ROHDE&SCHWARZ

Modulation Analyzer

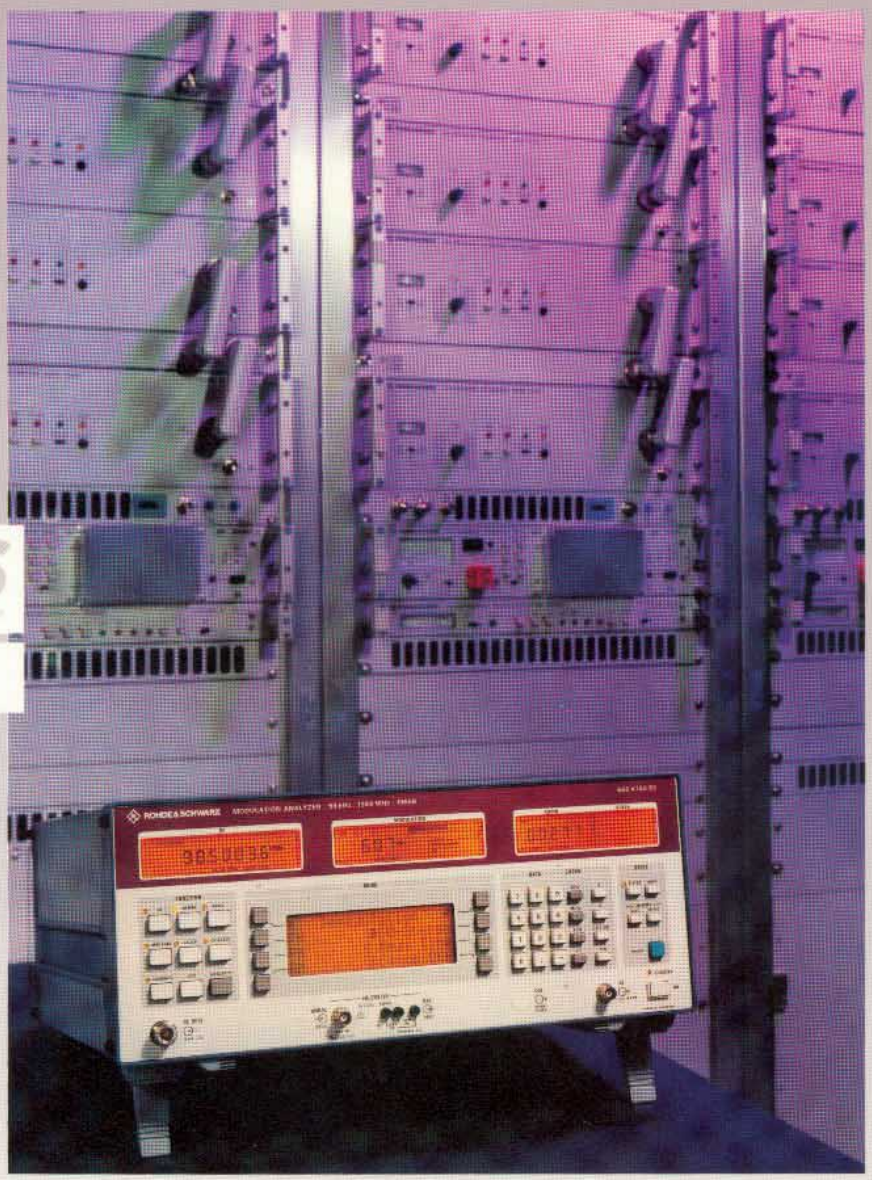
FMAB

50 kHz to 1360 MHz

The specialist
for sound broadcast
signals

R·D·S RADIO DATA SYSTEM

IEC625Bus IEEE 488



- First analyzer with built-in precision stereodecoder
- External stereodecoder input
- Demodulation of RDS and traffic program signals
- CCIR detector and standard weighted/unweighted CCIR filters
- Distortion meter from 10 Hz to 100 kHz

Modulation Analyzer FMAB

50 kHz to 1360 MHz

- RF frequency measurement with 10-digit readout
- High-precision AM, FM and φM measurement over a wide modulation frequency range
- Built-in precision stereodecoder both for internal FM stereo decoding and for decoding of an external stereo multiplex signal
- Complete AF analysis in the L, R, M, S channels including distortion measurement and S/N ratio measurement to CCIR standard
- Selective measurement of pilot deviation and deviation of 57-kHz traffic program carrier
- Built-in RDS demodulator with clock and data output for external decoding
- Measurement of modulation depth of 57-kHz traffic program carrier
- High-accuracy power measurement (typ. error <0.5 dB)

Modulation Analyzer FMAB has been especially designed for the **analysis of FM stereo broadcast signals**. It combines the universal features of the FMA basic model and the additional measurement capabilities of the built-in stereodecoder.

The measurement tasks of the FMAB mainly cover the field of sound broadcasting and include comprehensive analysis of VHF transmitters, channel transposers and VHF/baseband converters. Since the stereodecoder with all its analysis functions can be separately used via the rear-panel input, measurements on FM receivers and stereocoders are also possible.

Three large illuminated LCD displays simultaneously read out the measured carrier frequency, modulation and modulation frequency, plus additional information about device status and settings. The clear front-panel layout, with softkeys and a few main function keys, makes for user-friendly operation. Previously complex measurements on FM stereo signals thus become very simple.

All essential test parameters can be read at a glance on clearly arranged LCD displays

Characteristics

Thanks to the clear layout of the FMAB, all essential test parameters can be read at a glance on the LCD displays. Superimposed additional information, such as the test channel, deemphasis switched on, etc. affords high measurement reliability.

