

Record EMA synchronously with ultrasound/Video.

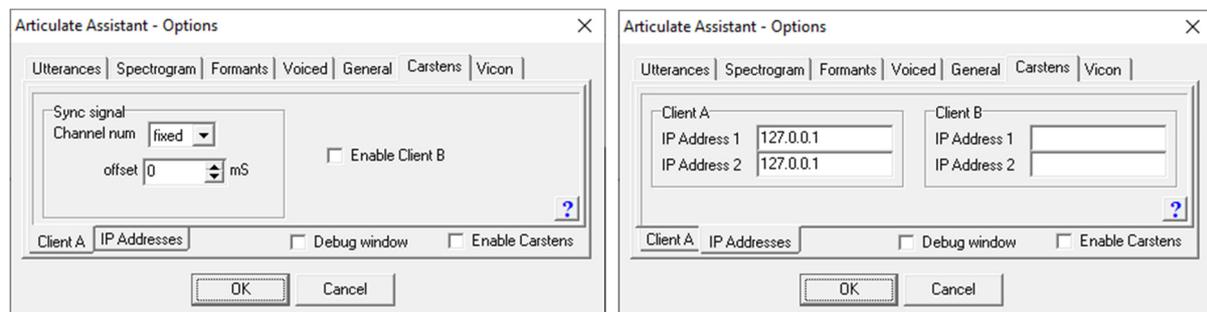
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For the double-talk project in 2013 we introduced the capability for AAA to record 2x AG500 machine synchronously with EPG, video and ultrasound. Funded by EPSRC EP/E01609X/1 and EP/E016539. We also added Maths analysis values tools to perform standard analysis of EMA data.

Configuring the hardware

An ethernet card may need to be purchased and connected to the AAA PC and the EMA PC. The ethernet used for connecting the PC to your ISP network cannot be used for both purposes.



Client A is the first EMA machine (typically there is only one) and Client B is the second. Enable Client B should therefore be unchecked.

Channel Num should be set to the Scarlett 4i4 channel the EMA sync signal will be recorded onto.

Offset should be left at 0ms

Enable Carstens should be checked if you intend to record EMA and unchecked when you are finished.

Client A

IpAddress 1 should be set to the address of the local network on the AAA host PC

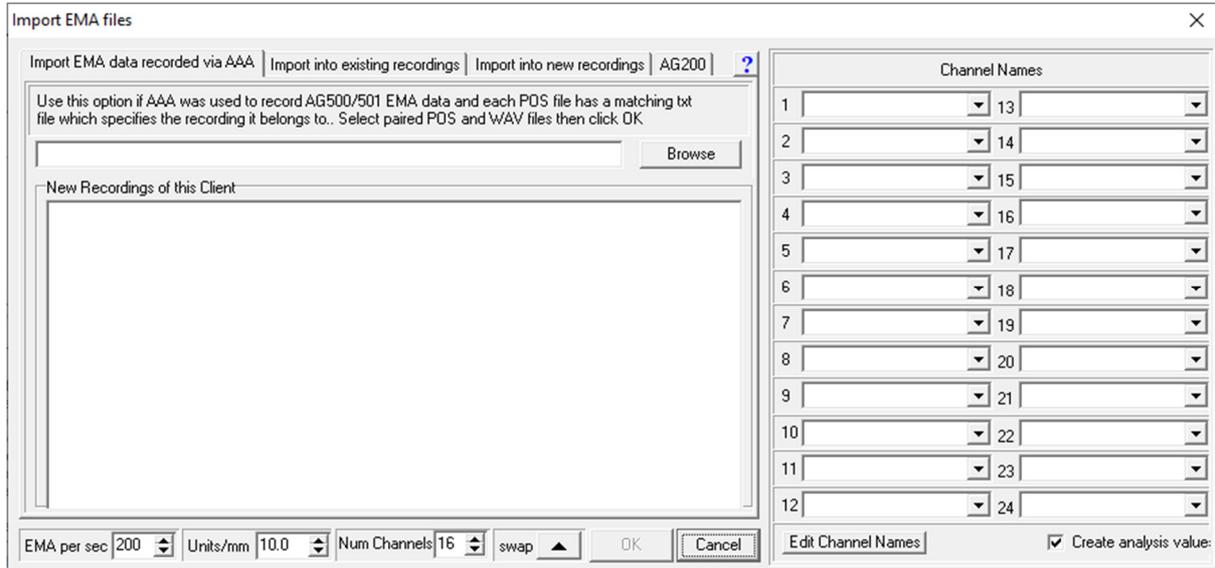
IpAddress 2 should be set to the address of the local network on the EMA host PC

