### 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:** ≤ 2 μV (∆), ≤ 6 μV (∆∆) @ 0.1 Hz ... 20 kHz
- **Sample rate:** 204.8 kSPS
- **Decimation:** down to 200 Hz sample rate, selectable per channel
- **Max. Input voltage:** ± 10 V peak
- **Amplification:** 0 dB, 20 dB
- **Inter-polarization:** ≤ 0.1° @ 20 Hz ... 20 kHz
- **Offset adjust:** yes, automatically with self-calibration
- **Input coupling:** DC, AC 0.15 Hz, HP 10 kHz, UP 2 kHz
- **Microphone power supply:** ± 14 V, ± 20 / 63 / 200 V switchable (with BNC versions on AUX only)
- **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
- **Real-time bandwidth:** DC ... 80 kHz
- **Input voltage range:** ± 35 V

#### Output channels 1-2
- **Resolution:** 24-bit
- **Real-time bandwidth:** DC ... 80 kHz
- **Max. output voltage:** ± 3.16 V peak

#### Input channels 1-4
- **Signal recording:** Sound level measurement
- **Frequency analysis:** Frequency analysis
- **Signal recording:** Signal recording
- **Human vibration measurement:** Human vibration measurement
- **Pass-by noise measurement:** Pass-by noise measurement
- **Building acoustics:** Building acoustics
- **Machine vibration measurement:** Machine vibration measurement
- **Modal analysis:** Modal analysis
- **Order tracking analysis:** Order tracking analysis
- **Operational vibration analysis:** Operational vibration analysis
The new 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-analyse both in real-time and as post-processing.

Savings 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
- GUREMUS 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.

- **Sound level meter and frequency analyzers with different parameters can be applied for each channel.**

### 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)
- 904200.5 Apollo_box 4L (LEMO7 connectors)

### Apollo_box accessories:
- 908190.4 Apollo SLOW CHANNEL BOX
- 908185.2 Apollo TACHO CABLE
- 908166.5 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
- 908053.7 Apollo GPS SYNCHRONIZATION
- 971010.4 LEMO7 / BNC ADAPTER