

BIOPAC MP160 QuickStart

- BIOPAC Device
 - Desktop connection
 - The BIOPAC is connected to either a laptop or desktop through an ethernet cable
 - Laptops without an ethernet port can use an ethernet adapter, available on site at the SensorLab
 - Transducers, Modules, and Wireless Transmitters
 - If you take a look at your BIOPAC, you may see these boxes connected to the primary system. These are modules. They allow you to make a connection to the transducers, and retrieve data from them:



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- Each module connects to its own individual set of different sensors, for example the “RSPEC-R” module can be used to collect data from RSP and ECG sensors, while the “PPGED-R” module can gather PPG and EDA data from sensors
- The modules are plug-and-play. They are sandwiched in between the two primary components of the BIOPAC device:



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■ BioNomadix Wireless Transmitters



- BioNomadix Transmitters noninvasively record full-bandwidth physiology data and are typically dual-channel devices that record two of the same biopotential or transducer signal or a combination of signals
- They can be hardwired to a matching transducer

■ Transducers:

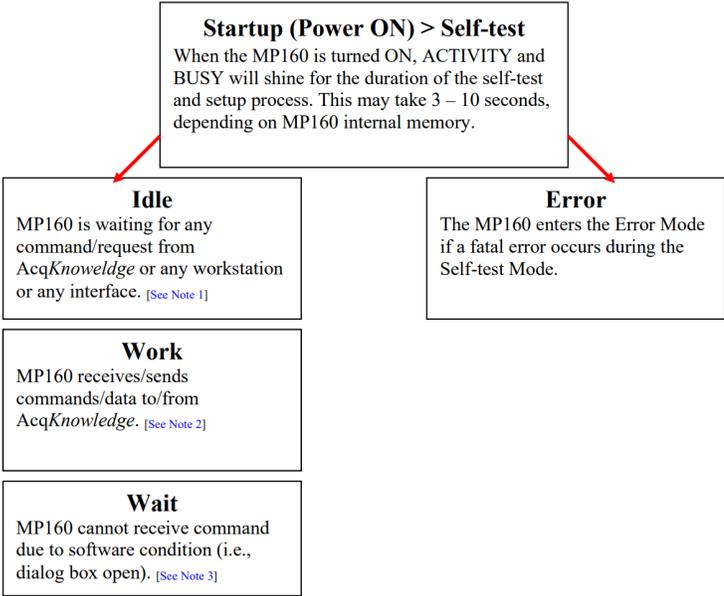


- The devices that connect to the wireless transmitters, and collect data to transmit back to the primary BIOPAC system
- They connect to the wireless transmitters using a hardwired connection. You have to choose the correct wireless transmitter for the transducer you are trying to use

○ BIOPAC Status Lights

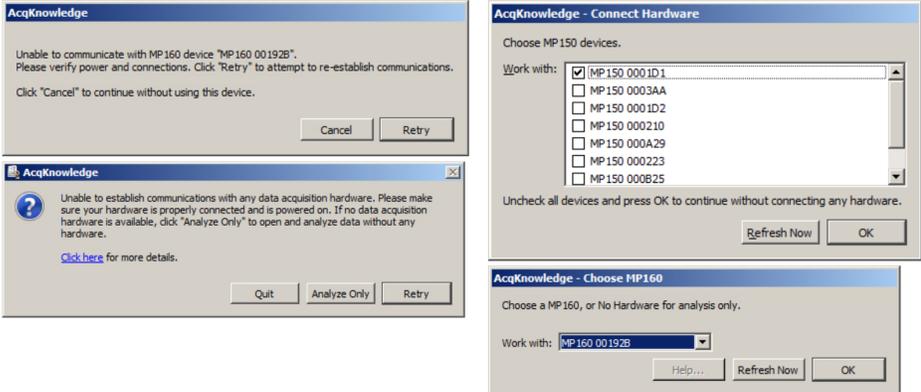
ACTIVITY BUSY	MODE	LIGHT STATUS DESCRIPTION
A Bright B Bright	Self-Test	ACTIVITY and BUSY be bright for the duration of the self-test and setup process. This may take 3 – 10 seconds, depending on MP160 internal memory.
	Work	During data acquisition, ACTIVITY reflects command/data traffic (for acquisition speeds of 1000 Hz or more, ACTIVITY will be permanently bright or blink at a high frequency) and BUSY will be bright. It is normal for both lights to be on—this does not indicate a problem unless an Error Message is generated on the computer screen.
	Error	ERROR: In rare cases, a serious problem may prevent a self-test and the lights may be erratic: both on, both off, or any other static combination.
A Bright B Blink	Error	The MP160 enters the Error Mode if a fatal error occurs during the Self-test Mode. In the Error Mode, ACTIVITY is bright and BUSY is blinking at a frequency of 5 Hz.
A Blink B Bright	Error	If the self-test fails or setup fails, the Error mode is initiated and ACTIVITY will blink at about 5 Hz rate and BUSY will remain bright.
A Blink B off	Idle-1	ACTIVITY <u>blinks twice</u> with approximately 1.5-2 second interval and BUSY is OFF. Double blink means: <ul style="list-style-type: none"> - MP160 may be disconnected from LAN or, - MP160 is connected to LAN but did not receive IP address from network's DHCP server and default 169.254.xxx.xxx address is self-assigned to MP160. This is the standard state for MP160 connected to NIC through Ethernet network cable. It means the MP160 is in working condition and ready for acquisition. <i>AcqKnowledge</i> may communicate with the MP160 through a serial cable or through a network by using 169.254.xxx.xxx address and/or Ethernet cable.
	Idle-2	ACTIVITY <u>blinks once</u> with approximately 1.5-2 second interval and BUSY is OFF. Single blink means: <ul style="list-style-type: none"> - MP160 is connected to LAN and received IP address from network's DHCP server. It means the MP160 is in working condition and ready for acquisition.
A off B off	Self-Test	ACTIVITY and BUSY will go dark for less than 1 second at the end of the self-test before proceeding to the Idle mode.
	Wait	Under some conditions, such as when a dialog box is open, <i>AcqKnowledge</i> cannot send commands to the MP160. When command flow from the workstation stops, the MP160 acts as if there is an open dialog and enters the Wait Mode to wait for a command from the workstation it is "locked" to—commands from any other workstation will be ignored. When it receives a command, the MP160 return to the Work mode. After five minutes with no command communication, the MP160 will revert to the Idle mode.
	Error	ERROR: In rare cases, a serious problem may prevent a self-test and the lights may be erratic: both on, both off, or a static combination.

MP160 STATUS LIGHT PATHS



- NOTES**
1. **IDLE**—Both light patterns are normal and indicate that the MP160 is waiting for a command—neither indicates a problem with the MP160. The MP160 can switch between Idle-1 and Idle-2. Idle-1 or Idle-2 pattern indicates which IP address the MP160 is using:
 - Idle-1: self-assigned address in 169.254.xxx.xxx network
 - Idle-2: address from DHCP server).
 2. **WORK** — When the MP160 receives any command from any workstation, it locks on to that workstation and communicates with it exclusively. The MP160 “remembers” the active workstation and will ignore commands from any other workstation. The MP160 usually remains in the Working Mode until the *AcqKnowledge* software program is closed.
 3. **WAIT** — Under some conditions, such as when a dialog box is open, *AcqKnowledge* cannot send commands to the MP160. When command flow from the workstation stops, the MP160 acts as if there is an open dialog and enters the Wait Mode to wait for a command from the workstation it is “locked” to—commands from any other work station will be ignored. When it receives a command, the MP160 enters the Work mode; if the MP160 does not receive a command within five minutes, it reverts to Idle.

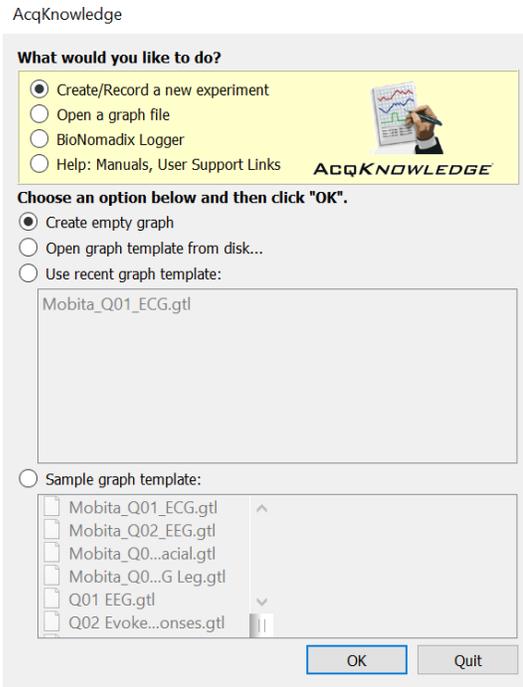
- AcqKnowledge
 - Hardware connection issues
 - Upon opening Acq5, if the MP160 is not correctly connected to the desktop (either via Ethernet or LAN), you may receive one of the following prompts



- If so, please ensure the BIOPAC is correctly connected to the computer, is on and is ready to receive requests.