Record EMA data using AAA

EMA must first be started so that it is ready to record “sweeps” (recordings). Clicking the AAA Record button will send a message over the local ethernet to the EMA PC where it will initiate a

“Sweep” Clicking it again will stop the “sweep” and transfer the filestem of the recording just made back to AAA where it will be stored so that when the EMA pos data is imported it can be associated with the correct AAA recording.

Import EMA data using AAA



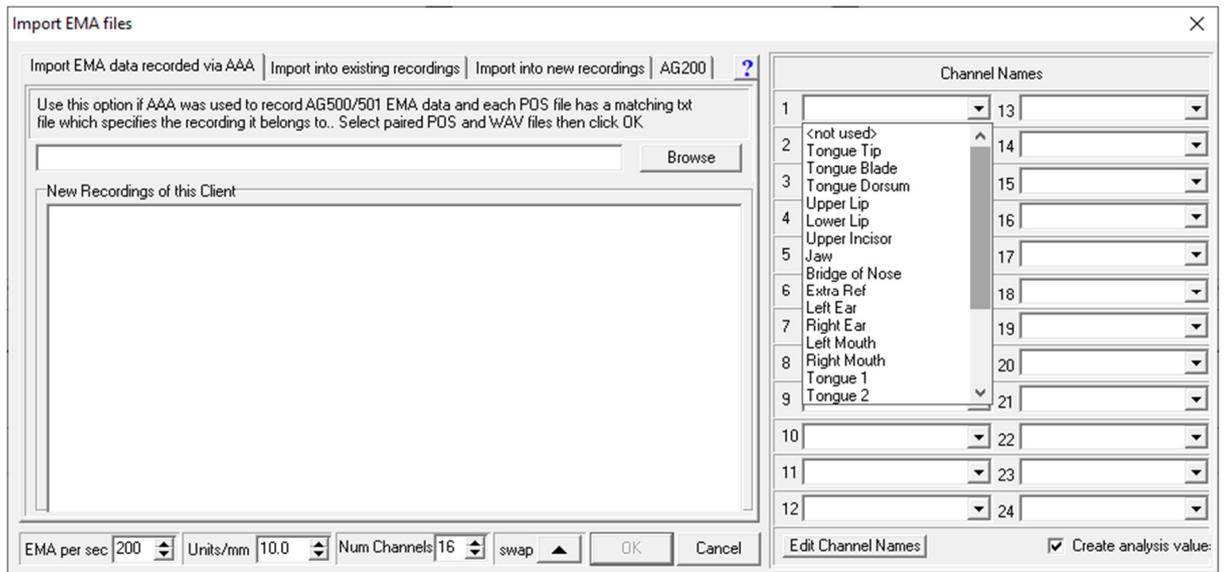
Importing can be done in four ways

1. Importing EMA AG50x pos files recorded synchronously by EMA. As described above.
2. By importing EMA AG50x pos files and associated wav files together as they are recorded with the EMA system alone.
3. By importing EMA AG50x pos files and associating manually each pos file with a wav file already present in the current project. Not synchronised.
4. Importing AG200 *.0?? , .1?? , *.2?? , *.M?? data files. For importing the MocHa data.

