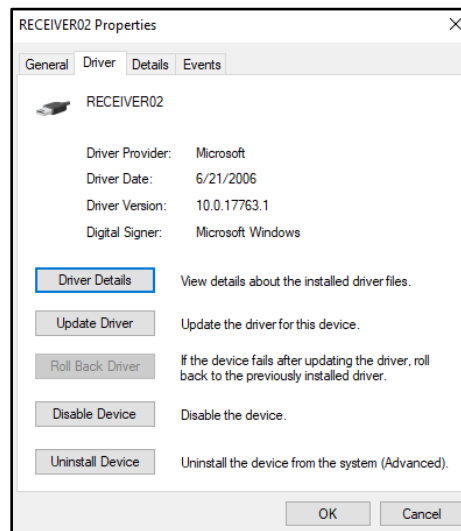


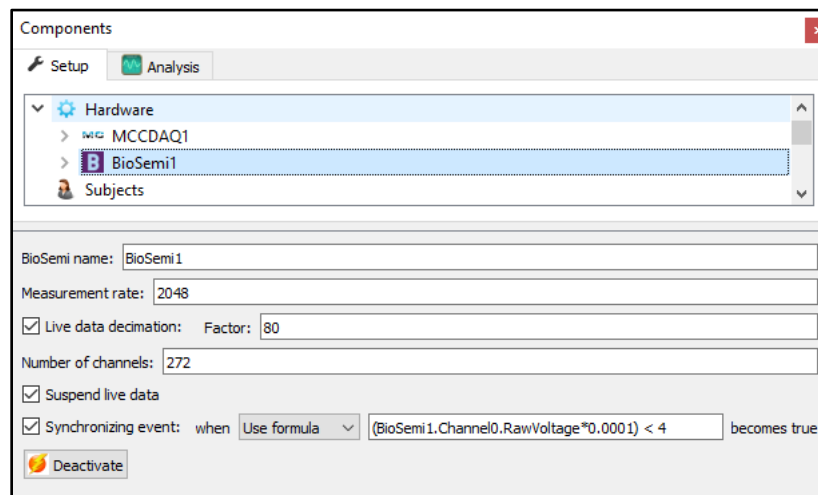
The MotionMonitor xGen Hardware Guide: USB-based BioSemi EEG Device Configuration

The following document outlines the steps required to configure and collect from a BioSemi EEG unit that is connected to The MotionMonitor xGen computer via a USB connection. The USB device must first be installed on the computer before it is configured within The MotionMonitor xGen. Before beginning, ensure that the BioSemi drivers are saved on the computer.

1. Power on the EEG unit and connect it to the computer. The device should automatically be recognized. If it is not, right-click on the unrecognized device in the device manager and select Properties. Go to the Driver tab and select Update Driver. Then, select “Browse my computer for driver software” and browse to the BioSemi drivers. If the device is still not recognized after this process, contact a Client Support Engineer for assistance.

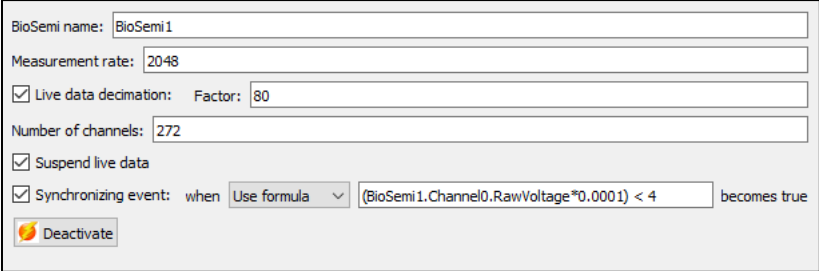


2. Start The MotionMonitor xGen and add the Biosemi device under the hardware node by right clicking or using the “Add” button at the bottom of the components menu when hardware is selected. Ensure the measurement rate and number of channels matches the hardware configuration. A Live data decimation factor of 80 should be enabled to reduce live data streaming demands. The Suspend Live data checkbox can further reduce computer processing demands by preventing data from this device from being used in the Live Window. For configuring the synchronizing event please see the section below.



Synchronizing the EEG Device with Analog Data

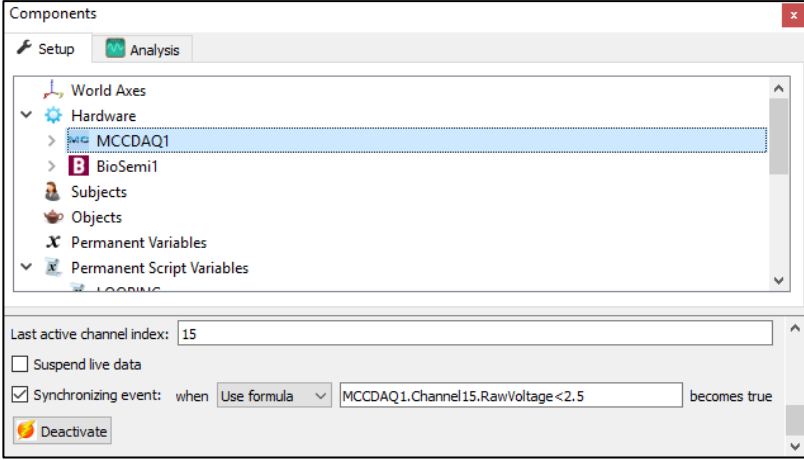
1. To actively synchronize the EEG Device with other hardware components, you will need an Event Marker provided by your Client Support Engineer and a connector to input the event marker signal into the BioSemi Input/Output. Please note that hardware are already passively synchronized by The MotionMonitor xGen synchronization routines, but that an active synchronization can force data streams into a 1 to 1 alignment using a common signal between each device.
2. In the BioSemi parameters panel, a synchronizing event is enabled using the corresponding checkbox. The channel that the synchronizing event is connected to on the BioSemi device is mapped to this field, in this case a handheld Event Marker is being used. Then, a condition is defined to identify when the Event Marker is pressed. In the example below, the (scaled) BioSemi signal drops from 6V to 3V when the Event Marker is pressed. Therefore, the synchronizing event that the software will use is defined when the signal crosses a threshold between these two voltage levels. ie: 4V.



The screenshot shows the BioSemi parameters panel with the following settings:

- BioSemi name: BioSemi1
- Measurement rate: 2048
- Live data decimation: Factor: 80
- Number of channels: 272
- Suspend live data
- Synchronizing event: when Use formula $(\text{BioSemi1.Channel0.RawVoltage} * 0.0001) < 4$ becomes true
-

For the A/D hardware a similar procedure is applied using the respective data metrics. In the example below the signal drops from 5V to 0V when the Event Marker is pressed and therefore a 2.5V threshold is used to trigger the synchronizing frame.



The screenshot shows the Components panel with the following settings:

- Hardware: MCCAQ1
- BioSemi1
- Subjects
- Objects
- Permanent Variables
- Permanent Script Variables
- Last active channel index: 15
- Suspend live data
- Synchronizing event: when Use formula $\text{MCCAQ1.Channel15.RawVoltage} < 2.5$ becomes true
-

3. The MotionMonitor xGen is now configured to synchronously collect A/D and EEG data. Take a recording, while pushing the Button at some point during the collection. Plot the corresponding channels for A/D and BioSemi. You should see that the synch pulse occurs at the same frame in both data sources, as shown below:

