

MiniLINK



User Manual





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1. Introduction

Congratulations and thank you for buying NTi Audio's MiniLINK, a product to support the documentation of test results from the Minilyzer ML1, the Digilyzer DL1 and the Acoustilyzer AL1 (please refer to the AL1 user manual). This manual describes the PC Software "MiniLINK" and includes the new firmware features of the Minilyzer and Digilyzer. Further information about the analogue, acoustical and digital handheld analyzers can be found at www.nti-audio.com.

The MiniLINK package includes the following:

- 1x MiniLINK USB interface
- 1x Battery cover for Minilyzer ML1 (black)
- 1x Battery cover for Digilyzer DL1 (blue)
- 1x USB cable
- 1x MiniLINK user manual

Register your instrument and download the MiniLINK software here <https://my.nti-audio.com>.

CE Declaration of Conformity

We, the manufacturer, NTi Audio AG, Im alten Riet 102, 9494 Schaan, Liechtenstein, Europe, hereby declare that the product MiniLINK, released in 2003, conforms to the following standards or other normative documents.

EMC-Directives: 89/336, 92/31, 93/68
Harmonized Standards: EN 61326-1

This declaration becomes void in case of any changes on the product without written authorization by NTi Audio.

Date: 01.07.2003

Signature:

Position of signatory: Technical Director





International Warranty and Repair

International Warranty

NTi Audio guarantees the functionality of MiniLINK against defects in material or workmanship for a period of one year from the date of original purchase, and agrees to repair or to replace at its discretion any defective unit at no cost for either parts or labor during this period.

Note

Using one MiniLINK USB interface for more than one test instrument is not permitted. After the installation of the USB interface into a Minilyzer or Digilyzer, it has to remain inside this test instrument and is not allowed to be installed into another device. Any actions against this term will cause the non-validity of the warranty conditions.

Restrictions

This warranty does not cover damages caused through accidents, misuse, lack of care, the attachment or installation of any components that were not provided with the product, loss of parts, connecting the instrument to a power supply, input signal voltage or connector type other than specified or wrongly polarized batteries. In particular, no responsibility is granted for special, incidental or consequential damages.

This warranty becomes void if servicing or repairs of the product are performed by any party other than an authorized NTi Audio service center or if the instrument has been opened in a manner other than specified in this manual.

No other warranty, written or verbal, is authorized by NTi Audio. Except as otherwise stated in this warranty, NTi Audio makes no representation or warranty of any kind, expressed or implied in law or in fact, including, without limitation, merchandising or fitting for any particular purpose and assumes no liability, either in tort, strict liability, contract or warranty for products.

Repair of MiniLINK

In case of malfunction, take - or ship prepaid - your NTi Audio Minilyzer or Digilyzer with the installed USB interface packed in the original box, to the authorized NTi Audio representative in your country. For contact-details see the NTi Audio web page "www.nti-audio.com".

Make sure to include a copy of your sales invoice as proof of purchase date. Transit damages are not covered by this warranty.



Warnings



The **MiniLINK USB interface** is designed for the installation into one ML1 or DL1. It shall not be removed and used in any other device. The mounting connector may be damaged due to multiple plug in/off actions.



The pin1 of the XLR input connector and the RCA connector are grounded. The connection of the test instrument via the USB interface to the PC causes a test instrument connection to the PC ground.

Please observe these ground connections at any measurements of high power amplifier outputs, otherwise the device under test or the test instrument may be damaged.

The way to safely test any power amplifier output is to connect the speaker + and - terminals to the balanced instrument pins 2 and 3. **Do not use pin1.** Otherwise the USB cable has to be removed for the measurement. **The Minilyzer RCA connector should not be used for any power amplifier measurements with connected USB cable.**

NTi Audio recommends that any sensitive measurements with low levels or good THD+N values are carried out without the USB cable connected. The test results can be stored in the audio analyzer and transferred to a PC at a later date.



Please observe the common ESD protection measures at the installation of the MiniLINK PCB interface.

2. Installation

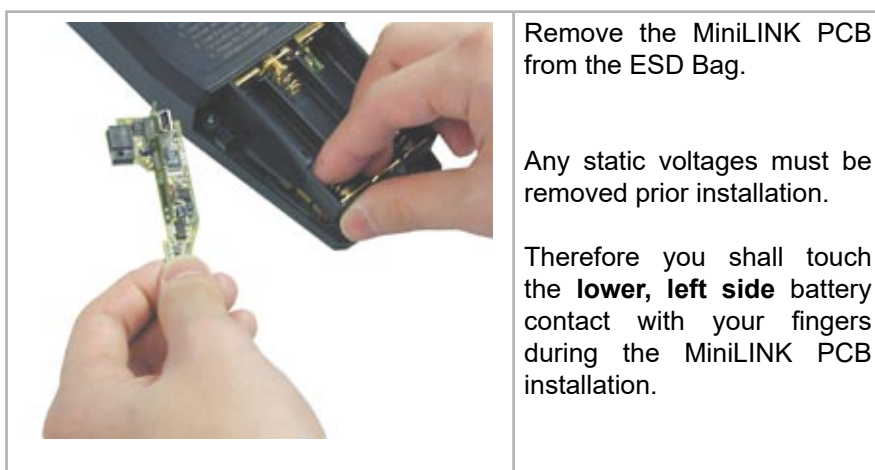
Installation of MiniLINK USB Interface

The following instructions must be observed to avoid the any damages on the instrument during installations:

a. Preparation

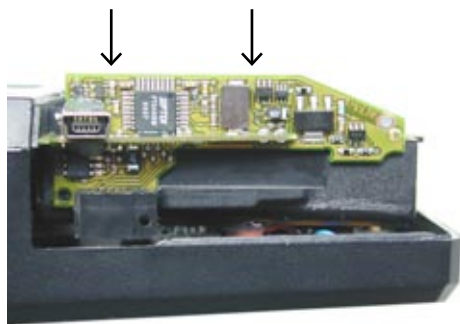


b. ESD Precautions



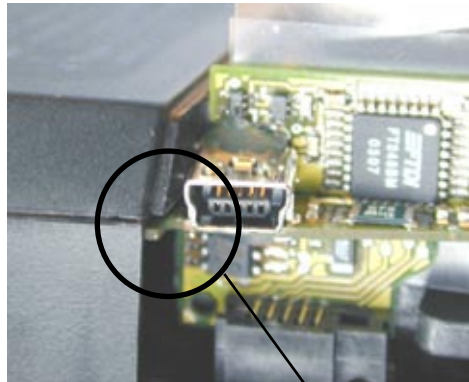


c. Position the USB interface



Place the USB interface onto the left side of the battery case.

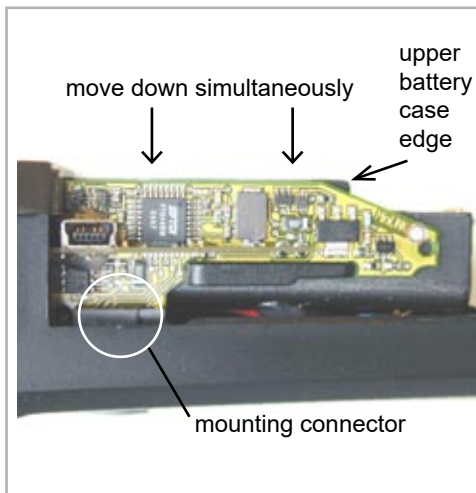
d. Insert the USB interface



front corner positioned below housing

Move the USB interface slowly down until the front corner at the USB connector is positioned below the test instrument housing.

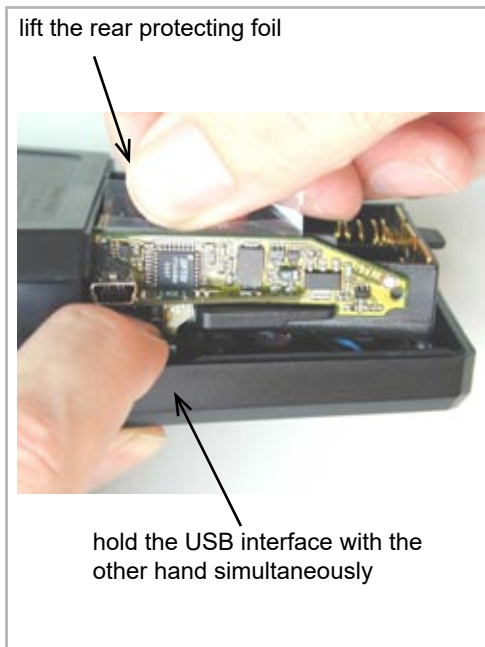
e. Plug-in the USB interface



Push the USB interface gently onto the mounting connector at the left side of the battery case.

After plugging in the connector, the upper battery case edge must be visible. This proves the USB interface has been installed correctly.

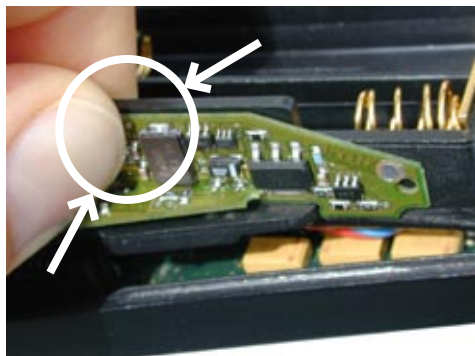
f. Remove the protecting foil



Remove the protecting foil from the backside of the USB interface. Hold the USB interface with one hand and lift the rear protecting foil simultaneously.