The **precision stereodecoder** has been especially designed for wide dynamic range and flat amplitude and phase response that are required in FM stereo measurements. The values guaranteed for the weighted stereo S/N ratio of ≥80 dB and the channel crosstalk attenuation of ≥60 dB in the range 30 Hz to 15 kHz are top-class.

The special characteristics of the built-in FM demodulator regarding frequency and phase response as well as low distortion are ideally matched to the stereodecoder. The values guaranteed meet the relevant specifications of broadcasting corporations and are even better in many cases.

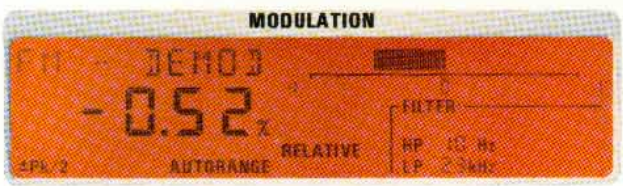
Dynamic range An extremely low-noise local oscillator (typ. —130 dBc at 1 GHz, 20-kHz carrier offset) ensures a sufficient S/N ratio for FM stereodecoding even far above the VHF band, eg for measurements on channel transposers in the UHF range. A weighted FM stereo S/N ratio of typically 78 dB for carrier frequencies up to 170 MHz allows precise S/N ratio measurements on FM broadcast transmitters, channel transposers and VHF/baseband converters.

Result display Frequency or level, deviation or modulation depth as well as frequency or distortion are read out independently of one another on three LCD displays. All essential device settings, such as operating mode, test channel, type of detector, weighting filter, etc are superimposed on the relevant display.

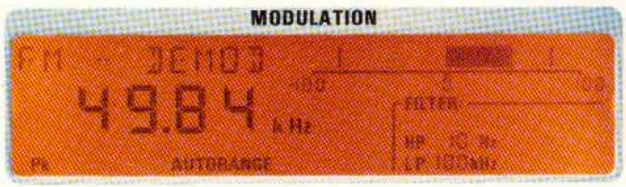
A scaled bargraph indicator with a high resolution (one hundred divisions) is provided especially for the alignment of DUTS followed by modulation and voltage measurements.

When relative measurement (% or dB) is selected, the bargraph indicator automatically switches to plus/minus indication in the measurement of small deviations. This ensures fast and easy adjustment to a defined reference value.

A special min/max hold mode allows simultaneous analog display of the current result and the defined minimum and maximum values.



The analog bargraph indicator is ideally suited for adjustments, eg to a defined reference value



In min/max hold mode the current result can be displayed in analog form between minimum and maximum value

Operation

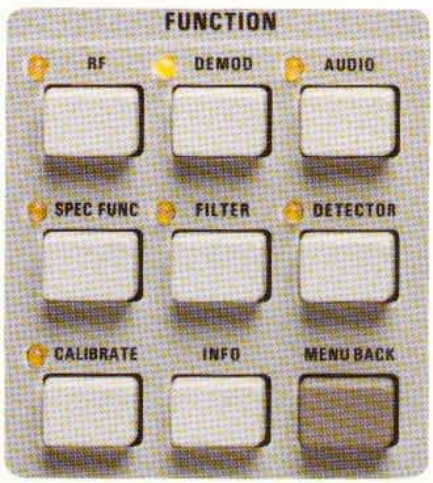
Due to its versatile measurement functions, the FMAB is **menu-controlled** so that there is no need for a great number of individual keys.

The minimal number of **main function keys** as well as an alphanumeric menu display with four softkeys arranged at both sides make for clear front-panel layout and fast access to the desired measurement functions. Important functions are at a high menu level, the number of submenu levels being limited to a maximum of three so that finding one's way in the menu is easy.

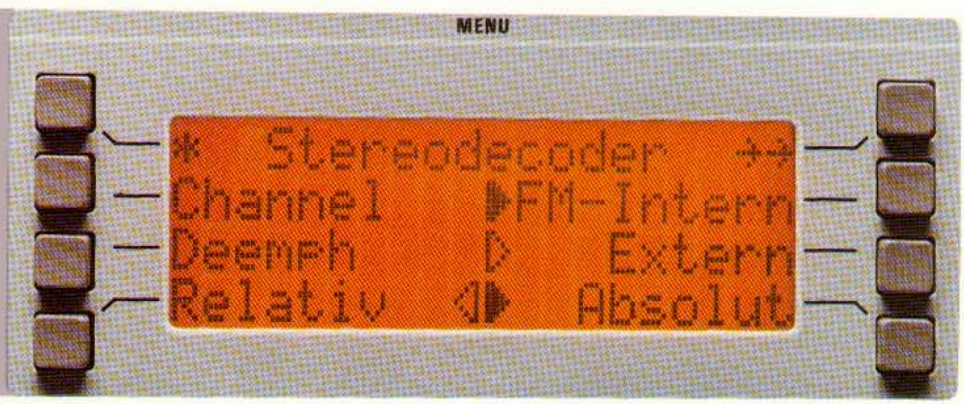
Parameters, like for instance a reference value for relative display, can be entered via the numeric keypad and are terminated with one of the ENTER keys (unit/multiplier keys). The fact that up to 20 complete setups can be stored considerably enhances the measurement reliability in complex applications.

