1 Putting into Operation

This chapter contains all information about putting into operation (unpacking, connection to AC supply, switching on and off), functional testing and installation of the instrument, preset settings and views of the front and rear panel showing the controls and connectors needed for operation.

General Instructions

Before putting the SML into operation, please make sure that

- the cover of the casing are put on and screwed,
- the ventilation openings are free,
- no signal voltage levels exceeding the permissible limits are applied at the inputs,
- the outputs of the instrument are not overloaded or connected incorrectly.

If these points are not observed, the instrument might be damaged.

Unpacking the Instrument
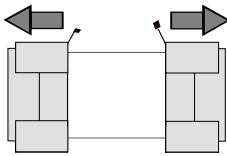
remove protective cabs

➢ Take the instrument out of the shipping box and check whether the items listed in the packing list and in the lists of accessories are all included.

➢ Remove the two protective caps from the front and rear of the instrument and carefully check the instrument for damage.

Should the instrument be damaged, immediately notify the forwarder who shipped the instrument to you and keep the box and packing material.

For further transport or shipment of the instrument the original packing should also be used. It is recommended to keep at least the two protective caps for front and rear side in order to prevent damage to the controls and connectors.

Setting up the Instrument

For applications in the laboratory or on a work bench, it is recommended that the support feet on the bottom of the instrument be extended. For the LCD display, this provides the optimum viewing angle which typically ranges from perpendicular to the display front to approximately 30° below.

Warning

The feet must be fully folded in or out. Only in this way can the stability of SML be guaranteed and reliable operation be ensured. With the feet out, the weight of other units put onto SML must not exceed 30 kg. The units must be secured against slipping (eg by locking the feet of the unit at the top side of the enclosure).

When shifting the unit with the feet out, the feet might collapse and fold in. To avoid injuries, the unit must therefore not be shifted with the feet out.

Supply Voltage

The SML can be operated at a.c. systems from 100 to 120 V and 200 to 240 V at system frequencies from 50 to 60 Hz. The power supply socket is situated at the rear of the instrument. The instrument automatically sets itself to the voltage applied within the permissible voltage ranges. It is not necessary to set the instrument to a certain supply voltage.

How to Ensure EMC

In order to avoid electromagnetic interference, the instrument may only be operated when it is closed and with all shielding covers fitted. Only appropriate shielded signal and control cables may be used.
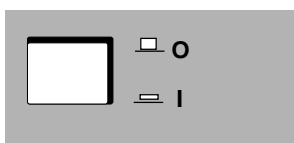
Power Fuses

The SML is protected against short circuits by means of two fuses according to nameplate of the power supply. The fuses are situated in the draw-out fuse holder which is inserted close to the power supply socket (see below).

Power supply socket

Fuse holder
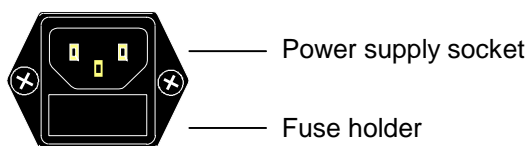
Power supply socket at the rear of the instrument

Switching On/Off the Instrument

Switch on:	➢ Press switch.
	The instrument is ready for operation.
Switch off:	➢ Release switch.

O

I

On/Off switch at the front of the instrument

Initial Status

Upon switching on, the instrument automatically assumes the status which was set when it was switched off.
If the instrument need not to be operated from the initial status any further, a defined default status should be established by pressing the [PRESET] and [SELECT] keys prior to further settings.

Frequency accuracy after switching on when the oven-controlled reference oscillator is fitted (option SML-B1)

The reference oscillator needs some minutes of warm-up time to reach its nominal frequency. During this period of time, the output frequency does not yet reach its final value either. In the status line in the header field of the display the message "OVEN COLD" is displayed for this time.

RAM With Battery Back-Up

The SML has a static read-write memory (CMOS-RAM) with battery back-up, in which 50 different complete settings of the instrument can be stored (cf. Chapter 3, section "Storing and Calling of Instrument Settings"). In addition, all data and/or lists the user enters himself, such as for user correction of the level, are stored in the RAM. Further, all data of the calibrations running within the instrument in the SML are stored in the RAM (cf. Chapter 4, section "Calibration"). A lithium battery with a service life of approx. 5 years serves to supply the RAM with power. When the battery is discharged, the data stored will be lost. Exchanging the battery is described in the Service Manual.

Preset Setting

A defined setting status is achieved by pressing the [PRESET] key.

Preset Status:

RF frequency	100 MHz
RF level	-10 dBm
Reference frequency	internal, adjustment off
Offsets	0
Modulations	switched off
Transient-free level setting	switched off, level attenuator mode: Auto
Internal level control	level Alc: On
User correction	level Ucor: Off
LF output	switched off
Sweep	switched off
Suppression of indications	system security: unaltered
Protection of calibration data	protection lock: unaltered
Settings stored	unaltered
Data, lists etc. stored	unaltered
IEC-bus address	unaltered

All parameters and circuit states, even those of operating modes which are not activated, are preset by means of Preset. The presettings going beyond the above list can be seen from the menu representations as of Chapter 4 which each indicate the Preset setting status.

Functional Test

On switching on the instrument and permanently during operation, the SML carries out a self test. The ROM contents as well as the battery of the non-volatile RAM are checked. The most important instrument functions are automatically monitored during operation.
If an error is detected, the message "Err" is displayed in the status line. For further identification of the error, press the [ERROR] key. Thereupon a description of the error is displayed (cf. Chapter 9, section "Error Messages"). Return to the menu exited by pressing the [BACK] key.
If required, internal test points can be polled by the user and the results be read out and displayed, cf. Service Manual.

Mounting into a 19" Rack

Caution: *Ensure free air inlet at the perforation of the side walls and air outlet at the rear of the instrument in rack mounting.*

The SML can be mounted into a 19" rack by means of rack adapter ZZA-94 (stock no. 396.4905.00). The mounting instructions are attached to the adapter.

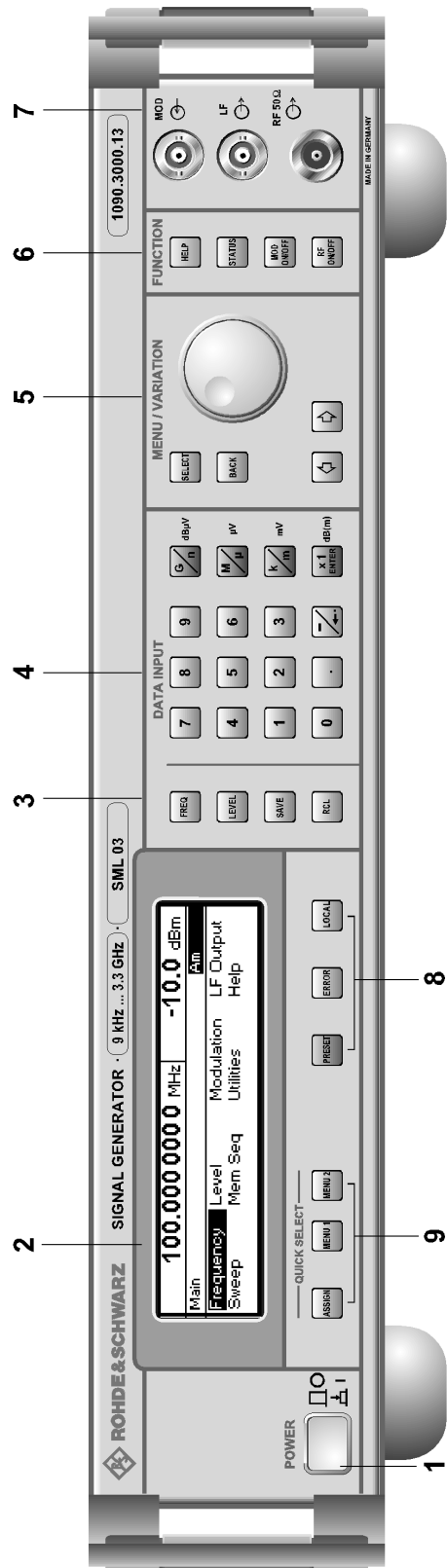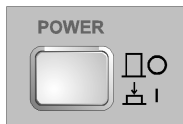# Explanation of Front and Rear Panel

Elements of the Front Panel

1   ON/OFF SWITCH

The On/Off switch switches the instrument on ("I") or off ("O").

