault 2, Dir
  TEF3-Earth Fault 3, Dir
  TUU1-Time UnderVoltage 1
  TUU2-Time UnderVoltage 2
  TUU3-Time UnderVoltage 3
  TOU1-Time OverVoltage 1
  TOU2-Time OverVoltage 2
  TOU3-Time OverVoltage 3
  TOU4-Time OverVoltage 4
  TOU5-Time OverVoltage 5
  TOU6-Time OverVoltage 6
  OUEX-OverExcitation
  THOL-Thermal OverLoad
  FRME-Frequency Measurement
  Single Command Function 1
  Multiple Command Function 1..20
  Disturbance Recorder
  SPA Communication
  LON Communication

  Installed ->  Not installed -> 

PgDn PgUp      F7      Enter      Esc
NEXT PREU     REPORT CHANGE EXIT

```

Fig. 4 TRM-OVER Screen 4

Screens 4 and 5 - Information presented

- ‘Installed Protection & Control Functions’ shows a list of functions that can be installed in the terminal. Installed functions are marked with a square to the left of the text.

```

RET521 TRM-OVER Monitor                               Screen 5 of 6
TERMINAL OVERVIEW - INSTALLED FUNCTIONS                Terminal Time= 98-02-14 00.00

  Installed Protection & Control Functions
  -----
  Event Function 1..12
  Event Recorder
  Time Synchronisation
  Trip Logic 1..12
  Logic Gate AND 1..40
  Logic Gate OR 1..40
  Logic Timer 1..10
  Logic Pulse Timer 1..10
  Logic Inverter 1..20
  Logic MOUE 1..6
  Fourier Filter C1P1..C1P5
  Fourier Filter C3P1..C3P5
  Fourier Filter C3C1..C3C2
  Fourier Filter U1P1..U1P5
  Fourier Filter U3P1..U3P3
  Binary Converter
  Active Group
  Fixed Signals
  Internal Signals
  Test
  Not Connected Signal

  Installed ->  Not installed -> 

PgDn PgUp      F7      Enter      Esc
NEXT PREU     REPORT CHANGE EXIT

```

Fig. 5 TRM-OVER Screen 5

```

RETS21 TRM-OVER Monitor                               Screen 6 of 6
FUNCTION SELECTORS AND TRANSFORMER SIDE CONFIGURATION
Terminal Time- 98-02-14 08:00

Function Selector Side      Function Selector Side
-----
DIPP      None      -
TOC1, Dir None      No
TOC2, Dir None      No
TOC3, Dir None      No
REP1      -          No
REP2      -          No
REP3, Dir None      No
TEP1, Dir None      No
TEP2, Dir None      No
TEP3, Dir None      No

