

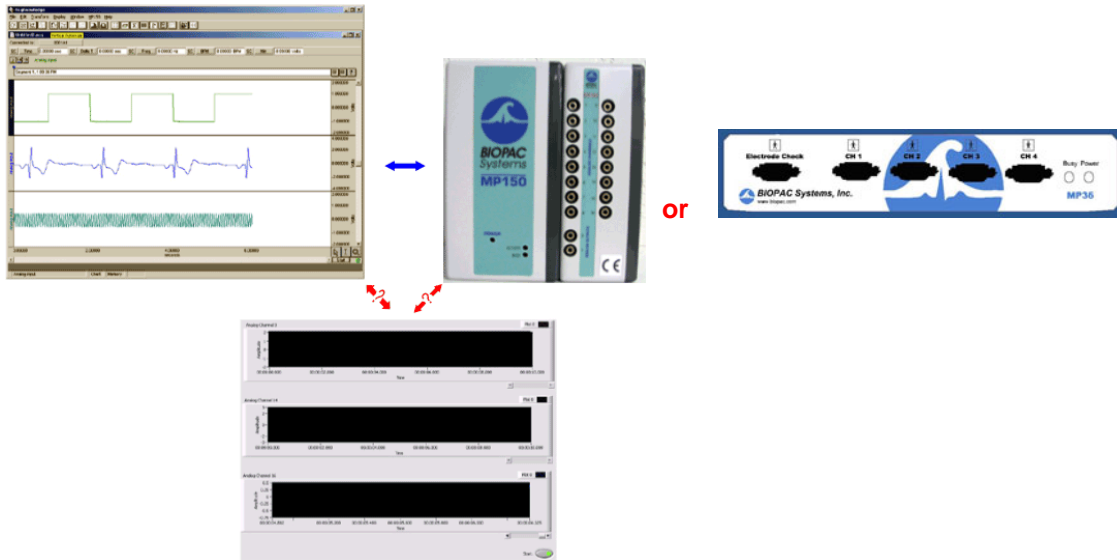
Application Note 218: BHAPI BIOPAC Hardware API

This Application Note provides an overview of the [BIOPAC Hardware API](#). If you have specific questions or interface needs not addressed, please [contact BIOPAC](#).

What is the API?

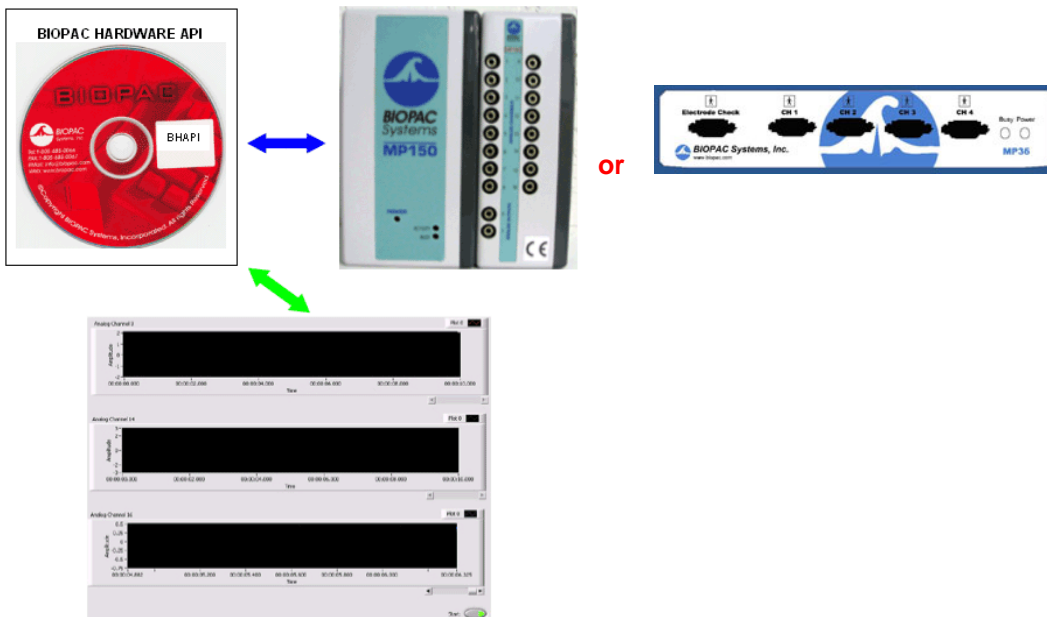
The BIOPAC Hardware API is a tool to permit third-party software programs to communicate with an MP160 or MP150 unit (Ethernet/UDP protocol), an MP36, or an MP35 for basic data acquisition.