⇒ Cf. Chapter 1, Section "Switching On/Off the Instrument".

2   DISPLAY

Cf. Chapter 3 for the design of the display.

3

Parameter field

Parameters RF frequency and RF level can be entered directly by means of the parameter keys, alternatively to menu operation. Further, complete instrument settings can be stored and called.

FREQ   Opens the setting of the RF frequency via value input or variation by means of a rotary knob. The current menu is maintained. Return to the menu by means of the [BACK] or [SELECT] key. (Setting of the RF frequency also in the FREQUENCY menu).

LEVEL   Opens the setting of the RF level via value input or variation by means of a rotary knob. The current menu is maintained. Return to the menu by means of the [BACK] or [SELECT] key. (Setting of the RF level also in the LEVEL menu).

SAVE   Opens the storing of the current instrument setting. Memory selection is effected by entering a number (1 to 50) and is finished by means of the [x1/ENTER] key.

RCL   Opens the calling of an instrument setting stored. Memory selection is effected by entering a number (1 to 50) and is finished by means of the [x1/ENTER] key.

⇒ Cf. Chapter 3, Sections "Use of [FREQ] and [LEVEL] Keys", "RF Frequency", "RF Level" and "Storing and Calling of Instrument Settings".
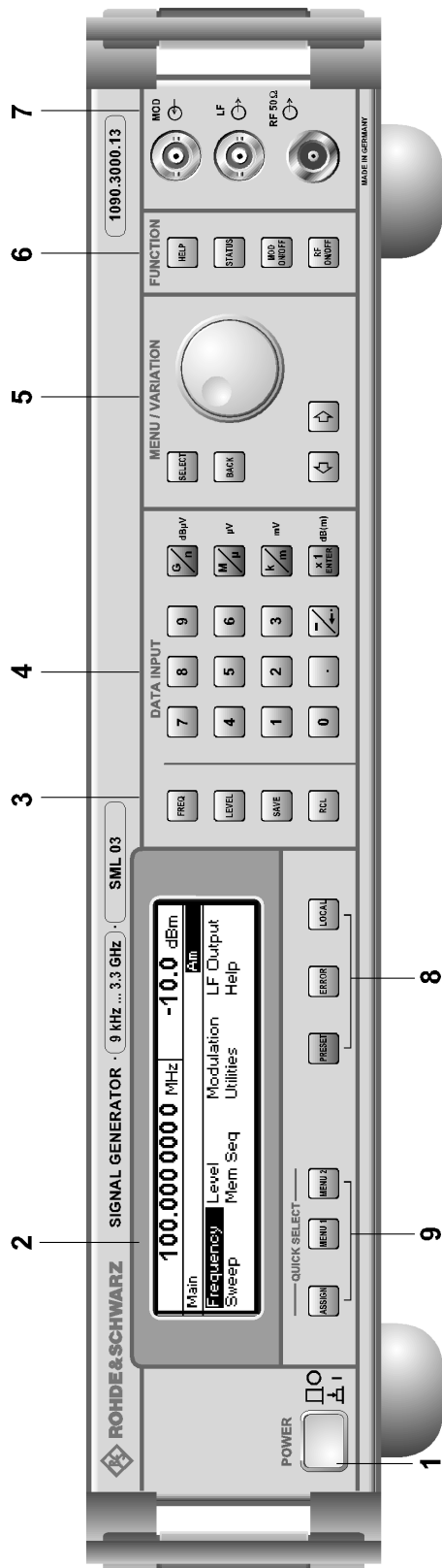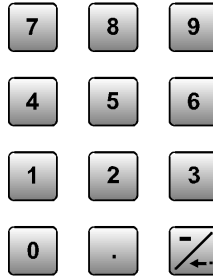
Fig. 1-1   Front panel view

Fig. 1-1   Front panel view

4   DATA INPUT

Numeric input field

7	8	9
4	5	6
1	2	3
0	.	-/←

Numeric values, decimal point and minus sign can be entered by means of the digital keys.

0 to 9   Enters the digit.

•   Enters the decimal point.

-/←   Enters the minus sign.

Deletes the last input (digit, sign or decimal point) - key [BACKSPACE].

Unit keys with enter function

G/n dBµV	M/µ µV	k/m mV	x1 ENTER dB(m)

The unit keys terminate the input of values and specify the multiplication factor for the respective basic unit.

The basic units are displayed next to the input field while numbers are entered. In the case of level settings, the unit keys specify the unit.

G/n   dBµV   Selects giga/nano, with RF level dBµV.

M/µ   µV   Selects mega/micro, with level µV.

k/m   MV   Selects kilo/milli, with level mV.

X1
Enter   dB(m)   Terminates entries in the basic unit and value inputs without unit.

Selects with level dBm.

Selects with level offset and level step width dB.

In order to change to another level unit, simply press the unit key desired. Parameter LEVEL must be activated, e.g. by pressing the [LEVEL] key.

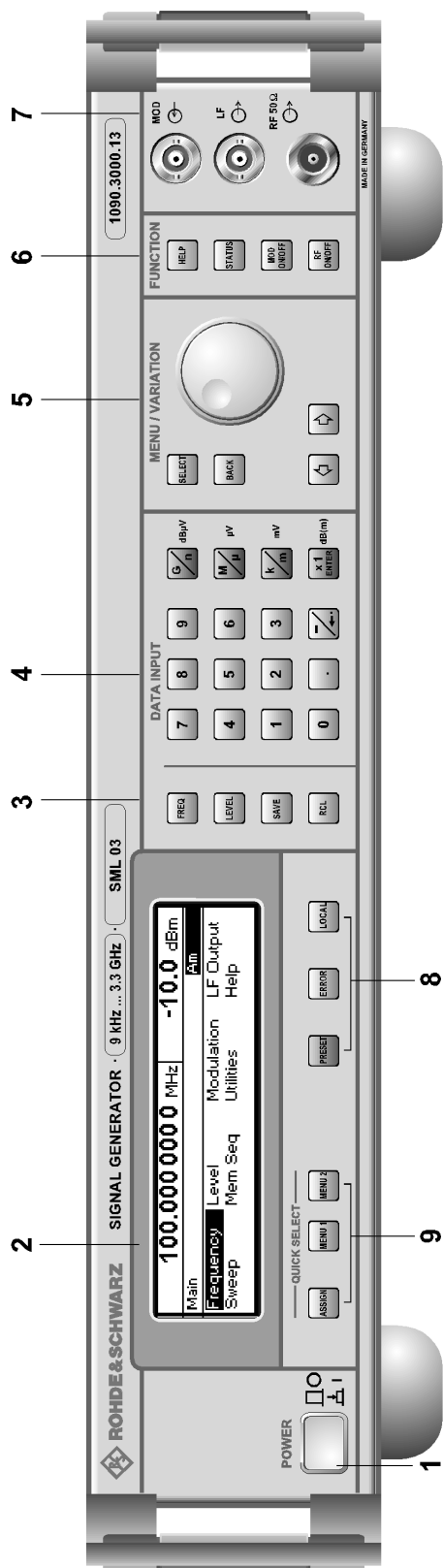⇒   Cf. Chapter 3, Section "Change Unit of Level".

