

# Distributed Multichannel System

## Nor850

Norsonic is introducing a new concept in multichannel measurements; the Nor850 Distributed Multichannel System. By connecting a number of individual measuring units through various communication channels, the user may create the optimal multichannel system for any task. Dedicated user-friendly application packages for various uses are available, and the system control is done with a PC running the latest state-of-the-art Windows7 platform.



## Expandable

The multichannel system Nor850 may be expanded as the needs grow. At the time of introduction, Norsonic is offering two front end choices for the configuration of the measuring channels in a multichannel system:

- Nor140 Sound Level Meter
- Nor850-MF1 mainframe containing 1-10 measuring channels

Start with two units of the standardized Nor140 SLM's and increase step-by-step by adding additional Nor140 units. Or, choose the multichannel Nor850-MF1 mainframe containing up to 10 measuring channels. The user may even set up a mix with a few Nor140 units plus a number of Nor850-MF1's in order to create the ideal multichannel system.

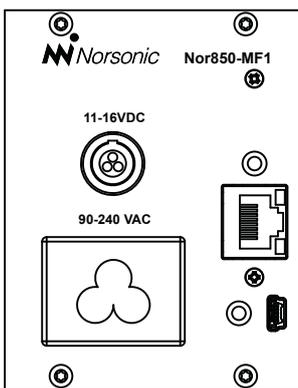
In the future, Norsonic will expand the number of front end choices by introducing a dual channel module in order to measure sound intensity as well.

So, if you today have one or more Nor140 units available as your instrument, you have already the start of your future multichannel system!

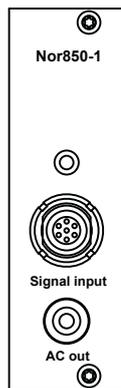


### Nor850-MF1 moduls

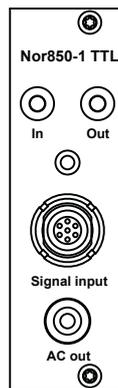
The Nor850-MF1 mainframe runs on 230Vac or 12Vdc. The controlling PC is connected with LAN or USB interfaces. It has room for 10 slots, but the functionality is the same independent of the number of slots in use. There is a choice of five different modules:



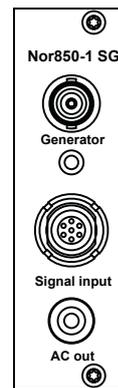
**Nor850 I/O**  
which holds one RS-232 serial interfaces and one RF control interface intended for control of Nor265 Rotating Microphone Booms and Nor277 Tapping Machines.



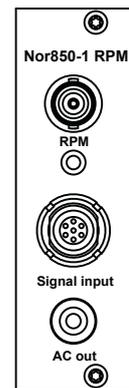
**Nor850-1**  
which is the standard single channel measuring module



**Nor850-1 TTL**  
which in addition to the standard measuring features holds one TTL input line and one TTL output line



**Nor850-1 SG**  
which in addition to the standard measuring features holds a signal generator with BNC output



**Nor850-1 RPM**  
which in addition to the standard measuring features holds the ability to log the RPM level

Each Nor850-MF1 mainframe can hold maximum two Nor850-Remote modules.



## Flexibility

The concept of individual units for each measuring channel offers a very high degree of operating flexibility. It allows the user to operate a multichannel system one day – and many individual measuring units another day! No need to store away an expensive multichannel system for months until the next big project turns up!

This flexibility is very well suited for building up a complete measurement system for larger laboratories with many measurement rooms. By placing one or more measurement channels in each measurement room, the full system may be controlled via LAN interfacing from pre-defined control rooms.

## Software

In addition to the standard Nor850 basic multichannel software package, Norsonic supplies dedicated user-friendly application packages for various use. The first of a long list of such application packages is the Building Acoustics package. The system control is done with a PC running the latest state-of-the-art Windows7 platform.

The application packages are all written in the new Microsoft Windows Presentation Foundation software environment which opens up a new world of user friendly features. Other application packages are planned for Sound Power, Vibration, Sound Intensity, Advanced Building Acoustics, Environmental Noise, and more .....



