

Synthesizer

Important Synthesizers for ResLab

Typ Synthesizer	Application	Frequency [Hz]	RF-Power [dBm]	Reference	Comment
Marconi 2024	Reprate	1 000 000 226	7	Passive H-Maser	
Marconi 2024	Amplifier for 10 MHz distribution	10 000 000	14	Rb Clock	
Marconi 2024	Stell-AOM Mixdown	74 940 000	7	Rb Clock	
Marconi 2024	Free				was broken
Marconi 2023B	Free				
Rhode&Schwarz SMC100A	Free				
Rhode&Schwarz SMC100A	30m Fiber stabilization Reference	160 222 000	4	Rb-Clock	
Rhode&Schwarz Hameg HM8134-3	30m Fiber stabilization	80 111 000	1.4	Rb-Clock	* ext. Mod. on (400 kHz Dev.) * Name: AOM2 * Shit stability
Rhode&Schwarz Hameg HM8134-3	Free				Shit stability!
MG520 M Frequency Generator	EOM R1	13 810 000	10	Rb-Clock	
Rhode&Schwarz SMH 845.4002.52	EOM R2	16 200 000	13	Rb-Clock	
Rhode&Schwarz SML01	Double-pass AOM R1	104 630 000 + Computer	13	Rb-Clock	* Name: AOM0 * located in upstairs-Lab
Rhode&Schwarz SMC100A	* Linewidth Lock with Blue AOM R1 * 5m Fiber stabilization	77 111 000	2	Rb-Clock	* Name: AOM1 * located in upstairs-Lab
Rhode&Schwarz SMY01	5m Fiber stabilization Reference	77 111 000	5	Rb-Clock	* Name: AOM1 * located in upstairs-Lab
	Double-pass AOM R2				

Specks

Typ Synthesizer	Phase Noise @ 1 GHz [dBc]	Resolution [Hz]
Marconi 2024	-90 @ 100 Hz -100 @ 1 kHz -115 @ 10 kHz -121 @ 20 kHz	0.01 < 100 Hz 0.1 < 1 kHz 1 < 20 kHz

Typ Synthesizer	Phase Noise @ 1 GHz [dBc]	Resolution [Hz]
Marconi 2023B	-75 @ 100 Hz -100 @ 1 kHz -112 @ 10 kHz -121 @ 20 kHz	1
Rhode&Schwarz SMC100A	-45 @ 1 Hz -70 @ 10 Hz -82 @ 100 Hz -100 @ 1 kHz -115 @ 10 kHz with internal OCXO	0.1
Rhode&Schwarz Hameg HM8134-3	-15 @ 1 Hz -50 @ 10 Hz -80 @ 100 Hz -100 @ 1 kHz < -100 @ 10 kHz	1
Rhode&Schwarz SML01	-95 @ 1 Hz -120 @ 10 Hz -130 @ 100 Hz -138 @ 1 kHz -148 @ 10 kHz with 9.5 MHz output frequency -128 @ 20 kHz with 1 GHz output frequency	0.1

Marconi Synthesizer

Marconi Synthesizer 2024



- Manual 2024:
[ifr_2024_datasheet.pdf](#)
- possible settings: Frequenzbereich von 9 kHz bis 2,4 GHz, Auflösung 1 Hz, Ausgangspegel von -140 bis +13 dBm, Auflösung 0,1 dB, interne 2-Ton-Modulationsquelle für Sinus, Rechteck und Dreieck, lineare und logarithmische Wobblung, AM, FM, pM, Puls und FSK, Rückleistungsschutz bis 50 W, LC-Display, numerische Tastatur, GPIB und RS-232

Options

- 01 No attenuator
- 03 high Power
- 04 high stability frequency standard
- 11 Fast pulse and high power



- **Error message:** "External reference is missing!!!"
- **Important:** External(Ext): 1 Ext 10MHz direct

(MENÜ)-Button → Frequency/Sweep (Select) → 4 Frequency standard (Select) → 1 Ext 10MHz direct

- **Possible errors:** no Rb-referenz/ GPS/ OXCO connection or wires connected?



- **Normal state (10MHz):**

Synthesizer is broken?

Manual for repair: <http://www.ko4bb.com/getsimple/index.php?id=manuals&dir=Marconi>

Quick repair project (Marconi 2024): a forum where several defects are presented and explained how to fix them: <http://www.eevblog.com/forum/repair/quick-repair-project-marconi-2024/>

Output signal (dBm) is too small: Probably the amplifier is broken. Check backwards the signal inside the synthesizer with a measuring tip.

1. Adjust the frequency of the half from the maximal Oszi-frequency
2. Measure the distance between the minimum and maximum sinus-signal. Half of the distance divide by root(2) provide the effective voltage
3. Use the data sheet for dBm calculation:
dbm-volts-wattconversion.pdf

Solved Problems:

1. Problem: No Output Signal
 - Solution: Transistor TR708 was broken. The Transistor has been replaced by a BC847 Transistor.

Marconi Synthesizer 2023B (ehemals ausgeliehen von Q-Port)



- Manual 2023B:

[datenblattmarifr2023b_2025.pdf](#)

Rohde&Schwarz Synthesizer

Rohde&Schwarz Synthesizer SMC100A



- Manual SMC100A:

[smc100a_operatingmanual_en_09.pdf](#)

- Datasheet SMC100A:

[smc100a_dat-sw_en.pdf](#)

Rohde&Schwarz Synthesizer SML01



- Datasheet SML01:

[rohde-schwarz-sml01-datasheet.pdf](#)

Rohde&Schwarz Synthesizer Hameg HM8134-3



- Manual Hameg HM8134-3:

hm8134-3_usermanual_de_en_04.pdf

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