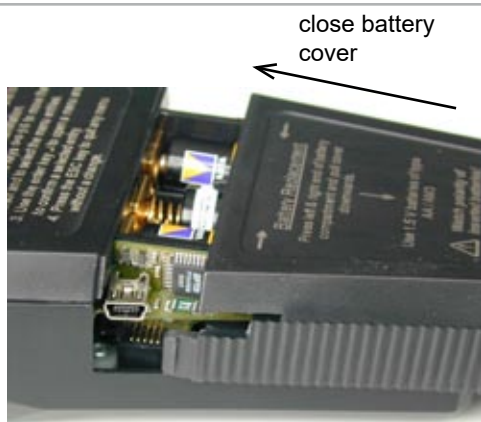
g. Press the USB interface to the housing



Press the USB interface gently together with the battery case. It should be mounted properly in the test instrument and stick to the battery case.

The USB interface is mounted permanently inside the ML1/DL1 and must not be removed again.

h. Complete the test instrument



Insert the batteries and use the new enclosed battery cover to close the battery case. Use the blue colored case for the Digilyzer and the black one for the Minilyzer.

i. Final check



The USB interface installation is completed and the test instrument is ready for operation.



MiniLINK PC Software Installation

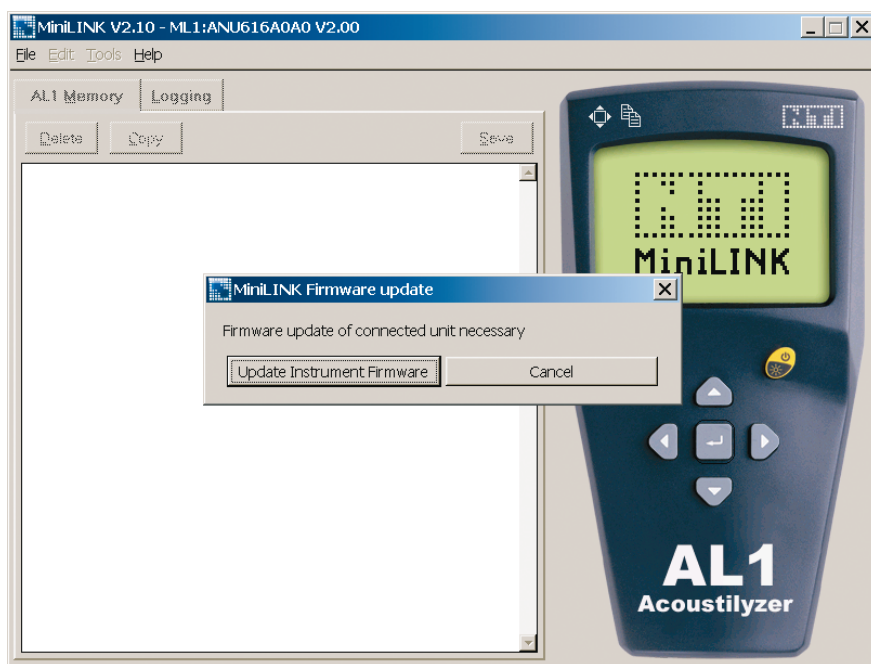
- a. Start up the PC with Windows operating system (MiniLINK V3.00 or higher supports Windows XP, 7, 8 and 10 (32 & 64 Bit)).
- b. Register your instrument and download the MiniLINK software here <https://my.nti-audio.com>.
- c. Install the MiniLINK software.
- d. Use the supplied USB cable to connect the AL1 to the PC. Windows recognizes the new hardware component automatically and starts the hardware installation assistant.
- e. The pop-up window "Digital signature found" will be displayed. Confirm this and continue with the installation.



Start the MiniLINK PC Software

After the successful driver installation, the MiniLINK software can be started (the audio analyzer needs to be connected with the PC).

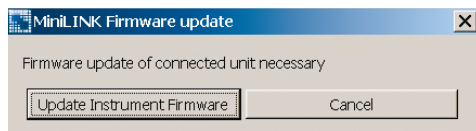
- To start the software follow the windows path “Start -> Program -> MiniLINK”.
- The analyzer switches on automatically and the following screen is displayed on the monitor:



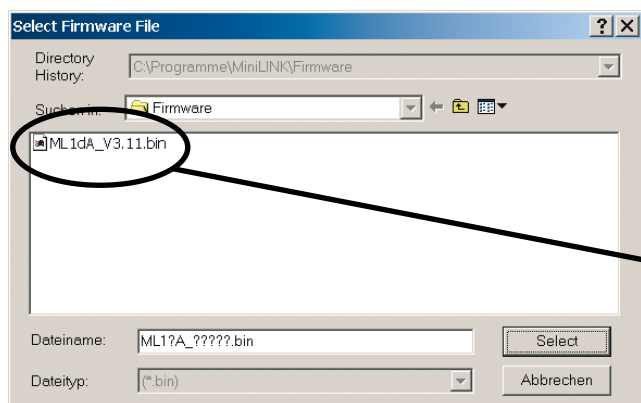
- The MiniLINK software checks the installed test instrument firmware and suggests an automatic firmware upgrade of the analyzer if required.

MiniLINK Firmware Upgrade

The MiniLINK software checks the installed firmware version of the connected test instrument and suggests an automatic firmware upgrade if required.



Confirm the displayed message box showing “Update Instrument Firmware” and select the new firmware version.



for Minilyzer ML1:
ML1dA_V3.xx.hex

for Digilyzer DL1:
DL1eD_D2.xx.hex

applicable firmware
for the connected
device

After confirming the selected device firmware, the test instrument firmware is updated automatically.

Note: In case of any problems during the firmware upgrade, such as power failure, etc., the upgrade procedure can be repeated anytime.



Free Registration of your Test Instrument

The new firmware includes additional “bonus features“, enabled after the registration of the test instrument at the NTi Audio web site.

Overview of available bonus features:

Instrument	Function	Display
ML1	Sound pressure logging (SPL/LEQ) with additional memory menu “LOG AS xxx_LOGSPL“	
ML1 AL1 DL1	Customized start-up screen	

After the startup, the MiniLINK software automatically suggests the registration of non-registered connected instruments.

Online registration:

The test instrument needs to be connected to the PC. Proceed with the above automatic registration or alternatively select the MiniLINK menu “Help -> Register“.

Offline registration:

Register your device at <http://my.nti-audio.com>. Key in your details and the serial number of the device. Read out the instrument serial number from your device by starting the instrument and keeping any button pressed. The start up screen remains displayed. The serial number starts with three letters (such as ANK675A0A2).

After successfully registering your device, you will receive an e-mail with your registration key within a few minutes. Please insert this key in the MiniLINK menu “Help -> Register“. The test instrument needs to be connected to the PC.

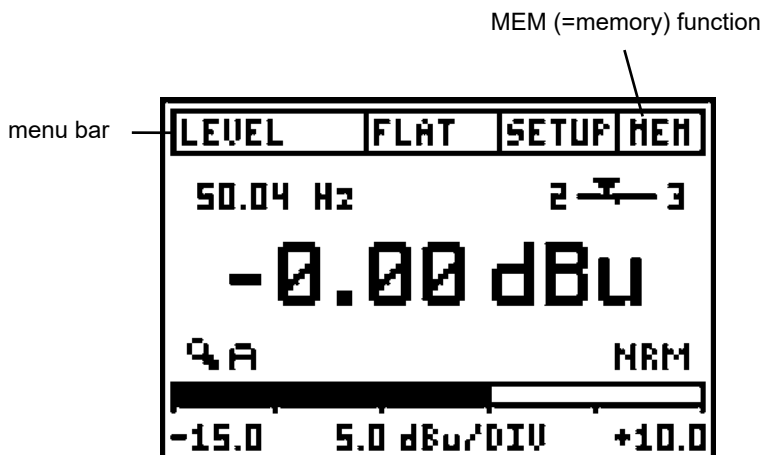
3. New ML1 & DL1 Firmware

Starting with the following firmware versions the ML1 and DL1 includes many additional new features:

Minilyzer	firmware V3.00
Digilyzer	firmware D2.00

The most important one is the memory function. The new Minilyzer and Digilyzer features are described below. Please note, that all new features applicable for the audio analyzers, ML1 and DL1, are shown and explained by using the Minilyzer ML1.

Memory Function



The menu bar includes the new memory field to store a measurement as screenshot on the device itself. At test functions with many numerical test results, such as the 1/3rd octave analysis or sweeps, the results are stored in table form at the same time.



Each recorded screenshot is automatically saved with a file name consisting of the test mode and a continuous running number (“xxx” = running number from 000 - 999, afterwards starting with 000 again):

- ML1: “Mxxx_test mode“, e.g. M075_Balance, M076_LOGSPL
- DL1: “Dxxx_test mode“

Note: The stored measurements remain available in the memory even after removing the batteries for longer period of up to several years.