## Communication

By connecting a number of individual measuring units through various communication channels – including both standardized LAN and USB interfaces – the user may create the optimal multichannel system for any task. Wireless communication through BlueTooth or WLAN is also available.

As all connected front end channels communicate digitally with the controlling PC, any kind of errors introduced by long analogue cables are avoided. No need to worry about tear and wear on long microphone cables!

## Easy connectivity

Connecting measuring instruments to a PC may sometimes seem pretty troublesome. Hassling around with different baud rates, selecting the correct COM-ports, installing the latest driver, etc. take most of the joy out of a job – long time before the job has started. The Nor850 software offers a unique improvement to this problem. Simply connect the measuring units for all the channels – and the software handles the rest. Within a couple of seconds the measuring channels appear automatically on the PC screen ready to be used!





## Sensor database

In the heart of the Nor850 software there is a sensor database containing all possible information about each customer complete list of measurement transducers (microphones, accelerometers, etc.), measuring channels, serial numbers, producers, calibration values, verification laboratories, verification dates, correction data, etc. By first time use the operator must key-in these data to the system. Next time, however, as soon as any of the known transducers and measuring channels is connected, all data are automatically available within the Nor850 system.

Each time a normal daily calibration is performed, the date and value of this calibration is stored and presented together with the previous calibration values for this particular transducer/channel combination.

The operator may also key-in a unique name of the used combination which means that each measuring channel in the multichannel system may appear with pre-selected names instead of only type- and serial-numbers. Even the color of the displayed measuring results from each channel may be pre-selected in the sensor database.

## Homologation

Each individual unit may be homologated by an independent verification laboratory which means that even the entire multichannel system may be homologated! The software holds control of next verification dates for all connected measuring channels and gives warning in time for the possible upcoming verification.

## Simplicity in use

The basic Nor850 software is running on a standardized PC under the Windows7 operating system. As soon as the software is started, a list of the connected measuring channels is displayed along the left hand side of the screen. If these channels already are known within the sensor database, these channels are displayed with their preselected name and color.

The user clicks and drags each channel into any of the display windows; Level vs. Frequency, Level vs. Time, or their numerical table respectively. Each window may hold only one channel or a selection of several channels. And each channel may be dragged to several windows. Hence, the user may easily create the optimal screen for any measurement task. Or, load any pre-defined window configuration.



## Measurement setups

The settings for the next measurement is done in the Measurement Menu which expands on the screen by a click on the Measurement tab. Within this menu, the operator sets the miscellaneous measurement parameters and functions. These include overall measurement duration, profile measurement resolution, filtering bandwidth, upper and lower frequency limitations, weighting networks, time constants, statistical percentiles, and finally the required measurement functions.

## Transducer calibration

Prior to the measurement, each microphone or transducer should be calibrated. After selecting the actual measurement channel followed by a click on the Input tab, the Input Menu opens. Connect the calibrator to the transducer, select the correct calibration level and let the Nor850 system check out the sensitivity. Thanks to the content in the sensor databank, the result of the calibration process is compared with the nominal values and presented as an historic graph for easy comparison with earlier calibration results.

The Input Menu additionally holds the parameter setting for various parameters such as possible high-pass and low-pass filters, windscreen corrections and microphone linearity.

