General technical specification of APOLLO_box

The following data refer to the 4-channel versions Apollo_box_4L (LEMO7) and Apollo_box_4B (BNC).
Other versions on request possible.
The Apollo_box is able to operate with any Windows-based PC via USB 2 interface.

Recommended PC data:

Processor	Intel ™ dual core, 2 GHz, 2 GB RAM
Display	TFT 10.4" 1024 x 768
Storage medium	HDD 160 GB
Interface	USB 2
Operating system	Windows 7 or higher

Input channels 1-4

Resolution	24-bit
Real-time bandwidth	DC ... 80 kHz @ 4 channels
Dynamic range	115 dB
Random noise	< 3 µV(A), < 6 µV(Z) @ 0.1 Hz ... 20 kHz
Sample rates	204.8 kHz
Decimation	down to 200 Hz sample rate, selectable per channel
Anti-aliasing filter	yes
Max. input voltage	± 10 V peak
Amplification	0 dB, 20 dB
Overload detection	yes
Phase mismatch	< 0.1° @ 20 Hz ... 20 kHz
Offset adjust	yes, automatically with self-calibration
Input coupling	DC, AC 0.15 Hz, HP 10 Hz, LP 2 kHz
Microphone power supply	± 14 V, + 20 / 63 / 200 V switchable (with BNC versions on AUX only)
ICP power supply	2 mA switchable
Support of IEEE 1451.4	yes

AUX channels

Digital Input	2x TTL
Digital Output	2x TTL
Microphone power supply	± 14 V, + 20 / 63 / 200 V switchable

Slow channels 1-8

Resolution	24-bit
Sample rate	200 Hz
Input voltage range	-25 V ... +25 V

Output channels 1-2

Resolution	24-bit
Real-time bandwidth	DC ... 80 kHz
Max. output voltage	± 3.16 Vpeak

Service channels

Trigger	2x Trigger / Tacho, trigger level settable via software
Synchronization	Sample-synchronous synchronization on external clock (e.g. GPS)

Physical characteristics

Dimensions	200 mm x 100 mm x 35 mm
Weight	750 g
USB cable (standard)	customized USB cable 1 m
USB cable (option)	customized USB cable 5 m
Power supply	via USB 2

Environmental conditions

Protection rating	IP40
Humidity	30 % ... 90 %
Temperature range	-10 °C ... +50 °C
Storage conditions	-20 °C ... +60 °C, max. 95 % humidity

EMC

Emission	conforming with IEC 61000-6-3
Immission	conforming with IEC 61000-6-1

Trade marks and owners

Windows™	Micrsoft Corp.
Centrino™	Intel Corp.
Toughbook™	Panasonic Corp.
Soundbook™, Apollo™, SAMURAI™	SINUS Messtechnik GmbH
MATLAB™	The MathWorks, Inc.
ME'scope VES™	Vibrant Technologies

Apollo™

The new generation of our black-box acoustics analyzer with 24-bit AD-converters and USB 2 interface

- Sound level measurement
- Frequency analysis
- Signal recording
- Human vibration measurement
- Pass-by noise measurement
- Building acoustics
- Machine vibration measurement
- Modal analysis
- Order tracking analysis
- Operational vibration analysis

SINUS Messtechnik GmbH

Apollo_box

The new Apollo™ hardware platform from SINUS is now also available as a USB device !
Just plug-in & start your measurement
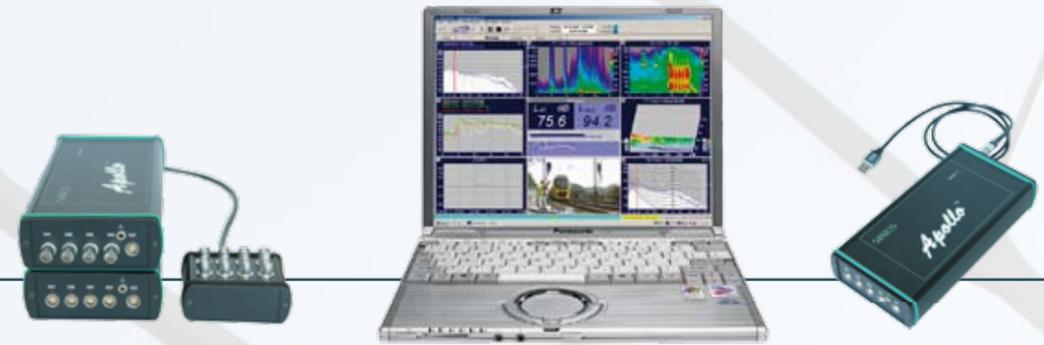
The new SINUS **Apollo_box** is our flexible and inexpensive 4-channel front-end device with USB 2.0 interface. The robust and small box can easily be used with any Windows Personal Computer and a wide range of application software.

It is a universal portable measuring system for acoustic, vibration and engineering measurements in general, representing the latest generation of mobile PC-controlled instruments on the basis of the new **Apollo™** hardware platform.