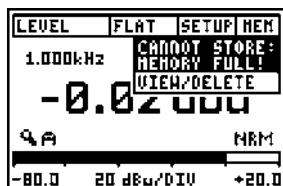
a. Storing test results



Store screenshots/numerical results:

- Open the menu “MEM”
- Press the enter key

Each recorded screenshot is automatically stored with a file name consisting of the test mode and a continuous running number.



Maximum memory:

- Minilyzer ML1: 39 Screenshots
- Digilyzer DL1: 78 Screenshots (without numerical data)

If no more memory is available, the message “CANNOT STORE: MEMORY FULL!” appears.

b. Display & manage memory



Open memory overview

All previously stored measurements can be displayed in the memory overview screen:

- Open the menu “MEM”
- Select “VIEW/DELETE”
- Press the enter key

MEMORY		FREE: 742
EXIT	DEL ALL	
■ M075_FSHEEP	DEL	
■ M074_LOGSPL	DEL	
■ M068_BALANCE	DEL	
■ M067_360_OCT5	DEL	
■ M066_SCOPE	DEL	
■ M064_LULRMS	DEL	

Recorded test results

The stored measurements are listed in continuous order from top to bottom. The latest recorded measurement is always on top of the list.

The remaining memory space is displayed in the right-upper corner of the screen.

MEMORY		FREE: 742
EXIT	DEL ALL	
■ M075_FSHEEP	DEL	
■ M074_LOGSPL	DEL	
■ M068_BALANCE	DEL	
■ M067_360_OCT5	DEL	
■ M066_SCOPE	DEL	
■ M064_LULRMS	DEL	

Display recorded test results

- Select any record in the list using the cursor
- Press and hold the enter key
- The recorded measurement is displayed on the instrument screen.

Note that at the same time the small square in front of the selected measurement changes color. This measurement is now ready for the quick recall mode.

square

MEMORY		FREE: 742
EXIT	DEL ALL	
■ M075_FSHEEP	DEL	
■ M074_LOGSPL	DEL	
■ M068_BALANCE	DEL	
■ M067_360_OCT5	DEL	
■ M066_SCOPE	DEL	
■ M064_LULRMS	DEL	

Quick recall mode (ML1 only)

After leaving the memory overview the previously marked memory location can be displayed by pressing and holding the keys ESC + ENTER. This feature is very useful e.g. to compare the actual 1/3rd octave spectrum with a stored spectrum.



Delete single memory

Each stored result can be deleted individually from the memory.

- Select the “DEL” field beside the memory location to be deleted
- Press the enter key
- The memory location is deleted from the device memory



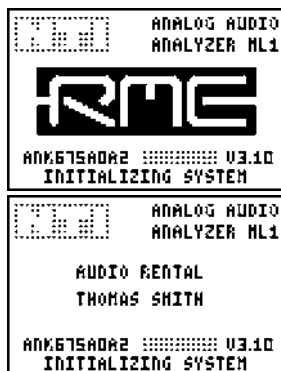
Delete all memories

The complete memory can be deleted with the field “DEL ALL”.

Exit the memory overview

press the ESC key twice or select EXIT

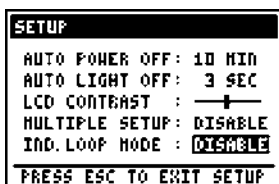
Start-up Screen



The start up screen remains displayed by pressing and holding any button during the start up of the unit. This supports e.g. the read out of the instrument serial number from your device. The serial number starts with three letters (such as e.g. ANK675A0A2).

After the successful registration of the ML1/DL1 the start-up screen may be customized. See details in “Customizing start-up screen” later in this user manual.

Power Saving Function

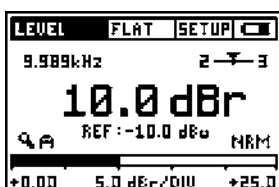


During the operation of the ML1/DL1 with the MiniLINK PC software, the ML1/DL1 is powered from the PC and the following power saving functions are disabled:

- Auto Power Off
- Auto Light Off

After the PC software MiniLINK is switched off the ML1/DL1 is continuously further powered from the PC but the power saving features are enabled again.

Low Battery Indication



A low battery symbol is displayed in the "MEM" field of the menu bar to indicate that a change of batteries is required.



4. Minilyzer ML1 specific Features

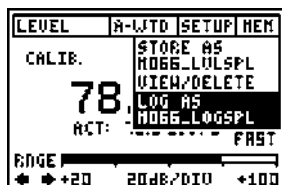
The new Minilyzer ML1 specific features are described in the following capture.

SPL/LEQ Logging

Note: The logging function is a free add-on to the MiniLINK, available after the registration of your test instrument (see “Free Registration of your Test Instrument”)

The Minilyzer can record the SPL/LEQ curve flow, e.g. during an event, for many hours. The results can then be loaded to a PC and visualized as a level diagram using e.g. Microsoft Excel.

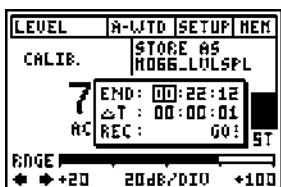
The stored results remain within the Minilyzer memory even in the event of a battery failure during the recording session.



Start SPL/LEQ logging

After the ML1 is successfully registered, you will find the additional “LOG AS ...” function in the LEVEL SPL memory menu. This feature enables you to record the following test results:

- Actual SPL and LEQ value
- LEQ Overload
- At each recording interval:
SPL averaged, minimum and maximum



Setting of recording time

The maximum recording time (END) of the sound pressure level logging depends on the remaining memory and the selected test interval period (T). The logger may record a maximum of 1500 points over a custom defined time.

The test interval period (T) can be defined by the user in the format hh:mm:ss.



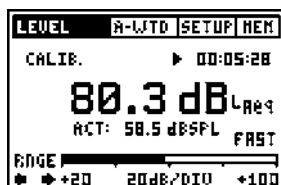
Review logging records

When checking the recorded data in the memory overview, the "SPL/LEQ LOG DATA" screen is displayed. The result table is stored together with this screenshot and can be read out by using the MiniLINK PC software.

Note: During the ML1 SPL/LEQ logging the change of settings is not possible.



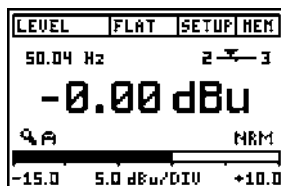
SPL/LEQ Filter



For most of the ML1 applications, the sound pressure level measurements require the use of the A-weighting filter. To prevent wrong filter settings, causing wrong non-usable test results, the default filter setting of the "LEVEL->SPL" mode is A-weighting (A-WTD).

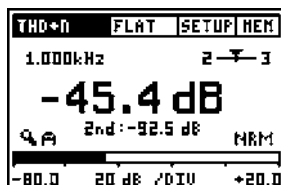
Note: Each time the LEVEL SPL mode is selected the A-weighting filter is pre-set by default.

"Flat" Filter



The previously used filter description "Linear" has been changed to the proper english term "Flat" for no filter setting.

THD+N, k2 - k5 Distortion Analysis

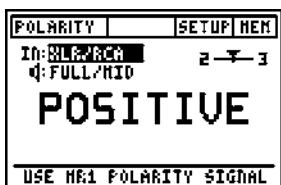


The THD+N menu measures additionally the 2nd, 3rd, 4th & 5th harmonics distortion simultaneously. Select the individual test to be displayed below the main THD+N test result.

Polarity Test Function

The polarity test function detects the correct cable and speaker polarity in combination with the Minirator MR1. The Minilyzer provides the following test configurations:

a. Speaker polarity test



Feed the speaker system with the polarity-test signal of the Minirator and adjust the level (at MR1 or amplifier) that the test signal is good to hear.

Minilyzer settings:

- IN:MIC (INT), using the internal mic of the Minilyzer ML1
- IN:XLR/RCA, using an external mic, such as the MiniSPL

Choose the polarity test frequency range:

- FULL/MID, for tests with wide band speakers
- WOOFER, for tests with woofers

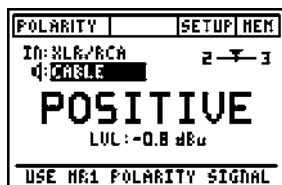
Note: Please note the polarity testing is a simplified measurement of a very complex signal phasing. Drivers, speakers and cross-overs cause severe phase shifts of the audio signal.

The polarity of various speakers within the same cabinet can be different. This is not a problem nor caused by bad speaker design.

Polarity testing is useful for checking the correct wiring of similar speaker systems.



b. Cable polarity test



Use the polarity test signal of the Minirator to feed the cable under test. The Minilyzer analyzes the signal polarity at the other end of the cable.

Minilyzer settings:

- IN: XLR/RCA,
- Mode: Cable

The following problems may be detected quickly and easily in this way:

- Wrong polarity, caused by wrong or defective wiring inside the cable
- Cable problems
unsymmetrical signals, displayed with the balance indicator, can lead to the accurate detection of various cable problems, such as
 - “-UBAL-“ leads to a broken internal wire at a symmetrical XLR cable
 - The balance indicator out of center leads to other cable problems as explained in detail in the NTi Audio application note “Signal Balance” (available for download at the NTi Audio website www.nti-audio.com).

The level measurement is very useful for applications, such as testing of multicore cables, providing additional information about the cable quality.