Remote control The Modulation Analyzer FMAB features full remote-control capability. The FM stereo measurement facilities are system-compatible. The IEC-bus interface fully complies with the new IEEE 488.2 standard and enables **plain-text programming**, which greatly facilitates program writing. For setting an FM deemphasis of 50 μs, for instance, with FM stereodecoding switched on, the following entry is made:
STEREODECODER:DEEMPHASIS 50 US

The few main function keys make the FMAB user-friendly:



RF	All RF settings such as tuning frequency input level RF frequency counter
DEMOD	Selecting the demodulation modes and access to the FM stereodecoder functions
AUDIO	Setting the audio frequency counter or the DIST/SINAD meter
SPEC FUNC	Special functions like voltmeter mode, IEC-bus address, bargraph indicator control etc.
FILTER	Selecting the audio filters
DETECTOR	Selecting the detector for the modulation display
CALIBRATE	Calibrating functions
INFO	Readout of all internal settings on the menu display
MENU BACK	Going back a level in the menu tree



Softkeys enable fast access to desired measurement functions

Measurement functions

The FMAB features standard measurement functions in modulation analysis and a wide variety of additional capabilities thanks to the built-in stereodecoder:

- Fast, fully automatic ranging to input frequencies from 50 kHz to 1360 MHz at levels from 3 mV to 7 V
- RF frequency measurement with 10-digit readout and resolution down to 0.1 Hz
- AM modulation depth, FM and φM deviation with error of less than 0.5%, wide dynamic range and 3-dB bandwidth of >300 kHz
  FM and φM deviation measurement range 700 kHz (700 rad)
  AM, FM and φM demodulation from 50-kHz carrier frequency upwards
- Audio frequency measurements with 5-digit readout and resolution down to 1 mHz
- Distortion and SINAD measurement continuously from 10 Hz to 100 kHz with a dynamic range of >80 dB
- Psophometric weighting filters:
  highpass filters 10/20/300 Hz
  lowpass filters 3/23/100 kHz
  CCIR filters (468-4) weighted and unweighted
  CCITT and other special weighting filters
- Precision detectors: separate +PK and —PK detector with extremely short response time, MAX PEAK function
  True RMS detector
  Quasi-peak detector to CCIR 468-4
- AC and DC voltage measurement
- Power measurement (error typ. ≤0.5 dB, overload protection circuit for up to 5 W input power)