TOU1      None      No
TOU2      None      No
TOU3      None      No
TOU4      None      No
TOU5      None      No
OUEK      None      No
THOL      -          No
FRHE      None      No

```

Fig. 6 TRM-OVER Screen 6

Screen 6 - Information presented

- Shows the list of the function selector values and side of the transformer connection for the specified protection and control functions.

‘-’ Not applicable

‘No’ Inactive

For more information about the function selectors, see Ref. 5 in chapter 4: “References”.

6 Disturbance Report

6.1 DRP-OVER Disturbance Overview

The part DRP-OVER contains information about the 10 last disturbances stored in the terminal. In this part, the user also selects which disturbance to activate for more information in the other DRP-xxxx parts (DRP-INDC, DRP-EVEL and DRP-TRIP).

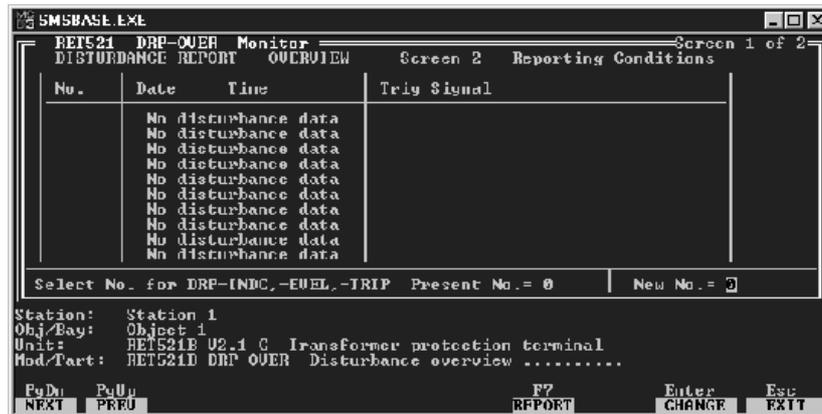


Fig. 7 DRP-OVER Screen 1

Screen 1 - Information presented

- The 'No.' of the recorded disturbance is a number running from 0 to 200, and then starting from 0 again. This is the primary disturbance identifier in the terminal, not to be mixed up with the daily sequence number that is reset to zero each new date. This is also the number to be entered by the user in order to select a new disturbance to be loaded into the disturbance report memory in the terminal. By selecting a disturbance, the detailed information about the disturbance will be available for SMS.
- An overview of the stored disturbances is shown with information regarding the 'Date' and 'Time' of the recording, 'Outgoing TRIP', and 'Trig Signal' causing the start of the recording.

Screen 1 - Select a new disturbance number

Both SMS and the terminal presents detailed information about one disturbance at a time. This means that a disturbance must be selected before any detailed information about the disturbance can be accessed from SMS. In order to get more detailed information on each of the recorded disturbances the user selects one of the listed disturbances by entering a disturbance number in the 'New No.' field.

- 1 To select a disturbance, press <Enter>.
- 2 Enter the number of one of the disturbances listed to the left on the screen, and press <Enter>
- 3 Press <Esc> to leave the part and select 'Activate selected DistRep No.'

This action will make the terminal load the selected disturbance into an active memory area accessible from SMS. When detailed presentation of data is selected from SMS, the terminal will, on request, upload the data to the PC.

- 4 Finally select 'Monitor PC-file information' in order to verify that the selected number is now presented in the 'Present No.' field.
- 5 The selection of a new disturbance will make more information regarding the selected disturbance available to SMS.

The additional information is shown in the three parts DRP-INDC, DRP-EVEL, and DRP-TRIP provided that the required functions are installed in the terminal.

It is also possible to select a disturbance and upload the data of the disturbance to the PC in one step. This allows presentation of the data in the DRP-INDC, DRP-EVEL and DRP-TRIP parts by 'Monitoring PC-file information'. To select a disturbance and upload the data:

- 1 Press <Enter> in DRP-OVER Screen 1.
- 2 Enter the number of one of the disturbances listed to the left on the screen, and press <Enter>.
- 3 Press <Esc> to leave the part and select 'Upload DistRep DPR-INDC-EVEL-TRIP'.

This action makes the terminal load the selected disturbance into an active memory area accessible from SMS, and upload the disturbance data for the DRP-INDC, DRP-EVEL and DRP-TRIP parts to the PC.

- 4 Select 'Monitor PC-file information' in order to verify that the selected number is now presented in the 'Present No.' field.

The selection of a new disturbance and upload of data makes the information regarding the selected disturbance available to SMS. As the information is already uploaded to the PC, the detailed information is available in DRP-INDC, DRP-EVEL, and DRP-TRIP by selecting 'Monitoring PC-file information' when opening these parts, provided that the required functions are installed in the terminal.

Screen 1 - Disturbance numbering

The terminal has a storage capacity of 10 disturbances, equivalent to approximately 1,5 Mb. On the built-in HMI these are numbered 1-10, while in SMS the index numbers 0-200 are used. The reason for this is that after the user has read the DRP-OVER and selected, for example, the last disturbance named Disturbance 1, a new disturbance might occur in the terminal, which means that Disturbance 1 has changed contents. By using the index numbers 0-200, the number of the selected disturbance will be unique, and the situation described will never occur.

