

6.2 Service and Selftest Functions

The following measures have been taken to allow for error localization by means of the selftest functions:

Each synthesizer and signal module contains one or two 1-out-of-8 analog multiplexer(s), which select(s) up to 16 test voltages via buffer amplifier. The test voltages are output to the common selftest channel. Various functions can be checked:

- supply voltages generated on-board
- operating points of amplifiers
- signal levels by means of level detectors

Selection of the test channel is made via the serial board control. All instrument settings required for checking a test function are made automatically.

A differentiation has to be made between:

- permanent selftest functions
- the user selftest
- the service test

6.2.1 Permanent Selftest

The permanent selftest consists of supervising the synthesizer loops and the operating voltages in the power supply unit.

a) Supervision of the synthesizer and reference frequencies:

It is checked with all loops during operation, whether the tuning voltages are within the permitted tolerance. The LO amplifier outputs are checked with regard to adherence to the required output levels, occurrence of overload is recognized by means of level detectors located in the signal path at suitable places. All supervisory circuits work as OPEN collector outputs to common interrupt lines, the error-indicating board is localized by the controller by reading the status registers on the boards. Several interrupt lines have been provided for these supervisory tasks:

LO-Unlock for supervision of the frequency PLLs

LO-Level for supervision of the LO levels

IF-OVR for supervision of the 2nd IF overload

RF-OVR for supervision of the RF and 1st IF overload

If a faulty function has been found, the user is informed by a system message. One or more of the following error messages is then displayed:

Message	Meaning
- Reference unlock	Reference oscillator not synchronized
- 1st LO unlock	First LO not synchronized
- 2nd/3rd LO unlock	Second and third LO not synchronized
- Level 1st LO	LO level at first mixer too small
- Level 2nd LO	LO level at second mixer too small
- Level 3rd LO	LO level at third mixer too small
- RF OVR	Input signal too large
- IF OVR	Signal following IF amplifier too large

b) Supervision of the power supply function:

All supply voltages are checked with regard to adherence to their tolerances. Correct functioning is indicated at the rear panel of the instrument by the SUPPLY CHECK LED. A shortcircuit on any of the supply voltages causes switch-off of the power supply.

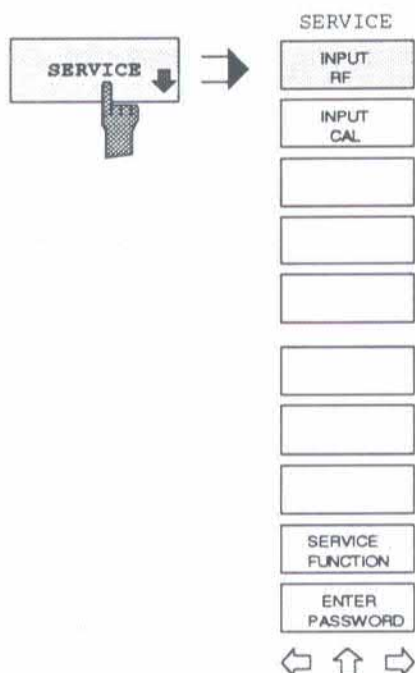
6.2.2 User Selftest

The user selftest checks the adherence to the rated values at the selftest points on all boards. First, all LO signals and, then, the signal path of the instrument is checked. Operating instructions for the selftest can be looked up in the Operating Manual, Section 2.4.4.3.

6.2.3 Service Selftest

The service selftest allows for specific check of circuitry on individual boards. This test is only accessible after entry of the password.

Upon entry of the password, a menu is displayed with calling the selftest, which is more extensive than the user selftest menu:



The FSE contains a number of service functions which would impair the analyzer functions if applied inappropriately. These functions are normally disabled and are not enabled until entering the *PASSWORD*.

SERVICE
FUNCTION



The *SERVICE FUNCTION* softkey calls various service functions. The individual functions are described in the subsequent section.

