



EQUIVITAL AND LABCHART

Getting Started

Introduction

A basic Equivital System consists of the following components:

- SEM (Sensor Electronics Module)
- Sensor Belt
- SEM USB Lead
- Bluetooth Dongle
- LabChart Software
- LabChart Equivital Device Enabler Software
- Equivital Manager Software

A number of optional ancillary devices are also available (see 'Ancillary Devices' section).

System Requirements

A modern Windows based desktop or Laptop PC capable of running LabChart (system requirements [here](#)).

Note: Equivital products cannot be used with LabChart for Mac.

Setup

Install Software

- 1 Ensure your copy of LabChart is up to date (latest update [here](#)). LabChart 8.1.13 for Windows or newer is required.
- 2 Download and install both the Equivital Manager utility and the Equivital Device Enabler available [here](#). For SEM file import, Equivital Device Enabler 1.1 or later is required.

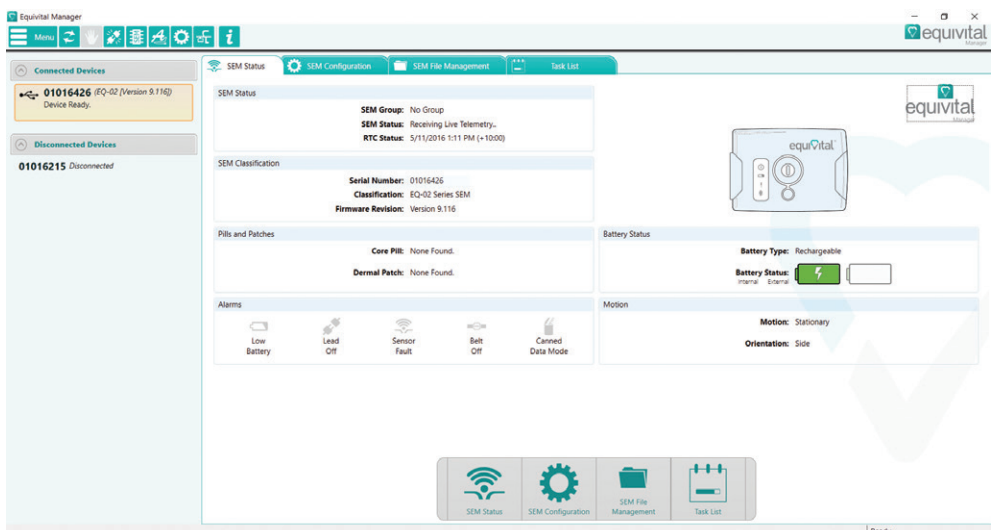
Connect the hardware

- 3 Connect the Bluetooth dongle to the PC via USB and wait for Windows to automatically install the correct USB Express drivers. Note: this step is only required if you plan to stream data into LabChart
- 4 Connect the SEM to the PC via USB using the SEM to USB lead. The SEM should power up automatically and you will see a sequence of LEDs on the front panel.