Fig. 1-1   Front panel view

5   MENU/VARIATION

[SELECT] [BACK] [⇦] [⇨]

Menu keys

The menu keys access the menus and settings within the menus.

|	
SELECT	Acknowledges the choice marked by the menu cursor.
BACK	Returns the menu cursor to the next higher menu level.
⇐	Moves the digit cursor to the left by one position in the marked value indication.
	Moves the menu cursor to the top by one position in a 1-out-of-n selection.
⇒	Moves the digit cursor to the right by one position in the marked value indication.
	Moves the menu cursor to the bottom by one position in a 1-out-of-n selection.
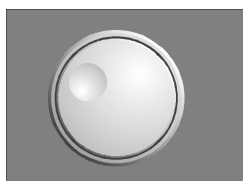
Rotary knob

The rotary knob moves the menu cursor over the positions of a menu level to choose from, or varies the value of a parameter. The variation is either effected in steps of one or in a step width that can be specified at will.

Furthermore, by pressing the rotary knob when the cursor marks a menu position, the lower menu level or the setting menu is displayed (cf. function of [SELECT] key).

⇒   Cf. Chapter 2, Section "Sample Setting for First Users" and Chapter 3, Section "Basic Operating Steps".
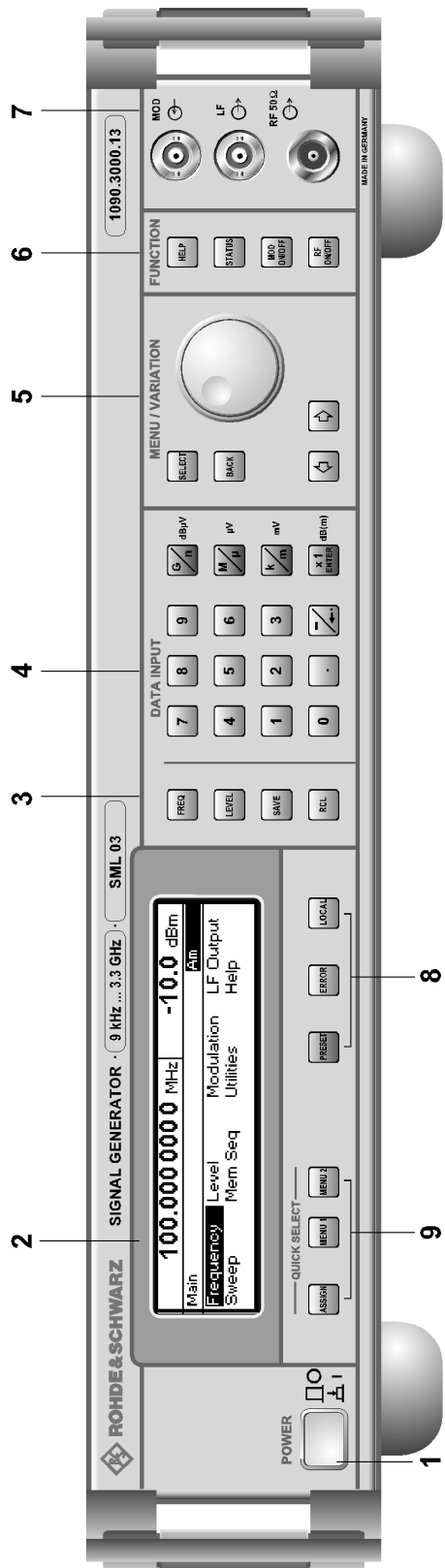
Fig. 1-1   Front panel view

6   FUNCTION

HELP*   Indicates context-sensitive auxiliary text.

STATUS*   Indicates the instrument status.

MOD
ON/OFF   Switches on/off the modulation selected in
                    Utilities - ModKey.

RF
ON/OFF   Switches on/off the RF signal.

⇒   Cf. Chapter 4, Sections "The Help System", "Status",
    and Chapter 3, Section "Use of [MOD ON/OFF] and
    [RF ON/OFF] keys".

* Exit the menus using the [BACK] key.]

7

MOD   Input of external modulation signal
               alternately for AM, FM and φM.
LF   Output LF signal of the internal LF
               generator.
RF 50 Ω   Output RF signal.

⇒   Cf. Chapter 4, Sections "LF Output" and "[RF ON/OFF]
    key".

8

PRESET   Establishes a defined instrument status.
               Confirm by [SELEC] key.

ERROR*   Indicates error and caution messages.

LOCAL   Switches the instrument from the REMOTE
               mode (remote control) to the LOCAL mode
               (manual control).

⇒   Cf. Chapter 1, Section "Preset Settings", Chapter 9,
    "Error Messages" and Chapter 6, "Remote Control".
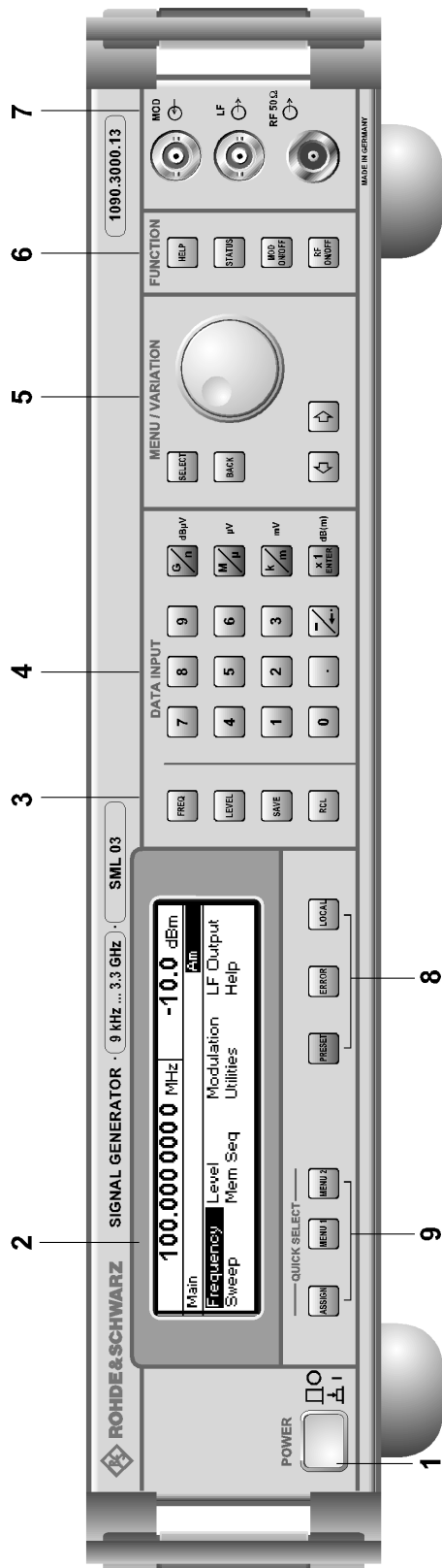
* Exit the menus using the [BACK] key.