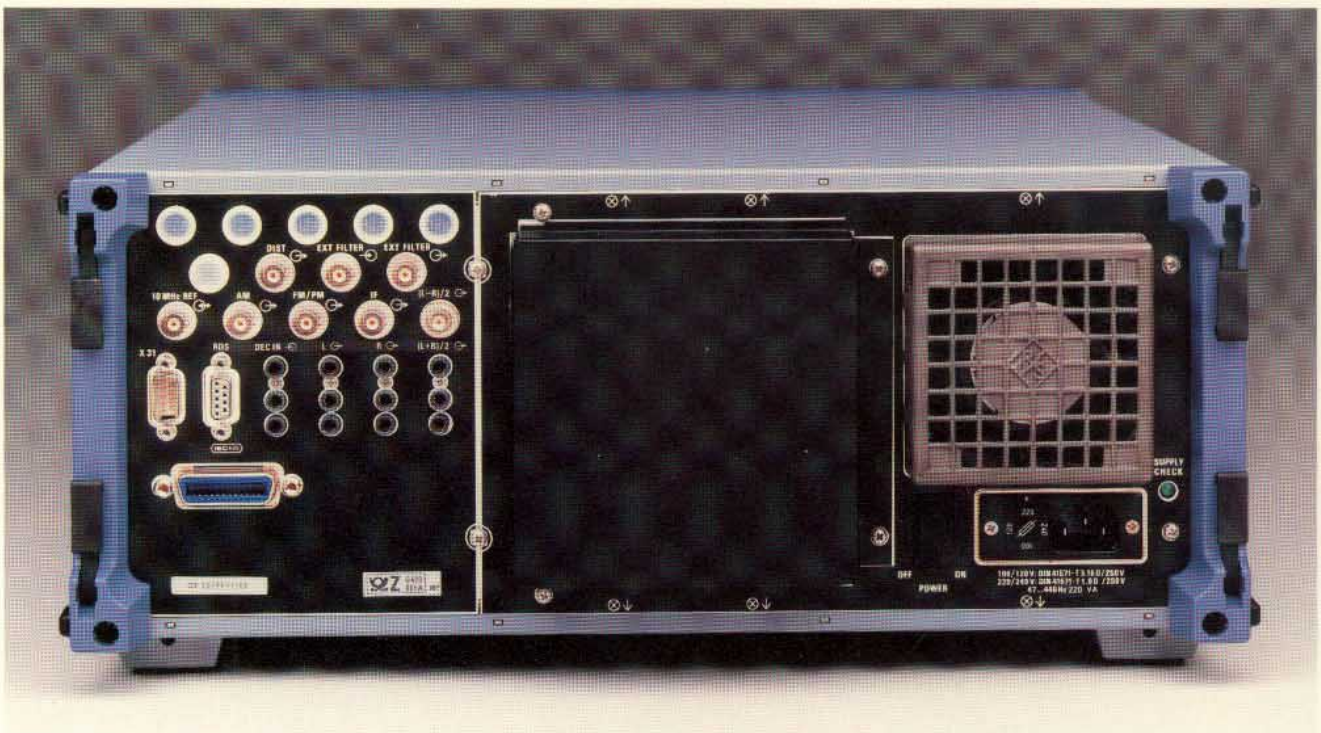
Options

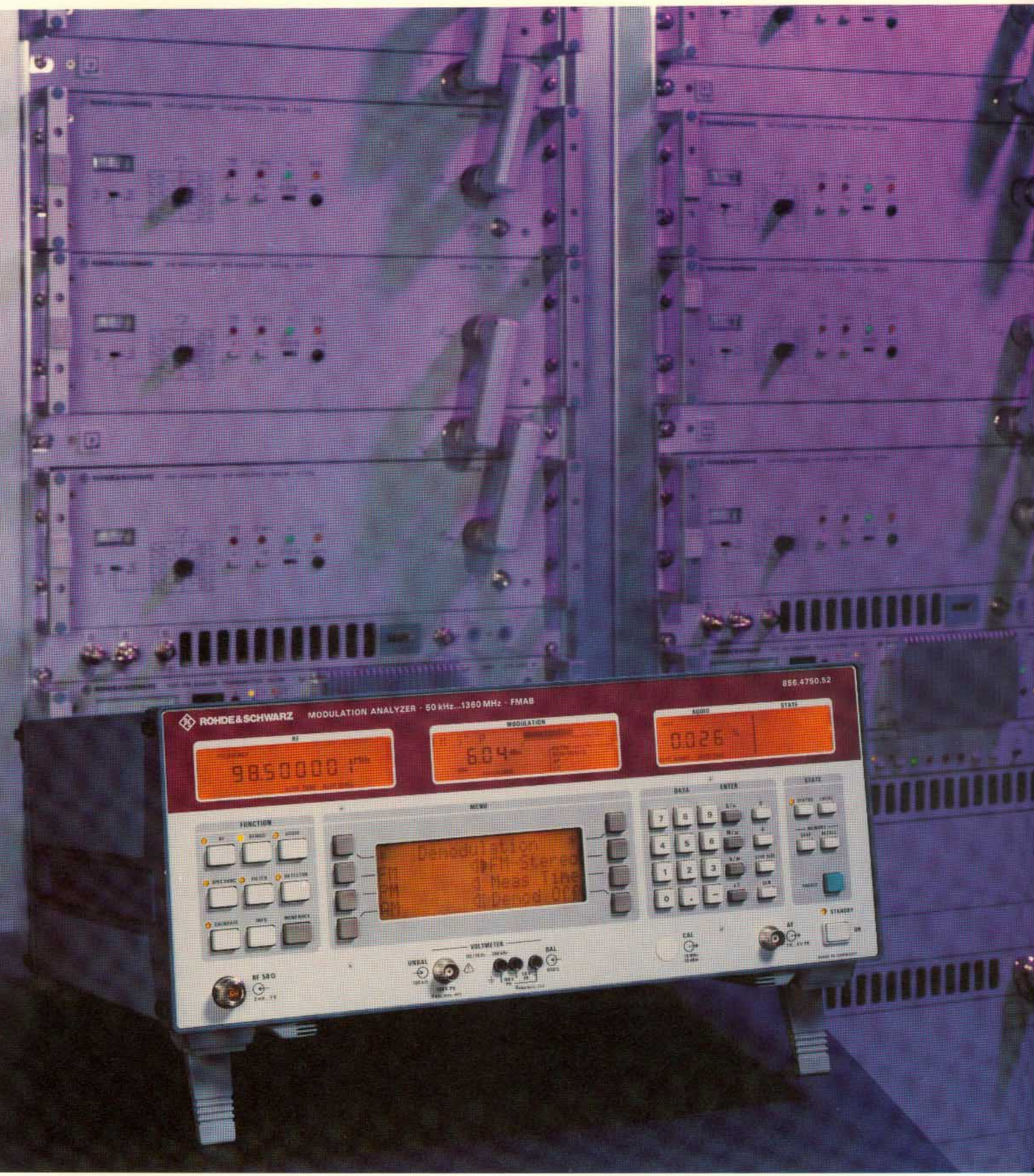
The FMAB can be expanded by the optional highly stable **10-MHz Reference Oscillator (FMA-B10)** with aging of $< 1 \times 10^{-9}$/day. The frequency measurement error at 100 MHz of maximally 200 Hz is thus reduced down to 10 Hz within a calibration interval of one year.

The **AM/FM Calibrator FMA-B4** including an AF generator from 10 Hz to 100 kHz with two external, separately switchable outputs is also available as an option. The error of the calibration source is less than 0.1%.

A **5.2-GHz Frequency Extension (Option FMA-B12)** is provided for special applications at higher frequencies, eg outside-broadcast links in the GHz range.

Rear view of FMAB




ROHDE&SCHWARZ
MODULATION ANALYZER · 50 kHz...1360 MHz · FMAB
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RF
9850000
MODULATION
604
AUDIO
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STATE
FUNCTION
MENU
DATA
ENTER
VOLTMETER
UNBAL
BAL
CAL
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STANDBY
RF SHD