## Performing the measurement

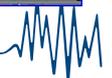
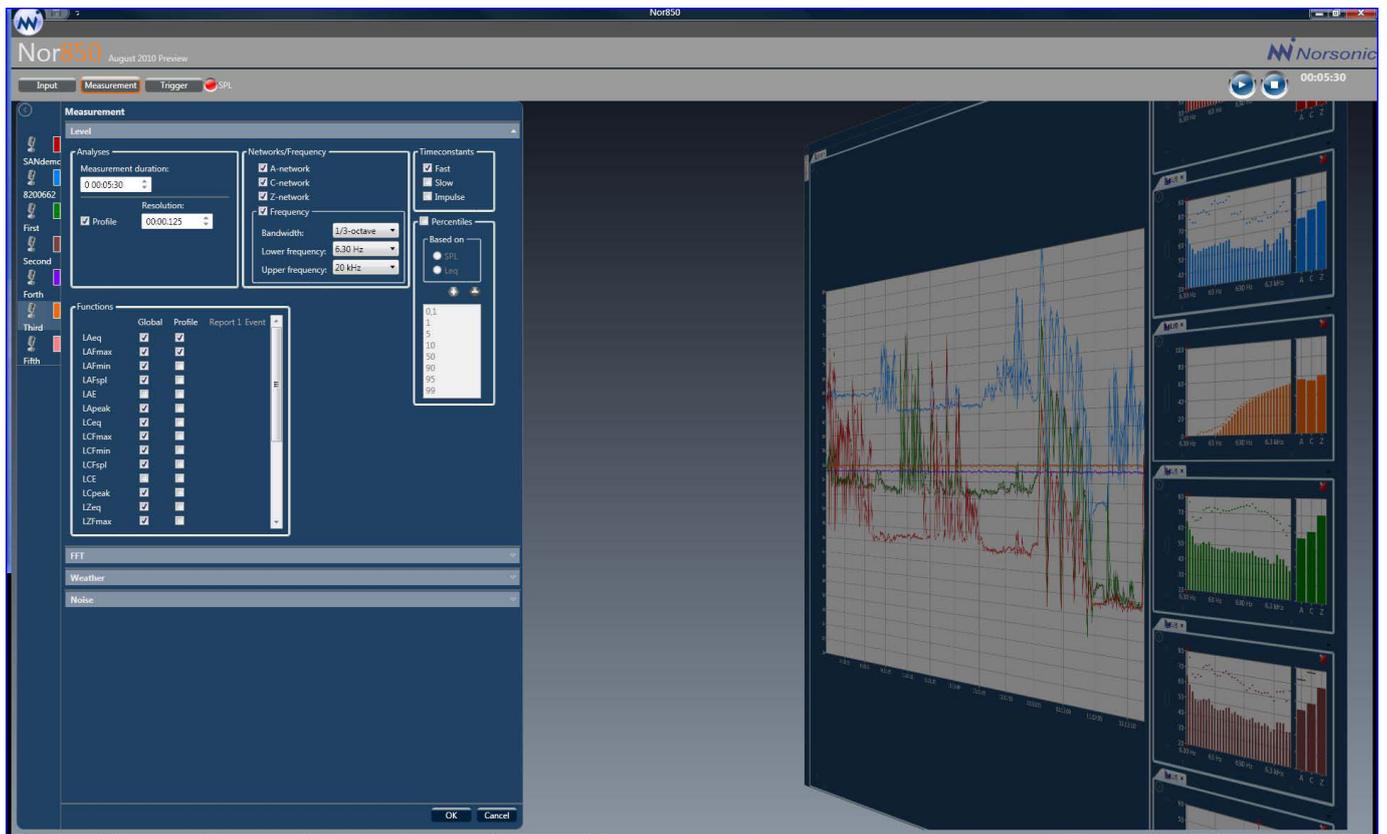
A click on the Start button initiates the actual measurement. The measurement data is presented in the pre-selected windows and formats as it progress.

Individual window properties may be altered at any time. Each window includes a numerical part on the left hand side which easily may be slided out if the space should be used for the graphical part only.

If any channel communication fails during a running measurement, the digital interface system will automatically ensure that measurement data are saved temporarily within the individual measurement frontend. Upon re-establishing the communication, the measurement data not transferred to the controlling PC are automatically transferred.

## Application modules

The Nor850 system offer various application modules developed for the most efficient operation within the selected application. The first available application module is designed for building acoustic field testing of airborne and impact sound insulation.