Induction Loop Mode

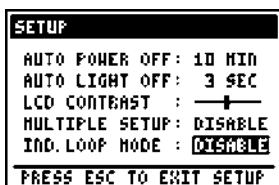
The Minilyzer simplifies verifications and adjustments of AFILS (Audio Frequency Induction Loop Systems). AFIL systems are used in public buildings to increase the speech intelligibility for users of hearing aids. Most hearing aids have a built in magnetic coil receiving audio signals generated by induction loop systems. AFIL systems consist of a wire loop and a current amplifier generating a magnetic field into the hearing aid, modulated by the audio input signal, e.g. voice.

Adjustment and verification of AFIL systems is described in the IEC 60118 standard. The Minilyzer, together with an induction loop receiver, is an ideal tool to accomplish the necessary measurements.

Induction Loop Receivers

There are various induction loop receivers available from different AFILS components manufactures. All known types work together with the ML1. Some receivers have a built in A-weighting filter, which must be disabled to prevent measurement errors.

Activation of the Induction Loop Mode

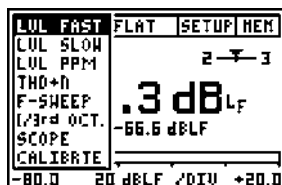


- Enter the setup page of the ML1
- Change the position “Ind. loop mode” to “ENABLE”
- Press ESC key to exit the setup page

After this the ML1 restarts in the induction loop measurement mode. To return to the common ML1 measurement mode, disable the induction loop mode in the setup page again.



Induction Loop Measurement Menu



The Minilyzer restarts with an specific new AFILS measurement menu including

- Level, fast weighted
- Level, slow weighting
- Level, PPM
- THD+N
- F-Sweep, frequency sweep
- 1/3rd Oct, spectrum analyzer
- Scope
- Calibrate

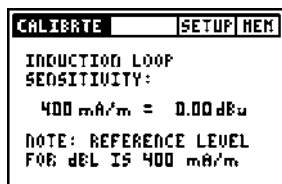
Units mA/m, dB

The magnetic field strength is measured in A/m (Ampere per meter). AFIL systems use 400mA/m as a reference level. The logarithmic unit of the magnetic field strength is dB (dB Loop) and has a reference level of 400mA/m.

$$\text{dB}^1 = 20 * \log \frac{\text{Magn. field strength}}{400\text{mA/m}}$$

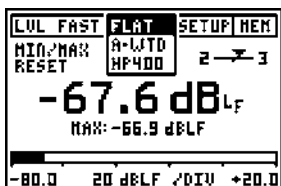
¹ The designator of the unit dB is not standardized yet - but resulted of IEC 60118 committee members recommendations.

Calibration



An induction loop receiver transforms a magnetic field strength to an electrical level. The receiver sensitivity is specified within the technical data. Before a valid measurement can be started the ML1 sensitivity setting must be adjusted accordingly.

Filters

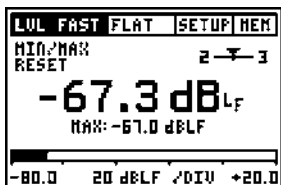


The ML1 has a built-in A-weighting and a HP400 (high pass 400Hz) filter, which may be activated using the filter menu. For detailed test requirements please refer to the IEC 60118 standard. The HP400 filter has an excellent rejection of mains frequencies, which sometimes is a dominant part of the signal received by the induction loop receiver.

Logging

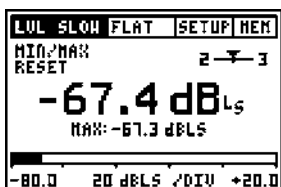
The following functions support the read out of the test result in numerical data: THD+N, FSweep, 1/3rd Octave.

Level Fast, Level Slow



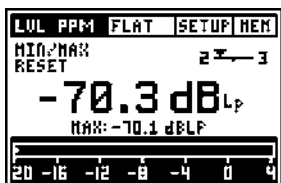
Level of the magnetic field strength measured in accordance to IEC60804 (sound pressure level time weighting) with the following integration times:

- Level Fast: 125ms



- Level Slow: 1s

Level PPM

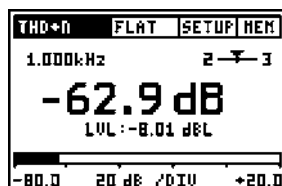


Level of the magnetic field strength measured with a ppm like peak detector (type IIa).

- Integration time: 10 ms
- dB_{LP} = dB Loop peak



THD+N

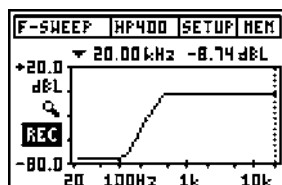


Total harmonic distortion + noise

The THD+N value and Level RMS is displayed.

Please refer to the Minilyzer user manual for more details.

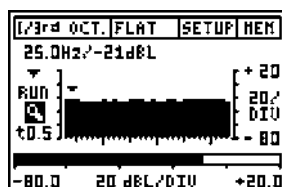
FSweep



Frequency Sweep recording

Please refer to the Minilyzer user manual for more details. The frequency tracking will not work if mains frequency components dominate the input signal. Activating the HP400 filter will attenuate all main frequency components and a frequency recording is possible.

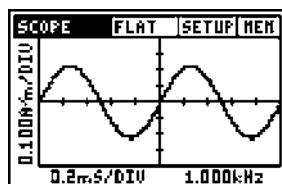
1/3rd Octave



1/3rd octave spectrum analyzer

This function shows the spectrum of the input signal in 1/3 octave bands. Please refer to the Minilyzer user manual for more details. The ML1 input ranging is not necessary in the induction loop mode and therefore not included.

Scope



Time domain of the input signal in A/m

Please refer to the Minilyzer user manual for more details.



5. Digilyzer DL1 specific Features

Starting with the DL1 firmware D2.00 the Digilyzer includes the features already described in “New ML1 & DL1 Firmware” such as

- Memorizing of screenshots and measured data
- Online logging
- Customizing of start-up screen.

Event Logger

Starting with the firmware D2.10, the Digilyzer supports the read out of all numerical event logger data to the computer.

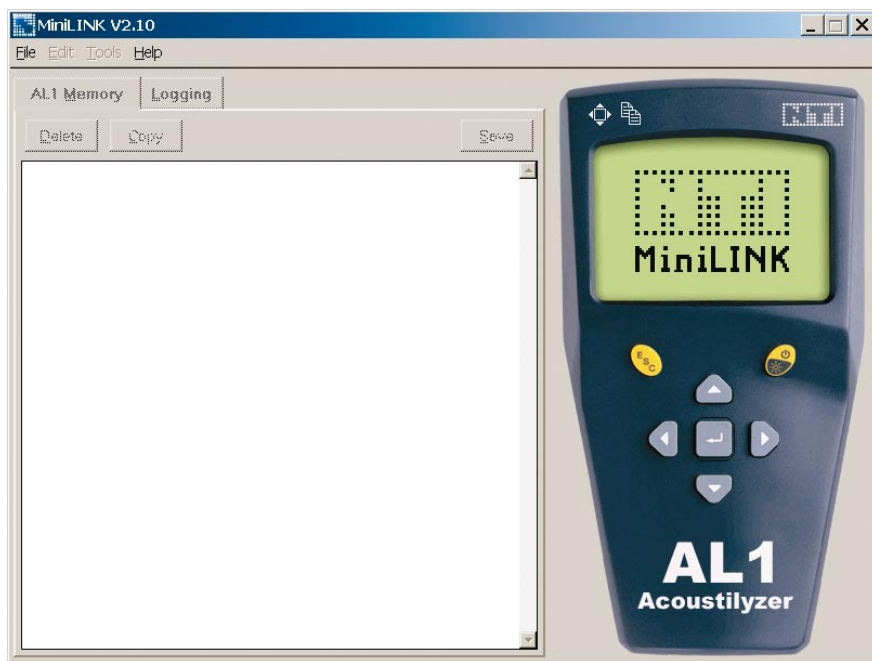
Please note the specific DL1 event logger display-masking feature is not applicable. **All event records are memorized at anytime.**



6. MiniLINK PC Software

The MiniLINK PC software enables the transfer of stored measurements from the Minilyzer / Digilyzer to the PC and the online data logging.

