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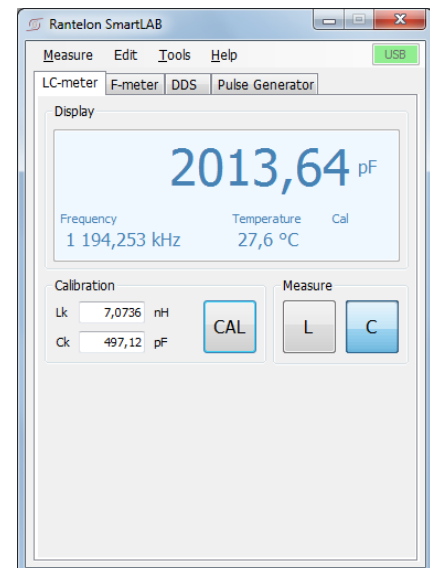
SmartLAB SMLAB-1 is a high precision inductance, capacitance and frequency digital USB meter with additional functions: direct digital synthesizer function generator and dual output pulse generator.

KEY FEATURES

- High precision
- Wideband frequency measurements
- Active resistance compensation
- User calibration possible
- Frequency meter
- DDS function generator
- Dual output pulse generator
- Compatible with both SMD and THM

APPLICATION AREAS

- Laboratories
- Electronic design offices
- Amateur radio
- Electronics manufacturing
- Electronics repair
- Technical universities and schools
- Hobby groups



PRODUCT DESCRIPTION

SmartLAB SMLAB-1 is a perfect measuring instrument that RF designers have been waiting for many years. SMLAB-1 is an exceptional device, it includes precise high frequency capacitance and inductance meter, RF frequency meter, functional generator and dual output impulse generator. Measuring set is a simple and smart USB box operating in modern Microsoft Windows environments. SMLAB-1 will clear your working desk from bulky and expensive measuring monsters!

One of the special features is the capability of precise measurement of small-value SMD components at frequencies up to 2,7 MHz. Rantelon's LCF-meter is capable of measuring capacitance and inductance starting from 0 pF and 0 nH with an incredible resolution of 0,01 pF and 0,1 nH correspondingly. Moreover, measurement temperature and frequency data is also provided.

Internal RF frequency meter can be used to measure signal frequencies from 200 kHz up to 5 GHz. Based on direct digital synthesizer, SMLAB-1's functional generator provides an option to generate signals with different waveforms (sine, triangle, saw, rectangle) within the frequency range 0 – 500 kHz with a stunning resolution of 0,1 Hz. Dual output impulse generator operates within the range from 3 kHz to 12 MHz. Duty cycle of each output can be set independently.

TECHNICAL SPECIFICATIONS

GENERAL	
Parameter	Value
Interface	Physical USB 1.1 or 2.0 / Software GUI
Supported operating systems	Microsoft Windows XP, Vista, 7 (32 and 64 bit)
Power	+5V (max 100mA) from USB
Enclosure type	Plastic, indoor
Maximum dimensions	61 x 105 x 26 mm

CAPACITANCE MEASUREMENTS	
Parameter	Value
Measurement range	0 – 100nF 100pF – 2 μ F (with additional inductor)
Resolution	0,01pF (within range 0 – 1nF)
Measurement frequency	1kHz – 2,7MHz typical
Accuracy	1% typical
Measurement method	Resonance method

INDUCTANCE MEASUREMENTS	
Parameter	Value
Measurement range	0 – 10mH 100 μ H – 1H (with additional capacitor)
Resolution	0,1nH (within range 0 – 1 μ H)
Measurement frequency	1kHz – 2,7MHz typical
Accuracy	1% typical
Measurement method	Resonance method

FREQUENCY MEASUREMENTS	
Parameter	Value
Measurement range	RF input: 200MHz – 5,0GHz Fx input: 3kHz – 200MHz
Input power/voltage range	RF input: -10 ... +15dBm typical (max +15dBm) Fx input: max 10Vpp ¹
Accuracy	1ppm typical
Input connectors	RF input: SMA-female Fx input: 2,54mm female header

¹ For frequency meter input sensitivity study graphs 1 - 5

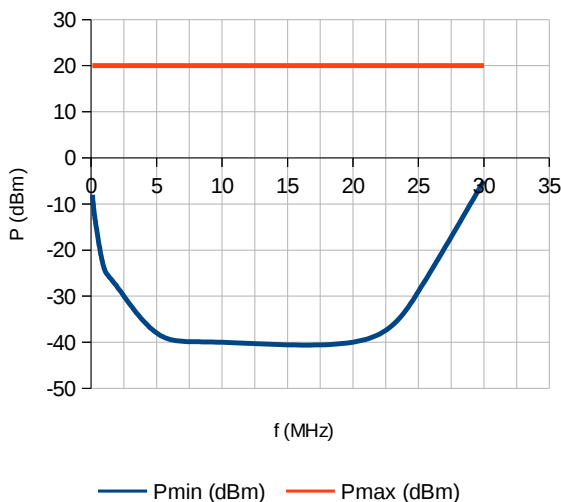
TECHNICAL SPECIFICATIONS (continued)

