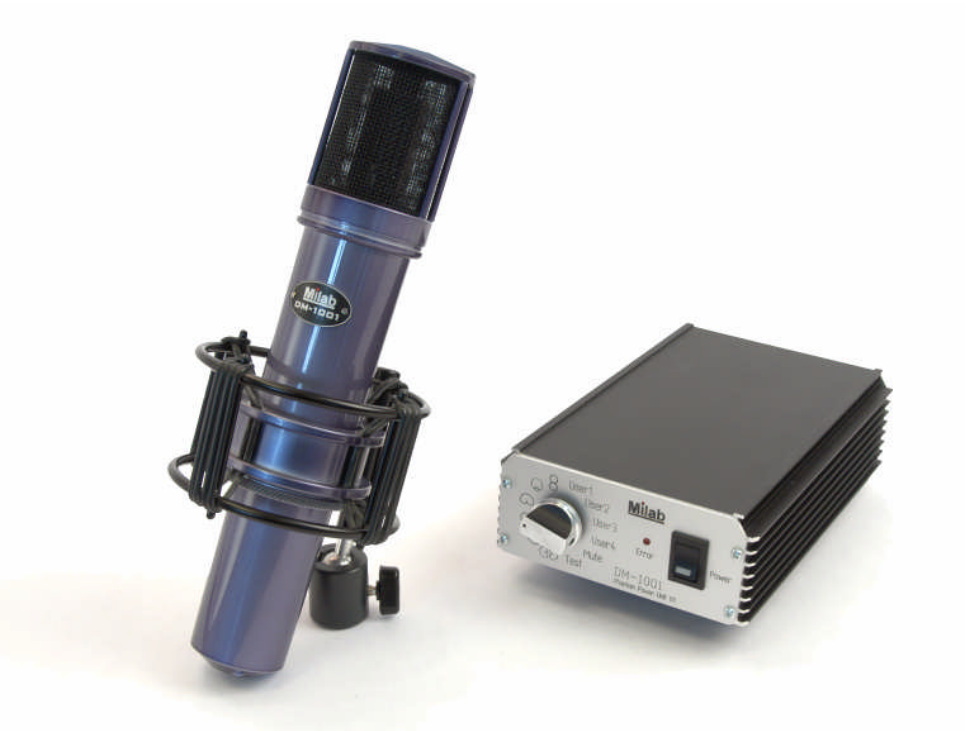
Milab



DM-1001

Milab
Digital Microphone System
User Manual

The DM-1001 system

The DM-1001 digital microphone system is full of possibilities for the professional user. It is based on the classic Milab rectangular dual cardioid condenser capsule, followed by a 24-bit 48 kHz Sigma-Delta ADC and a 24-bit Digital Signal Processor. The signal leaves the system in AES/EBU digital format. Standard settings could be made from the phantom power unit, but the microphone is also controllable with PC software. There you have free choice of polar pattern, analog/digital gain, and frequency response tailoring using digital filters. Anything the user can control can be saved for future reuse, either in the PPU-01 phantom power unit or on computer disc.

System parts

You should have received the following DM-1001 system components:
Microphone DM-1001
Phantom Power Unit PPU-01
18V AC/AC power adapter
Cable, 5-pol XLR
Elastic suspension with stand adapter
Milab DM-1001 Acoustic Designer software on CD or Diskettes

Using the system

The relationship between the microphone, the phantom power unit and the Acoustic Designer software can be summarised as follows:

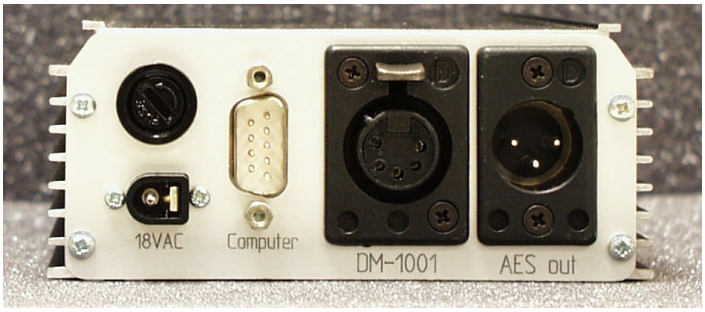
The microphones main job is to transform the acoustical signal to on electric signal and then take it further to the digital domain. It contains most of the sound shaping hardware, e.g. the DSP, the ADC, etc. but has no kind of 'memory', in the sense that nothing user-specified is ever stored inside it.