- To start the software follow the windows path “Start → Program → MiniLINK”.
- The analyzer switches on automatically and the following screen is displayed on the monitor:



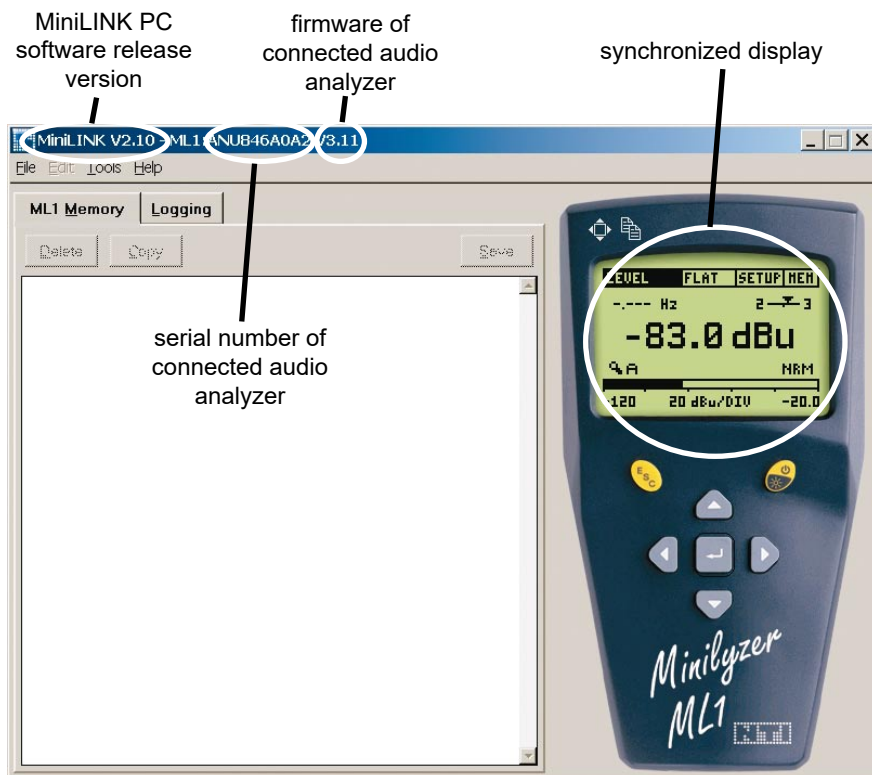
The test instrument is powered by the USB interface and therefore switches on by itself. During the operation with the connected USB interface the **batteries should not be removed** from the device.

Read Out of Stored Test Results

The analyzer memory is automatically transferred to the PC and visualized with small screenshots at the MiniLINK memory window.

Note: The MiniLINK memory window remains empty when no test results are stored within the instrument. Otherwise, use the PC mouse to click onto the “ML1 Memory” tab to initiate and update the data memory window.

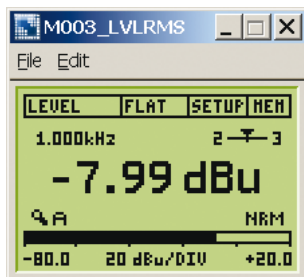
The test instrument display at the PC is synchronized to the actual LCD screen display of the connected audio analyzer. The title bar reads the serial number and firmware version of the test instrument.





Visualizing the Test Results

All stored screenshots are shown in the MiniLINK tab “ML1 Memory”.

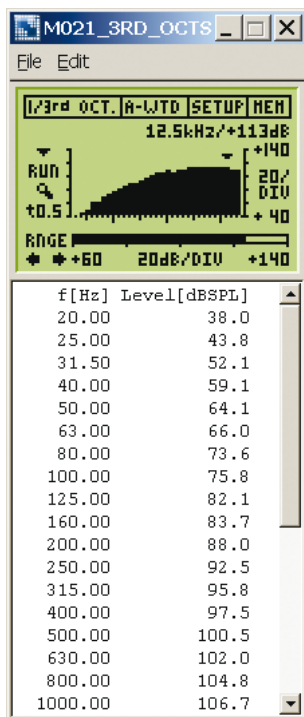


Big view of screenshots

A double click on the screenshot will enlarge this screenshot. In this mode the menu allows printing, saving or copying of the screenshot or the numerical test results.

Any available numeric table is listed below the big view screenshot.

Copying of Test Results and Screenshots



The displayed screenshots can directly be copied into reports for documentation.

- Select the menu “Edit -> Copy Bitmap” to choose the graphics or select the menu “Edit -> Copy Text” to choose the numerical measurement data
- Insert the clipboard into the reporting document with “Ctrl + V”, such as Excel,...

Alternatively import the stored “*.txt” file, including the numerical measurement data, e.g. to Microsoft to Excel by using the Excel import assistant.

In the 1/3rd octave measurement screen the following additional numeric data is displayed below the big view screenshot:

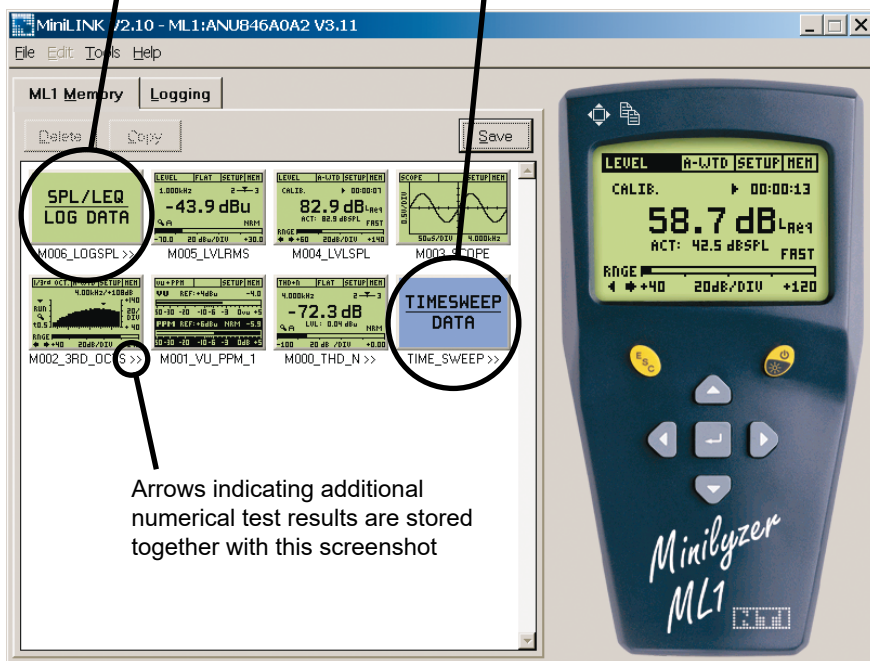
- 1/3 octave frequencies
- Level

Additional display of Minitizer test results:

- Logged sound pressure level records are displayed with the “SPL/LEQ LOG DATA” screenshot. The detailed test records are saved behind the screenshot. Double-click onto this screenshot to enlarge the screenshot and display the numeric test records.
- TimeSweep mode: The Minitizer is able to record the results within the time sweep mode. All numeric data is recorded and available by double clicking on the “TIMESWEEP DATA” screenshot. The time sweep records are stored in a different memory bank than the other stored measurements. Therefore, this screenshot is displayed in a different color at the last position.

SPL/LEQ LOG DATA

TIMESWEEP DATA





Example: Display of SPL/LEQ Logging test results

The screenshot shows a software window titled "MO00_LOGSPL" with a menu bar containing "File" and "Edit". A green box in the upper left corner contains the text "SPL/LEQ LOG DATA". The main area displays test configuration and results.

```
> Level SPL
> Selected Filter      : A-Weighting acc. IEC 60651
> Time Weighting      : Fast
> Initial Integration Time: 00:00:00
> Mic Calibration      : 20 mV/Pa
> Selected Range       : 40 to 120 dBSPL

> ACT: Mean SPL value during one interval
> Min: Minimum SPL value during one interval
> Max: Maximum SPL value during one interval
```

Time	LEQ[L _{Aeq}]	ACT[dBSPL]	Min[dBSPL]	Max[dBSPL]	OVLD
00:00:00	88.7	88.7	88.7	89.2	.
00:00:01	89.7	91.0	89.2	94.0	.
00:00:02	91.7	93.2	92.7	94.5	.
00:00:03	93.1	95.6	94.5	96.6	.
00:00:04	94.6	97.8	96.6	98.7	.
00:00:05	96.1	99.9	98.7	100.7	.
00:00:06	97.2	101.0	100.7	102.5	.

The SPL/LEQ logging function provides the following test results:

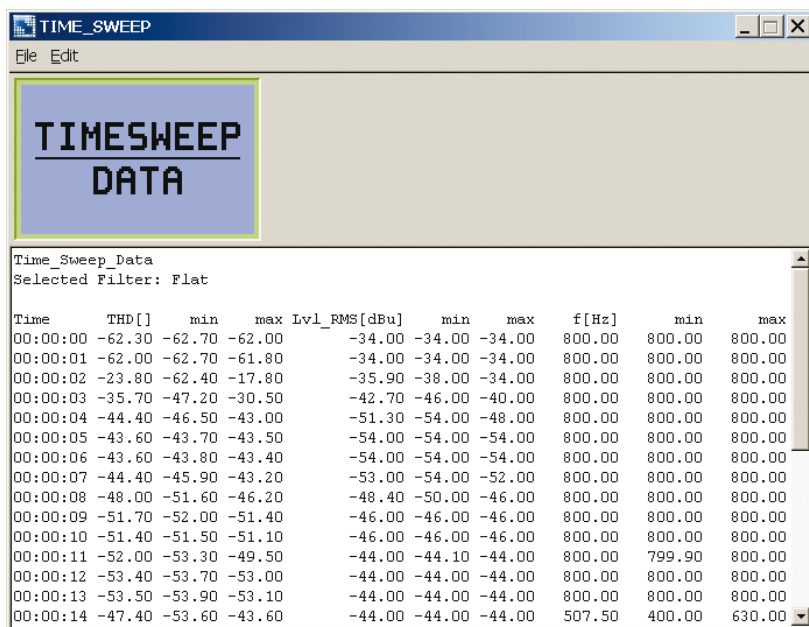
- Test configuration
- Time, relative to logging start
- Actual SPL and LEQ value
- At each recording interval:
 - SPL averaged, min. and maximum
- LEQ Overload



Example: Display of numeric time-sweep test results

The following numeric test results can be recorded and displayed in the time sweep mode:

- Test configuration
- Time, relative to logging start
- THD, actual, min. & max. of selected time interval
- Level, actual, min. & max. of selected time interval
- Frequency, actual, min. & max. of selected time interval



The screenshot shows a software window titled "TIME_SWEEP" with a menu bar containing "File" and "Edit". Inside the window, there is a blue box with the text "TIMESWEEP DATA". Below this, the text "Time_Sweep_Data" and "Selected Filter: Flat" are visible. A table of test results is displayed, with columns for Time, THD, min, max, Lvl_RMS, min, max, f, min, and max. The table contains 15 rows of data, showing test results over a 15-second interval.