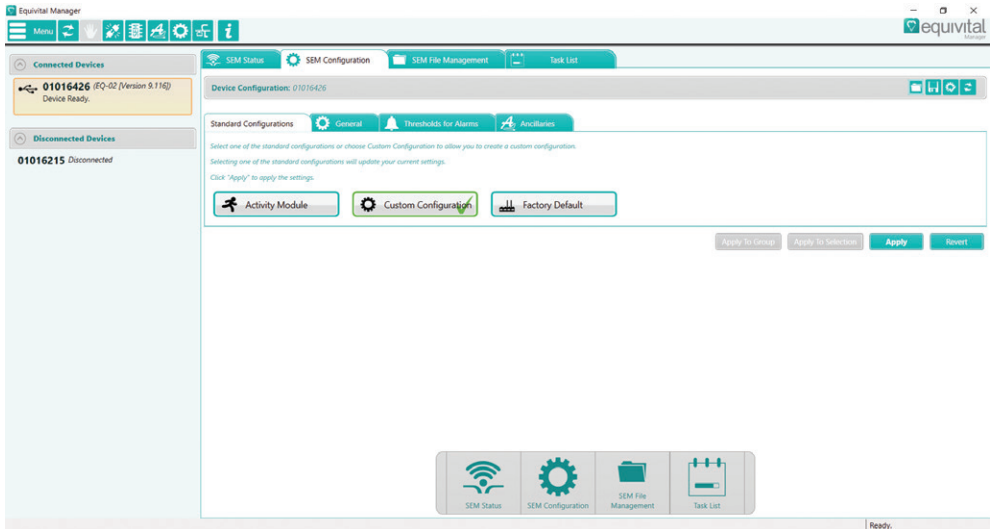
Note: Your SEM may not be fully charged out of the box. Leave the SEM connected to your PC until the battery icon turns solid green (i.e no longer flashing) before continuing.

Configure your SEM

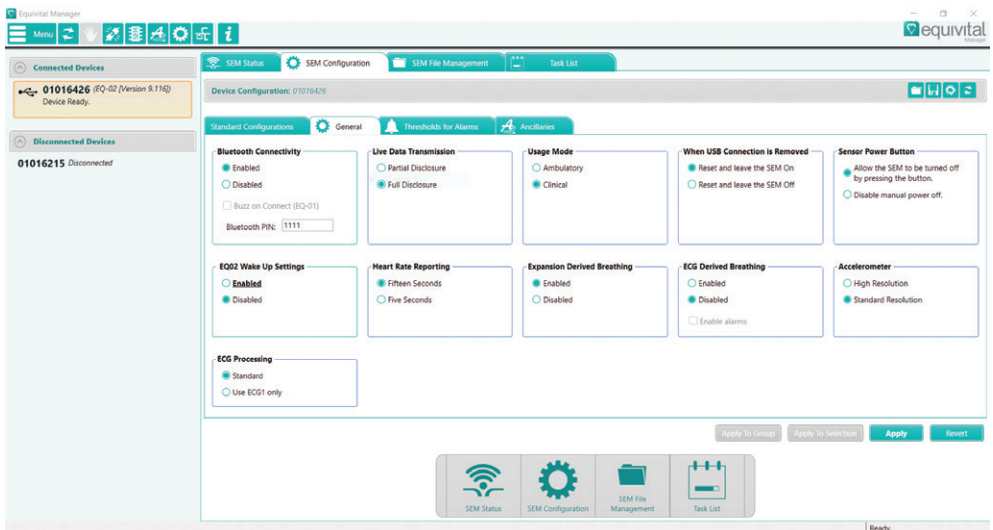
- 5 Open the Equivital Manager utility. This software is used to configure your SEM. Detected SEMs should appear in the column on the left hand side.



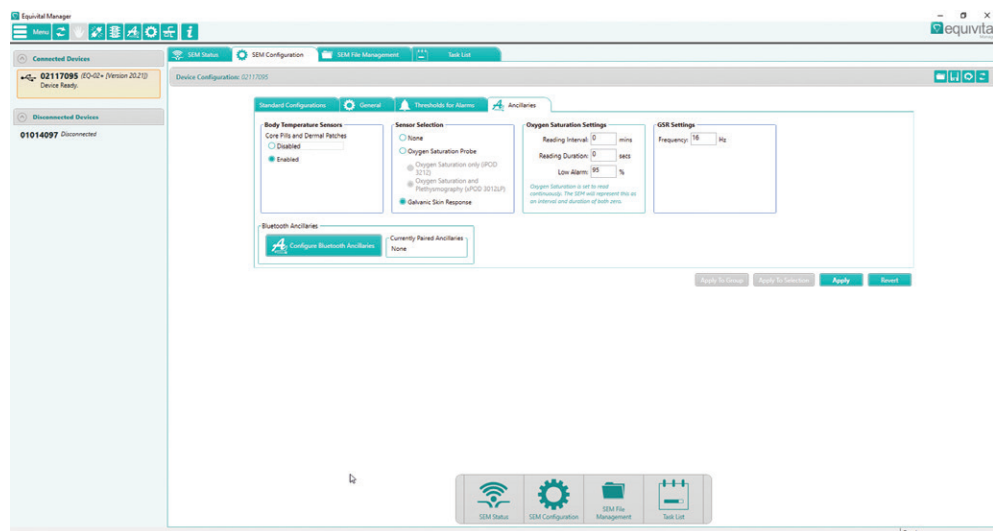
- 6 Select the 'SEM configuration' tab. If you have no ancillary devices you can leave the 'Standard Configuration' set to 'Factory Default' and skip to step 10. Otherwise select 'Custom Configuration'.