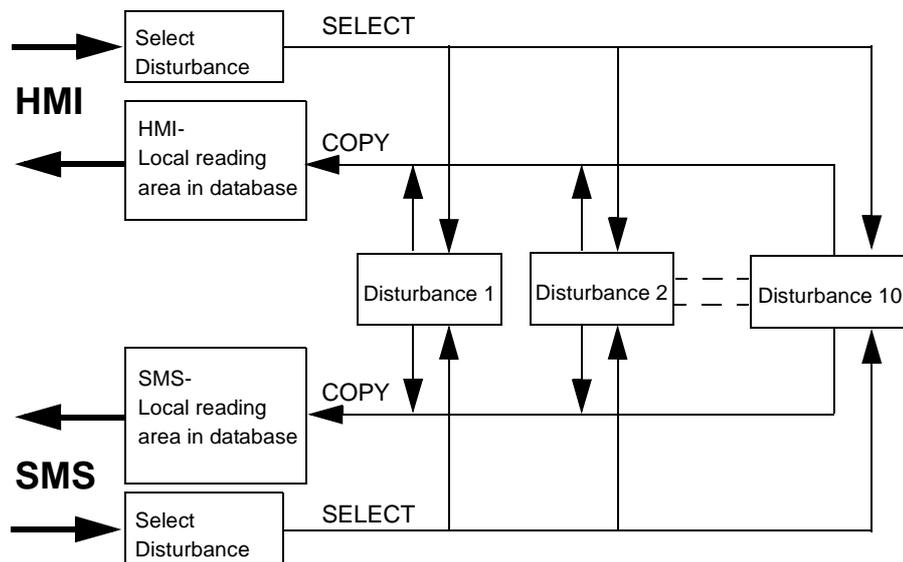


Fig. 8 SMS and built-in HMI reading areas for disturbances.

Screen 1 - Information structure of disturbance report function

Depending on the functions installed in the terminal, the information on one disturbance varies. The indications, event list, fault locator values, trip values and disturbance recording header are always available for the last 10 disturbances. The number of disturbance recordings containing oscillographic information depends on the recording times set in the terminal and the harmonic contents of the signals. All information is accessed via SM/RET 521. The disturbance recordings, which are available via FrontRECOM (or RECOM), can be evaluated with REVAL.

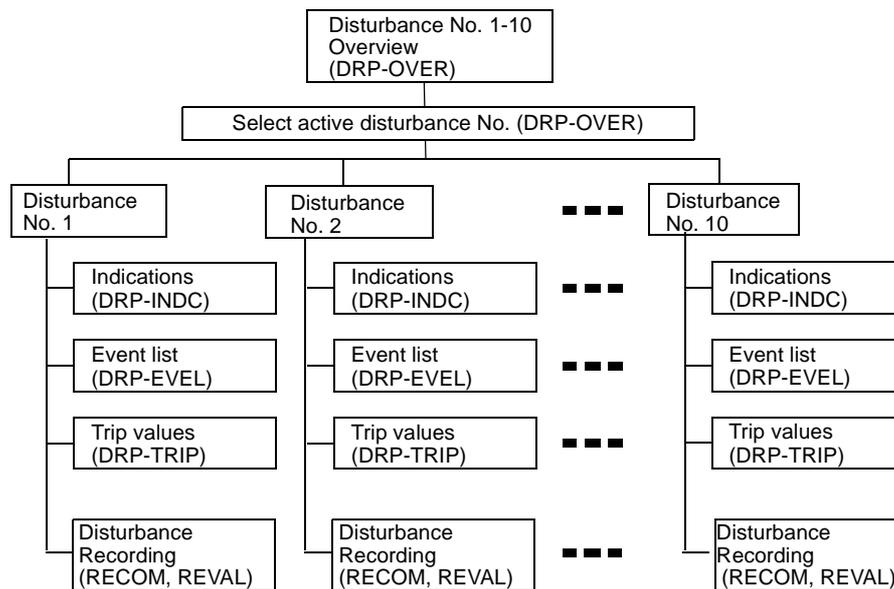


Fig. 9 Information structure of disturbance reporting functions.

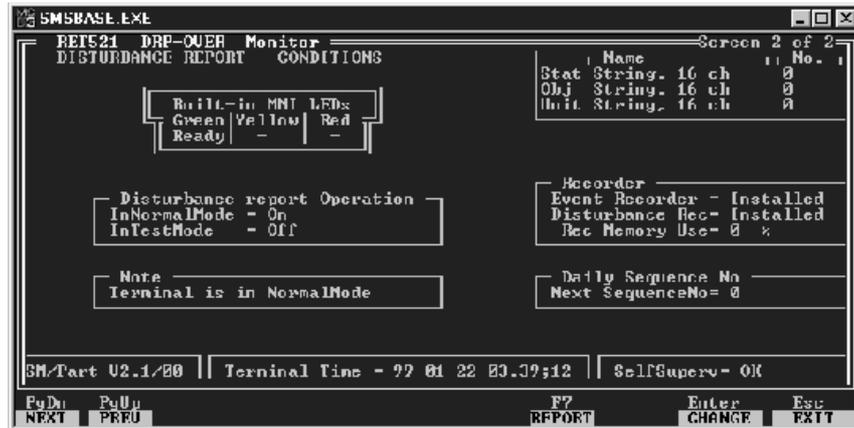


Fig. 10 DRP-OVER Screen 2

Screen 2 - Information presented

- 'Disturbance report Operation' shows if the disturbance reporting functions are active or not in normal mode and in test mode. These settings can be changed in the parts 'SET-DREP Disturbance Report Contents' and 'TST-MODE Test - block functions'.
- At the lower left part of the screen, the user is informed if the terminal is in 'Test-Mode' or in 'NormalMode' at the moment of communication.
- The 'Recorder' shows if the 'Event Recorder' function is installed in the terminal and if the 'Disturbance Recorder' function is installed along with the amount of disturbance memory used by the Disturbance Recorder at the moment.
- The 'Daily Sequence No' shows the status of the sequence number counter, i.e. the number the next recorded disturbance during the present day will get. The number is reset to 0 when a new day begins. The first report that day gets the number 0, the second number 1, etc.

6.2

DRP-INDC Indications

The part DRP-INDC contains information on indications during the disturbance that was selected in the part DRP-OVER. Note that it is not possible to set any parameters in the DRP-INDC part.



Fig. 11 DRP-INDC Screen 1

Screen 1 - Information presented

- If no disturbances are stored in the terminal this will be indicated with the text 'WARNING - NO DISTURBANCES STORED IN TERMINAL'.
- If the disturbances were stored while the terminal was in test mode, this will be indicated with the text 'WARNING - RECORDING MADE IN TESTMODE'.
- 'Disturbance information' shows some basic information regarding the selected disturbance.
- 'Number' is the same number as was selected in the part DRP-OVER.
- 'Date, Time' is the time of the triggering of the disturbance report.
- 'Daily Sequence No' shows the terminal sequence number of this specific disturbance report. The number is reset to 0 when a new day begins and the first report that day gets the number 0, the second number 1, etc.
- 'Trig Signal' shows which signal triggered the disturbance reporting function.
- 'tPre, pre-fault' shows the pre-fault time of the recording, i.e., the time recorded before the triggering signal was activated.
- 'tTotal' shows the total recording time, i.e. pre-fault, fault, and post-fault times.
- 'Active Setting Grp' shows which setting group was active during the disturbance.

RET521 DRP-INDC Monitor Screen 2 of 2
 DRP NO.0 - INDICATIONS AMONG 48 USER SELECTED SIGNALS
 Date, Time - 08-01-01 00:00:00.000 Trig Signal -

No.	Signal Name						
01	FIXD-OFF	13	FIXD-OFF	25	FIXD-OFF	37	FIXD-OFF
02	FIXD-OFF	14	FIXD-OFF	26	FIXD-OFF	38	FIXD-OFF
03	FIXD-OFF	15	FIXD-OFF	27	FIXD-OFF	39	FIXD-OFF
04	FIXD-OFF	16	FIXD-OFF	28	FIXD-OFF	40	FIXD-OFF
05	FIXD-OFF	17	FIXD-OFF	29	FIXD-OFF	41	FIXD-OFF
06	FIXD-OFF	18	FIXD-OFF	30	FIXD-OFF	42	FIXD-OFF
07	FIXD-OFF	19	FIXD-OFF	31	FIXD-OFF	43	FIXD-OFF
08	FIXD-OFF	20	FIXD-OFF	32	FIXD-OFF	44	FIXD-OFF
09	FIXD-OFF	21	FIXD-OFF	33	FIXD-OFF	45	FIXD-OFF
10	FIXD-OFF	22	FIXD-OFF	34	FIXD-OFF	46	FIXD-OFF
11	FIXD-OFF	23	FIXD-OFF	35	FIXD-OFF	47	FIXD-OFF
12	FIXD-OFF	24	FIXD-OFF	36	FIXD-OFF	48	FIXD-OFF

Indication symbol: Active -> ■

F7 REPORT Enter CHANGE Esc EXIT

Fig. 12 DRP-INDC Screen 2

Screen 2 - Information presented

- At the top of the screen, 'No. of the disturbance', 'Date, Time' and 'Trig Signal', are shown.
- The 48 binary signals that can be configured by the user are shown. The signals are presented with the user-defined names. All signals that were active during the disturbance, i.e. the signals that have changed state once or several times, are indicated with a square in front of the name.