According to your requirements you may choose from variants having 4 main channels with LEMO7 or BNC input connectors. The additional 8 slow channels, 2 Tacho & Trigger channels, Synchronization port and AUX port make the Apollo_box suitable for many applications. You can use up to 4 boxes with one PC to increase the number of channels; the Apollo_box can also be used as a channel extension unit for the ruggedized Soundbook_MK2.

The Apollo_box is particularly suitable for:
• Industrial safety and environmental protection
• Engineering services
• Quality assurance
• Research and development.

Our **SAMURAI™ 2.0** software package includes sound level meters according to IEC 61672-1 and third-octave analyzers according to IEC 61260, with 2 or 4 channels. For multi-channel-systems with 4x Apollo_box we offer the extension to 16 channels. SAMURAI 2.0 provides an even better intuitive user interface and allows **multi-analysis both in real-time and as post-processing**. Saving and loading of created setups, optimized working modes, a convenient transducer database with sensor calibration, as well as data export and import (including time signals from other devices for post-processing) offer a comfortable user experience.

The **Easy Operator Mode** allows setups with restricted features to be created for less experienced users, in order to avoid operator errors in field measurements. The **REPLAY Mode** allows stored measurements to be replayed at various speeds.

The measured values are displayed independently from the data acquisition and storage in **up to 16 windowpanes**. The display settings may be adjusted before, during and after the measurement. A wide range of auxiliary channels allow for external triggering, the additional capture of 8 slow process signals, and an extension of the number of channels by means of further Apollo boxes working sample-synchronously.

The two output channels may be used either for signal generators or for the output of the input signals.

Alternative software solutions:
• **SMT** (SINUS Matlab Toolbox) for individual programming
• **µREMUS** for mechanical investigations
• **AFD 1000** for measurements with impedance tube
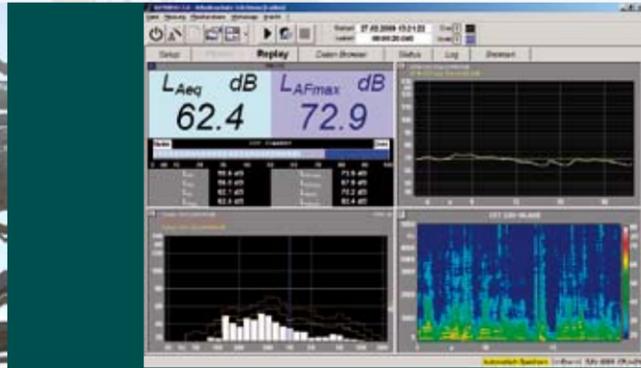
SAMURAI contains the following virtual measuring devices as basic features for each channel:

■ **Sound level meter**
Class 1 Sound Level Meter according to IEC 61672-1 allowing simultaneous measurements with the frequency weightings A, C, Z and the time weightings Fast, Slow, Impulse.
The Sound Level Meter also supports the processing of statistical values, automatic impulse detection, measurement of Takt-maximal levels, impulsive and low- frequency characteristics as well as intelligent markers and triggers.

■ **Frequency analyzer**
Real-time 1/3 octave analysis from 1/3 octave center frequencies of 0.04 Hz ... 20 kHz (class 1 according to IEC 61260) and FFT analysis of 100 ... 25600 lines, each feature including freely adjustable averaging modes and storage intervals. In addition the sum levels are displayed and stored.

■ **Sound signal storage**
Storage of the time signal from DC up to 20 kHz with freely adjustable decimation option (up to 200 Hz) to reduce data volumes.

■ **Reverberation time measurement**
Measurement of the reverberation time in 1/3 octaves. Excitation types: switched-off noise, impulse and sine-sweep. The 2 signal outputs are used for output of the generated signals.

Several sound level meters and frequency analyzers with different parameters can be applied for each channel.
All types of virtual instruments can operate with individual trgger and storage conditions.

Scope of Software options for SAMURAI 2.0 :

■ **Option: Post-Processing**
■ **Option: Automation**
■ **Option: Building acoustics**
■ **Option: Building vibration**
■ **Option: Fractional octaves**
■ **Option: Human Vibration Multi Analyzer**
■ **Option: Monitoring**
■ **Option: Multi-Generator**
■ **Option: NoiseCam**
■ **Option: Order tracking**
■ **Option: Remote client**
■ **Option: Room acoustics**
■ **Option: Sound intensity 1**
■ **Option: Sound intensity 2**
■ **Option: Sound power**
■ **Option: TCP/IP interface**
■ **Option: Transfer FRF**
■ **Option: Vibration meter**
■ **Option: Weather station**

Other SAMURAI software options on request

Apollo_box versions:

908202.1 Apollo_box_4B (BNC connectors)
908200.5 Apollo_box_4L (LEMO7 connectors)

Apollo_box accessories:

908190.4 Apollo_SLOW CHANNEL BOX
908185.7 Apollo_TACHO CABLE
908186.5 Apollo_TRIGGER SPLITTER BOX
908242.3 Apollo_SYNC CABLE 0.5 m
908243.1 Apollo_SYNC CABLE 5 m
908242.5 Apollo_USB CABLE 5 m
905053.7 Apollo_GPS SYNCHRONIZATION
971010.4 LEMO7 / BNC ADAPTER