# Building Acoustic Mode

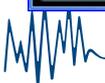
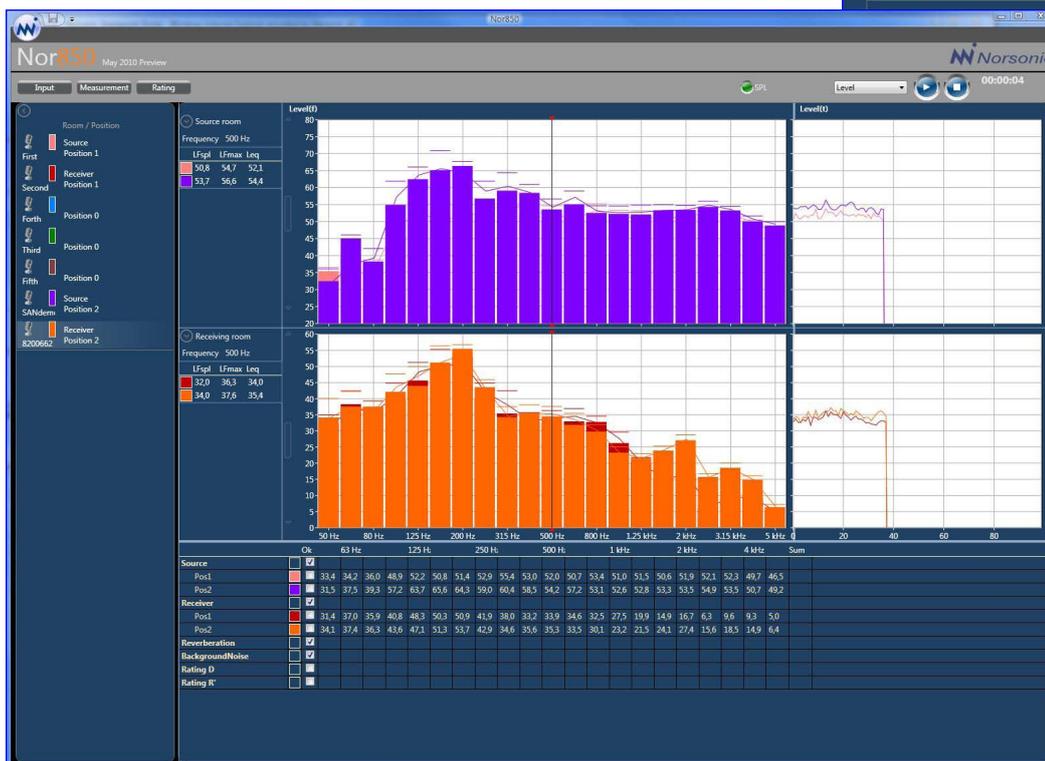
The application package for building acoustics is designed with two objectives in mind. Advanced laboratories with multiple test facilities require a system that offers great flexibility in the miscellaneous operational test tasks, including rapid setup of previous test procedures and the ability to use sophisticated measurement techniques. And yet the measurement system should be easy and efficient to use for the operators in order to produce test reports at the lowest possible number of man hours.