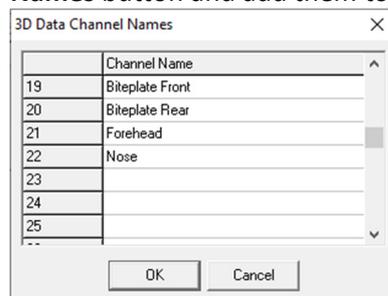
To import EMA and audio data that you have recorded using the standard Carstens equipment:

Import EMA recorded synchronously with ultrasound/Video/EPG using AAA

1. Back up the project (VERY IMPORTANT see point 5)
2. Open the project.
3. Select the 'File|Import EMA...' menu option to open the EMA import dialogue.
4. Select the "Import EMA data recorded via AAA" tab.
5. Use the Browse dialog to open the folder with the pos files. Note: The same database record is used to store the pos file name and the channel name so the pos file name is deleted after the first attempt to import. It is crucial therefore that the AAA project is backed up immediately after the EMA session is completed or you will be unable to import the EMA pos files again if a mistake is made on the first attempt.



- 6.
7. Parameters
 - a. **EMA per sec** – defaults to 200Hz. This is sufficient but can be increased to 500Hz if that was the rate that the EMA was recorded.
 - b. **Units/mm** – defaults to spatial resolution of 0.1mm
 - c. **Num channels** should be set to the maximum number of channels that your EMA system can record
 - d. **Swap** – defaults to swapping the Y and Z axes so that the 2D plots in AAA look correct when plotting x vs y values. (Only from version 222.1.x and above. Earlier AAA versions need to be swapped manually.)
8. Examine your list of channel names and associated channel indices. If any of your names are not in the default dropdown list of channel names then click the **Edit Channel Names** button and add them to the bottom of the list.



9. Use the dropdown list to add the appropriate channel name to each channel index.

| Channel Names | | |
|---------------|-----------------|---------------|
| 1 | Tongue Tip | 13 <not used> |
| 2 | Tongue Blade | 14 <not used> |
| 3 | Tongue Dorsum | 15 <not used> |
| 4 | Upper Lip | 16 <not used> |
| 5 | Lower Lip | 17 <not used> |
| 6 | Upper Incisor | 18 <not used> |
| 7 | Jaw | 19 <not used> |
| 8 | Bridge of Nose | 20 <not used> |
| 9 | Left Ear | 21 <not used> |
| 10 | Right Ear | 22 <not used> |
| 11 | Biteplate Front | 23 <not used> |
| 12 | Biteplate Rear | 24 <not used> |

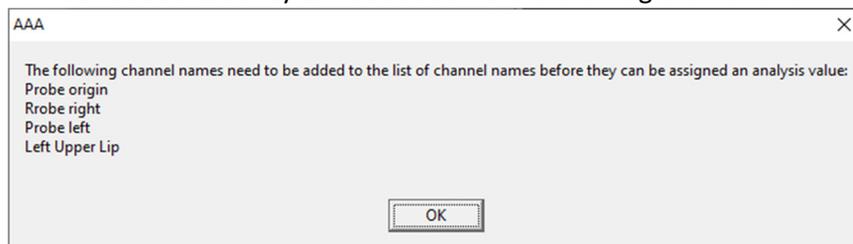
10. Click OK to import the data.

Converting raw 3D data to x/y/z analysis values

AAA cannot display or perform calculations on raw 3D data. The raw data first needs to be converted to 3 x/y/z displacement analysis values. Once the raw data is imported a dialog will automatically appear with the indices of all the channels. For each selected channel index, three x, y and z displacement analysis values will be created. In most cases, all of the channel names should be selected and converted. The only reason for deselecting (not converting) a channel name is if that channel is never going to be required for analysis.

If conversion to analysis values is carried out at a later date then:

1. Open the analysis values editor and click the 3Ddata button.
2. You may get a message saying that channel names need to be added. These names should already have been added but they can be added from the dialog that follows.



3. The conversion dialog will appear. The default values of x, y and z co-ordinates are sufficient. AAA does not work with the phi theta rms and extra parameters.



4. Click OK and the selected named channels will be available as analysis values for charting, plotting and measuring

Note: The raw data also contains information on the orientation of the sensor but this data is not currently offered as an analysis value within AAA. If you need this, contact Articulate Instruments Ltd.