SERVICE FUNCTION
1.23.45.345675

The selection of the service function is made according to the following nomenclature:

Service function: gg.bb.ff.p1.p2

gg	Number of function group:
	0: general
	1: means boards/functions which are controlled by the 486 processor
	2: means boards/functions which are controlled by the transputers (particularly analog modules)
bb	Board number, presently reserved:
0	Functions which are performed simultaneously on all boards
1	Grafic Board
2	CPU Board
3	Dig. Motherboard
4..9	reserved
10	FRAC SYN
11	RF Module
12	2nd IF Converter
13	LO Phase
14	Preselector
15	Tracking Gen
16	MW Converter
17	MW YIG Filter
18	reserved
19	FSET-Z1-FT
20	Detector
21	RF Attenuator
22	TG Attenuator
23	Dig. IF Board
24	I/Q Demod
25	Channel Filter
26	IF-Filter
27	FSET-Z1-PT
28	FSET-IF1
29	FSET-IF2
30	FSET-IF741
31	FSET-Video
32...	reserved

- ff Function number:
number of service function assigned to the module. The number "0" has been reserved for switching off all active service functions on the module selected under bb (if required and if possible). The numbers "1 to 19" select functions which have been realized equally for all modules (e.g., read-out of the analog multiplexers), however, which differ in the following parameters and/or are to be performed on the selected module, only.
- p1 Parameter 1 (optional)
1st parameter for entered service function, entry range:
-2147483648 to +2147483647 (32-bit integer, signed)
- p2 Parameter 2 (optional)
2nd parameter for entered service function, entry range:
-2147483648 +2147483647 (32-bit integer, signed)
- Note:** *Shortly switch off the analyzer and on again to make sure that the activated service function is switched off. Individual functions can be switched off using the reserved function code 0. PRESET normally does not reset any service function. Parameters which have not been entered are assigned 0.*
Examples:
2.10
FRACSYN module, function=0, parameter1=0, parameter2=0
2.10..4
FRACSYN module, function=0, parameter1=4, Parameter2=0
- Note:** *The softkey is not provided until entering the SECURITY CODE.*

6.2.3.1 List of Service Functions

Function Group 0 (General Functions)

Function	Parameter	Function description

Function Group 1 (486 Section)

Function	Parameter	Function description
Software 0.0.xx		
1.0.0 Identification of model and availability of options	Parameter 1: 0 Transputer request 1 Setting of FSEA 2 Setting of FSEB 3 Setting of FSEM 4 Setting of FSEL 5 Setting of FSEIA 6 Setting of FSEIB 7 Setting of FSEIM 8 Setting of FSET Parameter 2 (optional): 10 Model 10 20 Model 20 30 Model 30 If parameter 2 unequals 10, 20 or 30, model 30 is used	Requesting or setting of the module options
Grafic Board 1.1.xx		
CPU Board 1.2.xx		
Dig. Motherboard 1.3.xx		

Function Group 2 (Transputer/Analog Modules)

The subsequent table contains all service functions which simultaneously affect all modules:

Function	Parameter	Function description
all boards 2.0.xx		Functions for all boards
2.0.1	-	This function causes an interrupt reset to be released on all boards (singular LOW pulse)
2.0.2	Parameter 1: 0 Restore Flags 1 CalCorr 2 CalBWData 3 CorrRAMData 4 CalLevelData 5 CalTempData 6 CalLOSupData 7 CalIQData 8 FreqCorrRF 9 FreqCorrSC 10 FreqCorrPreSel 11 FreqCorrPreAmp 12 FreqCorrRFAtt 13 FreqCorrMWConv 14 FreqCorrMWYig 15 FreqCorrMWDiplex 20 CalHighSpeed Parameter 2: 0 = OFF 1 = ON	This function allows for switching on or off (part of) the calibration data. Parameter 1 indicates which calibration data is to be switched, parameter 2 specifies the switching direction (ON, OFF). The setting thus selected can be overwritten by the system at any time. If parameter 1 is assigned the value 0, the complete flag structure is reset to the setting which prevailed prior to the first manipulation by this function.