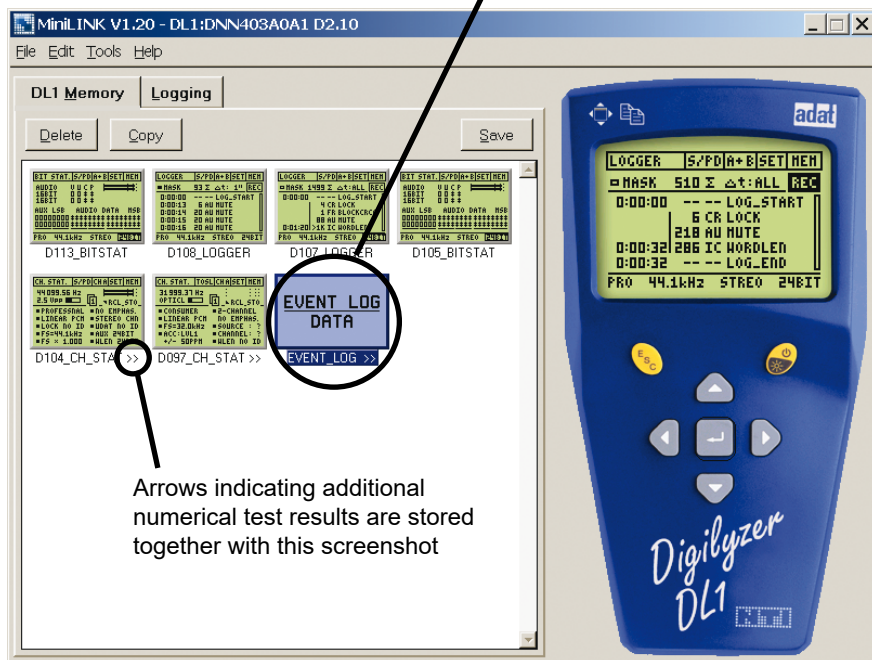
Time	THD[]	min	max	Lvl_RMS[dBu]	min	max	f[Hz]	min	max
00:00:00	-62.30	-62.70	-62.00	-34.00	-34.00	-34.00	800.00	800.00	800.00
00:00:01	-62.00	-62.70	-61.80	-34.00	-34.00	-34.00	800.00	800.00	800.00
00:00:02	-23.80	-62.40	-17.80	-35.90	-38.00	-34.00	800.00	800.00	800.00
00:00:03	-35.70	-47.20	-30.50	-42.70	-46.00	-40.00	800.00	800.00	800.00
00:00:04	-44.40	-46.50	-43.00	-51.30	-54.00	-48.00	800.00	800.00	800.00
00:00:05	-43.60	-43.70	-43.50	-54.00	-54.00	-54.00	800.00	800.00	800.00
00:00:06	-43.60	-43.80	-43.40	-54.00	-54.00	-54.00	800.00	800.00	800.00
00:00:07	-44.40	-45.90	-43.20	-53.00	-54.00	-52.00	800.00	800.00	800.00
00:00:08	-48.00	-51.60	-46.20	-48.40	-50.00	-46.00	800.00	800.00	800.00
00:00:09	-51.70	-52.00	-51.40	-46.00	-46.00	-46.00	800.00	800.00	800.00
00:00:10	-51.40	-51.50	-51.10	-46.00	-46.00	-46.00	800.00	800.00	800.00
00:00:11	-52.00	-53.30	-49.50	-44.00	-44.10	-44.00	800.00	799.90	800.00
00:00:12	-53.40	-53.70	-53.00	-44.00	-44.00	-44.00	800.00	800.00	800.00
00:00:13	-53.50	-53.90	-53.10	-44.00	-44.00	-44.00	800.00	800.00	800.00
00:00:14	-47.40	-53.60	-43.60	-44.00	-44.00	-44.00	507.50	400.00	630.00



Additional display of Digilyzer test results:

The event logger records are displayed with the “EVENT LOG DATA” screenshot. The detailed test records are saved behind the screenshot. Double-click onto this screenshot to enlarge the screenshot and display the event logger records. These data are stored in a different memory bank than the other stored measurements. Therefore, this screenshot is displayed in a different color at the last position.

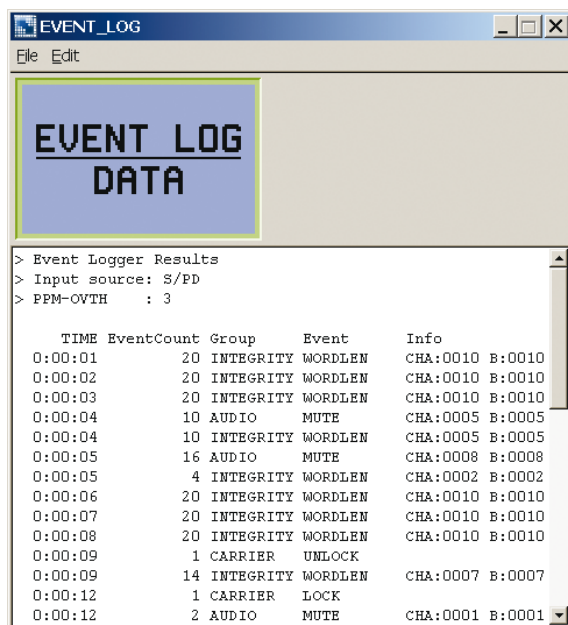
EVENT LOG DATA



Example: Display of Digilyzer Event Logger results

The following numeric test results can be recorded and displayed in the event logger mode:

- Test configuration
- Time, relative to logging start
- Event Count, number of irregularities of the digital input signal during each recording interval
- Group, listing the event category
- Event, exact description of signal irregularity
- Info, detailed listing of recorded events at channel A and B



The screenshot shows a window titled "EVENT_LOG" with a menu bar containing "File" and "Edit". Below the menu bar is a large blue box with the text "EVENT LOG DATA". Below this box is a scrollable text area containing the following data:

```
> Event Logger Results
> Input source: S/PD
> PPM-OVTH : 3
```

TIME	EventCount	Group	Event	Info
0:00:01	20	INTEGRITY	WORDLEN	CHA:0010 B:0010
0:00:02	20	INTEGRITY	WORDLEN	CHA:0010 B:0010
0:00:03	20	INTEGRITY	WORDLEN	CHA:0010 B:0010
0:00:04	10	AUDIO	MUTE	CHA:0005 B:0005
0:00:04	10	INTEGRITY	WORDLEN	CHA:0005 B:0005
0:00:05	16	AUDIO	MUTE	CHA:0008 B:0008
0:00:05	4	INTEGRITY	WORDLEN	CHA:0002 B:0002
0:00:06	20	INTEGRITY	WORDLEN	CHA:0010 B:0010
0:00:07	20	INTEGRITY	WORDLEN	CHA:0010 B:0010
0:00:08	20	INTEGRITY	WORDLEN	CHA:0010 B:0010
0:00:09	1	CARRIER	UNLOCK	
0:00:09	14	INTEGRITY	WORDLEN	CHA:0007 B:0007
0:00:12	1	CARRIER	LOCK	
0:00:12	2	AUDIO	MUTE	CHA:0001 B:0001



Save Test Results & Screenshots

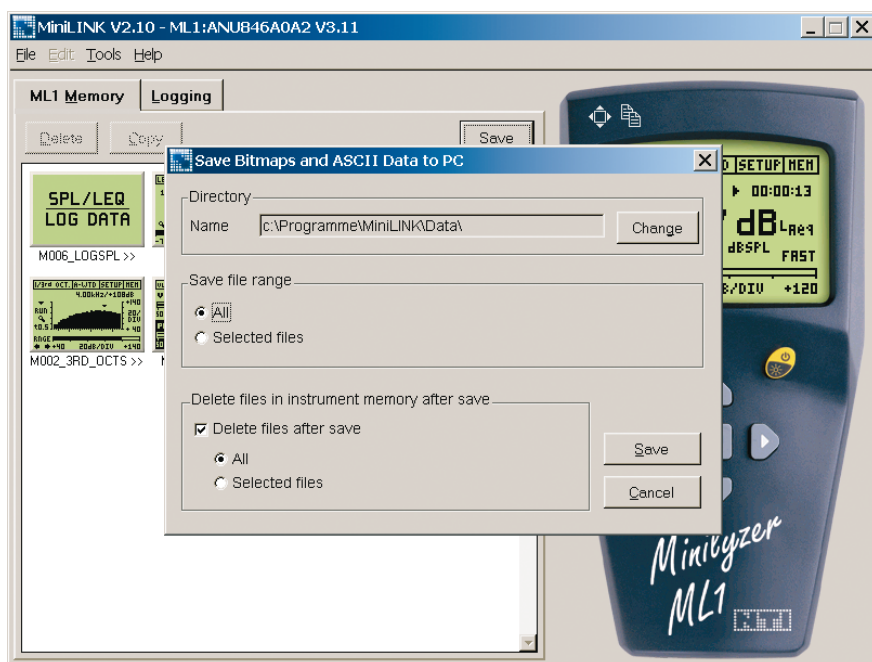
The displayed screenshots can be saved as bitmap files (*.bmp) and numeric data as text files (*.txt) to the hard drive. The file names consist of the first six device serial number digits and the screenshots name.