- 7 If you are using any Bluetooth ancillaries, select the 'General' sub-tab and ensure that 'Bluetooth Connectivity' is 'Enabled'. Ensure 'Clinical' is selected under 'Usage Mode'.



- Switch to the 'Ancillaries' sub-tab and configure wireless Bluetooth and wired ancillaries as appropriate for your configuration (Details in the 'Ancillary Devices' section).



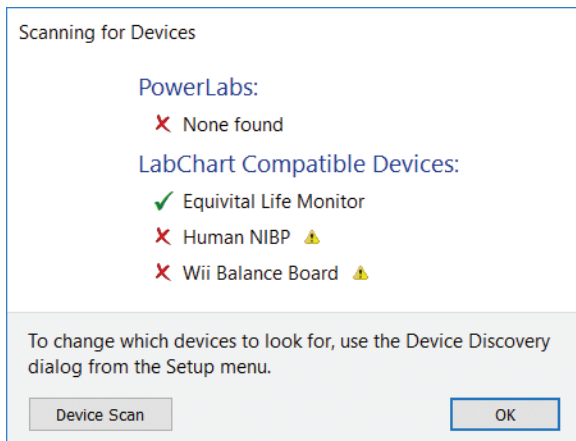
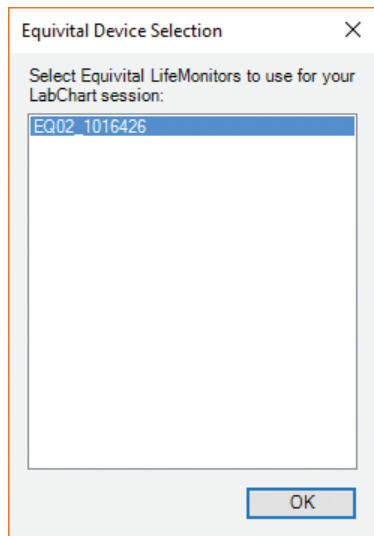
- If you have additional SEMs select them from the left hand panel and repeat steps 6-8. LabChart supports recording from up to 2 SEMs at once.
- Close the Equivital Manager software.
- Disconnect the SEM from the USB port. By default the SEM will remain powered on when disconnected from USB. If you have changed this setting then manually turn on the SEM by pressing and holding the button until you see the green power light illuminate (about 3 seconds).

Subject Setup

- Fit appropriately sized sensor belt to subject. To do this ensure a shoulder strap is fitted over each shoulder, the clasp closes in the center of the chest and the silver electrode pads have been moistened with water and are directly contacting the skin. (Detailed belt fitting instructions can be found in the EQ02 Sensor Belt User Guide).
- Connect the SEM and any ancillary devices to the belt. Only connect the SEM after inserting it into the pouch on the belt. Also ensure that the optical temperature sensor on the back of the SEM is facing the skin and lines up with the hole in the belt.
- To ensure the SEM is powered on, tap the POWER button. The green power indicator should flash 5 times. You are now recording data to the SEM.

