

FEATURES

- 2 - 20 GHz Frequency Coverage
- 10 Hz Step Size
- USB & Ethernet Interface
- LabVIEW compatible
- RF Power Leveling Available

APPLICATIONS

- Test Equipment
- Test Sets
- Production Test

DESCRIPTION

The **MLBS-Series** Bench test synthesizers are ideal for production test sets, laboratory tests and test equipment racks where generation of microwave signals is essential. Frequency coverage is 2 to 20 GHz. Each bench top synthesizer consists of a frequency synthesizer, Heat sink, power supply, cooling fans, keyboard, display, USB interface, Ethernet interface and a manual tuning knob. Components are housed in a 10" wide, 4" height, 13" deep enclosure with mounting feet and handle. Bench test synthesizers are CE certified and LabVIEW compatible. Units are available with RF power leveling options.



RF PERFORMANCE SPECIFICATIONS

Model No.	MLBS-2080	MLBS-8020	MLBS-2020
RF Specifications			
Output Frequency (Note 1)	2 - 8 GHz	8 - 20 GHz	2 - 20 GHz
Output Power Min.	+15 dBm	+12 dBm	+12 dBm
Po Variation over Freq/Temp	+/- 2.5 dB	+/- 2.5 dB	+/- 2.5 dB
Step Size, Min.	1 kHz	1 kHz	1 kHz
Switching Speed, 100 MHz Step, Typ.	1 mS	1 mS	1 mS
1000 MHz Step, Typ.	3 mS	3 mS	3 mS
Full Band Step, Typ.	5 mS	6 mS	7 mS
Warm-up Time ("Lock") @ 0C (Minutes) (with Internal Crystal Reference)	3.0	3.0	3.0
Output Impedance	50 Ohms	50 Ohms	50 Ohms
Load VSWR	2.0:1	2.0:1	2.0:1
Harmonics	-12 dBc	-12 dBc	-12 dBc
Non-Harmonic Spurious	-60 dBc	-60 dBc	-60 dBc
Phase Noise Performance (with Internal Crystal Reference)			
@ 100 Hz Offset	-79 dBc/Hz	-70 dBc/Hz	-70 dBc/Hz
@ 1 kHz Offset	-95 dBc/Hz	-87 dBc/Hz	-86 dBc/Hz
@ 10 kHz Offset	-95 dBc/Hz	-88 dBc/Hz	-80 dBc/Hz
@ 100 kHz Offset	-117 dBc/Hz	-115 dBc/Hz	-104 dBc/Hz
@ 1 MHz Offset	-140 dBc/Hz	-138 dBc/Hz	-134 dBc/Hz

RF Level Control: (see options)

MLBS RF PERFORMANCE SPECIFICATIONS (Continued)

Model No.	MLBS-2080	MLBS-8020	MLBS-2020
Reference Oscillator Options			
Option A			
External Reference (Note 2)	10 - 200 MHz	10 - 200 MHz	10 - 200 MHz
External Ref. Input Power	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability	Cust Supplied	Cust Supplied	Cust Supplied
Option B			
External Reference with Internal Crystal (Note 3)	10 - 100 MHz	10 - 100 MHz	10 - 100 MHz
External Ref. Input Power	0 +/- 3 dBm	0 +/- 3 dBm	0 +/- 3 dBm
Frequency Stability	Cust Supplied	Cust Supplied	Cust Supplied
Option C			
Internal Reference	100 MHz	100 MHz	100 MHz
Frequency Stability	+/- 1 PPM	+/- 1 PPM	+/- 1 PPM
Option D			
RF Power Leveling (31.5 dB delta from attained power level, +10 dBm Typ)	-31.5 dB	-31.5 dB	-31.5 dB
RF Level Step Size	0.5 dB	0.5 dB	0.5 dB
RF Level Flatness	+/- 2.0 dB	+/- 2.0 dB	+/- 2.0 dB
Attenuation Accuracy (Note 4)	+/- 1.0 dB (+1.5% of State)	+/- 1.25 dB (+2.5% of State)	+/- 1.25 dB (+2.5% of State)
Option E			
RF Power Leveling (63 dB delta from attained power level, +10 dBm Typ)	-63.0 dB	-63.0 dB	-63.0 dB
RF Level Step Size	0.5 dB	0.5 dB	0.5 dB
RF Level Flatness	+/- 2.0 dB	+/- 2.0 dB	+/- 2.0 dB
Attenuation Accuracy (Note 4)	+/- 1.0 dB (+1.5% of State)	+/- 1.25 dB (+2.5% of State)	+/- 1.25 dB (+2.5% of State)
PLL Lock indicator on display and via software			

MLBS Options:

Option A: External Reference / No Internal Reference

Option B: Internal Reference / External Reference

Option C: Internal Reference / No External Reference

Option D: RF Power Leveling (-31.5 dB Delta from attained power level (i.e. +10 to -21.5 dBm), in 0.5dB increments).

