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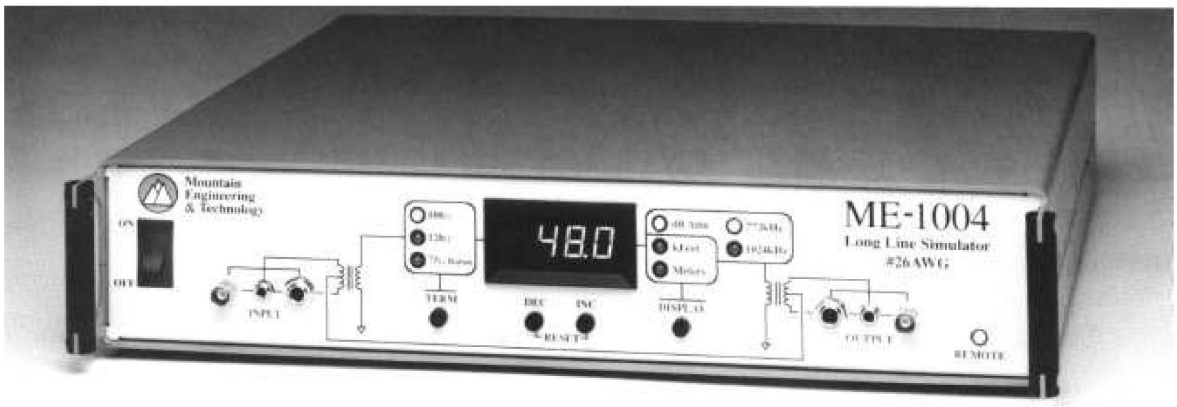
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Find the *Mountain Engineering & Technology ME-1002* at our website: ***Click HERE***

Mountain
Engineering
& Technology

ME-1004

Long Line Simulator, #26AWG



Features

- Simulates #26AWG (0.41mm) PIC unshielded twisted-pair (UTP) telephone transmission line
- Selectable attenuations levels 0dB to -48dB @ 772kHz (1.544Mb/s) in 1dB steps and from 0dB to -55.7dB @ 1024kHz (2.048Mb/s) in 1.16dB steps
- Selectable line impedance: 100Ω , 120Ω , or 75Ω BALUN
- Accurate over a 3 decade frequency range, from 10kHz to 10MHz
- Convenient front panel controls and display, calibrated in kFeet, Meters, and dB of Attenuation at 772/1024kHz
- Remote control of all functions via standard RS-232 port
- Accepts standad BNC, Bantam, and 310 connectors

Compatibility

Applications

- Design and evaluation of serial data receivers and repeaters
- Replaces 7.2kft (2.2km) of transmission line in laboratory experiments
- Allows automated testing of telecommunications, PBX, and LAN equipment

General Description

The ME-1004 is a highly accurate, programmable filter designed to simulate the attenuation versus frequency characteristics of the #26AWG (0.41mm) unshielded twisted-pair transmission wire commonly used in long distance telephone trunk lines in the US and around the world. This same wire is also found in office buildings and industrial complexes where it forms the backbone of PBX and LAN communication systems. By simulating 7.2kft (2.2km) of transmission line in 150ft (46m) increments, the ME-1004 offers a convenient and practical method of developing and testing

- US and European AMI-PCM codes:
  T1 - 1.544Mb/s
  T1C - 3.152Mb/s
  T2 - 6.312Mb/s
  CEPT - 2.048Mb/s
  CEPT - 8.448Mb/s
- ISDN Primary rate standards, 1.544Mb/s and 2.048Mb/s
- Japan's CMI code standard, 2.048Mb/s
- Manchester coded data from 100kb/s to 10Mb/s

communications equipment intended for use on this wire.

Easy to use front panel controls set the ME-1004's simulated line length displayed in kFeet, Meters, or dB of Attenuation at either 772kHz for 1.544Mb/s applications or 1024kHz for 2.048Mb/s applications. Input and output line terminations are also user-selectable to correctly match the characteristic impedances of either 100Ω or 120Ω twisted-pair wire systems. A 75Ω BALUN connection is also provided. All ME-1004 functions can be computer controlled via a standard RS-232 serial port for automated test applications. Options include 19" rack mount chassis, battery back-up, and an internal noise mixer.