The phantom power unit's first and most important job is to provide the microphone with power. The second job is to send control commands to the DSP, inside the microphone. The third job of the PPU-01 is to store user-specified settings in a EEPROM.

Finally, the Acoustic Designer software gives the user control over all features of the system. User specified settings can be downloaded into the PPU-01 or saved on computer disc for future use. It is also possible to read back the settings from the PPU-01 into the Acoustic Designer.
It is important to realize that you don't have to use the Acoustic Designer software at all in order to use the system. The phantom power unit arrives with factory presets stored in the selector knob USER positions. The user can either use these settings or replace them from the Acoustic Designer, but either way, once you have stored something useful in the PPU-01 you don't need any PC computer for the system to work.

Microphone connection

Install the microphone elastic suspension on a microphone stand.
Insert the DM-1001 microphone into the shock mount.
Tighten the locking device by turning the lower ring clockwise.
Connect the 5-pin XLR cable to the microphone.
Connect the other end of the 5-pin XLR cable to the 'DM-1001' input on the back of the PPU-01 phantom power unit.



Milab Microphones AB

Mailing address	Office address	Phone	Fax	E-mail
P. O. Box 1342 S-251 13 HELSINGBORG SWEDEN	Norra Strandgatan 4	+46 42 381620	+46 42 136350	milab@milabmic.com Internet www.milabmic.com

NOTE! The DM-1001 microphone must ONLY be used with the Milab PPU-01 phantom power unit. NEVER connect a DM-1001 microphone to any other phantom power source. That can severely damage both the microphone and the power source !!!

Connect the AC/AC adaptor to the '18 VAC' input on the back of the PPU-01.
Connect the 3-pin XLR cable (not included) to the output labeled 'AES out' of the phantom power unit.
Connect the other end of the 3-pin XLR cable to the AES/EBU input of for example a mixing console or a DAC (digital-to-analog converter).

NOTE! The PPU-01 phantom power unit AES out must ONLY be connected to a AES/EBU digital input. NEVER connect the PPU-01 phantom power unit to an analog microphone input or phantom power source. That can severely damage both the Microphone and the power source !!!

Connect the female end of the RS-232 cable (not included) to the 'Computer' connector on the back of the PPU-01.
Connect the other end to a free serial port on your PC computer.

Software installation

In order to use the Milab Acoustic Designer software you need to have access to a PC computer running at least Microsoft Windows 95 with one free serial port (COM1 or COM2).
To install the software, turn the computer on and insert the CD or the disk #1 into the disk drive. Start the setup.exe program at the CD/diskette and follow the instructions on the screen.

Using the PPU-01

The selector knob on the phantom power units front panel is used to choose between the predefined or the 4 user specified settings. The DM-1001 system delivers a standard suite of polar patterns, as Omni, Wide Cardioid, Cardioid, Super Cardioid and Figure-of-eight.

The position with two cardioid symbols is called Pass through. The front signal is sent out in the left channel and the back signal to the right channel. This makes it possible to do stereo recordings with one microphone, and also give the possibility to change the front to back ratio in the mixer. This is the only position where there are different signals in the left and right channels of the AES signal.

The selector knob MUTE position, it mutes the digital audio output.
Turning the knob to the TEST position results in a 1 kHz sinusoidal tone (- 36 dB from full scale), being sent on both the left and right AES/EBU channels.

The LED error indicator is ON when there is a microphone error and the microphone doesn't respond to the PPU-01. For instance not connected.



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Fax
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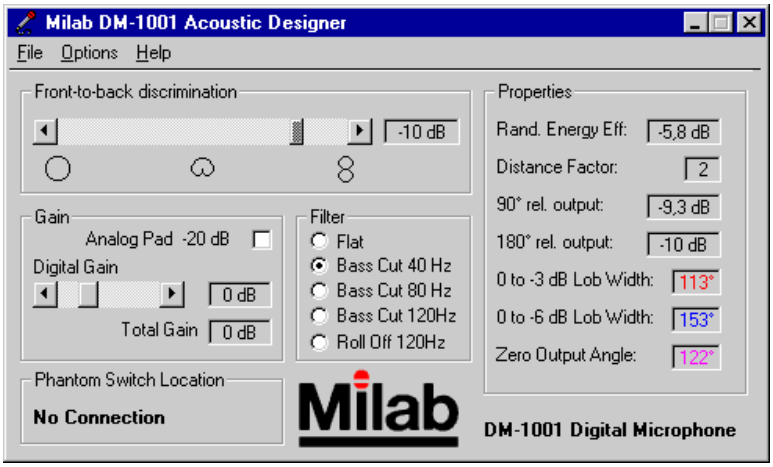
E-mail
milab@milabmic.com