6.3

DRP-EVEL 150 Events List

The part DRP-EVEL contains information on events during the disturbance that was selected in the part DRP-OVER. Note that it is not possible to set any parameters in the DRP-EVEL part. The 'Event recorder' function must be installed in the terminal in order to get an event list. If not, the event list will always be empty. In this case the whole part can be removed as shown in paragraph "Removing Parts of Unit from an installation" on page 74 in the chapter "Technical description".



Fig. 13 DRP-EVEL Screen 1

Screen 1 - Information presented

- If no disturbances are stored in the terminal, this will be indicated with the text 'WARNING - NO DISTURBANCES STORED IN TERMINAL'.
- If the disturbances were stored while the terminal was in test mode, this will be indicated with the text 'WARNING - RECORDING MADE IN TESTMODE'.
- 'Disturbance information' shows some basic information regarding the selected disturbance.
- 'Number' is the same number as was selected in the part DRP-OVER.
- 'Date, Time' is the time of the triggering of the disturbance report.
- 'Daily Sequence No' shows the terminal sequence number of this specific disturbance report. The number is reset to 0 when a new day begins and the first report that day gets the number 0, the second number 1, etc.
- 'Trig Signal' shows which signal triggered the disturbance reporting function.
- 'tPre, pre-fault' shows the pre-fault time of the recording, i.e. the time recorded before the triggering signal was activated.
- 'tTotal' shows the total recording time, i.e., pre-fault, fault, and post-fault time.
- 'Active Setting Grp' shows which setting group was active during the disturbance.
- 'Stat', 'Obj' and 'Unit' shows the station, object and unit numbers and associated label texts.

6.4

DRP-TRIP Trip values

The part DRP-TRIP contains information on trip values related to the disturbance that was selected in the part DRP-OVER. The 'Measurement 1A/5A' function must be installed in the terminal in order to get any values. If not, all values will always show 0. In this case, the whole part can be removed as shown in paragraph "Removing Parts of Unit from an installation" on page 74 in the chapter "Technical description".



Fig. 15 DRP-TRIP Screen 1

Screen 1 - Information presented

- If no disturbances are stored in the terminal this will be indicated with the text 'WARNING - NO DISTURBANCES STORED IN TERMINAL'.
- If the disturbances were stored while the terminal was in test mode, this will be indicated with the text 'WARNING - RECORDING MADE IN TESTMODE'.
- 'Disturbance information' shows some basic information regarding the selected disturbance.
- 'Number' is the same number as was selected in the part DRP-OVER.
- 'Date, Time' is the time of the triggering of the disturbance report.
- 'Daily Sequence No' shows the terminal sequence number of this specific disturbance report. The number is reset to 0 when a new day begins and the first report that day gets the number 0, the second number 1, etc.
- 'Trig Signal' shows which signal triggered the disturbance reporting function.
- 'Active Setting Grp' shows which setting group was active during the disturbance.

NET521 DRP-TRIP Monitor Screen 2 of 2
 DRP NO.0 - TRIP VALUES
 WARNING-NO DATA

Date,Time - 00-01-01 00.00000.0000

Input	Analog name	PreFault Condition		Fault Condition	
		Magnitude	Phase	Magnitude	Phase
1	Input1	0.0	0.0 deg	0.0	0.0 deg
2	Input2	0.0	0.0 deg	0.0	0.0 deg
3	Input3	0.0	0.0 deg	0.0	0.0 deg
4	Input4	0.0	0.0 deg	0.0	0.0 deg
5	Input5	0.0	0.0 deg	0.0	0.0 deg
6	Input6	0.0	0.0 deg	0.0	0.0 deg
7	Input7	0.0	0.0 deg	0.0	0.0 deg
8	Input8	0.0	0.0 deg	0.0	0.0 deg
9	Input9	0.0	0.0 deg	0.0	0.0 deg
10	Input10	0.0	0.0 deg	0.0	0.0 deg
F		50.00	Hz		

F10n F10p F2 F3n
 NEXT PREV REPORT CHANGE EXIT

Fig. 16 DRP-TRIP Screen 2

Screen 2 - Information presented

- On the top of the screen, 'No. of the disturbance', 'Date, Time' and 'Trig Signal', are shown.
- The phasors for the pre-fault conditions are shown on the left part of the screen along with the frequency. On the right, the phasors for the fault conditions are shown.

6.5

DRP-CLRS Clears and Manual trig

In the part DRP-CLRS it is possible to clear LED indications and disturbances stored in the terminal. It is also possible to activate a manual trig that generates a disturbance report.

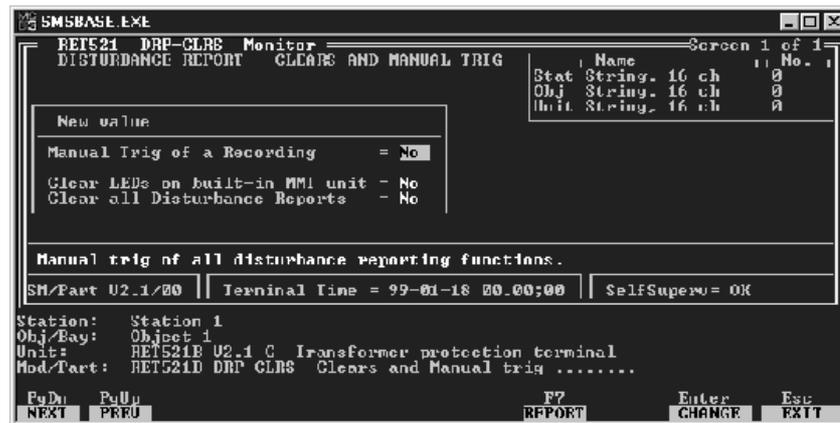


Fig. 17 DRP-CLRS Screen 1