Operating Specifications

(Valid at all attenuation settings, test signal (f_o)=772kHz and 0°C < $T_{ambient}$ < 50°C unless otherwise stated)

Input

Terminating Impedance ..... 100Ω/120Ω/75Ω, ±5%

Recomended Frequency Range ..... 10kHz to 10MHz

Maximum Balanced Input Voltage,
Zero to Peak ..... ±6V

Maximum Balanced DC Input Current,
Input Center-Tap to Output Center-Tap .. 70mA

Output

Sourcing Impedance ..... 100Ω/120Ω/75Ω, ±5%

Maximum Rise/Fall Time At 0dB,
$V_{IN} = 3V_{PEAK}$ ..... < 40nsec

Maximum Overshoot At 0dB,
$V_{IN} = 3V_{PEAK}$ ..... < 10%

Short Circuit Tolerance ..... Continuous

Attenuation Characteristics

Attenuation range at f_o with display setting:

f_o = 772kHz ..... 0dB to -48.0dB
f_o = 1024kHz ..... 0dB to -55.7dB

Frequency dependent attenuation simulates that of #26AWG (0.41mm) unshielded twisted-pair wire at 20ºC. The following indicates the relative attenuation (A_R) versus frequency normalized at f_o = 772kHz.

Freq. (kHz)	10	20	30	50	70	100	200	300
A_R (dB)	.415	.420	.425	.434	.446	.470	.560	.650
Freq (MHz)	.500	.772	1.024	2.0	3.0	5.0	7.0	10.0
A_R (dB)	.805	1.0	1.16	1.65	2.07	2.74	3.34	4.20

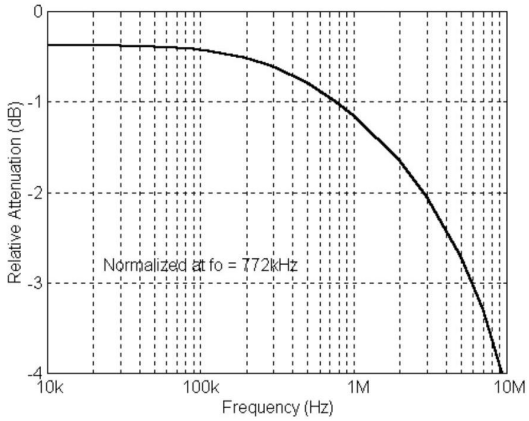
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Attenuation adjustment step size with display setting:

f_o = 772kHz 1.00dB
f_o = 1024kHz (Displayed to nearest 0.1dB) .. 1.16dB

The attenuation at any frequency, A(f), can be calculated as a function of the attenuation setting at f_o = 772kHz as follows:

$$A(f) = A_R(f) \text{ X } A(f_o)$$



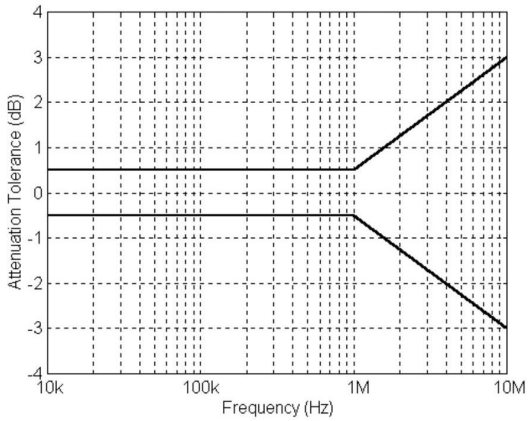
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Attenuation Characteristics

Attenuation tolerance at f_o with display setting:

f_o = 772kHz ..... ± 0.25dB
f_o = 1024kHz ..... ± 0.30dB

Attenuation tolerance at all other frequencies ralative to f_o is given by the following graph:



CLICK ON GRAPH TO ENLARGE

General Specifications

Power input voltage:
- Option A ..... 103V to 132V
- Option B ..... 210V to 250V
- Option J ..... 90V to 110V

Power input frequency ..... 45Hz to 66Hz
Power consumption 10W
Dimensions (w x h x d in inches) ..... 17 x 3.5 x 14
Weight ..... 13 lbs
Storage temperature ..... -40°C to 85°C

Ordering Information

Transmission Line Simulator: ME-1004-A-1CD
Options: A - 120V supply
B - 240V supply
J - 100V supply
1 - Bench-top chassis
2 - Rack-mount chassis
C - Battery back-up
D - Noise mixer

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