- Startup Wizard

- Once the hardware is set up, opening Acq5 greets you with the Startup Wizard. This wizard is used to choose whether to create a new experiment, open a graph for analysis or to access to help/support manuals, as shown below:



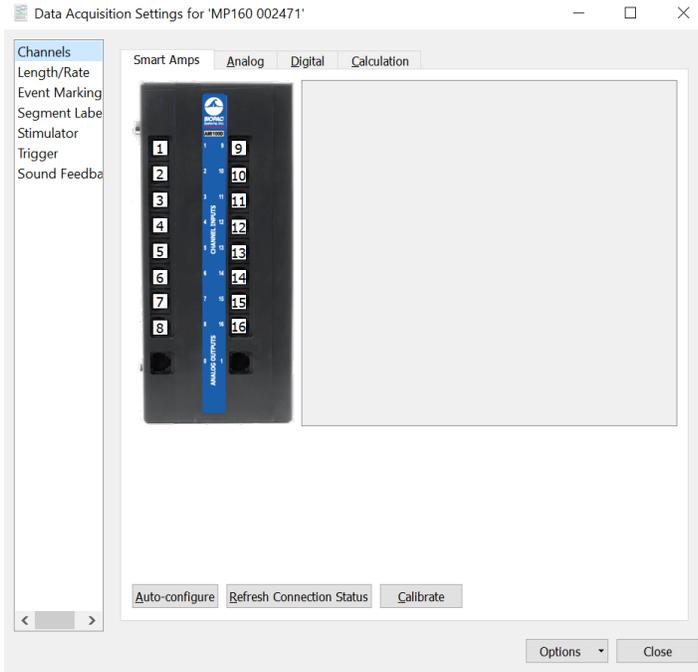
- If you want to Create/Record a new experiment, these are the different options

Standard Startup Wizard under 'Create and/or Record a new experiment'	Functionality
Create empty graph	Opens new graph window for acquiring data with hardware. Combo box to the right selects hardware, if more than one type is available.
Open graph template from disk	Brings up 'Open' window for browsing to location of saved graph templates.
Use recent graph template	Activates list of recently-opened graph templates for easy selection.
Sample graph template	Activates list of sample graph templates stored in AcqKnowledge program folder for easy selection.

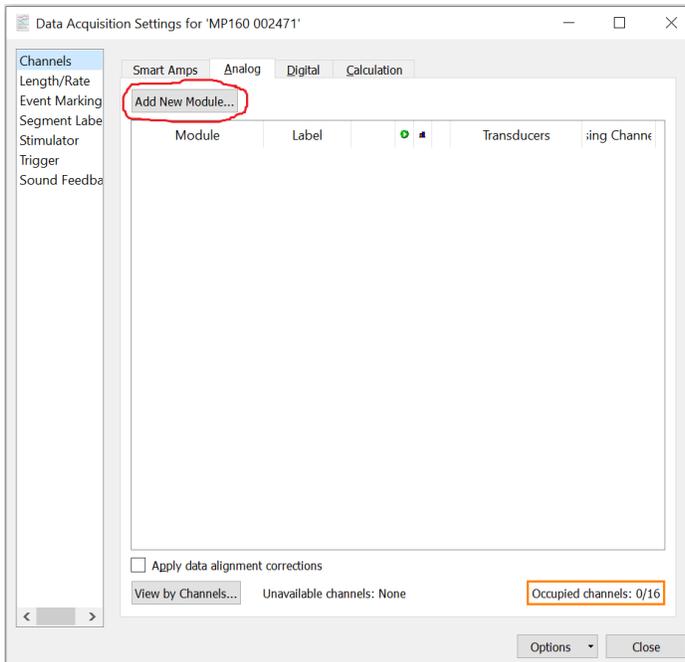
- You can also **Open a graph file**, which contains options similar to creating an empty graph. Except, you can import a graph directly from the disk, or from DropBox.
- You can also utilize the **BioNomadix Logger** which presents options for importing logger data from either the logger device or from the disk. This option is not

applicable unless the wireless BioNomadix Data Logger is being used. [Further information.](#)

- Transducer and Module Setup
 - By default, Acq5 prompts the Data Acquisition Setup dialogue when a new graph window is launched via “Create/Record new experiment”. This involves a step-by-step configuration by choosing options out of a list.