Fig. 1-1   Front panel view

9   QUICK SELECT

The menu-quick-selection keys permit fast access to two menus selected.

ASSIGN   Stores the current menu as menu1 when the MENU1 key is pressed afterwards or as menu2 when the MENU2 key is pressed afterwards.
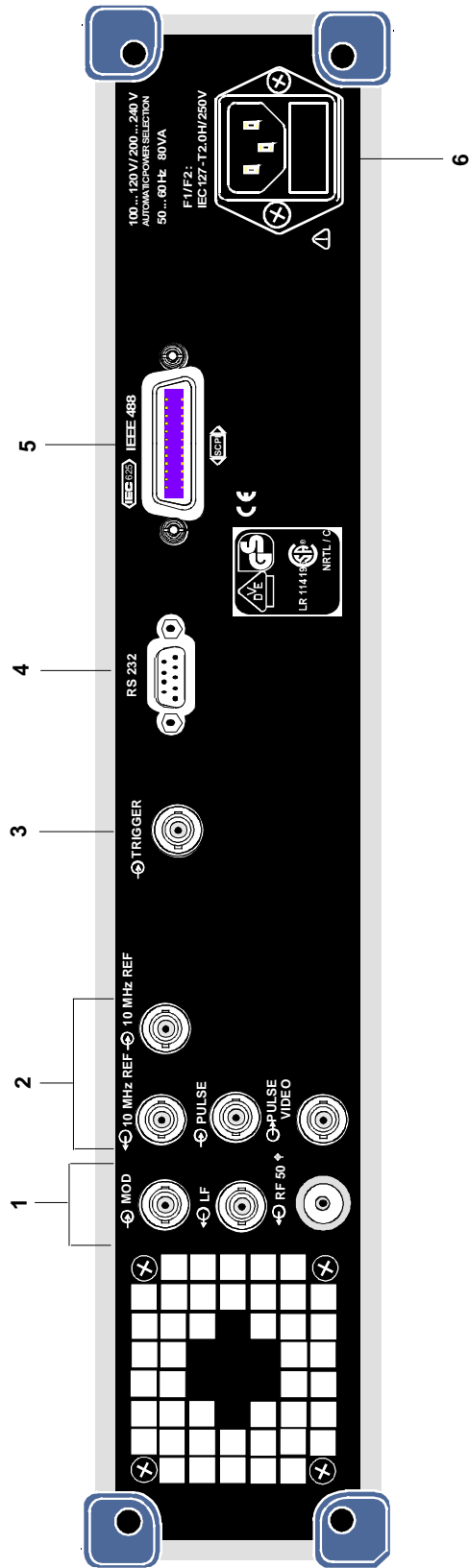
MENU1   Activates menu1 stored.

MENU2   Activates menu2 stored.

⇒   Cf. Chapter 3, Section "Quick Selection of Menu (QUICK SELECT)".
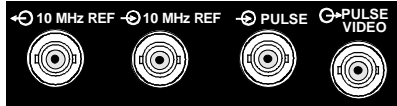
Elements of the Rear Panel

Fig. 1-2   Rear panel view

1

MOD	Relocation of MOD input for external modulation signals. Only with option SML-B19.
LF	Relocation of LF output for signals of internal LF generator. Only with option SML-B19.
RF 50 Ω	Relocation of output for RF signals. Only with option SML-B19.

2

10 MHz REF	Output of the internal 10-MHz-reference signal with reference internal. Input for external reference frequency 10 MHz with reference external.
PULSE	Input for triggering the pulse generator or for direct control of the pulse modulation. Only with option SML-B3.
PULSE/ VIDEO	Output of pulse generator or video output (only with option SML-B3).

⇒   Cf. Chapter 4, Section "Pulse Generator".

3

TRIGGER Input to trigger the sweep.

⇒   Cf. Chapter 4, Sections "Sweep Inputs".
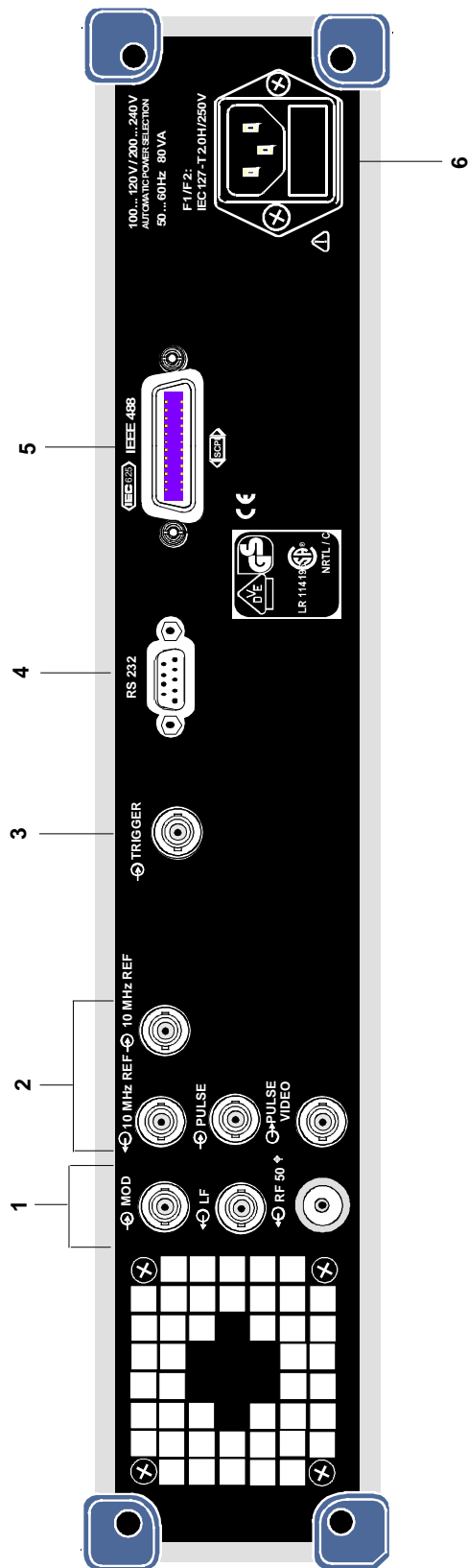
Fig. 1-2   Rear panel view

4
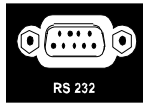
RS-232   RS-232-C interface
         used for software update and remote control. The
         pin assignment corresponds to the pin assignment
         of a PC.

⇒   Cf. Chapter 5, Section "Interface RS-232-C".
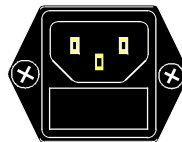
5

IEC 625   IEC-bus (IEEE 488)

IEEE 488   Interface for Remote Control

⇒   Cf. Chapter 5 "Remote Control".

6

Power supply connector and

fuse holder

⇒   Cf. Chapter 1, Section "Power Fuses".

2   Short Tutorial
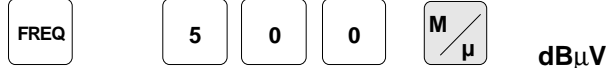
The present chapter contains a short tutorial with sample settings allowing the users to operate immediately the instrument.