IEC 625 Bus
IEEE 488

Modulation Analyzer **FMAB**

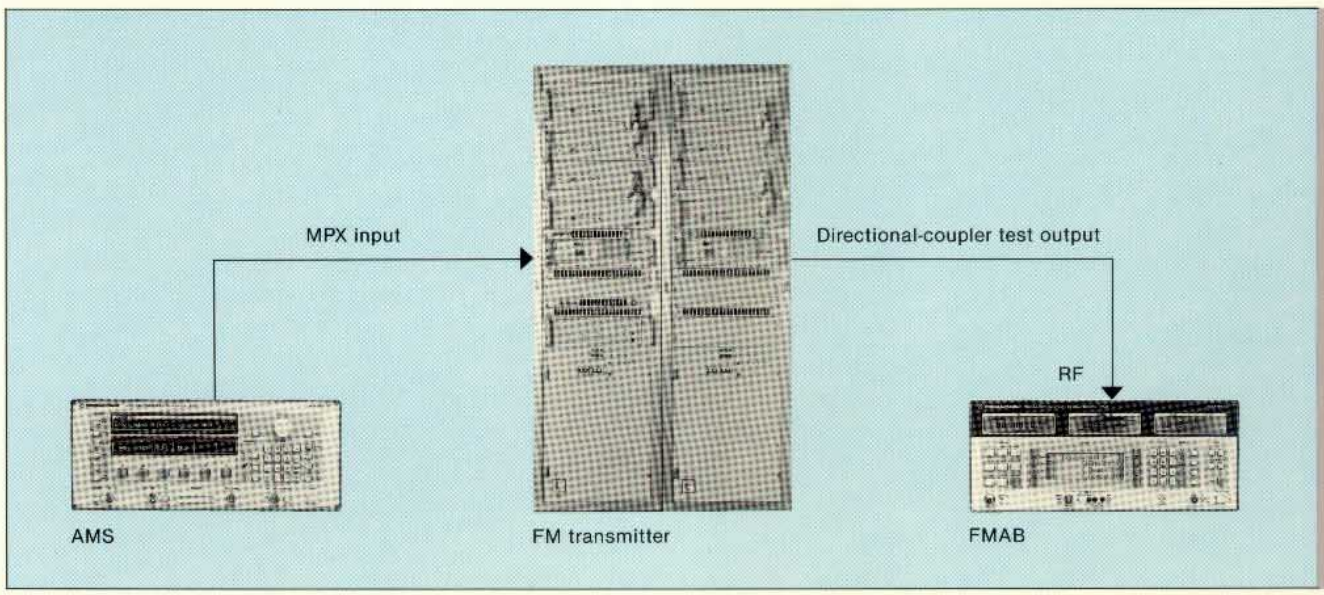
50 kHz to 1360 MHz

- RF frequency measurement with 10-digit readout, maximum resolution 0.1 Hz
- High-precision AM, FM, φM measurement over a wide modulation frequency range (error ≤0.5% for FM)
- Low-frequency measurement with 5-digit readout, resolution 1 mHz
- Distortion measurement down to <0.005%, continuous in the range from 10 Hz to 100 kHz
- Wide range of filters, psophometric weighting filters
- AF voltage measurement AC/DC
- High-accuracy power measurement (typ. error <0.5 dB)
- Built-in precision stereodecoder both for internal FM stereodecoding and for decoding of external stereo multiplex signals
- Complete AF analysis in L, R, M, S channels including distortion measurement and S/N ratio measurements to CCIR standards
- Selective measurement of pilot tone deviation and deviation of 57-kHz traffic program carrier
- Built-in RDS demodulator for external decoding
- Modulation-depth measurement on 57-kHz traffic program carrier

Applications

A phase-compensated noise suppression filter with a bandwidth of 95 kHz (—3 dB) can be switched into circuit between FM demodulator and stereodecoder especially for internal stereodecoding. High-frequency spurious components can thus be efficiently kept away from the stereodecoder, with negligible effect on the phase linearity and channel crosstalk from L to R and R to L. In conjunction with the **Arbitrary Waveform Generator AMS** from R&S, which produces a synthetic stereo multiplex signal with a crosstalk attenuation of more than 60 dB, the FMAB can be expanded to form a complete test set especially for FM broadcast transmitters. All quality-relevant parameters of VHF sound broadcast transmitters can thus be measured without the need for any additional measuring instruments.

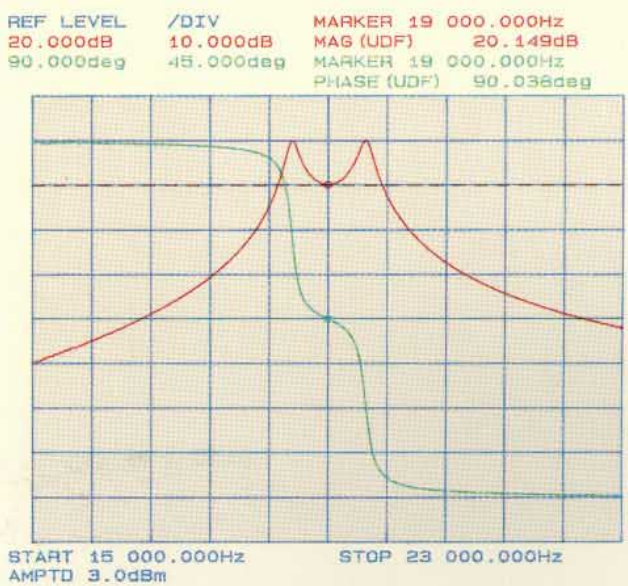
FMAB in conjunction with Arbitrary Waveform Generator AMS for transmitter measurements



Frequency response in L channel

Selected components ensure minimum frequency response and high spurious suppression in the L, R, M, S channels

Frequency response of pilot filter



A high-selectivity pilot tone filter allows unimpaired measurement of the pilot tone deviation. The phase error of the pilot tone filter can be automatically eliminated with the aid of a method specially developed by R&S. New standards are thus set in the measurement of stereo channel crosstalk.

Separate +PK and —PK detectors featuring very short response time and high precision are ideally suited for simultaneous detection of positive and negative peak deviation of FM stereo program signals. In conjunction with the PK HOLD function, peak deviations can be monitored for periods ranging from very short to a duration of any length. If the MAX PEAK function is selected on the FMAB, the maximum deviation will be indicated on the display.