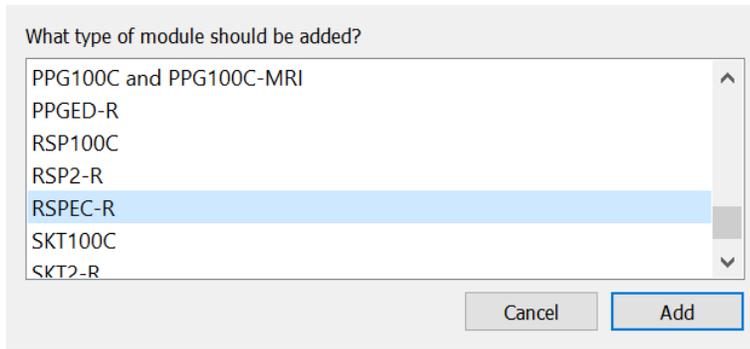


- If you notice at the top, we are in the Smart Amps tab. To add new modules to the BIOPAC, we need to utilize the Analog tab. Clicking Add Module on that tab will prompt a list of all the addable modules

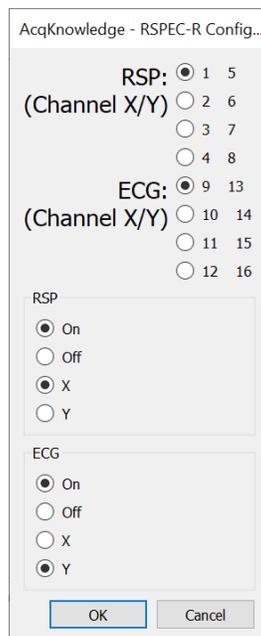


- Once you have been prompted with a list of modules to add

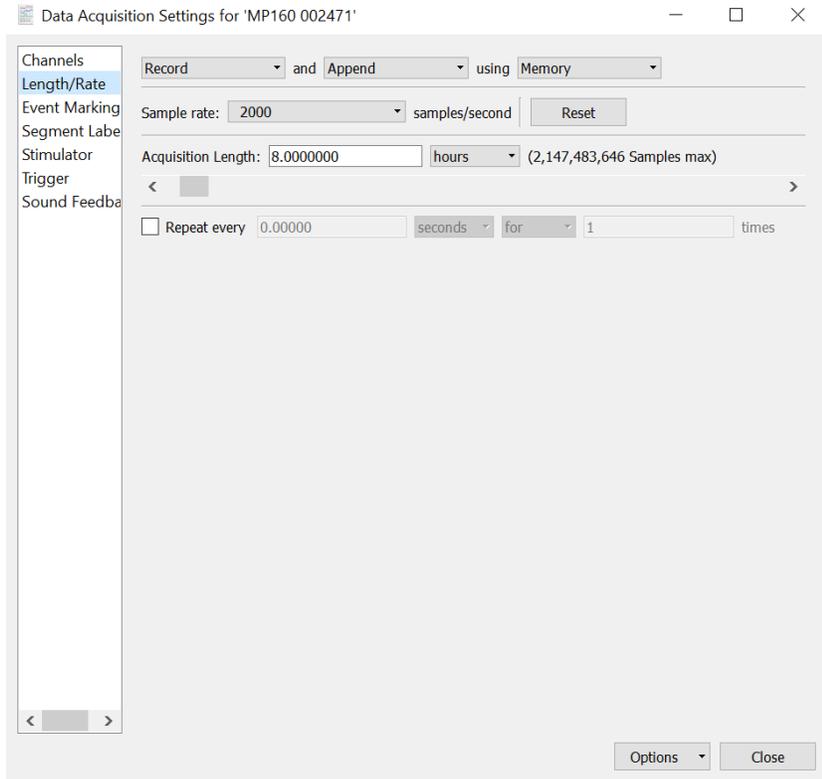
AcqKnowledge



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- Choose the module you have screwed into the BIOPAC and would like to connect to. As I am using the “BN-RESP-XDCR” transducer, which connects to the “RSPEC-R” module, I will select that option. This will then prompt you to input the connection settings for that specific module.