Screen 1 - Performing a manual trig

- By selecting 'Yes' on the 'Manual Trig of a Recording' all disturbance reporting functions available in the terminal will be activated when the command is sent to the terminal. If 10 disturbances are stored in the terminal, or if the disturbance memory is full, this action will overwrite the oldest disturbance.

Screen 1 - Clearing information

- The HMI LEDs are cleared if 'Yes' is selected. This corresponds to pressing the 'C' button on the built-in HMI.
- If 'Yes' is selected, all disturbance reports, i.e. the information available in the different DRP-... parts and RECOM will be erased . After this action the disturbance memory will be empty.

Note!

All desired settings must be reselected each time, since all actions set to 'Yes' are performed when selecting 'Write settings to terminal'. For this reason, always start with the command 'Read terminal data to PC-file', as this action sets all answers to 'No'.



All actions in the DPR-CLRS part can be carried out even if remote setting is blocked in the terminal. However, a password is requested before any clearing can take place.

- The first and second columns show the date and the daily sequence number. The first disturbance occurring each day gets the daily sequence number 000. The next gets the sequence number 001, and so on. Note that this number is **not** the same number as shown in the DRP-OVER part. In this case, the number is an index running from 0 to 200 in order to give each disturbance in the terminal database an unique number. In the parts DRP-INDC, DRP-EVEL and DRP-TRIP, both the index number and the daily sequence number are shown on the first screen.
- The third and fourth columns indicate where the disturbance is stored. 'R' stands for disturbance file, and 'H' stands for header file. If the disturbance memory is full due to long recording times, the oldest disturbances might consist of the header only. There might also be disturbances that are only stored in the PC, because the whole recording has been deleted or overwritten in the terminal.
- 'Time' shows when the trigger of the disturbance recorder was activated. 'Trig' is the triggering signal, analog or binary, or manual triggering.

Screen 1 - Uploading a disturbance to the PC

- To upload a disturbance to the PC, highlight the disturbance of interest by positioning the cursor with the **<up arrow>** and **<down arrow>** keys.
- Press **<U>** to upload all information, i.e. the header (H) and the disturbance file (R) from the terminal to the PC. This action does not delete the recording in the terminal. It is still available for other users until it is manually deleted or overwritten by new disturbances. The uploaded disturbance is stored in the same directory structure as the terminal settings, e.g. c:\sms\data\o001\s001\o001\u001. The name of the disturbance file will be, for example, 94120100.RE* where the first six digits are the date, YYMMDD, and the last two digits the sequence number. The file name extension is .REV for the disturbance file and .REH for the header file. When opening the file with the REVAL Disturbance evaluation program, the same station and unit names as entered in SMS-BASE are shown in order to simplify handling.

Screen 1 - Refreshing information on screen

- Selection **<R>** (refresh) updates the information on the screen, e.g. if a new disturbance has occurred.

Screen 1 - Deleting a disturbance from the PC

- Selection <D> (delete) deletes the current highlighted disturbance file in the PC.

Note!

It is only the PC-file containing the disturbance information that is deleted. Disturbances stored in the terminal are not affected.

**Screen 1 - Getting Help**

- Selection <E> (help) will present a short help text for handling of FrontRECOM.

Screen 1 - Exiting FrontRECOM

- Press <Esc> or <X> to exit the FrontRECOM Unit disturbance summary.

Note!

If the disturbance memory is full and the oldest disturbance is uploaded at the same time as a new disturbance occurs, the information in the oldest disturbance is lost. This will result in a disturbance that is only partly stored on the PC and, consequently cannot be opened by the REVAL Disturbance evaluation program. The REVAL program then gives the indication 'Not readable'. However the so called Header part can be read.



7

TRM-STAT InternalEvents - SelfSuperv

The part TRM-STAT consists of the status of the terminal, coming from the self supervision functions, and article numbers of the terminal and the included hardware modules.

```

SMSBASE.EXE
RET521 TRM-STAT Monitor          Screen 1 of 8
TERMINAL STATUS SELF SUPV, INTERNAL EVENTS
Stat String, 16 ch  0
Obj String, 16 ch  0
Unit String, 16 ch  0

CONTENTS
Screen
2..3 Internal events - 1..40
4 Observed modules - Article number, revision
5 Noted modules - Article number, revision
6 Users Notes
7 Self supervision information
8 Function status

SM/Part U2.1/00 | Terminal Time = 99-01-18 00.00:00 | SelfSuperv= OK

Station: Station 1
Obj/Bay: Object 1
Unit: RET521E U2.1 C Transformer protection terminal
Mod/Part: RET521D TRM STAT InternalEvents SelfSuperv ...

F7      F8      F9      F10
NEXT    PREV    REPORT  CHANGE  EXIT
  
```

Fig. 19 TRM-STAT Screen 1

Screen 1 - Information presented

- 'READ ERROR - THE CONTENTS CHANGED. READ AGAIN'
This warning is displayed if the 'Internal Events' shown on screen 2-3 have changed during the communication. To access an updated list, the data part must be read again by selecting '**Read terminal data to PC-file**'.



Fig. 20 TRM-STAT Screen 2

Screen 2 to 3 - Information presented

- On these screens the internal events of the terminal are presented. The list mainly contains events from the internal self supervision signals. The list is a first-in-first-out list and all the events are presented with date and time. The latest event is always presented as the last event in the list. The events are presented in chronological order.



Fig. 21 TRM-STAT Screen 4

Screen 4 - Information presented

- On this screen the article numbers of the included hardware modules are presented. The reason for this information is to give the user the correct identification number if a module is faulty and has to be replaced. The article numbers of all I/O-modules and the NUM-module are stored as a code on the module itself and will automatically be updated if the module is replaced.
- The terminal type, version and revision number are presented together with a unique serial number of the terminal. The 'Ordering No.' of the terminal is also presented.



Fig. 22 TRM-STAT Screen 5

Screen 5 - Settable parameters

- The article numbers of the mechanical frame, the HMI module, the Power supply module, the Serial and the LON communication module can be changed manually by the user. These numbers are changed when selecting 'Write User's Notes to terminal'.



Fig. 23 TRM-STAT Screen 6

Screen 6 - Settable parameters

- On this screen the notes made by the user are shown. After downloading, these notes are stored in the terminal and can be read by other users from other locations, using the SMS. The user's notes are intended to store information regarding, for example, additional hardware co-operating with the terminal or the date of the last test or maintenance. This information can only be read from SMS, and is not available on the built-in HMI. The possibility to change the user's notes is not affected by the setting restrictions ('OPEN'/'BLOCKED') in the terminal, i.e., they can always be changed. The notes are changed when selecting 'Write User's Notes to terminal'.

```

RETS21 TRM-STAT Monitor                               Screen 7 of 8
SELF SUPERVISION INFORMATION

Terminal = 98-02-14 00.00

Signal      Status      Comment
INT--FAIL   --OK        Summary - Serious fault in terminal if FAIL.
INT--WARNING --OK       Summary - Minor fault in terminal if WARNING.
RealTimeClock --OK     Internal real time clock has halted if WARNING.
TimeSynch   --OK     Time synchronisation is lost if WARNING.
NUM-module  --OK     Faulty NUM-module if FAIL - change module.
AIM1, PCIP3 --OK     Faulty AIM-module 1 or PCI comm. if FAIL.
AIM2, PCIP2 --OK     Faulty AIM-module 2 or PCI comm. if FAIL.
MM1, CANP12 --OK     Faulty mA Input module 1 or CAN comm. if FAIL.
I/O-1,CANP9  --OK     Faulty I/O-module 1 or CAN comm. if FAIL.
I/O-2,CANP10 --OK     Faulty I/O-module 2 or CAN comm. if FAIL.
I/O-3,CANP11 --OK     Faulty I/O-module 3 or CAN comm. if FAIL.
I/O-4,CANP12 --OK     Faulty I/O-module 4 or CAN comm. if FAIL.

PgDn PgUp      F7      Enter      Esc
NEXT  PREU    REPORT CHANGE EXIT

```

Fig. 24 TRM-STAT Screen 7

Screen 7 - Information presented

On these screens, the current status of all self supervision signals, at the time of communication with the terminal, is presented along with a brief explanation. All activated self supervision signals in this list will also be included in the internal event list on screen 2.

```

RETS21 TRM-STAT Monitor                               Screen 8 of 8
FUNCTION STATUS

Terminal = 98-02-14 00.00

Selected Function      Status
Transformer Differential OK
Voltage Control        OK
Line OverCurrent 1     OK
Line OverCurrent 2     OK
Line OverCurrent 3     OK
Line OverCurrent 4     OK
Restricted Earth Fault 1 OK
Restricted Earth Fault 2 OK
Restricted Earth Fault 3 OK
Earth Fault 1          OK
Earth Fault 2          OK
Earth Fault 3          OK
Line UnderVoltage 1    OK
Line UnderVoltage 2    OK
Line UnderVoltage 3    OK

Selected Function      Status
Line OverVoltage 1     OK
Line OverVoltage 2     OK
Line OverVoltage 3     OK
Line OverVoltage 4     OK
Line OverVoltage 5     OK
Line OverVoltage 6     OK
OverExcitation         OK
Thermal Overload       OK
Frequency Measurement  OK
DisturbanceReport      OK