Sample Setting for First Users

Setting frequency and level of the RF output signal

First frequency and level of the RF output signal are set via keys [FREQ] and [LEVEL] in the DATA INPUT field:
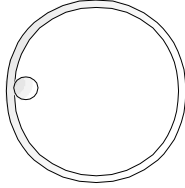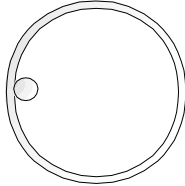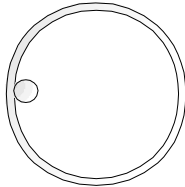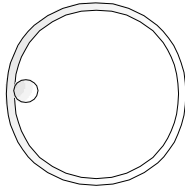
- Frequency   500 MHz
- Level   10 dBm
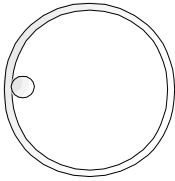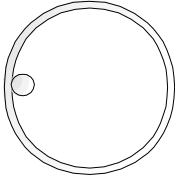
Operating steps	Explanations
MENU / VARIATION PRESET SELECT	Reset the instrument to the defined state.
DATA INPUT FREQ 5 0 0 M / μ **dBμV**	Set the frequency to 500 MHz. The menu cursor marks the permanent frequency indication.
DATA INPUT LEVEL 1 0 x1 ENTER **dB(m)**	Set the level to 10 dBm. The menu cursor marks the permanent level indication.
BACK	Reset the menu cursor to the menu field.

AM modulation of the output signal

The output signal is to be amplitude-modulated next.

- AM modulation depth   10.5 %
- AM signal   3-kHz sine

Operating steps	Explanations
MENU / VARIATION MENU / VARIATION Modulation SELECT	Select menu Modulation using rotary knob. Press [SELECT] key or rotary knob. The submenu is displayed.
MENU / VARIATION MENU / VARIATION AM SELECT	Select submenu AM. Press [SELECT] key or rotary knob. The AM setting menu is displayed.
MENU / VARIATION MENU / VARIATION AM Depth SELECT	Select parameter AM Depth using rotary knob. Press [SELECT] key or rotary knob. The menu cursor marks the setting value.
DATA INPUT 1 0 . 5 x1 ENTER	Enter modulation depth 10.5 % and acknowledge using [x1/Enter] key.
BACK	Reset menu cursor to AM Depth using [BACK] key.
MENU / VARIATION MENU / VARIATION AM Source SELECT	Select AM Source using rotary knob. Press [SELECT] key or rotary knob. A pop-up menu displays the current 1-out-of-n selection.

Operating steps	Explanations
MENU / VARIATION · · LFGen · · MENU / VARIATION [SELECT]	Select LF generator as modulation source using rotary knob. The selection mark marks LFGen.
[BACK]	Press [BACK] key. The cursor is set back to AM Source.
MENU / VARIATION · · LFGen Freq · · MENU / VARIATION [SELECT]	Select parameter LFGen Freq using rotary knob. Press [SELECT] key or rotary knob. The menu cursor marks the current frequency selection.
DATA INPUT [3] [k/m] mV	Set the frequency of the LF generator to 3 kHz. The AM modulation setting is completed. The indications on the display are represented in Fig. 2-1.

```
500.000 000 0 MHz    10.0 dBm
Modulation/AM                    AM
AM Depth                      10.5 %
AM Source                    LFGen
Ext Coupling                    AC

LFGen Freq      ►         3.0000 kHz
Back ↵
```
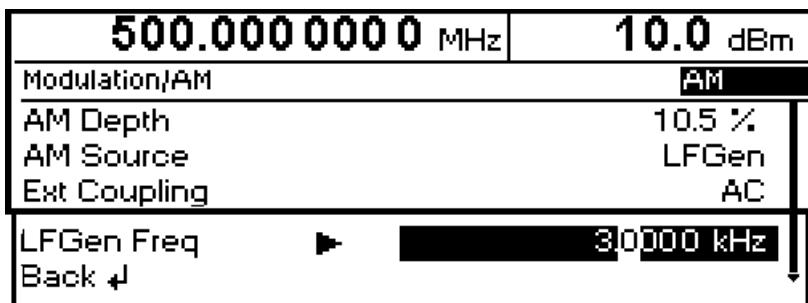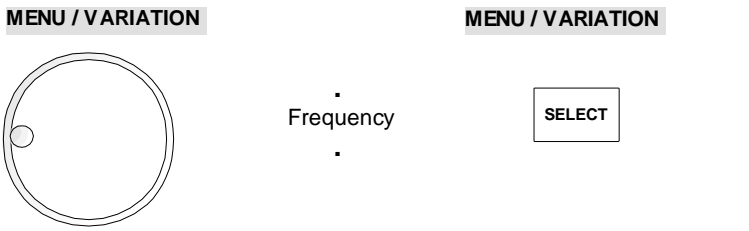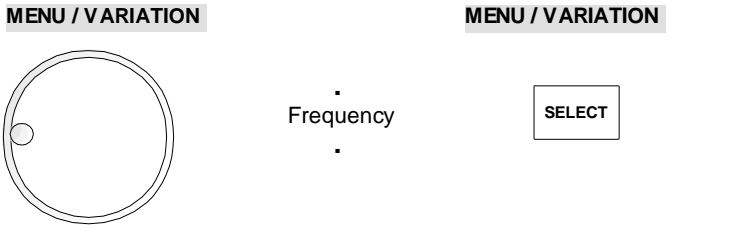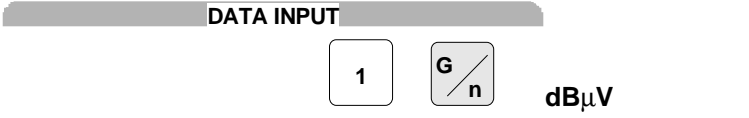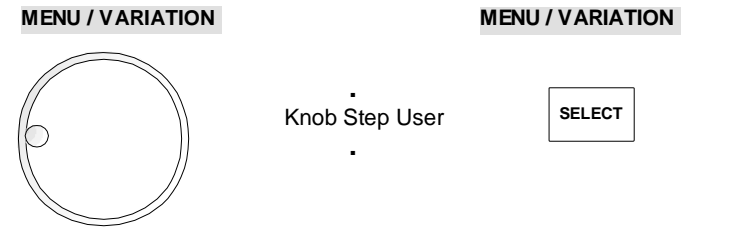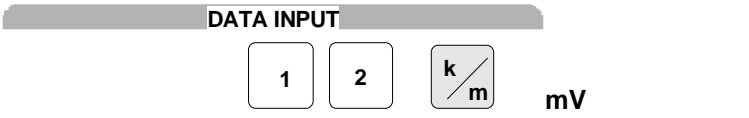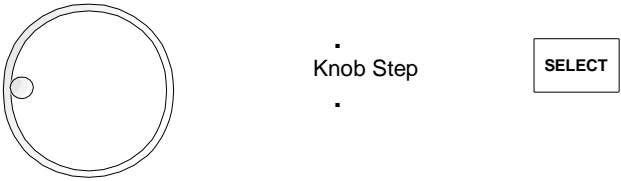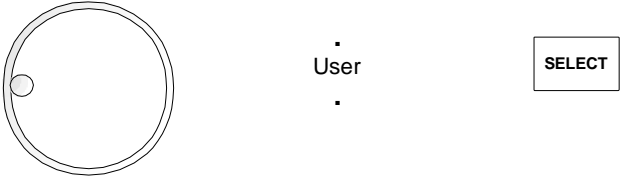
Fig. 2-1   Display for AM setting

Setting the step width

Subsequently to the above setting, 1 GHz as new RF frequency and 12 kHz as the step width for the RF frequency variation are set in the following.

