ibaPDA-Interface-Audio
Record Windows audio signals

Manual
Issue 1.0

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1 About this Manual

This document describes the function and application of the software interface 
ibaPDA-Interface-Audio

This documentation is a supplement to the ibaPDA manual. Information about all the other characteristics and functions of ibaPDA can be found in the ibaPDA manual or in the online help.

1.1 Target group and previous knowledge

This manual is aimed at qualified professionals who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as professional if he/she is capable of assessing safety and recognizing possible consequences and risks on the basis of his/her specialist training, knowledge and experience and knowledge of the standard regulations.

1.2 Notations

In this manual, the following notations are used:

<table>
<thead>
<tr>
<th>Action</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu command</td>
<td>Menu Logic diagram</td>
</tr>
<tr>
<td>Calling the menu command</td>
<td>Step 1 – Step 2 – Step 3 – Step x</td>
</tr>
<tr>
<td></td>
<td>Example: Select the menu Logic diagram - Add - New function block.</td>
</tr>
<tr>
<td>Keys</td>
<td>&lt;Key name&gt;</td>
</tr>
<tr>
<td></td>
<td>Example: &lt;Alt&gt;; &lt;F1&gt;</td>
</tr>
<tr>
<td>Press the keys simultaneously</td>
<td>&lt;Key name&gt; + &lt;Key name&gt;</td>
</tr>
<tr>
<td></td>
<td>Example: &lt;Alt&gt; + &lt;Ctrl&gt;</td>
</tr>
<tr>
<td>Buttons</td>
<td>&lt;Key name&gt;</td>
</tr>
<tr>
<td></td>
<td>Example: &lt;OK&gt;; &lt;Cancel&gt;</td>
</tr>
<tr>
<td>File names, paths</td>
<td>&quot;Filename&quot;, &quot;Path&quot;</td>
</tr>
<tr>
<td></td>
<td>Example: &quot;Test.doc&quot;</td>
</tr>
</tbody>
</table>
1.3 Used symbols

If safety instructions or other notes are used in this manual, they mean:

---

**Danger!**

⚠️ The non-observance of this safety information may result in an imminent risk of death or severe injury:

- Observe the specified measures.

---

**Warning!**

⚠️ The non-observance of this safety information may result in a potential risk of death or severe injury!

- Observe the specified measures.

---

**Caution!**

⚠️ The non-observance of this safety information may result in a potential risk of injury or material damage!

- Observe the specified measures

---

**Note**

ℹ️ A note specifies special requirements or actions to be observed.

---

**Tip**

💡 Tip or example as a helpful note or insider tip to make the work a little bit easier.

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**Other documentation**

📖 Reference to additional documentation or further reading.
2 System requirements

The following system requirements are necessary for the use of the audio interface:

- *ibaPDA* v7.2.0 or higher
- License for *ibaPDA-Interface-Audio*
- Windows audio source in the *ibaPDA* server computer (sound card, USB device, etc.)

License information

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Product name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.001101</td>
<td><em>ibaPDA</em>-Interface-Audio</td>
<td>Extension license for an <em>ibaPDA</em> system for data acquisition and recording of audio signals from the Windows system; max. 1 audio module with one audio input (mono/stereo)</td>
</tr>
</tbody>
</table>
3 Audio interface

3.1 General information

The audio interface in ibaPDA is used to acquire audio data from Windows audio sources. For this purpose, a suitable component must be installed in the ibaPDA server computer, e.g. a sound card or a USB device that can work as an audio source.

This allows microphone signals, for example from a headset, to be acquired and recorded. Other audio sources coming from a “line-in” input can also be acquired. Finally any source can be used that can be configured under Windows as an audio source.

Possible applications are, for example, the signal-synchronous acquisition and recording...

- of the voice traffic via industrial intercom systems
- from radio communication in the plant
- from loudspeaker announcements
- from announcements from automated audio information systems (e.g. text-to-speech)
- of acoustic recordings on a machine for search for faults

ibaPDA can process a maximum of one (1) audio input (mono or stereo).

The audio interface is not designed for high-quality records (HiFi).

3.2 Settings under Windows

Note

Please note that the driver for the device you are using may need to be manually installed first.

An audio device is operated in “shared mode,” which means several applications can use the same device simultaneously. This also means that the audio system settings cannot be changed with respect to the recording. Proceed as follows to be able to change these settings (example: Microphone under Windows 10):

1. Click the right mouse button on the “Sound” icon in the taskbar (Windows tray).
2. Open Sound settings.
3. Under “Input,” select the device or microphone that should be recorded by ibaPDA.
4. Click below on Device properties.
5. In the dialog for device properties, click on Additional device properties under ”Related settings.”
6. Select the tab Advanced in the dialog “Properties of...” Depending on the installed sound card, you can choose between different sample rates and bit depths here. This may not be possible with different devices. Later in the configuration of the audio module in ibaPDA, the
system sample rate can be adapted to the desired acquisition rate (resampling).

7. The options for the exclusive mode should be enabled.
8. Exit the dialog by clicking <OK> and also close the Windows sound settings.
9. Then check whether the audio input signal under Windows is detected and, if necessary, adjust the input level.

In the next step, configure the audio interface in *ibaPDA*. 