Streaming to LabChart

- 1 Open LabChart and wait for the device selection screen to detect any Equivital SEMs within range. Select up to 2 you wish to sample from and click OK. Once successful you should see a green tick next to 'Equivital Life Monitor' in LabChart's 'Scanning for Devices' screen.



- 2 When starting a new file LabChart will default to show all data channels from the SEM. Channels displayed can be configured in LabChart's 'Devices and Channels' dialogue found in the 'Setup' Menu.

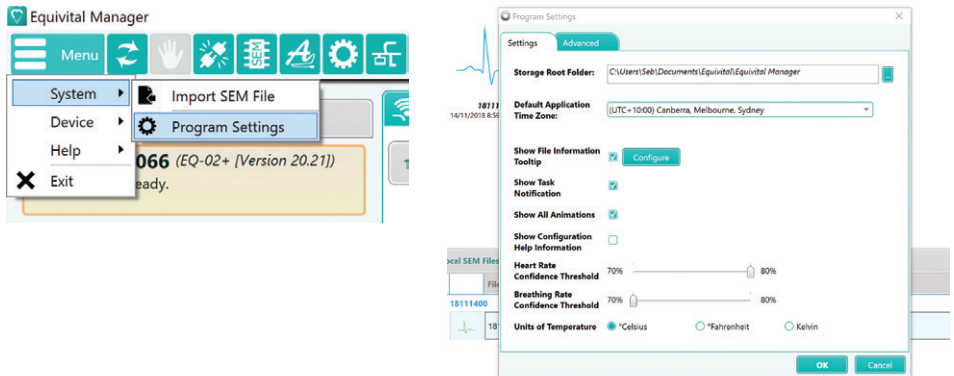
Finishing up

- 3 When recording is complete click the 'Stop' button in LabChart to stop the recording.
- 4 Power down the SEM by pressing and holding the button until the '!' icon turns red.

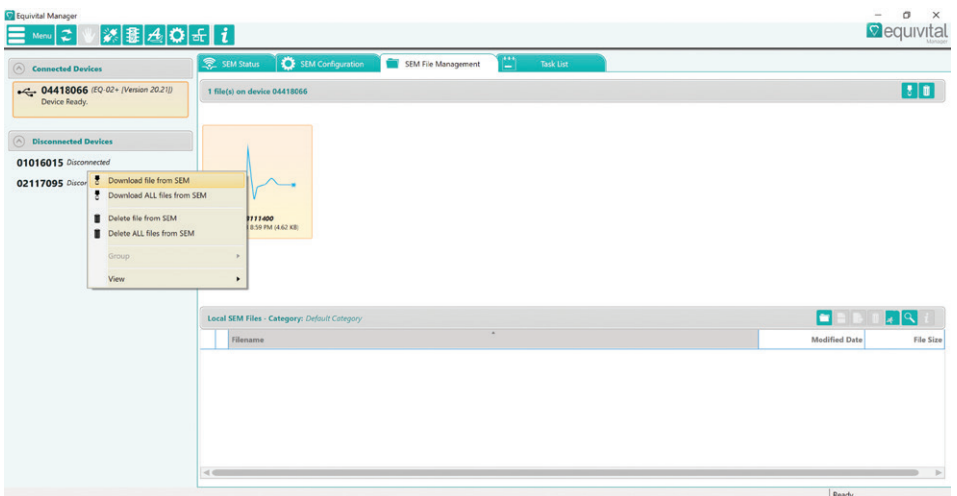
Note: It is only possible to power off the SEM once it is disconnected from the sensor belt.

Importing SEM Files

- 1 Open the Equivital Manager Software on your PC
- 2 Open the 'Program Settings' dialogue from the 'System' menu and note the 'Storage Root Folder'. This is where the files downloaded from your SEM will be stored. You may change this to another location if desired.