Operating steps	Explanations
BACK BACK BACK	Reset the menu cursor to the main menu in 3 steps.
MENU / VARIATION MENU / VARIATION . Frequency SELECT .	Select menu Frequency using rotary knob. Press [SELECT] key or rotary knob. The frequency setting menu is displayed.
MENU / VARIATION MENU / VARIATION . Frequency SELECT .	Select parameter Frequency. Press [SELECT] key or rotary knob. The menu cursor marks the setting value.
DATA INPUT 1 G/n dBμV	Enter frequency 1 GHz.
BACK	Press [BACK] key. The menu cursor is set back to Frequency.
MENU / VARIATION MENU / VARIATION . Knob Step User SELECT .	Select parameter Knob Step User using rotary knob. Press [SELECT] key or rotary knob.
DATA INPUT 1 2 k/m mV	Enter step width 12 kHz.

Operating steps		Explanations
BACK		Press [BACK] key. The menu cursor is set back to Knob Step User.
MENU / VARIATION · Knob Step ·	**MENU / VARIATION** SELECT	Select parameter Knob Step using rotary knob. Press [SELECT] key or rotary knob. A pop-up menu displays the available settings.
MENU / VARIATION · User ·	**MENU / VARIATION** SELECT	Select User (user-defined step width) using rotary knob. This results in step width 12 kHz being used in the case of variation using the rotary knob.
BACK		Press [BACK] key. The menu cursor is set back to Knob Step.

```
 1.000 000 000 0 GHz        10.0 dBm
Frequency
Frequency               1.0000000000 GHz
Offset                            0.0 Hz
Knob Step User               12.0000 kHz
Knob Step                           User
Exclude from Recall                  Off
Back ↵
```

Fig. 2-2   Display for pattern setting

3   Manual Operation

This chapter shows the design of the display and describes the manual control of the signal generator, for example calling up of menus, selection and editing of parameters, use of the list editor and the SAVE/RECALL function. This chapter also contains an overview of menus showing the functions available for the instruments and its options.

It is useful to read the sample settings for first users in Chapter 2, "Short Tutorial".

Design of the Display

(1)	100.000 000 0 MHz -10.0 dBm
(2)	Main Am
(3)	Frequency Level Modulation LF Output
	Sweep Mem Seq Utilities Help

Fig. 3-1   Design of the display

(1) Header field   The header field of the display indicates frequency and level of the RF output signal. In the RF-sweep operating mode, the start and stop frequencies are displayed in two lines one above the other. The start and stop levels are indicated in the LEVEL-sweep operating mode correspondingly.

(2) Status line   The status line indicates at the left the menu path of the current menu and at the right the operating mode and operating state of the instrument. Error messages and notes for caution are also displayed in the status line.

(3) Menu fields   The indication fields below the status line are reserved for the menu representations. The image contents of these fields change as a function of the menu selected.

The lowest menu level shows the setting menu with the current settings of the selected menu. Settings are made in select or input windows which open when the current setting is activated.

Menu cursor   The menu cursor shows the user at which position in the menu he is. The position of the menu cursor is evident from the inverse notation of the term (white characters on a black background).

Digit cursor   As a bright field, the digit cursor marks the position which can be varied by means of the rotary knob in a value indication.

Basic Operating Steps

To operate the instrument, menus are called in the display. All setting possibilities and the current setting status are evident from the menus. All settings can be made by accessing the menus.
RF frequency and RF level can also be set without menu operation using keys [FREQ] and [LEVEL].
RF signal and modulation can also be switched on/off without menu operation using keys [RF ON/OFF] and/or [MOD ON/OFF].

Calling the menus

Accessing the menus is effected using rotary knob [VARIATION], [SELECT] key and [BACK] key.

Rotary knob Rotary knob [VARIATION] moves the menu cursor over the positions of a menu level to be selected.
If a scrollbar is visible at the right-hand margin of a menu, the menu is larger than the screen window. If the menu cursor is moved to the margin of the screen window, the covered lines become visible.

If the rotary knob is pressed after a position has been selected, the lower menu level or the respective settings are called. The rotary knob hence has the same function as the [SELECT] key.

[SELECT] key The [SELECT] key acknowledges the selection marked by means of the menu cursor. Depending on the position, the next lower menu level or the the respective setting is called.

[BACK] key The [BACK] key

- returns the menu cursor to the next higher menu level; the menu cursor is shifted to the left into the preceding column of the menu structure,
- resets the menu cursor from frequency or level value indication in the header field into the menu field to the menu called last,
- closes the display pages called using keys [STATUS], [HELP] and [ERROR] again.

Settings are accessed in the setting menus ending with the right-hand display margin.
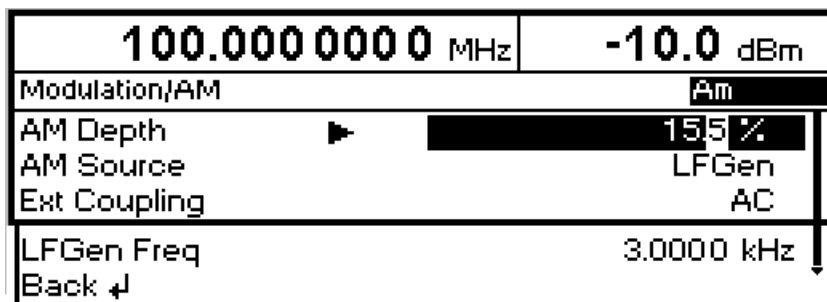
Fig. 3-2   Modulation - AM Menu

Selection and Change of Parameters

Select parameter   ➢ Set the menu cursor to the name of the parameter desired using the rotary knob, e.g. to AM Depth in the AM menu, cf. Fig. 3-2.

Change setting value ➢ Select parameter.

                          ➢ Press [SELECT] key or rotary knob.
                          The menu cursor changes from the parameter selected in the left-hand column of the setting menu to the setting value on the right, e.g. from AM Depth to 15%, cf. Fig. 3-2.

Via value inputs   ➢ Press the first digit of the new value or minus sign.
                          The old value is deleted, the entry is indicated in the marked field.

                          ➢ Enter further digits.

                          ➢ Terminate the input using a unit key or, in the case of inputs in the base unit or in the case of inputs without unit, using the [1x/Enter] key.

                          ➢ Press [BACK] key.

                          The menu cursor wraps back to the appropriate parameter.

Using rotary knob   ➢ Set the digit cursor (bright field) to the position of the setting value to be varied using keys [⇦] [⇨].

                          ➢ Turn rotary knob.
                          The value is varied.

                          Note: *RF frequency and RF level can also be varied in a step width which can be defined arbitrarily, using the rotary knob. In the respective setting menu (Frequency or Level), the step width is entered as Knob Step User and the Knob Step set from Decimal to User. To point to the fact that the step width has been converted to the value programmed, the bright field as a symbol of the digit cursor disappears in the respective value indication.*

1-out-of-n selection ➢ Select parameter.

➢ Press [SELECT] key or rotary knob.
A pop-up menu displays a selection of settings.

➢ Set the menu cursor to the position desired within the 1-out-of-n selection using the rotary knob or cursor keys [⇐] [⇒].

➢ Press [SELECT] key or rotary knob.
The setting is made.
The pop-up menu is closed using [BACK] key and the current setting is indicated at the right margin of the display.

➢ Press [BACK] key or mark selection Back using rotary knob and then press rotary knob.

The menu cursor wraps back to the next higher menu level.

Quick Selection of Menu (QUICK SELECT)

The keys of the QUICK SELECT control field are used to call selected menus quickly by one keystroke.