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- These settings need to be matched exactly by the physical settings on the BIOPAC module device to ensure the transducers can connect to the module

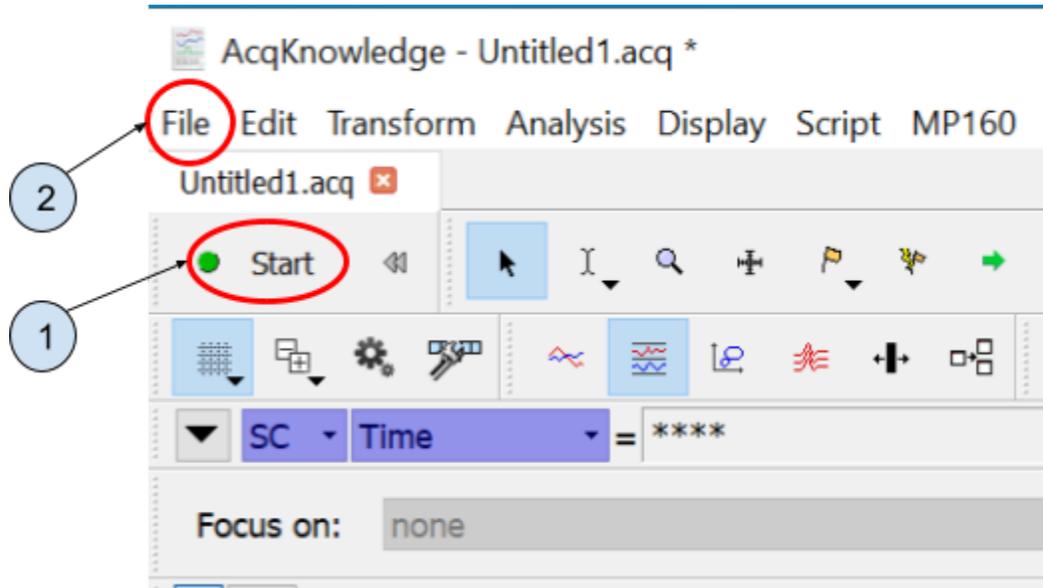


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- **Storage**
 - Record and Append using Memory is the default acquisition option. Under this option, the MP System automatically records data into a single continuous graph, and stores the data in computer memory during the acquisition
 - The third popup menu at the top of the dialog (which defaults to Memory) specifies where data should be stored during the acquisition. Data can also be stored to disk or to the MP160/150 hardware. Up to 4 mb of data can be stored directly to the MP160/150.
- **Rate**
 - Acquisition Sample Rate refers to how many samples the MP System acquires each second. The higher the sample rate, the more accurate the signal processing. However, as the sampling rate increases, so does the demand for system resources (memory, disk space, etc.)
- **Duration**
 - The final acquisition parameter is Acquisition Length (Total Length), which controls how long an acquisition will last. This can be scaled in seconds, minutes, hours, milliseconds or number of samples. Set this value either by entering a number in the acquisition length box, or by moving the scroll box left or right.

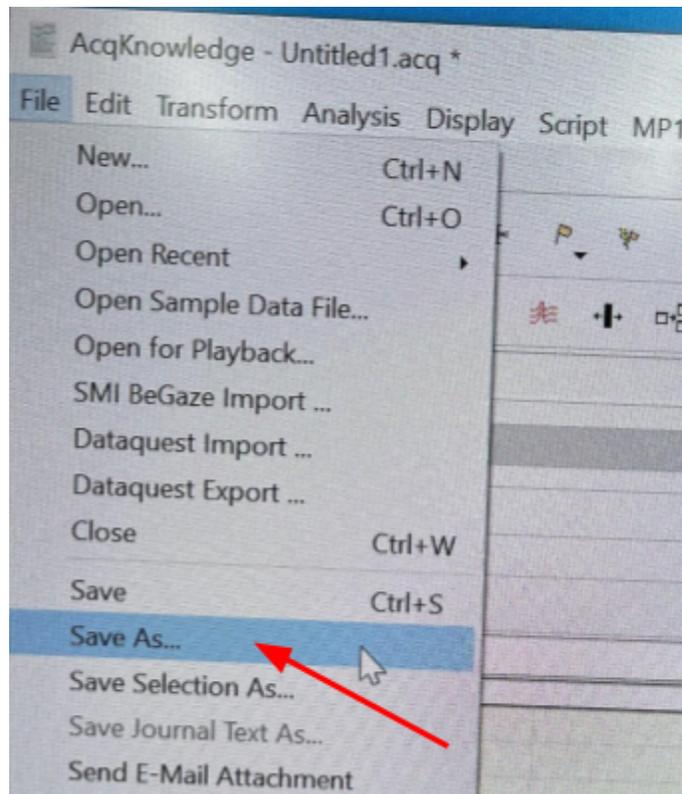
■ Data Save & Exoloring

To save and export the data you have collected in different types of file format, follow the following.

1. Firstly, stop recording data, then click on the **'File'** option on the top left.



2. Under **'File'** choose **'Save As...'** which is the eleventh option



3. Lastly, name your file and pick the file format of your choice.

NOTE: By default all files are in 'Graph .acq' format.

