



**TEKBOX**  
DIGITAL SOLUTIONS



## TBMR-110M

DC - 110 MHz high speed EMI-Analyzer

## Datasheet

Rev.1.0

**Tekbox Digital Solutions Vietnam Co. Ltd.**

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# 1 Main Features

- EMI Analyzer 1 Hz - 110 MHz (Measurement Receiver)
  - -162 dBm/Hz noise floor down to 1 kHz
  - 7-band hardware pre-selector filter bank.
  - 30 dBm maximum input power
  - CISPR-16, ANSI and MIL-STD compliant detectors
  - Peak, Quasi-Peak, Average, CISPR-Average, RMS and CISPR-RMS detectors working in parallel.
  - Sweep, STFFT and direct parallel resolution bandwidth setting (-3 dB and -6dB)
  - Numerous predefined Standards, ready to load and use
  - Pre-measurement with selective Peak measurement
  - Direct fast compliant STFFT measurement
  - Many pre-defined transducers, antenna factors and various other compensation files
  - Many data manipulation, display and documentation features
  - Direct control from EMCview or standalone operation
  - Quick load of predefined setups
- Spectrum Analyzer
  - 1 Hz - 110 MHz measurement range
  - Tracking Generator
  - 0.1 Hz to 3.5 MHz arbitrary RBW and VBW setting
  - Zero Span operation with time domain triggering
  - Linear, log amplitude and frequency display
  - Sweep, STFFT and direct parallel resolution bandwidth setting
  - Parallel RMS, Pos./Neg. peak and average detector
  - Trace Memory option, normalization
  - Equation based trace display
  - Peak hold
  - Noise marker, max and band power display
  - Quick load of predefined setups
- Tracking Analyzer 1 Hz - 110 MHz
  - Linear and logarithmic sweep
  - -50 dBm to 0 dBm adjustable TG power
  - 120 dB dynamic range
  - Use of power correction file and level correction file
  - Quick load of predefined setups.

- Oscilloscope 250 MS/s, DC - 110 MHz
  - 1 ns/DIV to 1 s/DIV horizontal resolution
  - Interpolated sampling up to 4 GS/s
  - Real-time Sampling up to 250 MS/s, 14 Bit
  - Up to 16 MS sampling size
  - Various Trigger options
  - Vertical CIC Filter option for noise reduction
  - Many automatic measurement features
  
- Demodulator
  - Direct demodulation into the PC sound system
  - FM, AM and SSB demodulator
  - Adjustable bandwidth, center frequency and demodulator parameters
  - Automatic demodulation parameter measurements
  
- IQ Stream Generator
  - GNU-Radio data source.
  - Directly stream floating point I and Q data into file or network
  - Adjustable center frequency and bandwidth
  
- Remote Control
  - Direct remote control of the EMI Analyzer over network
  - Text based protocol
  - EMCview compatible

## 2 Specifications

Parameter	Description	Value/Range	Remark
<b>Operating Voltage</b>	Mains Voltage Range	100-120 VAC / 200 - 240 VAC, 50-60 Hz	Mains voltage selection switch
<b>Operating Temperature</b>		0 °C – 40 °C,	
<b>Storage Temperature</b>		-20 °C – 60 °C	
<b>Frequency Range</b>	Oscilloscope	DC - 110 MHz	True DC coupled
	Spectrum Analyzer	1 Hz - 110 MHz	Max. 0V DC
	EMI Analyzer	1 Hz - 110 MHz	Max. 0V DC
	Tracking Analyzer	1 Hz - 110 MHz	Max. 0V DC
<b>Reference Frequency accuracy</b>	Initial accuracy after 30 minutes warm-up	+/- 10 ppm	
<b>RF Input connector</b>		50 Ohm, Type-N	
<b>RF input VSWR</b>		< 1 : 1.15	10 ... 30dB att.
		< 1 : 1.5	0 ... 30dB gain
<b>Maximum RF input level</b>	Attenuation / gain	+30 dBm/137dBμV/7V	20dB/30dB att.
	dependent	+25 dBm/132dBμV/4V	10 dB att.
	Negative att. = gain	+15 dBm/122dBμV/1.25V	0 ... -30dB att.
<b>Input RF attenuator</b>		0 - 30 dB in 10 dB steps	
<b>Input LNA</b>		0 - 30 dB in 10 dB steps	
<b>Amplitude Accuracy</b>	DC - 110 MHz	Better +/- 0.8 dB	at 18°C - 28°C
<b>Noise (DANL)</b>	f = 10 Hz	- 132 dBm typ.	RBW = 1Hz
	f = 100 Hz	- 144 dBm typ.	RBW = 1Hz
	f = 1 kHz	- 149 dBm typ.	RBW = 1Hz
	f = 10 kHz	-156 dBm typ.	RBW = 1Hz
	f = 100 kHz	- 160 dBm typ.	RBW = 1Hz
	f > 1MHz - 110 MHz	- 162 dBm typ.	RBW = 1Hz
<b>Intercept Point 2</b>	f = 10 MHz	+ 50 dBm typ.	ATT = 0 dB
<b>Intercept Point 3</b>	f <sub>1</sub> = 32 MHz, f <sub>2</sub> = 33 MHz	+ 43 dBm typ.	ATT = 30 dB
		+ 24 dBm typ.	ATT = 0 dB
		- 6 dBm typ.	ATT = -30 dB
<b>Resolution Bandwidth</b>		0.1 Hz - 3.5 MHz	arbitrary
<b>Video Bandwidth</b>		0.1 Hz - 3.5 MHz	arbitrary
<b>Pre-Selector Filter Bank</b>		7 Bands + Bypass	6th order band-pass
<b>Sampling Rate</b>		250 MSPS, 14 Bit	
<b>Detector</b>		RMS, pos./neg. Peak, Average, Quasi Peak, CISPR Average, CISPR RMS.	According to CISPR-16-1-1 and Mil Std. 461
<b>Processing</b>		Sweep, STFFT, parallel sweep	
<b>Tracking Generator frequency stability</b>		+/- 25 ppm	
<b>Tracking Generator amplitude stability</b>		better +/- 0.5 dB	
<b>Tracking Generator amplitude range</b>	DC - 100 MHz	-50 dBm to 0 dBm	
	100 MHz - 110 MHz	-50 dBm to -10 dBm	
<b>Dimensions / weight</b>		L x W x H: 33 x 38 x 12 cm; 5.2 kg	

Attenuation [dB]	Absolute Max. Input Level [dBm, dB $\mu$ V, V]
<b>30</b>	<b>30 dBm, 137 dBuV, 7 V</b>
<b>20</b>	<b>30 dBm, 137 dBuV, 7 V</b>
<b>10</b>	<b>25 dBm, 132 dBuV, 4 V</b>
<b>0</b>	<b>15 dBm, 122 dBuV, 1.25 V</b>
<b>-10 (equivalent 10dB gain)</b>	<b>15 dBm, 122 dBuV, 1.25 V</b>
<b>-20 (equivalent 20dB gain)</b>	<b>15 dBm, 122 dBuV, 1.25 V</b>
<b>-30 (equivalent 30dB gain)</b>	<b>15 dBm, 122 dBuV, 1.25 V</b>

### 3 History

Version	Date	Application software version	Changes
V1.0	24.4.2024	V1.2	Initial document

The application software version refers to the most recent version available at the time of writing the datasheet.