- 3 Connect a SEM to the PC using the EQ-ACC-SL-1 SEM USB Lead and wait a moment for the device to be detected.
- 4 Select the SEM from the list on the left hand side and then select the 'SEM File management' Tab.
- 5 The top pane of this window represents data files stored on the internal memory of the SEM. Right click on the desired recording session and click 'Download file from SEM'.

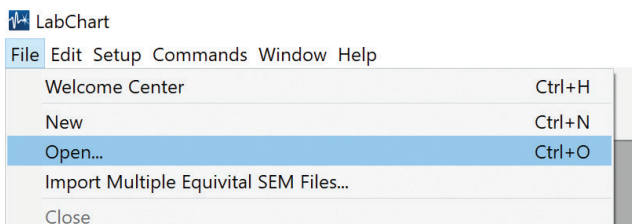


- 6 The file will be saved onto your local machine. A subfolder will be automatically created in the root folder selected in step 2 and named after the serial number of the device (e.g the bold number in the left hand column of the screenshot above). Within this subfolder the files will be named with an 8 digit filename. The first 6 digits represent the date in YYMMDD format while the final 2 digits represent the recording number of that day.
- 7 Repeat step 5 if you have additional recordings on the one SEM, or repeat steps 3,4 and 5 for additional SEMs.

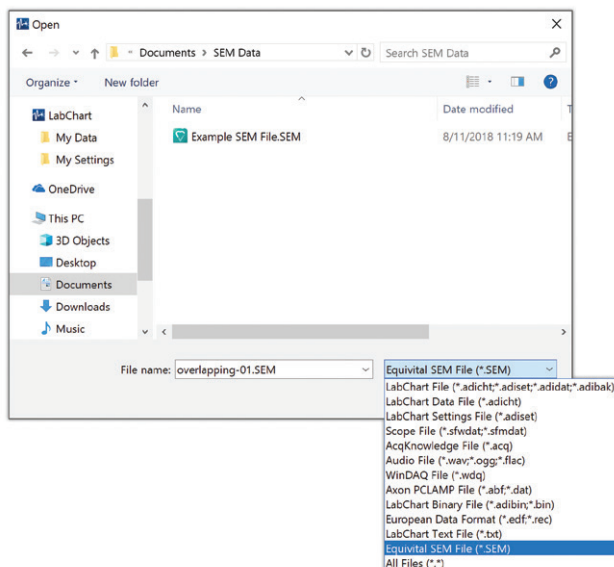
Opening the Downloaded Data in LabChart

If your SEM files were recorded at different times (or you have only one SEM file)

- 1 Select File—> Open

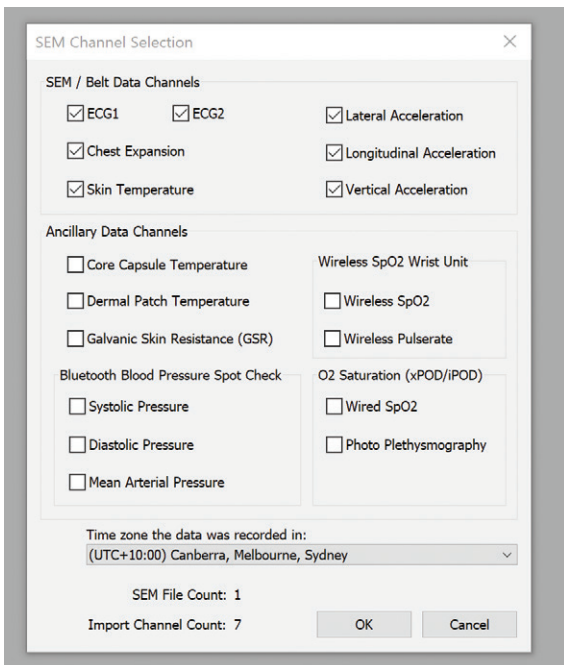


- 2 Browse to the folder identified in step 6 of the 'Downloading Data from your SEM' section, change the file type dropdown to show '.SEM' files, then select your desired SEM File.