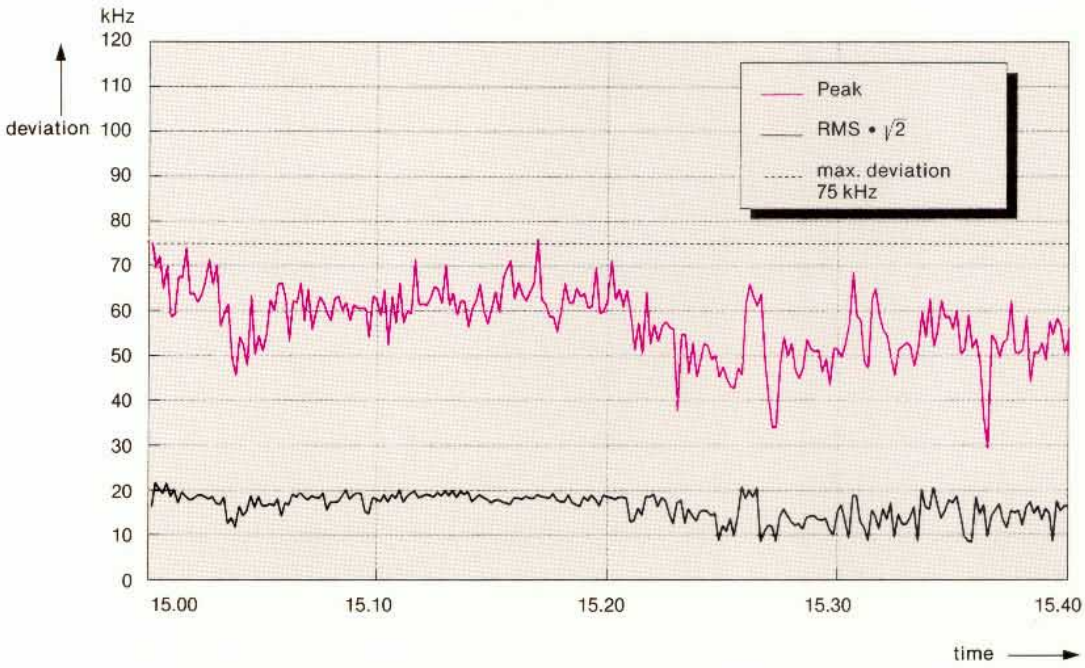
Peak deviation monitoring In conjunction with a process controller, eg the PSA from R&S, the FMAB is ideal for monitoring the peak deviation of VHF broadcast transmitters. In the PK hold mode, +PK and —PK detectors operating in parallel and featuring a very short response time ensure precise measurement of all, even the narrowest of modulation peaks. The monitoring intervals can be from ≤100 ms up to any duration. The values measured by all detectors such as +PK, —PK, RMS and quasi-peak can be read out per unit time.

The FMAB is designed for **high measurement speed:**

- Fast, automatic frequency adjustment by direct frequency measurement up to 1.36 GHz
- Correct frequency measurement even at large AM depth thanks to state-of-the-art technologies
- Two independent frequency counters for simultaneous RF and AF measurement
- All measurement times can be adapted to the specific measurement problem, eg lowest measurement frequency or required counter resolution

Measurement functions that are not required can be switched off, eg for extremely fast modulation measurement with preset RF level and preset RF frequency. In this way, 10 modulation values can be measured per second.

Future-oriented design The frequency range can be extended up to 5.2 GHz, thus allowing measurements on special broadcasting and program distribution systems. The built-in firmware can easily be updated via a serial interface using a PC compatible with the industry standard.



With the aid of an external PC, the FMAB is also suitable for monitoring of peak deviation measured at intervals of <100 ms

Specifications

Frequency range	50 kHz to 1360 MHz	
Frequency tuning	automatic[1]) or manual	
Display	10-digit readout	
Resolution	0.1/1/10/100 Hz selectable	
Frequency error and drift	± 1 digit + error of reference frequency	
Reference oscillator	**standard**	**option FMA-B10**
Aging	2×10^{-6}/year	1×10^{-7}/year
after 30 days of operation	—	1×10^{-9}/day
Temperature effect	2.5×10^{-6} (0 to 55°C)	2×10^{-9}/°C
Warmup time	15 min	15 min
External reference input/output	manual or remote-controlled switchover	
Output level	12 dBm ± 2 dB	
Input level range	−10 ... + 15 dBm	
RF input	Z_{in} = 50 Ω, N connector, VSWR <1.4 with 10 dB attenuation	
Overload protection	up to 5 W (15 V RMS)	
Maximum peak voltage	25 V (including DC)	

RF power measurement

Frequency range	50 kHz to 1360 MHz
Power measurement range	0.18 µW to 1 W (−37.5 to + 30 dBm)
Measurement error	
0.18 µW ≤ P < 0.1 mW	≤ ± 1.5 dB ± 0.05 µW
P ≥ 0.1 mW	≤ 1 dB (typ. 0.5 dB)

Amplitude modulation measurement

Modulation frequency range	10 Hz to 200 kHz			
Resolution	0.1% of rdg; max. 0.001% AM			
Measurement error[2]) with peak detection (% of rdg, plus peak residual AM)				
	f_{in}: 50 to 300 kHz	>300 kHz to 10 MHz	≥ 10 MHz	meas. error
		f_{mod}		
m ≤ 80%	30 Hz to 3 kHz	30 Hz to 10 kHz	30 Hz to 20 kHz	≤ 0.8%
m ≤ 95%	—	30 Hz to 20 kHz	30 Hz to 100 kHz	≤ 1%
	10 Hz to 8 kHz	10 Hz to 20 kHz	10 Hz to 100 kHz	≤ 2%
	—	10 Hz to 50 kHz	10 Hz to 200 kHz	≤ 5%

Residual AM[3])	
to CCITT	≤ 0.01%
20 Hz to 23 kHz, RMS	≤ 0.03%
to CCIR	≤ 0.05%
Incidental AM in FM mode (f_{mod} = 1 kHz, meas. bandwidth 20 Hz to 3 kHz)	
f_{in} = 50 kHz to 10 MHz, deviation = 5 kHz	≤ 0.2%
f_{in} ≥ 10 MHz, deviation = 50 kHz	≤ 0.1%
AF distortion for f_{mod} = 10 Hz to 20 kHz (for f_{in} <300 kHz: f_{mod} = 10 Hz to 5 kHz)	
m = 40%	≤ 0.2%
40% ≤ m ≤ 80%	≤ 0.4%