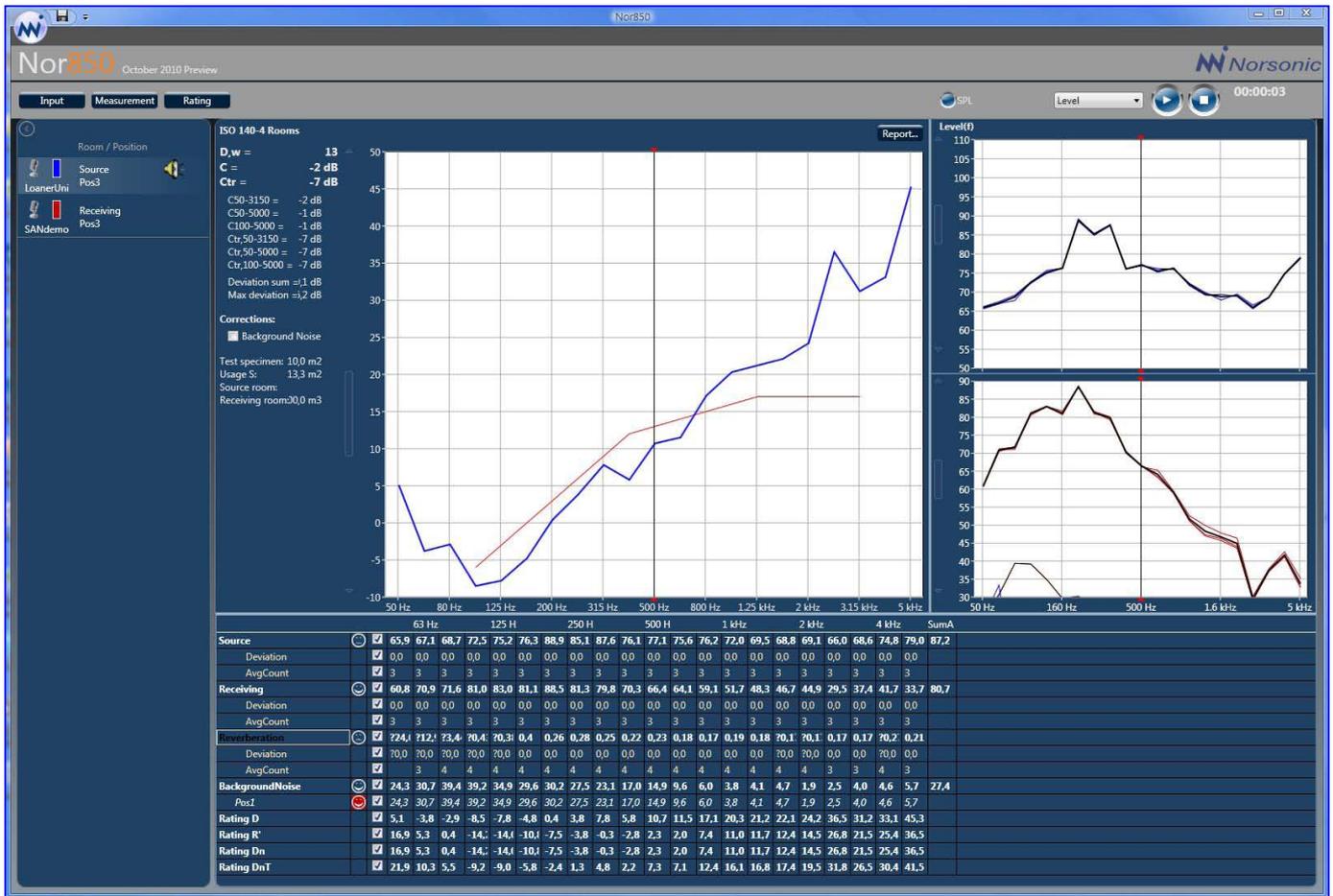
## Preset measurement Standards

The system is delivered with preset measurement setups for both national and international building acoustic Standards such as the ASTM E-336/E-1007 as well as the ISO-140/717 series. Simply select one of these and the entire system is ready to start the measurement procedure. All measurement parameters will automatically be set in the various menus accordingly.

## Application setup menus

The measurement setup menus in the Nor850 general measurement mode contain many parameters that are not in use for the building acoustic testing. And the rating calculations for the sound insulation require parameters that are not found in the general measurement menus. Hence, the Building Acoustic Mode offers dedicated setup menus that contain only the setup parameters of interest. All these get a default value from the selected measurement standard, but may easily be altered by the operator if required.





### Intelligent measurement control

The screen will show the operator all the vital data at any time during the sound insulation test. Simply start by dragging the available measurement channels into the Source- or Receive-window. Then the system knows which measurement channels that deliver source-room results and which channels that deliver receiving-room results. The operator may even alternate channels between the two measurement rooms during the test without any undesired mix of measurement results!

Before each individual measurement, the operator should select between Level, Background or Reverberation Time measurements. A mouse click on the Start key will then initiate the measurement at the selected microphone positions, and display the running frequency spectrum from all channels as well as the level versus time of a user-selected frequency band.

Upon measurement end, the display will show the measured results including a comparison with all previous results. Hence, the operator may quickly see if the last results are reasonable. If not, the last measurement may simply be rejected.

Every time a new measurement is accepted, the rating indexes are re-calculated and the screen automatically displays the rating view with all operator accepted measurement results.

New measurements may be added by a renewed click on the Start key followed by the same operation steps as already described.



## Detailed measurement report

The final measurement report as required in the measurement Standards (ISO-717 a.o.) is viewed as a separate window. Hence, details about the measurement object, conditions, project numbers, etc. may easily be edited by the operator. The report may be printed out on a color printer or send to the client as a .pdf document.