- 3 You will be asked which data channels you wish to import.

Note: If you are interested in the time of day of your recording it is important you select the correct time zone in which the data was recorded in the drop down.



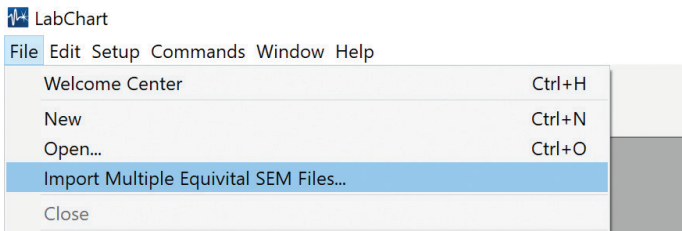
The image shows a 'SEM Channel Selection' dialog box with a close button (X) in the top right corner. It is divided into several sections for selecting data channels:

- SEM / Belt Data Channels:** This section contains six checkboxes, all of which are checked: ECG1, ECG2, Lateral Acceleration, Chest Expansion, Longitudinal Acceleration, and Skin Temperature. Vertical Acceleration is also checked.
- Ancillary Data Channels:** This section is divided into two columns. The left column has three checkboxes: Core Capsule Temperature, Dermal Patch Temperature, and Galvanic Skin Resistance (GSR), all of which are unchecked. The right column has two sub-sections: 'Wireless SpO2 Wrist Unit' with 'Wireless SpO2' and 'Wireless PulseRate' (both unchecked), and 'O2 Saturation (xPOD/iPOD)' with 'Wired SpO2' and 'Photo Plethysmography' (both unchecked).
- Bluetooth Blood Pressure Spot Check:** This section has three checkboxes: Systolic Pressure, Diastolic Pressure, and Mean Arterial Pressure, all of which are unchecked.
- Time zone the data was recorded in:** A dropdown menu showing '(UTC+10:00) Canberra, Melbourne, Sydney'.
- SEM File Count:** Displayed as 1.
- Import Channel Count:** Displayed as 7.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.

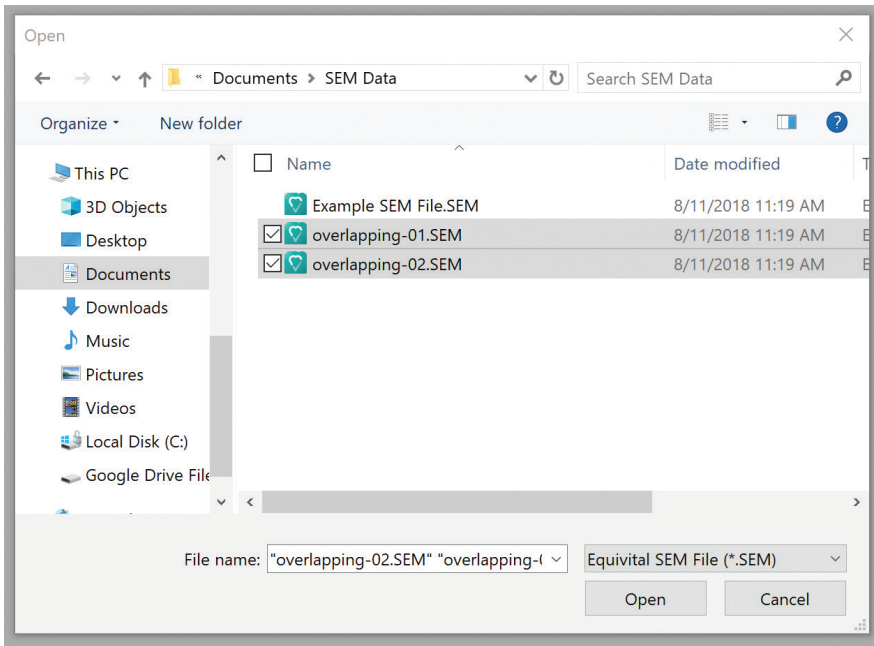
- 4 Click OK and then wait a few moments as data is imported into LabChart. This can take several minutes for very long recordings, particularly on slower PCs.
- 5 Repeat above steps to open multiple files in different windows.