DDS FUNCTION GENERATOR	
Parameter	Value
Frequency range	0 – 500kHz
Waveform	Sine, triangle, saw, rectangle
Minimum frequency resolution	0,1Hz
Output impedance/voltage peak-to-peak	1,8k Ω / 3Vpp
Output	1 output on 2,54mm female header

PULSE GENERATOR	
Parameter	Value
Frequency range	2,93kHz – 12MHz
Minimum time resolution	20ns
Output impedance/voltage peak-to-peak	150 Ω (TTL and CMOS compatible) / 3Vpp
Output	2 outputs on 2,54mm female header

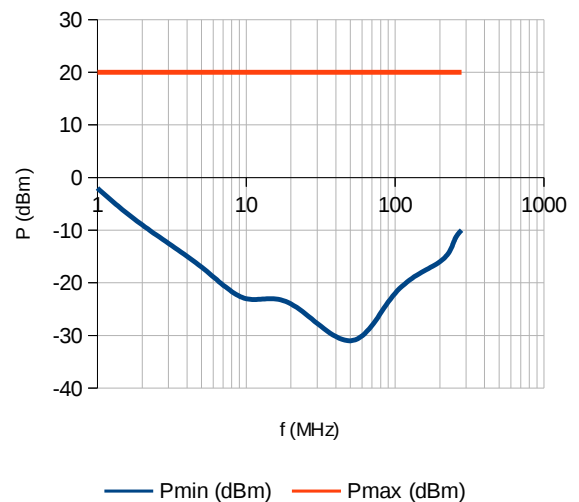
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Female header Fx input sensitivity (0 - 20 MHz)



Graph 1. Frequency meter female header Fx input sensitivity (0 – 20 MHz)

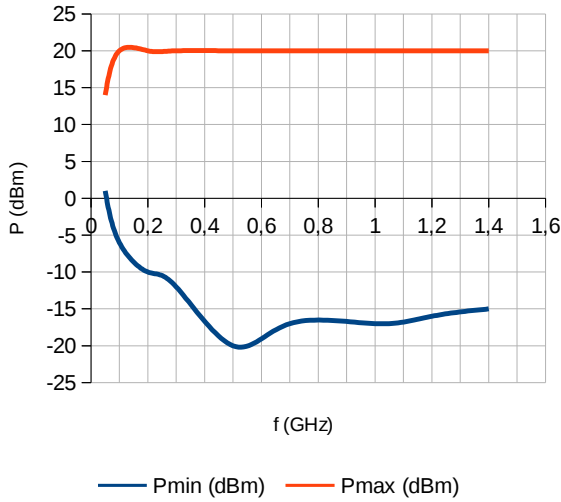
Female header Fx input sensitivity (5 - 200 MHz)



Graph 2. Frequency meter female header Fx input sensitivity (5 – 200 MHz)

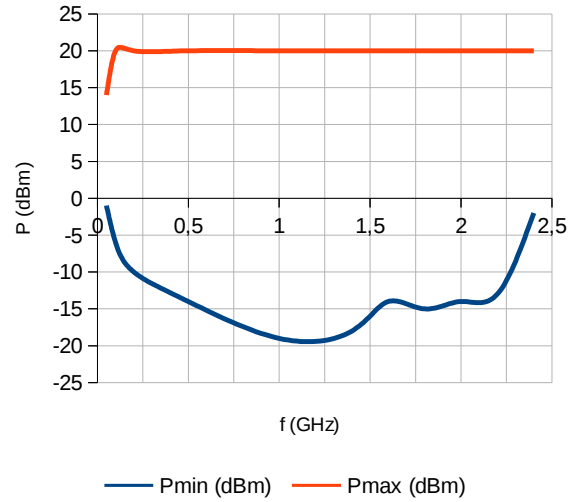
TECHNICAL SPECIFICATIONS (continued)

SMA RF input sensitivity (0,2 - 1 GHz)



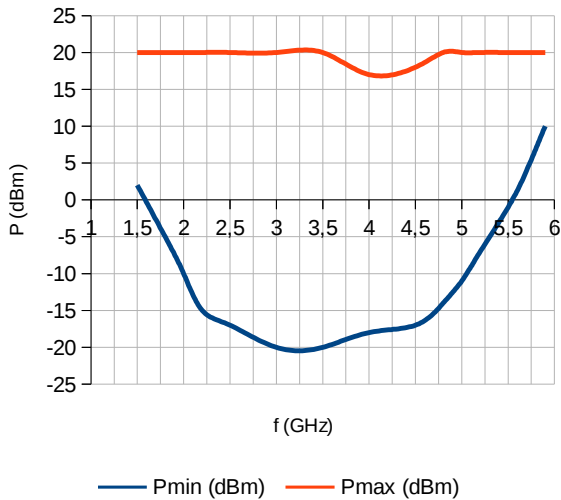
Graph 3. Frequency meter SMA RF input sensitivity (0,2 – 1 GHz)

SMA RF input sensitivity (0,2 - 2,1 GHz)



Graph 4. Frequency meter SMA RF input sensitivity (0,2 – 2,1 GHz)

SMA RF input sensitivity (2,1 - 5 GHz)



Graph 5. Frequency meter SMA RF input sensitivity (2,1 – 5 GHz)