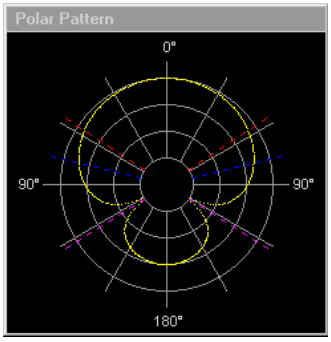
Internet
www.milabmic.com

Using the Acoustic Designer Software

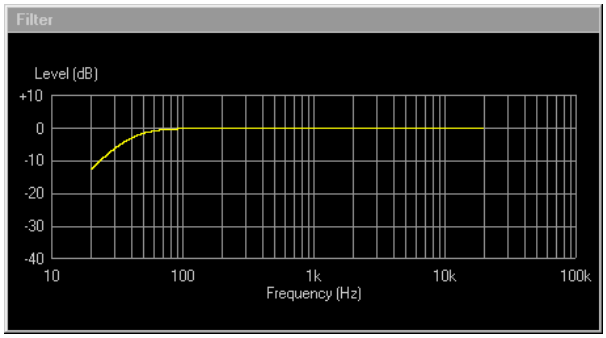
The Acoustic Designer software was designed to give the user total control of all the microphones features. The user interacts with three windows, the main window, the polar pattern window and the filter window.



Main Window
Used to modify the microphone performance.



Polar Pattern Window
Presents the directional



Filter Window
Presents the frequency response of the current digital filter.

The main window is divided into 5 frames with different tasks as followed.

Front-to-back discrimination
Set up the polar pattern. The printed value indicates the attenuation of the back signal in dB. The polar pattern window will present the graph.

Gain
Setting of the microphone gain. The analog pad will make it possible to record high levels, up to 144 dB.
Use the digital gain to adjust the level in the digital domain.

Phantom Switch Location
Indicate the PPU-01 switch position. Also indicate Mic Error and if the computer and PPU don't have connection or if no Com port are selected.

Filter
Buttons for selection of digital filter. The filter window will present the filter curve.

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milab@milabmic.com

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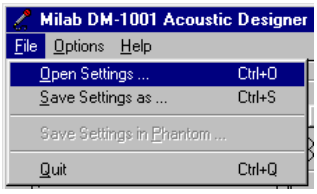
Properties
Information about the actual settings acoustical behaviour.

Random Energy Efficiency (REE): Reduce of the random (off-axis) signal level, relative to the desired (on-axis) signal. Omni = 0 dB, Cardioid = - 4.8 dB.
Distance factor (DF): The distance, with the omni pattern as unity, at which the directional pattern may be used for the same Random Energy Efficiency. Omni = 1, Cardioid = 1.7
90° rel. Output: Sound coming in at 90° relative to 0° in dB.
180° rel. Output: Sound coming in at 180° relative to 0° in dB. -Inf = infinity (total attenuation).
0 to –3 dB Lob Width: The open angular that the sound is between 0 and –3 dB relative 0°. Marked in the polar pattern graph with red lines.
0 to –6 dB Lob Width: The open angular that the sound is between 0 and –6 dB relative 0°. Marked in the polar pattern graph with blue lines.
Zero Output Angle: The angle where the sound is rejected to zero. Symmetric relative on-axis. Marked in the polar pattern graph with magenta lines.

Program Menus

File

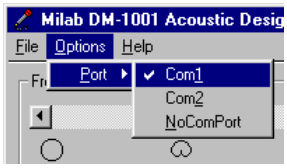


Open Settings… (Ctrl+O)
Open a saved microphone setting.

Save Settings as… (Ctrl+S)
The settings will be saved in a session file ending with '.mic'.

Save Settings in Phantom…
Store the last setting in the PPU-01 EEPROM. Makes it possible to use favourite settings in the user positions without a computer. Would light up when the PPU and computer have connection.

Options



Port select **Com1** or **Com2** for actual connection or **NoComPort** if the program is indented to run alone.

APPENDIX NOTE

This equipment is tested and found to comply with the **EN 55103-1** and **EN 55103-2** environments **E4**. (EMC controlled broadcasting and recording studios.)
This product is not intended to home use!

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