If you have multiple SEM files that were recorded at the same time

- 1 Select File —> Open Multiple SEM Files

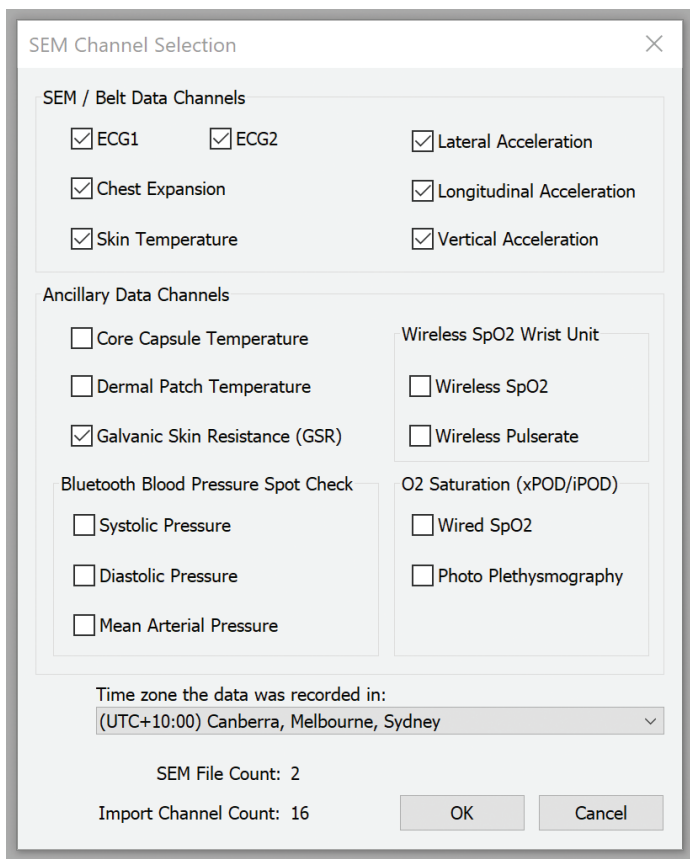


- 2 Browse to the folder containing your SEM files and hold down the Shift key to select more than one file, then click 'Open'. Note: The importer will align these files in time based on the real time clock data recorded by the SEM. Hence the files selected MUST have at least some overlap in time.



- 3 In the resulting dialogue select which channels of data you wish to import.

Note: LabChart supports a maximum of 32 channels of data in one file. The dialogue gives you an indication of how many channels will be used based on the number of SEM files, and number of channels, you have selected.



The image shows a 'SEM Channel Selection' dialog box with a close button (X) in the top right corner. It is divided into several sections for selecting data channels.

SEM / Belt Data Channels

- ☒ ECG1
- ☒ ECG2
- ☒ Lateral Acceleration
- ☒ Chest Expansion
- ☒ Longitudinal Acceleration
- ☒ Skin Temperature
- ☒ Vertical Acceleration

Ancillary Data Channels

- ☐ Core Capsule Temperature
- ☐ Dermal Patch Temperature
- ☒ Galvanic Skin Resistance (GSR)
- ☐ Wireless SpO2 Wrist Unit
 - ☐ Wireless SpO2
 - ☐ Wireless PulseRate
- ☐ Bluetooth Blood Pressure Spot Check
 - ☐ Systolic Pressure
 - ☐ Diastolic Pressure
 - ☐ Mean Arterial Pressure
- ☐ O2 Saturation (xPOD/iPOD)
 - ☐ Wired SpO2
 - ☐ Photo Plethysmography

Time zone the data was recorded in:
(UTC+10:00) Canberra, Melbourne, Sydney ▼

SEM File Count: 2

Import Channel Count: 16

OK Cancel

- 4 Click OK and then wait a few moments as data is imported into LabChart. This can take several minutes for very long recordings, particularly on slower PCs.