PgDn PgUp      F7      Enter      Esc
NEXT  PREU    REPORT CHANGE EXIT

```

Fig. 25 TRM-STAT Screen 8

Screen 8 - Information presented

On this screen, the current status of the function error signals, at the time of communication with the terminal, is presented along with a brief explanation.

8 Appendix

8.1 Diagnosing errors

- Check the technical requirements according to paragraph “System requirements” on page 12 in the chapter “Instructions”
- Check the installation with reference to paragraph “Installation procedures” on page 14 in the chapter “Instructions”

The operation of SM/RET 521 is described in chapters 2 and 3. When errors occur, their type as well as a probable cause are shown in the lower part of the screen. Normally, error messages must be confirmed with **<Enter>**. The user is then brought back to the activity prior to the one that caused the error.

See SMS-BASE User’s Guide Ref. 2 in chapter 4: References for more information regarding error messages.

8.2 Error messages during communication

During poor communication conditions when using a telephone line, data will not be transferred. After a number of unsuccessful attempts to transfer a quantity, the program asks the user to press **<R>** for a ‘Retry’ or **<Q>** for ‘Quit’.

Normally, select **<Q>**, finish the call and try to call again to get a better line.

Normally, both rear port channels on the terminal are served in parallel. However, during extremely busy terminal situations the service may be delayed and the ‘busy’ NAK 1 is sent by the terminal during read conditions, and NAK 7 during write conditions.

Note!

It is very important for the SMS user not to ‘Skip’ any NAK messages. Either press ‘Retry’ **<R>** or ‘Quit’ **<Q>**. Otherwise, the transmitted data will be faulty or incomplete.



8.3 Adopting PC to SMS programs

Sometimes when selecting '**Monitor PC-file information**' the text 'Not enough memory' is shown on the screen. This means that less than the required 450 kb minimum of work memory is available on the PC. One common problem is that other applications are resident in the same memory area in the PC. By removing these from the PC, memory will be released which means that the minimum requirement of 450 kb can be fulfilled.

8.4 Removing Parts of Unit from an installation

If any 'Part of Unit' is not relevant for a terminal, for example SET-ASIG if the 'Disturbance recorder' function is not installed, this part can be removed from the installation. Carry out the following for each new instance of unit to decide how to proceed:

- 1 For each part select 'Read terminal data to PC-file'.
- 2 Then select the 'Monitor PC-file information' in order to check that the required function is installed, and if the part contains functionality that is of interest for the user. If not, the part can be removed according to the procedure below;
- 3 Select the 'Alter application structure' in the 'UTILITIES' menu.
- 4 Go down the structure and select the terminal in question.
- 5 Select the part 'SET-ASIG' and press <D>.
- 6 Answer yes <Y> to the question.

This procedure can be repeated for any 'Part of Unit'.

To get a better overview, it is highly recommended to remove parts belonging to functions not installed in a terminal. Remove also parts like 'SET--ALL' or 'DRP-CLRS', if the philosophy of the user is that these actions should not be possible from SMS.

8.5 Handling SMS under MS Windows

SMS-BASE can be started as an icon in MS Windows (3, 11, 95, 98, NT), as described in the SMS-BASE User's Guide Ref. 2. When starting SMS-BASE from Windows the PC automatically opens a DOS-Window in which SMS-BASE is run. It is then possible to switch between different applications in Windows by pressing <Alt>+<Tab>.

It is also possible to reduce the DOS application to a smaller window, by pressing <Alt>+<Enter>. This means that the information in SMS can be overviewed at the same time as for example REVAL, as shown below. For more information regarding this facility refer to the MS Windows User's Guide.

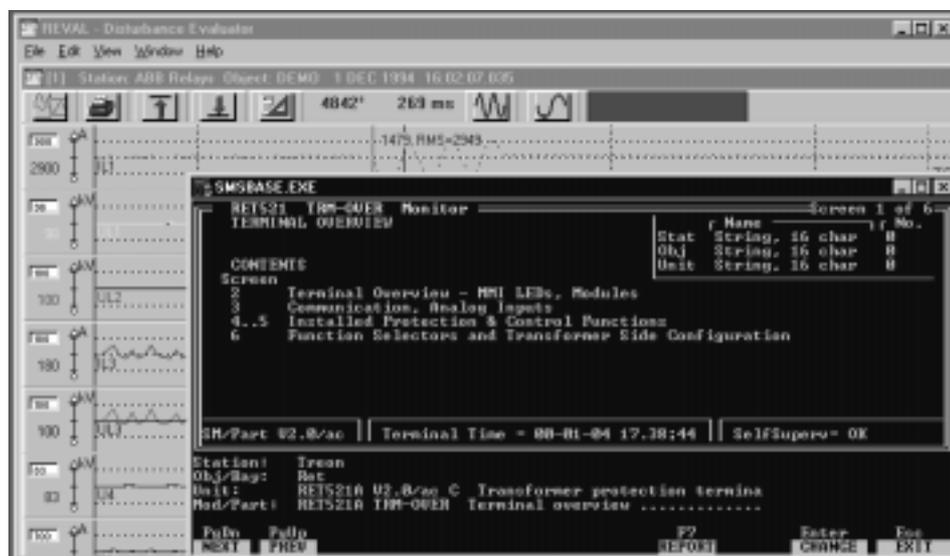


Fig. 26 SMS-BASE run as a small DOS window under MS Windows.

8.6 Error Messages

Terminal blocked

Internal fail:

- The internal supervision software of the terminal has detected an error, e.g. component malfunction.

The input "block" of the trip function element is activated:

- by an activated input signal via I/O, internally connected/configured to the element
- by another input signal, e.g. "FIXED-ON" internally connected/configured to the element

By local HMI:

- In menu "Test" the alternative "Block Terminal" is On. The blocking must be released from the same menu by changing the setting to Off. Warning - testmode active