The subsequent table contains all service function numbers which have been realized equally for all boards, however, which refer to one single board, only. These functions may be missing with individual boards due to the hardware configuration, which is why they are listed in the board-specific tables again, if they are provided with the respective board:

Function	Function description
2.bb.0	Switching off of all service functions started for the respective board. This includes stopping of running cyclic functions as well as enabling of disabled/modified system parameters.
2.bb.1	This function cyclically reads out a channel of the respective onboard diagnosis multiplexer selected via the parameter 1 and displays the result. Up to eight different channels on different boards can be read out and displayed, simultaneously. The repeated entry of a channel number terminates the measurement and output for just this channel. Entering the function 2.bb.0 terminates all active channel outputs for the selected board.
2.bb.2	This function cyclically reads out the status register of the selected board and displays the contents in binary form. The status register of one single board can be read out at a time, only. If the status register of another board is requested to be output, the read-out for the previously selected status register is stopped before. The function 2.bb.0 terminates the readout of the status register.
2.bb.3	This function enables reading the EEPROMs of a board into a file of the file system (CAL group) or loading new data from a file of the file system into the EEPROMs. Parameter 1 = 0: reading out the EEPROMs Parameter 1 = 1: programming the EEPROMs
2.bb.4	This function allows for modifying various parameters of the EEPROM header block of a board. The modifications are stored in the EEPROM immediately! Parameter 1 is used to select the header parameter which is to be varied, parameter 2 contains the new value for the parameter to be varied.
2.bb.5	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.bb.6	This function reads out the latest bit pattern which has been programmed into the control register of a board from the RAM copy of the hardware setting and displays it in binary (incl. subaddress) as well as in decimal form. Parameter 1 indicates the bus address of the register to be output, parameter 2 determines the subaddress (offset starting at 0, not the weighted bit pattern), if required. The service functions 2.bb.7 and 2.bb.8 subsequently refer to these information!
2.bb.7	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.bb.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access. They can be enabled again for <i>all</i> registers onboard using the function 2.bb.0 or for the register selected under 2.bb.6, only, using the function 2.bb.8. Active bits in the mask have to be set to 1. Using this function again for the same register, however, using another mask, partly releases a disabled access!
2.bb.8	This function reenables the register selected by 2.bb.6 for system access.

The subsequent tables contain all service functions which are presently provided for the various boards:

Function	Parameter	Function description
FRAC SYN 2.10.xx		FRAC SYN module
2.10.0		Deletion of all active service functions on this board
2.10.1	Number of the multiplexer channel to be read out	cyclical readout of the analog-multiplexer channel. Repeated entry of the same channel terminates the readout for this channel.
2.10.2	-	cyclical output of the status register of the board
2.10.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the FracSyn into the FRAC_SYN.DAT file of the file system (CAL group) or loading new data from this file into the EEPROMs.
2.10.4	p1: value[0..2] p2: value[0..99]	This function allows for modifying various parameters of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.10.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.10.6	p1: bus address p2: sub address	This function reads out the latest bit pattern which has been programmed into the control register of a board from the hardware and displays it.
2.10.7	p1: bitpattern mask p2: bit pattern new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.10.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access.
2.10.8	-	This function reenables the register selected by 2.10.6 for system access.
2.10.20	p1: value [0...4095] p2=0: modification only p2=1: modification and reading to the EEPROM	This function allows for modifying the D/A converter for adjustment of the reference frequency.
2.10.21	p1 = 0: CalGen off p1 = 1: CalGen on p2 = Cal level in dBm	This function switches over the calibration source. The setting made is locked for system access. Release via 2.10.0.

Function	Parameter	Function description
RF module 2.11.xx		RF Module
2.11.0		Deletion of all active service functions on this board
2.11.1	Number of the multiplexer channel to be read out	cyclical readout of the analog-multiplexer channel. Repeated entry of the same channel terminates the readout for this channel.
2.11.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the RF module into the RF.DAT file of the file system (CAL group) or loading new data from this file into the EEPROMs.
2.11.4	p1: value[0..2] p2: value[0..99]	This function allows for modifying various parameters of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.11.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.11.6	p1: bus address p2: subaddress	This function reads out the latest bit pattern which has been programmed into the control register of a board from the RAM copy of the hardware setting and displays it.
2.11.7	p1: bit pattern of mask p2: bit pattern of new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.11.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access
2.11.8	-	This function reenables system access to the register selected by 2.11.6.
2.11.20	p1 = 0: NoiseGen off p1 = 1: NoiseGen on	This function switches over the noise generator. The setting made is then locked for system access. Release via 2.11.0.
2.11.21		This function accepts the DAC setting values for the LO suppression and reads them to the EEPROM onboard.
2.11.22	p1 = -1: reading out the total attenuation error p1 = [0..700/1400]: reading out a level-correction value from the level-correction list of the FSEA/FSEB.	Readout of an EEPROM parameter from the RAM copy of the hardware setting and output on the display: p1: address or ID of the EEPROM parameter to be read out
2.11.23	p1 = -1: writing the total attenuation error to the RAM p1 = [0..700/1400]: writing a level correction value into the level-correction list of the FSEA/FSEB. p2: [0..255]	Overwriting an EEPROM parameter in the RAM copy of the hardware setting, updating the interpolation lists for the level correction and status output on the display: p1: address or ID of the EEPROM parameter to be overwritten p2: new value for the selected EEPROM parameter