![Fig. 1: Windows system settings - Sound - Properties of the audio source](image)
3.3 Configuration and engineering ibaPDA

Open the I/O manager, e.g., from the toolbar.

If all system requirements are met (see above), the "Audio" interface will be displayed in the signal tree.

![Audio Interface in the I/O Manager](image1)

Fig. 2: Audio interface in the I/O Manager

3.3.1 Interface settings

There are no settings at the interface level. The view shows the most important information about the connected audio source when the acquisition is running.

![Audio Interface with Active Connection](image2)

Fig. 3: Audio interface in the I/O Manager with an active connection

In the *Samples read* column, a counter value runs from the start of acquisition. You can zero the value by pressing the *<Reset statistics>* button.
3.3.2 Add Module

*ibaPDA* supports the use of a maximum of one audio module at the audio interface.

Click on *Click to add module*...

![Add module dialog](image)

Fig. 4: Add module dialog

Select the module type *Audio* and close the dialog with *<OK>*.

3.3.3 General module settings

The audio module has the following setting options.

![General settings of the audio module](image)

Fig. 5: General settings of the audio module
**Basic settings**

**Module Type (information only)**
Indicates the type of the current module.

**Locked**
A module can be locked to avoid unintentional or unauthorized changing of the module settings.

**Enabled**
Disabled modules are excluded from signal acquisition.

**Name**
The plain text name should be entered here as the module designation.

**Module No.**
Internal reference number of the module. This number determines the order of the modules in the signal tree of ibaPDA client and ibaAnalyzer.

**Time base**
All signals of the module will be sampled on this time base.

**Use name as prefix**
Puts the module name in front of the signal names.

---

**Note**

The timebase of the module is preset to 0.1 ms (10 kHz). You can adjust the timebase, which directly influences the recording rate. A resampling of the original signal is therefore automatically implemented.

---

**Audio**

**Recording rate**
This value is only displayed here. It is directly influenced by the setting of the timebase of the module (reciprocal value). The audio signal is recorded by ibaPDA at this rate.
3.3.4 Connection settings

In the Connection tab, you will find the settings for the audio source.

![Image of Connection settings window]

**Audio device**

If several audio sources are configured on the computer, select the desired device here, which should be recorded by ibaPDA.

If the desired device is not contained in the drop-down list, click on <Update device list>. If the device still does not appear, check the configuration in the Windows system settings for audio devices.

**Number of channels**

Select here whether you want to record mono (1 channel) or stereo (2 channels).

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enforce mono (1 channel)</td>
<td>If the audio source provides a stereo signal, both channels are arithmetically averaged and recorded as one channel by ibaPDA. This setting may be useful if you have a stereo source, but the difference between the right and left is irrelevant for the analysis.</td>
</tr>
<tr>
<td>Enforce stereo (2 channels)</td>
<td>If the audio source provides a mono signal, this is duplicated and two channels are recorded by ibaPDA, which however contain an identical signal. This setting is more of an emergency solution if, for example, a faulty stereo microphone has been replaced by a mono-microphone. Analyses with ibaAnalyzer, which are based on two channels, can therefore still be executed.</td>
</tr>
<tr>
<td>Use installed x channels</td>
<td>$x =$ number of original channels of the audio source (1 or 2) This setting uses the original channels of the audio source.</td>
</tr>
</tbody>
</table>
**Signal configuration**

The module only offers one (mono) or two (stereo) analog signals according to the setting for the number of channels.

![Audio Configuration Interface](image)

**Fig. 7: Analog input signals of the audio module**

You can change the name here, enter a unit and change the gain and offset. The signal values are supplied by Windows as floating point values in the range from -1.0 to 1.0.
3.4 Display in ibaPDA

After accepting the I/O configuration, the audio channels are available in the signal tree. The signals can be visualized, for example, as a trend graph or in an FFT view.

Fig. 8: Visualization of the audio signals in the ibaPDA client
3.5 Display in ibaAnalyzer

If you open a data file containing audio signals, you can drag these into a trend view from the signal tree as usual and display them as a trend graph.

If you have enabled the audio player in the View menu, then a small speaker symbol will be displayed on the signal legend.

Click on the speaker symbol to play the recorded signal through the speaker or the computer’s sound interface.

![Fig. 9: Using the audio player in ibaAnalyzer](image-url)
4 Diagnostics

4.1 License

If the "Audio" interface is not displayed in the signal tree, you can either check in ibaPDA under General - Settings - License info in the I/O manager or in the ibaPDA service status application to see whether your license "Interface Audio" has been properly recognized.

![License display in the ibaPDA I/O manager](image)

4.2 Diagnostic module

You can add a diagnostic module for diagnostic and monitoring purposes, which you then allocate the audio module to as a target module.

![Diagnostic module for the audio module](image)

With the diagnostic module, you receive statistical data about the audio connection in the Analog tab.
The Digital tab contains a “Connected” signal.

You can monitor the audio interface with these signals. If the audio device is disconnected during the ongoing acquisition, then the digital signal “Connected” changes to False. If the same audio device is reconnected within the same session (acquisition not stopped in the meantime), then the recording continues from there.
5 Support and contact

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Note
If you require support, indicate the serial number (iba-S/N) of the product or the license number.

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