

Specifications of the Level Measuring Sets		
Frequency range		
plus tracking generator (TX+ RX)		
	PSM-137	PSM-139
Coaxial input	50 Hz to 8 MHz	50 Hz to 32 MHz
Balanced input I	10 kHz to 8 MHz	10 kHz to 14 MHz
Balanced input II	50 Hz to 620 kHz	50 Hz to 620 kHz
Frequency display resolution	1 Hz (0.1 Hz with AFC)	
Frequency accuracy	2×10^{-6} (5×10^{-7} with option BN4203/00.06)	

Frequency control modes

Automatic tone search with pre-set level threshold (TONE SEARCH)

Automatic frequency control (AFC)

Automatic frequency stepping (AUTOSTEP)

Linear sweep up to 1 MHz per second, graphical presentation of measured results

Level measuring range			
Input*	Selective	Voice (50 Hz to 10 kHz)	Wideband
$Z_0 = 50, 75 \Omega$	± 130 to $+30$ dBm	± 110 to $+30$ dBm	± 50 to $+30$ dBm
$Z_0 = 124, 150 \Omega$	± 120 to $+25$ dBm	± 100 to $+25$ dBm	± 40 to $+25$ dBm
$Z_0 = 600 \Omega$	± 130 to $+20$ dBm	± 110 to $+20$ dBm	± 50 to $+20$ dBm

* North American versions: $Z_0 = 135 \Omega$ instead of 150Ω

Level, voltage, power	
Display of absolute level in	dB, dBm, dBm _p , dBm _C
Display of relative level in	dB0, dBm0, dBm0 _p , dBm0 _C
Voltage display in	$\propto \sqrt{V}$, mV
Add. display in	dB $\propto V$, pW0 _p
Digital display, resolution	0.01 dB (0.1 dB wideband)
Analog display	bar graph
Bar graph scale ranges	2 dB, 20 dB, 100 dB
Bar graph resolution	0.01 dB, 0.1 dB, 0.5 dB

Level display error limits

In selective mode, bandwidth 25 Hz to 3.1 kHz

Input level 0 dBm, digital display, $R_n = R_L = Z_0$, at $(23 \pm 3)^\circ\text{C}$, for $-f \geq 2$ kHz and $Z_0 = 50$ or 75Ω

Level error $\pm 0,1$ dB

Operating error limits			
for $R_n = R_L = Z_0, -f \geq 2$ kHz ¹⁾			
Input	Frequency range	Level range	Error limits
$Z_0 = 50, 75 \Omega$	200 Hz to 32 MHz	± 90 to $+30$ dBm	+0.20 dB
$Z_0 = 124, 150 \Omega$	60 kHz to 8 (14) MHz	± 85 to $+25$ dBm	+0.30 dB
$Z_0 = 150, 600 \Omega$	200 Hz to 620 kHz	± 85 to $+20$ dBm	+0.35 dB

¹⁾ The operating error limits (IEC 359) are valid within the specified operating ranges of the influence quantities and measured values of specifications. They include the specified influence effects and intrinsic deviations.

Filters	
Bandwidths	25 Hz, 100 Hz, 1.74 kHz, 1.95 kHz, 3.1 kHz, 48 kHz and 240 kHz
Bandwidths optional	6 Hz, 200 Hz, 400 Hz
Psophometer filter to ITU-T \square .41, G-message filter, Bandstop (notch) filter to ITU-T \square .132	
Attenuation in stop band, 804 to 850 Hz and 1004 to 1020 Hz	≥ 50 dB

Dynamics	
Intrinsic harmonic distortion a_2 and a_3	≥ 80 dB
Noise power ratio NFR for nominal system loading level	≥ 60 dB
With nominal load of 12 MHz baseband	typ. 65 dB

Demodulation	
AV/LSB and USB	switchable
Loudspeaker (built in)	volume adjustable
Phone jack	6.3 mm (113BCP)

Transmission impairment measurements TIMS

In a voice channel (direct or after internal demodulation from FDM allocation):

Interruption measurements to ITU-T \square .61

Time: 1 min to 100 h, thresholds $\pm 3, \pm 6, \pm 10, \pm 20$ dB

Level range ± 50 to $+10$ dBm, capacity: 9999 events

Impulsive noise measurements to ITU-T \square .71

Time: 1 min to 100 h, thresholds: switchable in 0.1 dB steps,

Level range: -60 to 0 dBm, capacity: 9999 events

Phase jitter measurements to ITU-T \square .91 (internal demod. test tone frequency 1020 Hz + 50 Hz)

Measuring range (for any input frequency) 0.2 to 30°_{pp}

Tracking generator		
Send level range		
Output	Impedance	Level range
Coaxial	$R_{st} = R_L = Z_0 = 50, 75 \Omega$	± 60 to $+9$ dBm
Balanced I	$R_{st} = R_L = Z_0 = 124, 150 \Omega$	± 60 to $+6$ dBm
Balanced II	$R_{st} = R_L = Z_0 = 150 \Omega$	± 60 to $+9$ dBm
	$R_{st} = R_L = Z_0 = 600 \Omega$	± 70 to $+3$ dBm
	$R_{st} = 5 \Omega, R_L = 600 \Omega$	± 64 to $+9$ dBm
Output level operating range limits for $R_{st} = R_L = Z_0$		
Output	Frequency range	Error limits
$Z_0 = 50, 75 \Omega$	200 Hz to 32 MHz	+0.25 dB
$Z_0 = 124, 150 \Omega$	10 kHz to 14 MHz	+0.35 dB
$Z_0 = 150, 600 \Omega$	200 Hz to 620 kHz	+0.40 dB
North American version: $Z_0 = 135 \Omega$ instead of 150Ω		
Harmonic distortion a_2 and a_3		≥ 40 dB