Function	Parameter	Function description
2nd IF Converter 2.12.xx		2nd IF Converter
2.12.0		Deletion of all active service functions on this board
2.12.1	Number of the multiplexer channel to be read out	cyclical readout of the analog-multiplexer channel. Repeated entry of the same channel terminates the readout for this channel.
2.12.2	-	cyclical output of the status register of the board
2.12.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the 2nd_IF_Converter into the SCND_IF.DAT file of the file system (CAL group) or loading new data from this file into the EEPROMs.
2.12.4	p1: value[0..2] p2: value[0..99]	This function allows for modifying various parameters of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.12.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.12.6	p1: bus address p2: subaddress	This function reads out the latest bit pattern which has been programmed into the control register of this board from the RAM copy of the hardware setting and displays it.
2.12.7	p1: bit pattern of mask p2: bit pattern of new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.12.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access.
2.12.8	-	This function reenables system access to the register selected by 2.12.6.
2.12.20.p1.p2	p1: value [0...255] p2=0: modification only p2=1: modification and reading to the EEPROM	This function allows for modifying the D/A converter DAC0 for adjustment of the OVR1 threshold
2.12.21.p1.p2	p1: value [0...255] p2=0: modification only p2=1: modification and reading to the EEPROM	This function allows for modifying the D/A converter DAC1 for adjustment of the OVR1-10 threshold
2.12.22.p1.p2	p1: value [0...255] p2=0: modification only p2=1: modification and reading to the EEPROM	This function allows for modifying the D/A converter DAC2 for adjustment of the OVR2 threshold
2.12.23.p1.p2	p1: value [0...255] p2=0: modification only p2=1: modification and reading to the EEPROM	This function allows for modifying the D/A converter DAC3 for adjustment of the OVR2-10 threshold
2.12.27.p1.p2	p1: value [0...255] p2=0: modification only p2=1: modification and reading to the EEPROM	This function allows for modifying the D/A converter DAC7 for adjustment of the VCO frequency
2.12.28		This function initiates the VCO calibration of the third LO. With normal operation of the instrument, this calibration is performed with total calibration, only.

Function	Parameter	Function description
LO Phase 2.13.xx		LO Phase module
2.13.0		Deletion of all active service functions on this board
2.13.1	Number of the multiplexer channel to be read out	cyclical readout of the analog-multiplexer channel. Repeating the entry of the same channel terminates the readout for this channel.
2.13.2		-
2.13.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the LO_Phase module into the LO_PHASE.DAT file of the file system (CAL Group) or loading new data from this file into the EEPROMs.
2.13.4	p1: value[0..2] p2: value[0..99]	This function allows for modifying various parameters of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.13.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.13.6	p1: bus address p2: subaddress	This function reads out the latest bit pattern which has been programmed into the control register of this board from the RAM copy of the hardware setting and displays it.
2.13.7	p1: bit pattern of mask p2: bit pattern of new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.13.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access.
2.13.8	-	This function reenables system access to the register selected by 2.13.6.