Before the BIOPAC Hardware API, third-party software programs had no way of communicating with an MP Device, either directly or via BIOPAC software:



Before BHAPI Hardware API

With the BIOPAC Hardware API, third-party software programs can communicate with an MP Device through a DLL using several API functions:



With BHAPI Hardware API

Glossary

- **API Application Programming Interface or Abstract Programming Interface:** A set of routines, protocols, and tools for building software application; it hides the details and complexities of how things are done. A good API makes it easier to develop a program by providing all the building blocks. A programmer puts the blocks together. (Webopedia)
- **DLL:** Dynamic Link Library is a type of library commonly used in Windows environment; it uses the file extension ".DLL"
- **Header File:** Traditionally, serves as a manifest for what is in a source file(s) of programs written in C/C++ language; it uses the file extension ".h" Serves as a contract for programmers and does not contain all the details of the implementation.
- **Library:** A group of precompiled routines, methods, functions and objects that a program can use. It allows software developer to reuse code without revealing the implementation and source code.

What is included?

Programmers receive the files necessary to use the API as easily as possible:

- mpdev.dll
- mpdev.lib
- mpdev.h
- Documentation – [preview reference manual](#)
- Sample Browser
- Hardware Utilities
- Sample Programs*
 - [download C/C++ sample projects](#)
 - [download LabVIEW sample projects](#)

*Sample programs

C/C++	mp1XXdemo: Demonstrates basic usage of BHAPI's methods.
C#	Biofeedback: A simple biofeedback application that uses BHAPI. GoalKick: A simple game that uses BHAPI and a transducer as a human interface. MPCommader: A command line interface to the MP35, MP36 and the MP160/150 using BHAPI. TemperatureControl: A temperature control system using BHAPI, BIOPAC transducer and common electronic parts. VideoStimulus with MP35: A video stimulation application using BHAPI to acquire data from MP35 device. VideoStimulus with MP36: A video stimulation application using BHAPI to acquire data from MP36 device.
LabVIEW	getBufferDemo with MP35: Demonstrates how to use BHAPI's getMPBuffer() function to acquire data from MP35. getBufferDemo with MP36: Demonstrates how to use BHAPI's getMPBuffer() function to acquire data from MP36. listAllIMP150Demo: A VI that list all MP160/150s in the network startAcqDaemonDemo with MP35 device: Demonstrates how to use BHAPI's startAcqDaemonDemo() and receiveMPData() functions to acquire data from MP35. startAcqDaemonDemo with MP36 device: Demonstrates how to use BHAPI's startAcqDaemonDemo() and receiveMPData() functions to acquire data from MP36. temperatureDemo: A VI that monitors temp. and outputs voltage to a specified Analog Output given a threshold.
MATLAB	mpdevdemo: Demonstrates basic usage of the BHAPI's methods.
VB .NET	bhapibasics: Demonstrates the basic usage patterns of the BHAPI. FunctionGenerator: A program that transforms an MP device to an arbitrary waveform generator using BHAPI. ImageStim with MP35: An image stimulation program that acquires data from MP35 device using the BHAPI. ImageStim with MP36: An image stimulation program that acquires data from MP36 device using the BHAPI.

User requirements

You must have programming knowledge to use the BIOPAC Hardware API. The BHAPI is a development tool and it will require programming on the part of the customer.

System Requirements

- OS: Windows 10, 8.1, 7
- NET Framework (for the sample browser)
- MP160/150: Ethernet/UDP protocol supported. For DLC, firmware upgrades may be required; USB not supported; generates communication errors.
- To update firmware, set scaling, etc.: contact BIOPAC

Installation

The BHAPI installer is called BHAPISetup.exe. The Installer will not install if the target machine does not have the .NET Framework. Additional files.

Sample Browser

The Sample Browser makes the API Reference Manual and Documentation accessible in one program. Requires the .NET Framework to run.

Tech Support Guidelines**Code Support**

The API can be used by a wide array of third-party programs for custom applications, which makes targeted technical notes impractical. Users can generally detect a problem with the API in a C/C++ or C# program that is less than 50 lines. If there is a problem with the API, it can usually be recreated with a program that is less than 25 lines of code.

To submit code for technical review, you must contact BIOPAC for authorization and then submit:

- A sample program (from the original API) modified to replicate the problem, or
- A stand-alone program of 50 lines or less written in C/C++ or C#

These guidelines will help BIOPAC resolve technical issues related to the BHAPI. Users are responsible for debugging large programs or problems with any third-party software used with the API.

OS Support

The BHAPI has been tested for Windows 10, 8.x and 7. (Contact BIOPAC if using an earlier release).

Protocol Support

BIOPAC only supports MP160/150 Ethernet/UDP and MP36/35 USB. MP160/150 USB is known to cause acquisition errors.

[Contact BIOPAC](#) with feature suggestions or other API comments.