Frequency modulation measurement

Modulation frequency range	10 Hz to 200 kHz		
Max. measurable deviation for f_{in}	50 to 300 kHz	300 kHz to 10 MHz	≥ 10 MHz
	f_{in}/10	150 kHz	700 kHz
Meas. error[2]) with peak detection (plus peak residual FM)	f_{in}: 50 to 300 kHz		
	f_{mod}		error
	30 Hz to 5 kHz		≤ 0.5%
	10 Hz to 8 kHz		≤ 2%
	f_{in}: 300 kHz to 10 MHz		
	f_{mod}		error
	30 Hz to 10 kHz		≤ 0.5%
	30 Hz to 20 kHz		≤ 1%
	10 Hz to 50 kHz		≤ 2%
	f_{in}: ≤ 10 MHz		
	f_{mod}		error
	30 Hz to 20 kHz		≤ 0.5%
	30 Hz to 100 kHz		≤ 1%
	10 Hz to 200 kHz		≤ 2%
Resolution	better than 0.1% of rdg (min. 0.1 Hz)		
Residual FM[3]) for f_{in}	≤ 340 MHz	≤ 680 MHz	≤ 1360 MHz
to CCITT, RMS	≤ 0.5 Hz	≤ 0.7 Hz	≤ 1 Hz
20 Hz to 23 kHz, RMS	≤ 2 Hz	≤ 3 Hz	≤ 5 Hz
CCIR, quasi-peak +50 µs deemphasis	≤ 3 Hz	≤ 4 Hz	≤ 6 Hz

Stereo S/N ratio[3]) weighted to CCIR, 40 kHz deviation, at FM output (with noise filter)		
f_{in}: 10 to ≤ 170 MHz	≥ 76 dB	
170 to ≤ 340 MHz	≥ 73 dB	
340 to 680 MHz	≥ 68 dB	
Stereo crosstalk (f_{in} ≥ 10 MHz, without noise filter)		
f_{mod} = 1 kHz	≥ 56 dB down	
30 Hz ≤ f_{mod} ≤ 15 kHz	≥ 50 dB down	
AF distortion for deviation of	75 kHz	500 kHz
f_{in} ≥ 10 MHz		
f_{mod} = 30 Hz to 20 kHz[4])	≤ 0.05%	≤ 0.2%
20 to 100 kHz	≤ 0.15%	≤ 0.5%
f_{in} >500 kHz		
f_{mod} = 30 Hz to 20 kHz	≤ 0.1%	—
Incidental FM (m = 50%, f_{mod} = 1 kHz, B = 20 Hz to 3 kHz, plus peak residual FM)	≤ 10 Hz	
Deemphasis	50/75/750 µs selectable, effective at AF output and, if selected, for readout of results	

Phase modulation measurement

Modulation frequency range	200 Hz to 200 kHz		
with special φM filter	10 Hz to 20 kHz		
Max. measurable deviation (up to max. 1 kHz AF, −6 dB/ octave for f >1 kHz)			
f_{in}	50 to 300 kHz	300 kHz to 10 MHz	≥ 10 MHz
	1/10 x f_{in}/kHz x 1 rad	150 rad	700 rad
Error[2]) of peak detection (plus peak residual φM)			
f_{mod}	300 Hz to 5 kHz	300 Hz to 10 kHz	300 Hz to 100 kHz
with special φM filter:			
f_{mod}	10 Hz to 5 kHz	10 Hz to 10 kHz	10 Hz to 10 kHz
	≤ 2%	≤ 2%	≤ 2%
Resolution	<0.1% (minimum 0.0001 rad)		
Residual φM[3]) for f_{in}	≤ 680 MHz	>680 MHz	
CCITT weighting	≤ 0.002 rad	≤ 0.004 rad	
300 Hz to 23 kHz	≤ 0.005 rad	≤ 0.01 rad	
AF distortion (at AF output)	≤ 0.1%		
(f_{mod} 200 Hz to 20 kHz, Δφ = 4 rad, f_{in} ≥ 500 kHz)			

AF voltmeter

DC voltage measurement	
Range	± 10 µV to 20 V
Offset voltage[5])	
unbalanced input	≤ 1 mV } can be corrected to ≤ 30 µV using offset
balanced input	≤ 3 mV } calibration
Resolution	<0.1%
Error	± 0.5% ± 10 µV ± offset voltage
AC voltage measurement	
Frequency range	10 Hz to 300 kHz
Measurement range	30 µV to 20 V
Resolution	0.1% of rdg
Error (RMS detector)	
30 Hz to 20 kHz	≤ 1% ± 30 µV (100-kHz lowpass filter)
10 Hz to 100 kHz	≤ 2% ± 100 µV (without lowpass filter)
10 Hz to 200 kHz	≤ 3% ± 100 µV (without lowpass filter)
Weighting facilities	all AF measuring facilities, such as detector, filter, frequency counter and distortion meter, can also be used in voltage measurements
Inputs	
unbalanced	input impedance 100 kΩ ‖ < 50 pF, BNC connector
balanced	input impedance 600 Ω, three-contact connectors to DIN 41628

AF detector

Peak detector	positive or negative peak of AF or their arithmetic mean
RMS detector	true RMS-responding rectifier, readout as RMS value or converted to peak for sinewave
Quasi-peak detector	detector to CCIR Rec. 468-4