Function	Parameter	Function description
MW Converter 2.16.xx		MW Converter
2.16.0		Deletion of all active service functions on this board
2.16.1		-
2.16.2		-
2.16.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the MW Converter into the MW_CONV.DAT file of the file system (CAL Group) or loading new data from this file into the EEPROMs.
2.16.4	p1: value[0..2] p2: value[0..99]	This function allows for modifying various parameters of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.16.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.16.6	p1: bus address p2: subaddress	This function reads out the latest bit pattern which has been programmed into the control register of this board from the RAM copy of the hardware setting and displays it.
2.16.7	p1: bit pattern of mask p2: bit pattern of new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.16.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access.
2.16.8	-	This function reenables system access to the register selected by 2.16.6.
2.16.20		This function sets the synthesizer to zero span and sets frequency conditioning to FB > 7GHz. No limitation of the maximum frequencies.
2.16.21	p1: value [0...255] p2=0: modification only p2=1: modification and storing in the RAM copy of the hardware setting	Parameter 1: frequency correction of YIG-Filter
2.16.22	p1: value [0...16383] p2=0: modification only p2=1: modification and reading to the EEPROM	Parameter 1: DAC value for start-frequency correction
2.16.23	p1: value [0...16383] p2=0: modification only p2=1: modification and reading to the EEPROM	Parameter 1: DAC value for stop-frequency correction
2.16.24	-	Extracts the required EEPROM data from the current hardware buffer and programs them into the EEPROM (for 2.16.21/22/23)
2.16.25	p1 = 0: 7..15GHz p1 = 1: 15..26.5GHz p1 = 2: 26.5..40GHz p2: [0..255]	Overwriting the EEPROM parameter for the frequency-dependent level correction of the first LO in the RAM, updating the DAC settings for the level correction and status output on the display: p1: frequency range of the new level-correction value p2: new value
2.16.26	p1 = 0: level error of the IF gain p1 = 1: level error of LO p2: [0..255]	Overwriting the EEPROM parameters for the level correction with external mixing in the RAM, updating the system data for the level correction and status output on the display: p1: selection of parameter p2: new value

Function	Parameter	Function description
MW YIG Filter 2.17.x		MW YIG Filter
2.17.0		Deletion of all active service functions on this board
2.17.1		-
2.17.2		-
2.17.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the MW YIG filter into the MW_YIG.DAT file of the file system (CAL Group) or loading new data from this file into the EEPROMs.
2.17.4	p1: value[0..2] p2: value[0..99]	This function allows for modifying various entries of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.17.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.17.6	p1: bus address p2: subaddress	This function reads out the latest bit pattern which has been programmed into the control register of this board from the RAM copy of the hardware setting and displays it.
2.17.7	p1: bit pattern of mask p2: bit pattern of new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.17.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access.
2.17.8	-	This function reenables system access to the register selected by 2.17.6.
2.17.20	p1:[0..620/800/1340]	Reading out a level correction value from the level correction list for 22/26.5/40GHz of the EEPROM buffer in the RAM and output on the display: p1: address of the correction value to be read out
2.17.21	p1: [0..620/800/1340] p2: [0..255]	Overwriting a level correction value in the level-correction list for 22/26.5/40GHz in the EEPROM buffer in the RAM, updating the interpolation lists for the level correction and status output on the display: p1: address of the EEPROM parameter to be overwritten p2: new value

Function	Parameter	Function description
Detector 2.20.xx		Detector board
2.20.0		Deletion of all active service functions on this board
2.20.1	Number of the multiplexer channel to be read out	cyclical readout of the analog-multiplexer channel. Repeating the entry of the same channel terminates the readout for this channel.
2.20.2		-
2.20.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the detector board into the DETECTOR.DAT file of the file system (CAL group) or loading new data from this file into the EEPROMs.
2.20.4	p1: Value[0..2] p2: Value[0..99]	This function allows for modifying various parameters of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.20.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.20.6	p1: bus address p2: subaddress	This function reads out the latest bit pattern which has been programmed into the control register of this board from the RAM copy of the hardware setting and displays it.
2.20.7	p1: bit pattern of mask p2: bit pattern of new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.20.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access
2.20.8	-	This function reenables system access to the register selected by 2.20.6.
2.20.20.p1	p1: value (-5V...+5V) in steps of [10mV]. e.g., 1.4V => p1 = 140	This function allows for modifying the D/A converter for the comparator setting with external trigger.