For example the screenshot “M011_FSWEEP” recorded e.g. with an Minilyzer S/N ANK675 is saved as

- “ANK675_M011_FSWEEP.bmp” & “ANK675_M011_FSWEEP.txt”

This enables to store various test results of more audio analyzers on the same PC. Save the stored test results as follows:

- Select the screenshots to be saved in the memory field.
- Press the SAVE button or select in the menu “File → SAVE”.
- The menu below will be displayed. The directory path may differ according the installed Windows system.
- Select the SAVE/DELETE configuration and press SAVE.



When saving the screenshots to the PC the same memorized values can be deleted at the test instrument automatically. Just select in the above displayed menu “Delete files in instrument memory after save” to empty the test instrument memory simultaneously.

Delete Test Results of Analyzer Memory

The memorized test results in the test instrument can be deleted as follows:

- Directly in the test instrument memory overview
- Select the screenshot in the MiniLINK memory screen and press DEL on the PC keyboard or using the delete function of the MiniLINK memory menu
- Selecting the delete function when saving the screenshots/test results to the PC

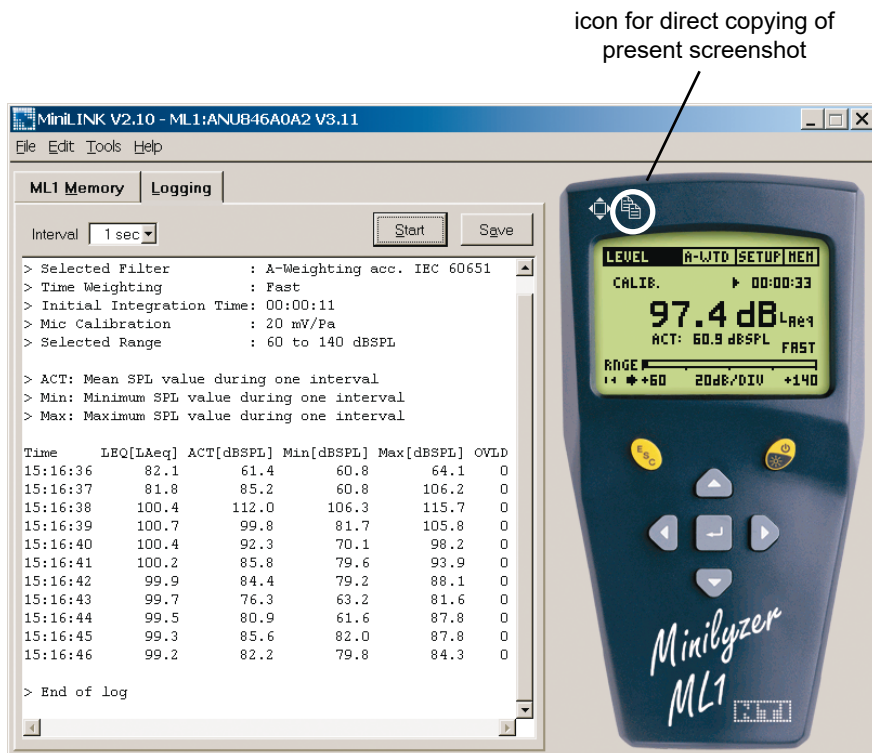
Test Result Logging at the PC

MiniLINK allows the continuous online logging of test results. The actual test results of the test modes

Minilyzer ML1	Digilyzer DL1
<ul style="list-style-type: none"> • Level RMS, REL, SPL • THD+N, vu + PPM • Balance 	<ul style="list-style-type: none"> • Bitstatistic • Level RMS, Level Peak • THD+N

can be logged online in customer defined time intervals. This test data is saved into the MiniLINK PC software directly. At the end of the logging process, press the “SAVE” button to save the test results in ASCII format to your PC. The saved data file name is e.g. “ANK675_PcLog_Level SPL”.

The logging function is ideally suited for long term monitoring or troubleshooting, e.g. in repair or broadcast applications.



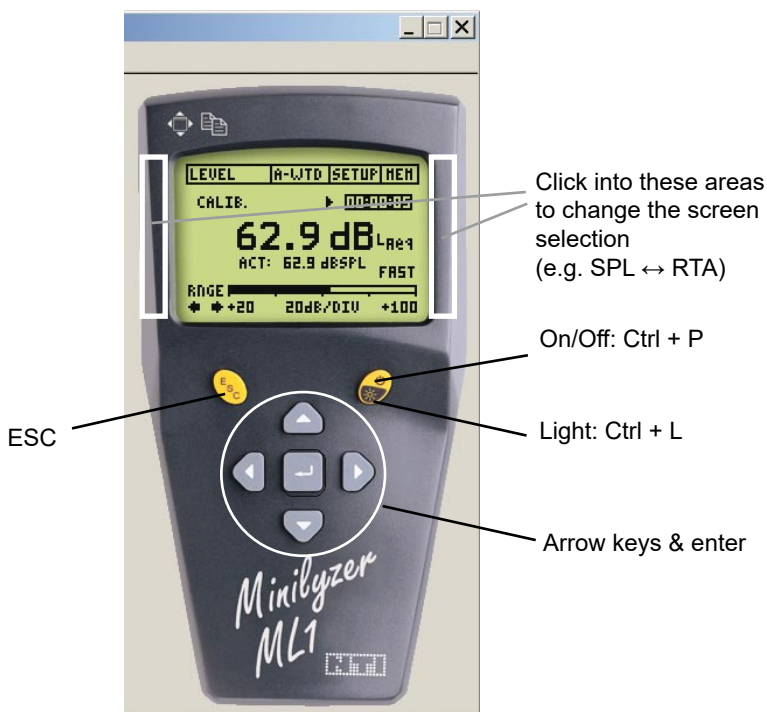
To log online results, please:

- Select the requested measurement function at the test instrument
- Select the “Logging” screen in the MiniLINK PC Software menu
- Select the required log time intervals
- Press the “START” button to start the test result logging
- Press the “STOP” button to end the logging process
- Press the “SAVE” button to save the record to file

Additionally the present screenshot displayed on the MiniLINK PC software can be directly copied to clipboard by pressing the marked icon with the mouse button. Paste the screenshot into any files by pressing “CTRL + V”.

Remote Test Instrument Control with the PC

MiniLINK supports the remote control of the analyzer from a PC. Just click on the displayed test instrument and all keys can be operated with the below listed keys at the PC keyboard or using the mouse.



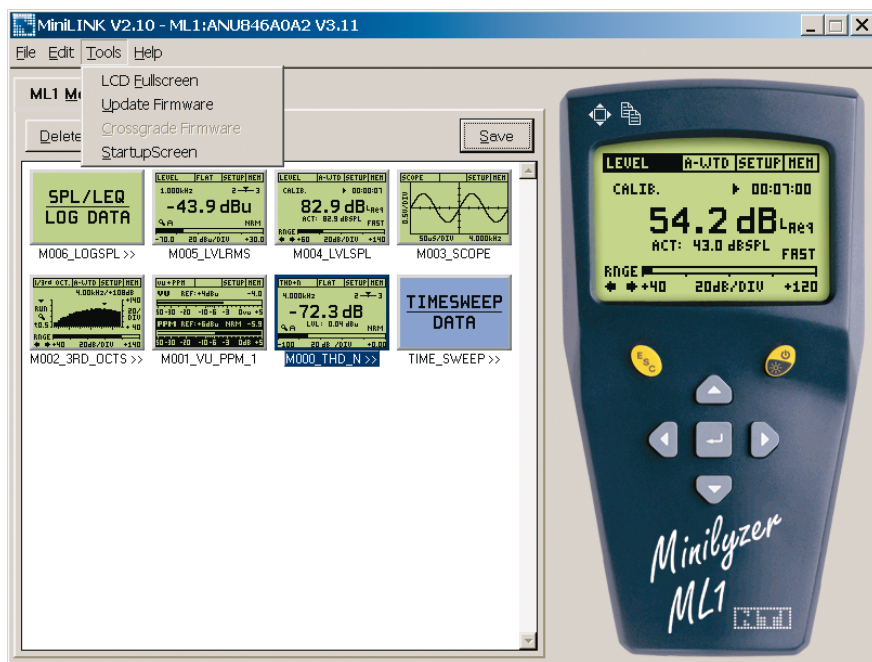
“Shift ←” or “shift →” or the above indicated areas allow to change the screen selection of the enabled measurement function.