Weighting filters

Highpass filters	10 Hz (2nd order) 20 Hz (3rd order) 300 Hz (2nd order)
Lowpass filters	3 kHz (4th order) 23 kHz (4th order) 100 kHz (4th order) 5-Hz lowpass (for DC measurement) 30-kHz Bessel lowpass (4th order) 120-kHz Bessel lowpass (4th order) 4.2-kHz Cauer lowpass
Standard filters	CCIR 468-4 weighted CCIR 468-4 unweighted CCITT P53; plus external filters

AF frequency display	5 digits
Frequency range	10 Hz to 300 kHz
Resolution	1 mHz to 10 Hz
Error	±0.005% ±3 mHz ±1 digit

Distortion measurement

Readout either in % or SINAD in dB, automatic adjustment for S/N ≥20 dB

Measurement range	10 Hz to 100 kHz
Display range	
THD	0.005 to 50%
SINAD	6 to 86 dB
Maximum error	
10 Hz to 100 kHz (harmonics up to 300 kHz)	±2 dB ±0.15% THD
20 Hz to 20 kHz (with 100-kHz lowpass filter)	±1 dB ±0.03% THD

Stereodecoder

Crosstalk	
30 Hz to 15 kHz, RMS or CCIR detector	
L to R, R to L	≥60 dB down
M to S, S to M	≥50 dB down
Frequency response L, R, M, S	
30 Hz to 15 kHz	max. ±0.1 dB
Level difference between L and R	≤0.1 dB
Measurement errors L, R, M, S	
19-kHz pilot tone	
Level, deviation	≤2%
57-kHz carrier (level)	≤5%
AM of 57-kHz carrier (f_{mod} = 10 to 125 Hz)	≤2% of rdg +0.1% AM
Nonlinear distortion (with input level 6 dBm and 12.5 dBm, L, R, M, S outputs)	
THD (30 Hz to 15 kHz)	≤0.1%
Intermodulation distortion to DIN 45403	d_2 ≤0.05%, d_3 ≤0.1%
S/N ratio, referred to +6 dBm at 500 Hz, deemphasis 50 µs	
CCIR unweighted	≥80 dB
CCIR weighted	≥80 dB
Auxiliary carrier suppression, referred to +6 dBm	
Pilot tone (19 kHz)	≥90 dB
RDS/ARI (57 kHz)	≥80 dB
Deemphasis	50 or 75 µs, switch-selectable
External decoder input	balanced, 3-contact connector to DIN 41628 on rear panel
Common-mode rejection	
f ≤1 kHz	≥60 dB
1 kHz <f ≤15 kHz	≥50 dB
15 kHz <f ≤100 kHz	≥36 dB
Input impedance	≥40 kΩ
Input level range	−12 to +12.5 dBm (600 Ω) (nominal +6 dBm/40 kHz)
Resolution of level setting	≤0.2 dB
Stereodecoder outputs	
L, R, M	balanced, 3-contact connectors on rear panel, to DIN 41628, +6 dBm, Z_{out} ≤30 Ω, Z_l ≥300 Ω
S (L−R/2)	unbalanced, BNC connector, Z_l ≥600 Ω
RDS demodulator outputs	9-contact Cannon connector on rear panel
Signals available	data, clock, quality signal, TP information, 57-kHz carrier (TTL)

Measuring time

Automatic tuning; RF, modulation and modulation frequency measurement with 10 Hz RF resolution (HP filter and PK detector switched on)	typ. 1 s
Fast modulation measurement (RF, modulation range and level already programmed)	≤120 ms
DIST measurement f_{mod} ≥30 Hz	typ. 2.5 s
≥300 Hz	typ. 1 s

Outputs

IF output	max. 200 mV into 50 Ω
AM output	max. 1 V into 600 Ω (can be DC-coupled)
FM-/φM output	
for FM	6 dBm (1.545 V) into 600 Ω, 40 kHz deviation (DC-coupled)
for φM	1.545 V into 600 Ω, 40 rad
Distortion output	max. 1 V into 600 Ω
AF output	1 to 4 V peak into 600 Ω with autoranging

Remote control

Interface	IEC 625-1/625-2 (IEEE 488.1/488.2), connector: 24-contact Amphenol; controlling all device functions including Serial Poll and Parallel Poll
Interface functions	SH1, AH1, L4, T5, SR1, RL1, DC1, DT1, PP1, CO

General data

Environmental conditions	to IEC 359, class I
Rated temperature range	0 to +55 °C
Storage temperature range	−40 to +70 °C
RFI suppression	complies with VDE 0871, limit B and PTT regulations 527/1979
Power supply	100/120/220/240 V ±10%, 47 to 440 Hz (170 VA)
Dimensions, weight	435 mm x 192 mm x 460 mm, 25 kg

Ordering information

Order designation	▶ Modulation Analyzer FMAB 856.4750.52
Accessories supplied	special cable for firmware updating, manual, power cable, spare fuses

Options

Reference Oscillator	FMA-B10	856.3502.52
AM/FM Calibrator	FMA-B4	855.6008.52
5.2-GHz Frequency Extension	FMA-B12	855.8500.52

Recommended extras

High-power Attenuator 20 dB, 50 W	RDL	1035.1716.00
Service Kit	FMA-Z1	856.4009.52
19″ Adapter	ZZA-94	396.4905.00
Set of Front Handles	ZZG-94	396.5160.00
Transport Case	ZZK-944	1013.9366.00

1) For amplitude-modulated signals: P_{in} ≥ −27 dBm, m ≤80%.

2) In temperature range 20 to 30 °C, additional error of ±0,5% over entire temperature range; error of RMS detection may be up to twice as high as of peak detection.

3) For input level ≥20 dB above specified minimum input level.

4) 100-kHz lowpass filter switched in.

5) Input attenuator switched on: value x 10.

ROHDE&SCHWARZ

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