Store menus ➢ Establish the desired operating status of the current menu.

➢ Press [ASSIGN] key.

➢ Press [MENU1] or [MENU2] key.
The current menu is stored as menu1 or menu2. That is to say, 2 menus can be stored in total.

Call menus ➢ Press [MENU1] or [MENU2] key.
Menu1 or menu2 stored is displayed. Exactly the operating status which was current at the point of time of storing is reconstructed.

Use of [FREQ] and [LEVEL] Keys

RF frequency and RF level can be set without menu operation as well using direct keys [FREQ] and [LEVEL].

[FREQ] / [LEVEL] keys ➢ Press [FREQ] or [LEVEL] key.
The frequency or the level indication in the header field of the display is marked. The current menu at the display is maintained.

➢ Alter the value via a value input or the rotary knob.

➢ Press [BACK] or [SELECT] key.
The menu cursor wraps to the position marked last in the menu.

Use of [RF ON/OFF] and [MOD ON/OFF]

RF signal and modulation can be switched on/off without menu operation as well using keys [RF ON/OFF] or [MOD ON/OFF] (cf. Sections "[RF ON/OFF] Key" and "[MOD ON/OFF] Key").

[RF ON/OFF] key ➢ Press [RF ON/OFF] key.
The RF output signal is switched on/off.

IEC/IEEE-bus short command: `:OUTP:STAT ON`

[MOD ON/OFF] key ➢ Press [MOD ON/OFF] key.
Modulation is switched on/off.

A direct IEC-bus command is not available. The modulations have to be switched on and off in the respective modulation submenus.

Changing Unit of Level

For the level, the unit of the value set can be changed without a new value input.

Change level unit ➢ Activate Level parameter.

- Press [LEVEL] key or

- set menu cursor in the level menu to the setting value of the Amplitude parameter.

➢ Press the unit key with with the desired level unit.
The level is indicated in the desired unit.

Correction of Input

Digits can be corrected by one of the following keys before the input is confirmed by the [Enter] key:

Key [-/←]   The backspace key deletes the value entered digit by digit.

[BACK] key   Pressing the [BACK] key deletes the entire entry and results in the previous value being indicated again.

                           For a subsequent new input in the setting menu, the menu cursor is to be set to the setting value again using the [SELECT] key.

                           For a subsequent new input via the [FREQ] or [LEVEL] keys, the respective key has to be pressed again.

[FREQ]/[LEVEL] keys   In the case of a frequency or level input by means of the [FREQ] or [LEVEL] keys, pressing the [FREQ] and/or [LEVEL] key again deletes the entire input.

List Editor

The SML offers the facility of generating lists for user-defined level correction (Ucor). The lists consist of elements (pairs of values) which are defined by an index and at least one parameter per index. Each list is assigned a separate name and selected by means of this name. Access to the lists is made in the associated menus. How to generate and edit lists is explained in detail in this section by the example of the user defined level correction Ucor (Level - UCor menu, see Fig. 3-3).

Menu selection: Level - UCor

```
┌──────────────────────────────────────────────┐
│    100.000 000 0 MHz │   -10.0 dBm            │
├──────────────────────────────────────────────┤
│ Level/UCor                              Am     │
├──────────────────────────────────────────────┤
│ State                                   Off    │
│ Select List                             UCor0  │
│ Delete List                                    │
├──────────────────────────────────────────────┤
│ Edit List                               Insert │
│ Back ↵                                         │
└──────────────────────────────────────────────┘
```

Fig. 3-3   Level - UCor menu

The settings for State are not relevant for the general description of the list editor. They are described in greater detail in chapter 4 in section "User Correction Ucor".

The Select List, Delete List and Edit List lines are always displayed. They are intended for the selection and deletion of lists and for the calling of editing functions.

Select List   Opens a window in which a list out of 10 lists can be selected. In this line, the currently active list is displayed (see section "Select List").

Delete List   Opens a window from which a list can be selected whose contents are to be deleted (see section "Delete List").

Edit List   Selection of editing functions for list editing. When this item is selected, a pop-up menu with the following editing functions opens (see section "Edit List"):

          Insert   Insertion of elements into a list

          Fill   Filling of a list with elements

          Edit/View   Editing of individual elements of a list

          Delete   Deletion of elements of a list

          If the list is empty, only selection Insert is available.

Select List

➢ Mark the desired list using the rotary knob (see Fig. 3-4).

➢ Press the [SELECT] key or the rotary knob.

   The selected list is included in the instrument setup. The selection window is closed. The selected list is displayed under Select List.

Selection: Select List

```
   100.000 000 0 MHz      -10.0 dBm
 Level/UCor/Select List
 UCor0 0100    UCor1 0000    UCor2 0000    UCor3 0000
 UCor4 0000    UCor5 0000    UCor6 0000    UCor7 0000
 UCor8 0000    UCor9 0000
```

Fig. 3-4   Select List window

UCor0   The currently selected list, in this case Ucor0, is marked in the selection window.

0100   The length of the list, in this case 100 elements, is indicated in the column right of the list designation.

Delete List

➢ Mark the desired list using the rotary knob (see Fig. 3-5).

➢ Press the [SELECT] key or the rotary knob.
   The following query will appear:
   "Are you sure? Press SELECT to confirm   BACK to cancel".

➢ Press the [SELECT] key or the rotary knob.
   The contents of the list will be deleted. If the query is answered by pressing the [BACK] key, the contents of the list will be retained. The selection window is automatically closed upon answering the query.

Selection: Delete List

```
   100.000 000 0 MHz      -10.0 dBm
 Level/UCor/Delete List
 UCor0 0000    UCor1 0000    UCor2 0000    UCor3 0000
 UCor4 0000    UCor5 0000    UCor6 0000    UCor7 0000
 UCor8 0000    UCor9 0000    Back ↵
```

Fig. 3-5   Delete List window

Edit List

When Edit List is selected, a pop-up menu with the editing functions opens.

Insert editing function (see Fig. 3-6)

The Insert function inserts a desired number of elements with constant or linearly increasing/decreasing values ahead of the element with the indicated start index. All elements already existing from the start index are shifted so that they come at the end of the range of elements to be inserted.

Elements are inserted in a list according to the following procedure:

When Insert has been selected, the menu cursor is on the Insert At menu item.

➢ Press the [SELECT] key or the rotary knob.
   The menu cursor is on the value for At.

➢ Vary the index value by means of the rotary knob or enter an index value using the numerical keys and the [ENTER] key.

➢ Press the [SELECT] key or the rotary knob.
   The menu cursor is on the value for Range.

➢ Vary the Range value by means of the rotary knob or enter a value using the numerical keys and the [ENTER] key.

➢ Press the [SELECT] key or the rotary knob.
   The menu cursor is on the value for Start Frequency.

➢ Vary the start value for the frequency by means of the rotary knob or enter a value using the numerical keys and the [ENTER] key.

➢ Press the [SELECT] key or the rotary knob.
   The menu cursor is on the value for Increment Frequency.

➢ Vary the value of the increment by means of the rotary knob or enter a value using the numerical keys and the [ENTER] key.

➢ Press the [SELECT] key or the rotary knob.
   The menu cursor is on the value for Power.

➢ Vary the start value for the power by means of the rotary knob or enter a value using the numerical keys and the [ENTER] key.

➢ Press the [SELECT] key or the rotary knob.
   The menu cursor is on the value for Increment Power.

➢ Vary the value of the increment by means of the rotary knob or enter a value using the numerical keys and the [ENTER] key.