MiniLINK Tools

The MiniLINK PC software includes many useful tools as follows:

- LCD Fullscreen
- Update Firmware
- Crossgrade Firmware
- StartUp Screen





LCD Fullscreen

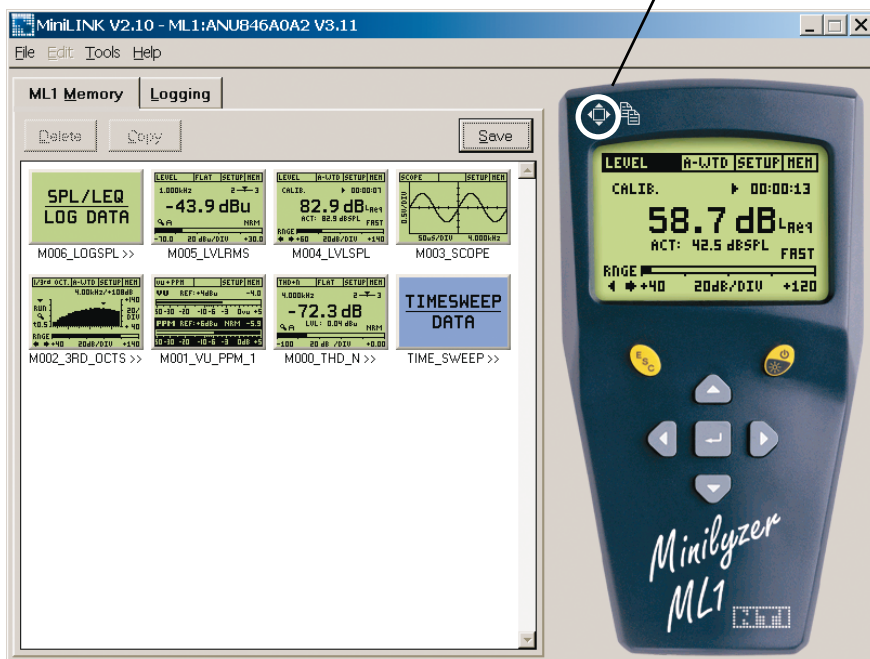
The actual test instrument display can be shown on the PC monitor in a full screen mode.

To enter the full screen mode:

- Select the menu “Tools → FullScreen” at MiniLINK.

To exit the full screen mode:

- Press the “Q” button on the PC keyboard
or simply click into the screen with your PC mouse.





Firmware Update

NTi Audio provides free updates of the test instrument firmware and the MiniLINK PC software at the NTi Audio website "www.nti-audio.com".

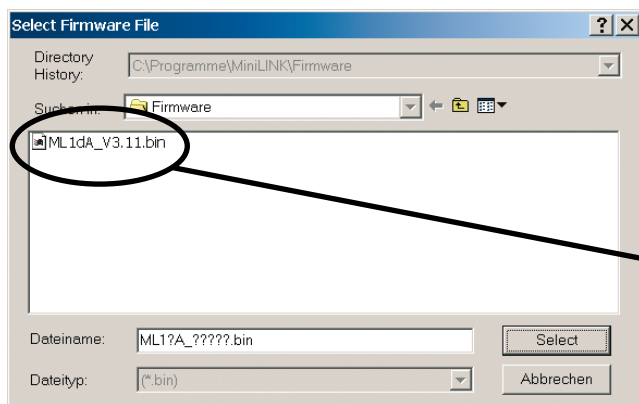
To check out any available online updates, follow these instructions:

- Connect your PC to the web & start the MiniLINK PC software
- Connect the instrument with the USB cable to the PC
- Select the menu "Help -> Look for Updates" at MiniLINK
- Follow the download instructions

Alternatively you can check for any new firmware and software releases at the web site "<http://registration.nti-audio.com/VersionCheck.php>".

- Select the menu "Tools -> Update Firmware" at MiniLINK

Select the new firmware version in the displayed screen below:



for Minilyzer ML1:
ML1dA_V3.xx.bin

for Digilyzer:
DL1dA_D2.xx.bin

applicable firmware
for the connected
device

After confirming the selected device firmware, the test instrument firmware is updated automatically.

Note: The firmware update deletes the internal device memory. In case of any problems during the firmware upgrade, such as power failure, etc., the upgrade procedure can be repeated anytime.

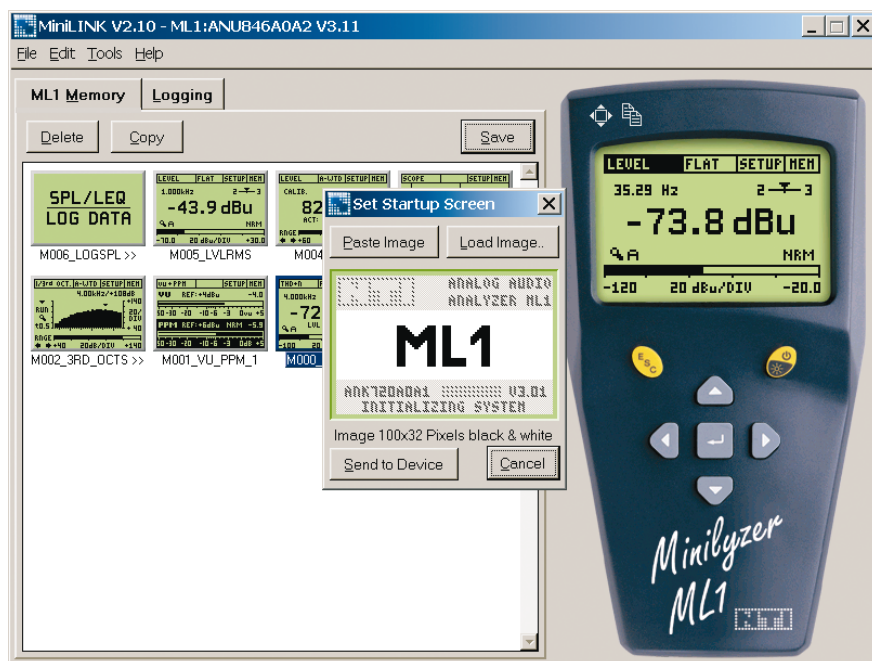
Firmware Crossgrade

The Acoustilyzer AL1 and the Minilyzer are based on the same hardware platform with different specific firmware installed. The available crossgrade packages allow to install the ML1 firmware into the AL1 or to install the AL1 firmware into the ML1. The Crossgrade function can be enabled by installing the option “ML1-AL1 Crossgrade”, available for purchase.

Note: The firmware crossgrade deletes the internal device memory, thus the customized start-up screen needs to be reloaded onto the instrument.

Customizing the Startup Screen

The MiniLINK PC software supports the transfer of customized start-up screens to the test instruments. The personally defined start-up screen will be displayed instead of the factory logo every time the test instrument is switched on.



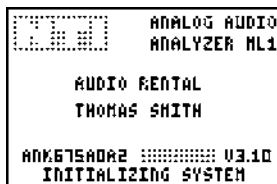
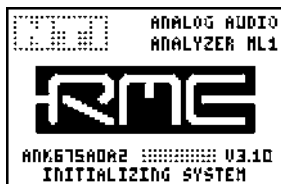


Open the “Set Startup Screen” window by using the menu “Tools -> StartupScreen” at MiniLINK. The panel “Set Startup Screen” displays a sample default factory startup screen. The white center area (100 x 32 pixels) can be customized by the user. The remaining top & bottom gray area is fixed and cannot be altered.

Guideline to define the new start-up screen:

- Use a pre-defined picture. The MiniLINK PC software will convert it to a 100x32 pixel black & white picture automatically. The following file types can be used as start-up screens: *.pcx;*.bmp;*.dic;*.rle;*.ico;*.wmf
- Alternatively create a new start-up screen yourself using any picture / paint programs, such as “Microsoft Paint”. Set the file size to 100x32 pixel and insert any text or graphics for the start-up screen. Save the file as “*.bmp” format.
- Press the button “Load Image” to select the file containing the new start up screen.
- The start-up screen preview is displayed on the PC monitor.
- Press the button “Send to Device” to transfer the file to the device
- The audio analyzer is switching off and on automatically, so you can check out the new start-up screen by yourself immediately.

Sample start-up screens:



7. Troubleshooting

a. Numeric data import of "*.txt" files to Excel

Problem:

The numbers are recognized as text only at the import of numeric test results to e.g. Microsoft Excel, so you cannot create tables or use the data for further calculations.

Solution:

The MiniLINK data files use blanks inbetween test results and the "." as decimal separator. Please set the decimal separator to "." at the import procedure of these numeric test results into e.g. Microsoft Excel.

Alternatively you can use copy -> paste in the big view mode, select the menu "Edit -> Copy Text" and paste the data into an open Excel document.

b. Registration

Problem:

The registration of your instrument does not work.

Solution:

Check out the latest available firmware and software releases on the web site "<http://registration.nti-audio.com/VersionCheck.php>".

In case you are using older releases please download the latest versions and try the registration again.

Overview Minstruments Products:



Minilyzer ML1
Analog Audio Analyzer



Acoustilyzer AL1
Acoustical Analyzer



MiniSPL
Measurement Mic



Minirator MR-PRO
Analog Audio Generator



Digilyzer DL1
Digital Audio Analyzer



MiniLINK
PC Interface & Software