Function	Parameter	Function description
RF Attenuator 2.21.xx		RF Attenuator
2.21.0		Deletion of all active service functions on this board
2.21.1	Number of the multiplexer channel to be read out	cyclical readout of the analog-multiplexer channel. Repeating the entry of the same channel terminates the readout for this channel.
2.21.2		-
2.21.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the RF attenuator into the RF_ATT.DAT file of the file system (CAL Group) or loading new data from this file into the EEPROMs.
2.21.4	p1: value[0..2] p2: value[0..99]	This function allows for modifying various parameters of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.21.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.21.6	p1: bus address p2: subaddress	This function reads out the latest bit pattern which has been programmed into the control register of this board from the RAM copy of the hardware setting and displays it.
2.21.7	p1: bit pattern of mask p2: bit pattern of new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.21.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access.
2.21.8	-	This function reenables system access to the register selected by 2.21.6.

Function	Parameter	Functionsbeschreibung
Dig. IF Board 2.23.xx		Dig. IF Board
2.23.0		Deletion of all active service functions on this board
2.23.1	Number of the multiplexer channel to be read out	cyclical readout of the analog-multiplexer channel. Repeating the entry of the same channel terminates the readout for this channel.
2.23.2	-	cyclical output of the status register of the board.
2.23.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the digital IF board into the DIGIT_IF.DAT file of the file system (CAL group) or loading new data from this file into the EEPROMs.
2.23.4	p1: value[0..2] p2: value[0..99]	This function allows for modifying various parameters of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.23.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.23.6	p1: bus address p2: subaddress	This function reads out the latest bit pattern which has been programmed into the control register of this board from the RAM copy of the hardware setting and displays it.
2.23.7	p1: bit pattern of mask p2: bit pattern of new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.23.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access.
2.23.8	-	This function reenables system access to the register selected by 2.23.6.

Function	Parameter	Function description
IF-Filter 2.26.xx		IF Filter board
2.26.0		Deletion of all active service functions on this board
2.26.1	Number of the multiplexer channel to be read out	cyclical readout of the analog-multiplexer channel. Repeating the entry of the same channel terminates the readout for this channel.
2.26.3	p1 = 0: readout of the EEPROMs p1 = 1: programming of the EEPROMs	This function enables reading the EEPROMs of the IF filter board into the IF_FILT.DAT file of the file system (CAL Group) or loading new data from this file into the EEPROMs
2.26.4	p1: value[0..2] p2: value[0..99]	This function allows for modifying various parameters of the EEPROM header block of the board. p1 = 0: type of board, p1 = 1: main modification index p1 = 2: temporary modification index p2 new value for the entry
2.26.5	-	This function programs all data from the EEPROM buffer in the RAM into the EEPROM of the respective board.
2.26.6	p1: bus address p2: subaddress	This function reads out the latest bit pattern which has been programmed into the control register of this board from the RAM copy of the hardware setting and displays it.
2.26.7	p1: bit pattern of mask p2: bit pattern of new value	This function writes the bitpattern transferred in parameter 2 into the register selected by function 2.26.6 at the bit positions given via the mask in parameter 1. The bits thus marked are subsequently disabled for system access.
2.26.8	-	This function reenables system access to the register selected by 2.26.6.
2.26.20	CalAmp1-value as integer: -3 .. +12 [dB]	The gain factor entered via parameter 1 is set for CalAmp1 and protected against system access. System access is enabled again by means of the function 2.26.0. The gain factor is then overwritten prior to the next sweep by the currently used gain.
2.26.21	CalAmp2-value as integer: -6 .. +9 [dB]	The gain factor entered via parameter 1 is set for CalAmp2 and protected against system access. System access is enabled again by means of the function 2.26.0. The gain factor is then overwritten prior to the next sweep by the currently used gain.

6.3 Test Instruments and Utilities

Item	Type of instrument	Required specifications	Suitable R&S instrument	Order No.	Application
1	Digital multimeter	1mV...100V 0.1mA...1A	UDS5	349.1510.02	
2	Frequency counter	Accuracy $>1 \cdot 10^{-8}$			
3	Signal generator	100kHz...3500MHz	SMHU	835.8011	
4	3-dB coupler	Decoupling $>20\text{dB}$; 1 to 3500MHz			
5	Attenuator	6dB	DNF	274.4110.50	
6	Spectrum analyzer	100kHz to 8000MHz	FSM	1020.7020.52	
7	Power meter	100kHz to 3500MHz	URV5 NRV-Z?	349.8012.02	
8	Network analyzer	300kHz to 3500MHz			
9	VSWR bridge	300kHz to 3500MHz			