➢ The cursor is on Execute. Press the [SELECT] key or the rotary knob to execute the insertion. The menu cursor goes back to Edit List.

Upon pressing the [BACK] key, the editing window is exited without any change being made. The menu cursor goes back to Edit List.

Selection: Insert

```
┌──────────────────────────────────────────────────────┐
│   100.000 000 0 MHz    │   -10.0 dBm                   │
├──────────────────────────────────────────────────────┤
│ Level/UCor/Insert                                      │
├──────────────────────────────────────────────────────┤
│ Insert At              ►        ██████0001██████       │
│ Range                                     0001         │
│ Start Frequency                  100.0000000 MHz       │
├──────────────────────────────────────────────────────┤
│ Increment Frequency                     0.1  Hz        │
│ Power                                   0.0 dB         │
│ Increment Power                         0.0 dB         │
│ Execute                                                │
│ Back ↵                                                 │
└──────────────────────────────────────────────────────┘
```

Fig. 3-6   Edit function Insert

Insert At	Input of start index.
Range	Number of elements to be inserted.
Start Frequency	Input of start value for the frequency.
Increment Frequency	Input of increment between two successive frequency values. If 0 is entered as an increment, identical values will be inserted.
Power	Input of start value for the power.
Increment Power	Input of increment between two successive power values. If 0 is entered as an increment, identical values will be inserted.
Execute	Starts the insertion. After the execution of the function, the menu cursor goes back to Edit List.

Fill editing function (see Fig. 3-7)

The Fill function overwrites a parameter with constant or linearly increasing/decreasing values within a defined range. If the [BACK] key is pressed, the editing window will be exited without any change being made.
If the fill range extends beyond the end of the list, the list is automatically extended.

Filling of a list is done in the same way as the insertion of elements in a list, see "Insert editing function".

Selection: Fill

```
┌────────────────────────────────────────────────┐
│  100.000 000 0 MHz  │    -10.0 dBm              │
├────────────────────────────────────────────────┤
│ Level/UCor/Fill                                  │
├──────────────────────────────┬───────────────── │
│ Fill At              ►       │        0001       │
│ Range                        │        0001       │
│ Parameter                    │     Frequency     │
├────────────────────────────────────────────────┤
│ Start Frequency        100.0000000 MHz           │
│ Increment Frequency          0.0 Hz              │
│ Execute                                          │
│ Back ↵                                           │
└────────────────────────────────────────────────┘
```

Fig. 3-7   Fill editing function

Fill At	Input of start index.
Range	Number of elements to be included.
Parameter	Selection of parameters (frequency, power) to be filled. This menu option is not offered if a list contains only elements with one parameter.
Start Frequency	Input of start value for the selected parameter. This option is offered only if Frequency is selected as a parameter.
Increment Frequency	Input of increment between two successive values. If 0 is entered as an increment, the list will be filled with identical values. This option is offered only if Frequency is selected as a parameter.
Power	Input of start value for the selected parameter. This option is offered only if Power is selected as a parameter.
Increment Power	Input of increment between two successive values. If 0 is entered as an increment, the list will be filled with identical values. This option is offered only if Power is selected as a parameter.
Execute	Starts the filling procedure. After the execution of the function, the menu cursor goes back to Edit List.

Edit/View editing function (see Fig. 3-8)

The Edit/View function allows viewing of a complete list or editing individual values of a list.

If the cursor is on a value in the left column of the list, the Edit/View mode can be exited by pressing the [BACK] key. The menu cursor goes back to Edit List.

There is no storage function for the list. This means that any modification of the list will be transferred to the internal data set and will be effective on exiting the Edit/View function.

Selection: Edit

100.000 000 0 MHz	-10.0 dBm
Level/UCor/Edit	RF Off
0001 1.0000000000 GHz 0.0 dB	▌UCor1
0002 1.0000000010 GHz 0.0 dB	Free 150
0003 1.0000000020 GHz 0.0 dB	Len 010

Fig. 3-8   Edit editing function

UCor   Indication of list number

Free   Available space. Free 150, for example, means that there is free space for a
                           total of 150 pairs of values (elements) in the list memory.

Len   Occupied space. Len 010, for example, means that the current list occupies
                           10 elements in the list memory.

Selection of index   ➢ Select an index by means of the rotary knob or enter an index value by
                             means of the numerical keys.

Editing of parameters   ➢ Select the parameter (frequency, power) to be edited by means of the
                             [SELECT] key.

                          ➢ Vary the numerical value by means of the rotary knob or enter a numerical
                             value using the numerical keys.

                          ➢ Upon pressing the [BACK] key, the menu cursor goes back to the column
                             left of the current column or to the Edit List menu.

Delete editing function (see Fig. 3-9)

The Delete function deletes the elements of the indicated range. After a delete no gap is left in the list but the remaining elements move up. If the indicated range extends beyond the end of the list, the elements until the end of the list are deleted.

The inputs for deleting elements from a list are the same as for inserting elements into a list, see section "Insert editing function".

Upon pressing the [BACK] key, the editing window will be exited without any change being made. The menu cursor goes back to Edit List.

Selection: Delete

```
┌─────────────────────────────────┬──────────────────┐
│  11.000 000 000 0 GHz           │  -20.0 dBm       │
├─────────────────────────────────┴──────────────────┤
│ List/Delete                                         │
├─────────────────────────────────────────────────────┤
│ ▌Delete At                                  0001    │
│ Range                                       0100    │
│ Execute                                             │
│ Back ↵                                              │
└─────────────────────────────────────────────────────┘
```

Fig. 3-9   Delete editing function

Delete At   Input of first element to be deleted in a list

Range   Number of elements to be deleted

Execute   Starts the deletion. After the execution of the function, the menu cursor goes back to Edit List.

Storing/Calling of Instrument Settings (SAVE / RECALL)

50 complete instrument settings can be stored in memory locations 1 to 50.

Operating Steps	Explanations
DATA INPUT SAVE 1 2 x1 ENTER dB(m)	Store current instrument setting in memory location 12.
DATA INPUT RCL 1 2 x1 ENTER dB(m)	Call instrument setting of memory location 12.

The digital display during a save or recall entry is faded in a window.

If an instrument setting is stored in which a sweep was switched on, the sweep is started using the recall.

The parameter Exclude From Recall in the Frequency and Level-Level menus determines whether the saved RF frequency and RF level are loaded when an instrument setting is loaded, or whether the current settings are maintained.

Store IEC-bus command: `"*SAV 12"`

Call IEC-bus command: `"*RCL 12"`

Note: *The contents of lists, as they are used for user correction (Ucor), is not saved in the SAVE memory. It is stored under the respective list name and can be called. If instrument settings are called which go back to list data such as level setting using Ucor, the current list contents is used. If this has been altered, it is not identical to the list contents at the point of storing any more.*

Menu Summary

Frequency

Level
— Level
— ALC
— Ucor

Modulation
— AM
— FM
— ☞M
— Pulse   (Option SML-B3)

LF Output

Pulse Output   (Option SML-B3)

Sweep
— Freq
— Level
— LFGen

Utilities
— Display
— System
         — GPIB
         — RS232
         — Security
         — Language
— Ref Osc
— Protect
— Calib
         — Ref Osc
         — Level
         — Attenuator
         — IF Filter
         — Main Loop
         — Mult Filter
— Diag
         — Config
         — TPoint
         — Param
         — Harm Filter
— Test
         — Level Preset
— Mod Key
         — LFGen Level
— Aux I/O
         — FM Offset
         — All

Status   (using STATUS key)