Ancillary Devices

GSR Add On

- During SEM configuration (Step 8) ensure that 'Galvanic Skin Response' is selected under 'Sensor Selection'.
- During subject setup (Step 13) connect the GSR Add-On to the round ancillary port on the belt.
- GSR Sample rate can be set to either 2, 4, 8 or 16Hz.
- The GSR interface can either be placed in the pocket on the belt (if desired electrode placement is on the chest) or the lead can be run down the arm and the unit secured on the wrist with the supplied velcro strap.
- The snap lead connectors work with commonly available disposable electrodes, such as the MLA1010. The unit is supplied with 2 such electrodes to get you started.

Bluetooth SpO₂ Add On

- Ensure 2x AAA batteries (included) are correctly installed in the main unit of the device.
- Ensure the device is switched on (either by inserting a finger into the cuff or pressing the small button on the top of the unit). The bluetooth icon should be visible on the unit's display.
- During SEM configuration (Step 8) click the 'Configure Bluetooth Ancillaries' button.
- In the resulting dialogue select 'Scan' in the left hand column.
- Once the 'Nonin' device is detected drag and drop it from the left hand side of the dialogue into the SpO₂ column on the right.

External Battery Pack

- Insert the appropriate number of AAA batteries (not included) into the battery pack. A small phillips head screwdriver is required to open the battery compartment.
- Insert the Battery Pack into the pouch on the Sensor Belt.
- Connect the Battery Pack to the round ancillary port on the Sensor Belt.

Additional Notes:

- 1 Please ensure you use an ADInstruments supplied install disk or download link to install the Equival Manager. The version supplied by Equival may not be compatible with LabChart.
- 2 The Device Enabler does not add any user interface elements to LabChart. It only adds the ability to detect Equival devices when LabChart starts up.
- 3 The SEM cannot be configured wirelessly using the ADI version of the Equival Manager.
- 4 Wired SpO₂ probes are not currently supported.
- 5 The GSR add on and the External Battery Pack cannot be used simultaneously as they connect to the same port on the Sensor Belt.
- 6 We recommend using only 1 core pill or dermal temperature patch at a time as data from these devices cannot be tied to a specific SEM.
- 7 When sampling with another device (especially with a Trigno Wireless System), LabChart can take up to 15 seconds before it starts displaying the new data after the user clicks Start. This only occurs if channels such as Skin Temp or other summary data channels are enabled.
- 8 Pairing the bluetooth dongle (Blue-1000) as a tetra ancillary will cause LabChart to fail to connect to the SEM. LabChart will still discover the SEM but won't connect and also appear to keep retrying to synchronize the device. Unpairing the dongle as a tetra will resolve this.
- 9 Turning ancillary devices on and off during sampling may result in LabChart dropping the connection to the EQ02 SEM.
- 10 Loss of connection with the EQ02 SEM during sampling will result in LabChart entering a SEM rediscovery mode. This will interrupt sampling and can last up to one minute. A block marker will appear in LabChart each time this occurs.
- 11 The dermal temperature patch has a default reading of 35 degrees celsius when not connected.
- 12 The data at the start of a block will sometimes not display correctly. This can be resolved by refreshing the display with the scale or autoscale buttons.
- 13 With Windows 7, when connecting the Dongle for the first time, the device driver may not install correctly. To fix this, uninstall the 'Equival LifeMonitor' device driver (in Device Manager) and reconnect the dongle.
- 14 By default whenever a SEM is switched on it will begin logging data to internal memory. There is a 'Logging' option that can be switched off manually in the Equival Manager software. You can verify that a SEM is logging by pressing the button on it (for less than 0.5secs) and confirmed that the '!' LED flashes slowly in a yellow colour.