Connectors	
Receiver input and tracking generator output	
Coaxial $Z_0 = 50$ and 75Ω	Versacon 9 (normally fitted with BNC female connector)
Balanced $Z_0 = 124, 135, 150, 600 \Omega$	3-pole CF socket ¹⁾
¹⁾ North American version: WECO 310; Japanese version: I 213	
Auxiliary inputs/outputs (connector Sub-D9-pole):	
Y-output, voltage proportional to bar graph	0 to 5 V
Alarm output, min.-max. limit violations	relay contacts
Output for interruptions to ITU-T \square .61	TTL signal
External level control input (± 1 dB) for tracking generator	± 500 mV/DC
Reference frequency output	10 MHz/2 V, BNC
Reference frequency input	1, 2, 5, 10 MHz, BNC

Interfaces	
Remote control interfaces:	
Parallel interface (control commands to SCPI recommendations)	to <IEC 625>/IEEE 488.2
Serial interface	to RS232 (V24)
Memory-Card	SRAM/Flash ROM

General specifications	
Power supply (AC and battery operation)	
AC line voltage, nominal range of use	90 to 264 V
AC line frequency, nominal range of use	47.5 to 63 Hz
Power consumption	approx. 80 VA
Safety class to IEC 1010	Class I
Battery operation with BAZ-2203 battery pack (plug-in module)	
	14 NiCd IEC KR35/62 cells, welded
Charger unit built-in to mainframe instrument	
Operating time	approximately 5 hours

Permissible ambient temperature	
Nominal range of use	0 to +40°C
Storage and transport	±20 to +60°C, 0 to +50°C, ±40 to +75°C
Dimensions (w x h x d)	312 x 159 x 375 mm
Weight	7.5 kg (10 kg with Battery Pack)

Ordering information						
	Frequency range	EL display	Memory Card	Tracking Generator	IEEE488.2/ V.24	Order number
FSM-137	8 MHz	•	•	•	•	4203/15
FSM-139	32 MHz	•	•	•	•	4203/17

Options	
Battery Pack (charged via mainframe instrument)	BN4203/00.04
Tuning Frequency stability 5×10^{-7} (factory fitted only)	BN4203/00.06
Additional 400 Hz bandwidth (only 1 additional bandwidth possible)	BN4203/00.23
Additional 200 Hz bandwidth (only 1 additional bandwidth possible)	BN4203/00.24
Additional 6 Hz bandwidth (only 1 additional bandwidth possible)	BN4203/00.26
Additional 80 Hz bandwidth	BN4203/00.27
Additional 300 Hz bandwidth	BN4203/00.29
Additional 800 Hz bandwidth	BN4203/00.30
Additional 1200 Hz bandwidth	BN4203/00.31
19-in Rack Mounting Kit	BN4203/00.07
"North American" input and output sections plus	BN4203/00.10
"Japanese" input and output sections plus	BN4203/00.11
LabWindows/CVI/DCS driver	BN4203/95.99
LevelProcontrol and evaluation software	BN4203/93.01

Accessories	
Return loss bridges	
RFZ-1 (50 Ω coax, 50 kHz to 190 MHz)	BN4045/30
RFZ-1 (75 Ω coax, 75 kHz to 190 MHz)	BN4045/10
RFZ-12 (75 Ω to 600 Ω, 200 kHz to 4.5 MHz)	BN4810/01
RFZ-30 (120 Ω bal., 30 kHz to 32 MHz)	BN4234/10
Impedance bridges	
BMB-30 (wire a to b, 10 kHz to 32 MHz)	BN4234/30
IMB-30 (wires a/b to ground, 50 Hz to 3 MHz)	BN4234/20
ITG-30 (wires a/b to ground, ITU-T1.431)	BN4234/15
Signal balance bridges	
SDZ-12 (124 Ω to 600 Ω, 200 Hz to 4.5 MHz)	BN4811/01
SDZ-30 (120 Ω, 10 kHz to 32 MHz)	BN4234/01
PSV-39 Amplifier, 20 dB, coaxial (for output levels up to +24 dBm, 50 Hz to 32 MHz)	BN4249/01
TBN-30 T Network for common mode simulation (Z = 120 Ω, 9 kHz to 32 MHz)	BN4234/25
MSD-2 Coaxial Choke (for measuring high losses on coaxial systems)	BN4227/01
KMK-100 Compensated Test Cable, coaxial	BN4862/00.01
TK-11 Active Probe, 75 Ω output (for low-capacitance, high impedance measurements)	BN4573/03
SD-930 Dust Covers (1 set)	BN4203/00.01
TRK-960/3 Transport Case	BN4203/00.32

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