Option E: RF Power Leveling (-63.0 dB Delta from attained power level (i.e. +10 to -53.0 dBm), in 0.5dB increments).

Part Number Example: MLBS-2080CD is a 2 GHz to 8 GHz with Internal Reference and -31.5 dB RF Power Leveling

Notes:

1) Special frequency ranges available.

2) 50-100 MHz OCXO recommended for best phase noise performance. External reference directly effects phase noise performance.

3) Output phase noise performance is not dependent on external reference phase noise.

4) Referenced to maximum attained, Leveled RF Power. % = % of attenuator setting, i.e. -10 dB setting = Δ from +10 dB = 20 dB, @ 15 GHz = +/- (1.25 + 0.025 * 20) = +/- 1.75 dB accuracy.

MLBS GENERAL SPECIFICATIONS

Input Voltage:	88 - 264 VAC @ 3 amps max, 47 to 63 Hz, Externally fused, Front panel push button on / off.
Display:	The 2 line x 16 digit display of the bench test synthesizer shows the current center frequency setting on the top display line, the bottom display line is blank. A cursor is positioned under one of the digits on line 1. This cursor can be positioned using the < or > arrow keys. Entering a new frequency via the keypad will display numbers as they are entered on line 2. The new frequency is selected by pressing the MHz key on the keypad. If a resolution less than a MHz is to be set, the decimal point must be used.
Keypad:	The bench test synthesizer provides a 16 key data entry keypad for simple operation. Pressing the > or < key will move the cursor to the right or left. Pressing the + key will increase the cursor position while the - key will decrease the cursor position. Frequency numbers and decimal point as needed are input via the keypad. The MHz key is also used as the enter data key.
Rotary Knob:	The bench test synthesizer provides a tuning knob. Rotating the knob clockwise increases the frequency while rotating counter clockwise decreases the frequency. The knob is also used to enter and to exit the settings menu by simply pressing the knob.
USB Interface:	USB 2.0 compliant, USB-Mini-B connector. Operating systems supported: Windows XP 32bit (All versions), Widows 7, 8 & 10; 32 and 64 bit (All versions). HID USB client mode interface, using Microsoft Windows Operating System native drivers. USB PC control interface software provided (Windows GUI).
Ethernet Interface:	Ethernet interface: 10/100 Mbit, RJ45 connector. TCP/IP protocols supported: HTTP, UDP socket and Telnet. DHCP and Fixed IP modes. Web interface access using most standard internet browsers (Chrome, Firefox). UDP PC control interface software provided (Windows GUI)

Environmental Specifications:

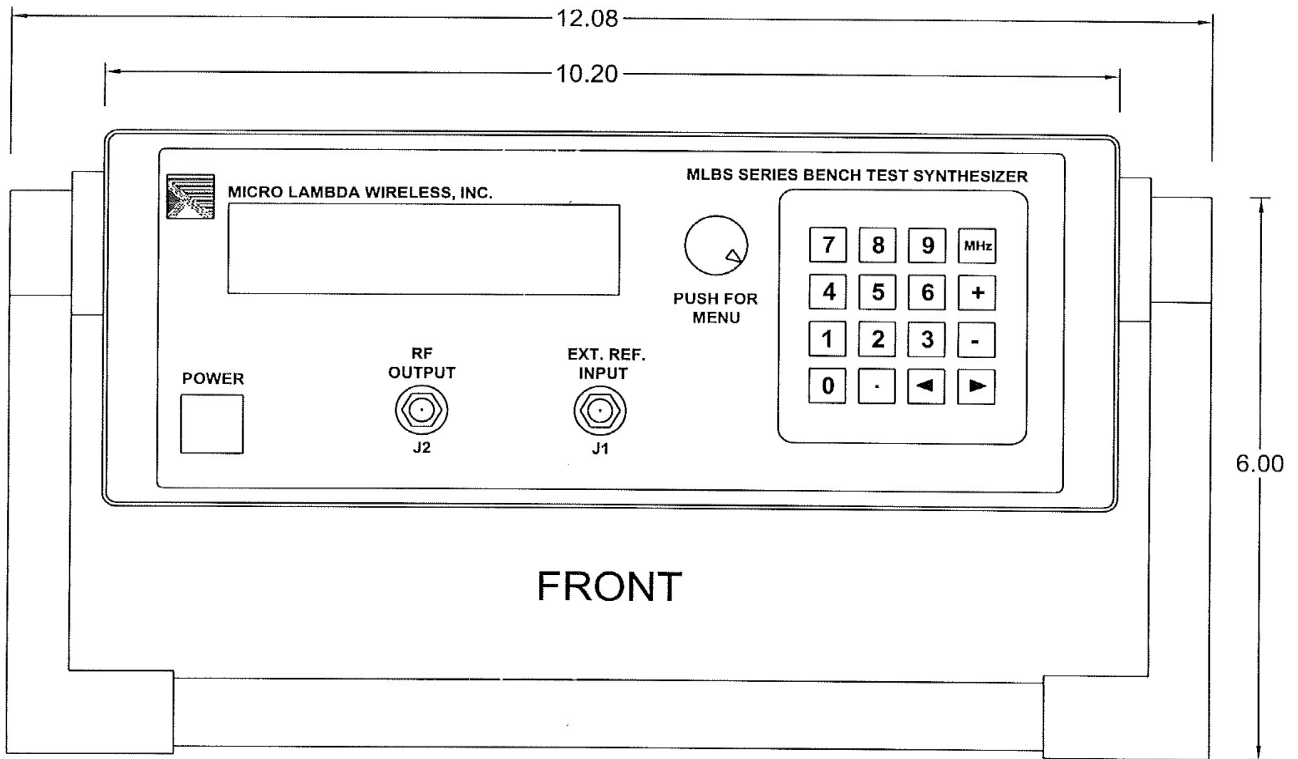
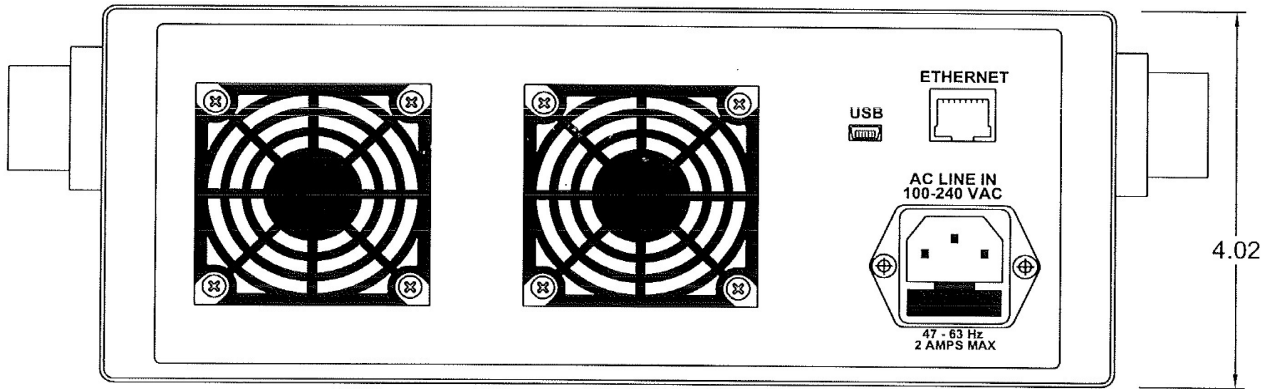
Temperature -	Operating 0 °C to +60 °C Non-operating -40 °C to +71 °C
Shock -	Functional, 30 G per MIL-PRF-28800F table 2, class 3 Transit drop, per MIL-PRF-28800F table 13, class 3 Bench Handling, per MIL-PRF-28800F para 4.5.5.4.3, class 3
Vibration -	Random 5-500 Hz per MIL-PRF-28800F table 2, class 3
Humidity -	5 to 95% per MIL-PRF-28800F table 2, class 3

Dimensions and Weight: Width - 10" Height - 4" Depth - 13"
Weight - 9 lbs.

RF Connectors: External Reference Input - SMA Female
RF Output - SMA Female

Included Accessories: Standard 120 VAC U.S. Power Cord, 6' CAT 5 Ethernet Cable, 6' USB-A to USB Mini-B Cable, User Manuel, PC Control Software on USB Flash Driver and a Quick Start Guide.

REAR



FRONT

NOTE:
- DEPTH WITHOUT HANDLE IS 13.00"

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ARE :		
FRACTIONS	DECIMALS	ANGLES
	.XX ± .02	
	.XXX ± .010	
MATERIAL		
FINISH		
DO NOT SCALE DRAWING		

CONTRACT NO.	
APPROVALS	DATE
DRAWN N.NGUYEN	8/8/12
ENGR. DS	8/8/12
MANUF.	
O.A.	



MICRO LAMBDA WIRELESS, INC.

MLBS SERIES BENCH TEST SYNTHESIZER

SIZE	CAGE No 0RN63	DWG. NO. 99 - 0201 - 001	REV.
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