Function element "Test" activated:

- by an activated input signal via I/O, internally connected to the function element.

Local HMI:

- In menu "Test" the alternative "Mode/Operation" is set to On.

Warning - recording made in testmode

Indicates that the presented data fields may not contain relevant information, since the terminal was not in normal mode. The mode may have been modified

- on local HMI in menu "Test" with alternative "TestMode/Operation"
- by an activated input signal (e.g. via I/O) connected to the function element "Test".

Warning - no data

Indicates that presented data fields in data part DRP-TRIP do not contain relevant information.

The information is not available since:

- Recording is made for a fault outside the protected range.
- The recorder is running in test mode, i.e. no analog data used to calculate data have been recorded.
- All analog channels are deactivated, which can be done in data part SET-ASIG or from local HMI:

"/Settings/DisturbReport/Operation"

"/Settings/DisturbReport/AnalogSignals/'channel name, e.g.UL1'/Operation"

8.7

List of References

HMI	Monitor SM/RET 521
Configuration AIM1 Service Report AIM1	Configuration/CNF-ALOG/ screen 3 Service Report/SRV-AIM2/ screen 2
Configuration AIM2 Service Report AIM2	Configuration/CNF-ALOG/ screen 4 Service Report/SRV-AIM2/ screen 3
Service Report IOM Configuration IOM	Service Report/SRV-IO01, SRV-IO02, SRV-IO03, SRV-IO04 Configuration/CNF-ALOG/ screen 5
Configuration Identifiers	Configuration/CNF-ALOG/ screen 2
Configuration Frequency	Configuration/CNF-ALOG/ screen 2
Configuration AnalogIn	Configuration/CNF-ALOG/ screen 2
Configuration LON Comm	Configuration/CNF-ALOG/ screen 7
Configuration Time	Configuration/CNF-ALOG/ screen 6
Configuration Built in HMI	Configuration/CNF-BMMI
Configuration SPA Comm	Configuration/CNF-ALOG/ screen 6
Service Report- Functions Disturbance Report	Service Report/SRV-ALOG/ screen 6, SRV-LGP2
Service Report- Functions TransfDiff Settings-Functions-GRP1-TransfDiff	Service Report/SRV-ALOG/ screen 2, SRV-LGP1 Settings/SET-GR1A screen 3
Service Report- Functions Voltage Control Settings-Functions-GRP1-Voltage Control	Service Report/SRV-ALOG/ screen 2, SRV-LGP1 Settings/SET-GR1A screen 4..6
Service Report- Functions OverCurrent Settings-Functions-GRP1-OverCurrent	Service Report/SRV-ALOG/ screen 2, SRV-LGP1 Settings/SET-GR1A screen 7..9
Service Report- Functions Restricted EF Settings-Functions-GRP1-Restricted EF	Service Report/SRV-ALOG/ screen 3,SRV-LGP1 Settings/SET-GR1B screen 2
Service Report- Functions Earth Fault Settings-Functions-GRP1-Earth Fault	Service Report/SRV-ALOG/ screen 3, SRV-LGP1 Settings/SET-GR1D screen 3..5
Service Report- Functions UnderVoltage Settings-Functions-Grp1-UnderVoltage	Service Report/SRV-ALOG/ screen 4, SRV-LGP1 Settings/SET-GR1B screen 9..10
Service Report- Functions OverVoltage Settings-Functions-Grp1-OverVoltage	Service Report/SRV-ALOG/ screen 4, SRV-LGP2 Settings/SET-GR1B screen 6..8
Service Report- Functions Overexcitation Settings-Functions-Grp1- Overexcitation	Service Report/SRV-ALOG/ screen 5, SRV-LGP2 Settings/SET-GR1B screen 11
Service Report- Functions ThermOverload Settings-Functions-Grp1-ThermOverload	Service Report/SRV-ALOG/ screen 5, SRV-LGP2 Settings/SET-GR1B screen 10
Service Report- Functions FreqMeasurement Settings-Functions-Grp1-FreqMeasurement	Service Report/SRV-ALOG/ screen 5, SRV-LGP2 Settings/SET-GR1B/ screen 3
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Service Report/IOM	Service Report/SRV-IO01, SRV-IO02, SRV-IO03, SRV-IO04
Service Report/BOM	Service Report/SRV-IO01, SRV-IO02, SRV-IO03, SRV-IO04
Settings-Disturbance Report-Operation/ Sequence No/Sampling Rate/Recording Times	Settings/SET-DREP/ screen 2
Settings-Disturbance Report-Binary Signals	Settings/SET-DREP/ screen 3
Settings-Disturbance Report-Frequency Channel	Settings/SET-ASIG/ screen 4

HMI	Monitor SM/RET 521
Settings-Disturbance Report- AnalogSignals	Settings/SET-ASIG/ screen 2,3
Settings-Functions-TransfData	Settings/SET-GR1A/ screen 2
Settings-ChangeActGrp	Settings/SET-ACTI
Setting-Time	Settings/SET-TIME
TerminalStatus-Self Super/Identity No	Terminal Status/TRM-STAT
Test-TestMode/ConfigMode	Test/TST-MODE

Reference Publications

Ref. 1: SMS 010 Buyer's Guide - 1MRK 511 014-BEN

Ref. 2: SMS-BASE User's Guide - 1MRS 750 146-ESD

Ref. 3: RECOM User's Guide - 1MRK 511 052-UEN

Ref. 4: REPORT User's Guide - 1MRS 750 335-ESD

Ref. 5: CAP 531 User's Guide - 1MRK 511 056-UEN

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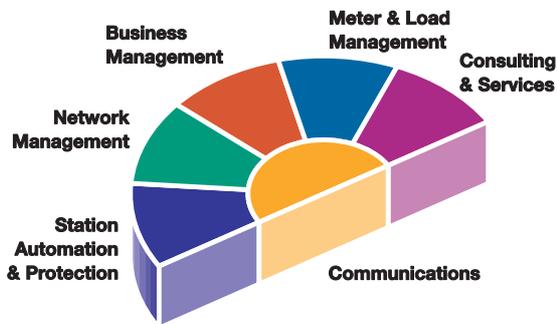
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