

USER MANUAL

# CSM Link Software v3.0

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# 1 Indications for Use

Take advantage of the online and offline data management offered in an intuitive and easy to use environment whenever your need is simple and practical case documentation and reporting or clinical and scientific research. The CSM Link Software™ for Windows® downloads wirelessly cases automatically stored in the CSM monitor or captures wirelessly (online) the CSM monitor parameters and processed EEG waveform.

## 1.1 Features

- Wireless download cases from the CSM Monitor™ memory for the last 18 hours of CSM parameters.
- Wireless online data capture from the CSM monitor including processed EEG waveform.
- Cerebral State Index (CSI), Electromyography (EMG%), Burst Suppression (BS%), Signal Quality Index (SQI), Sensor impedance, monitor events and CSI alarm values parameter capture.
- User event marker.
- Monitor and User Event labelling with notes.
- Event locator function.
- Indicators for sensor alarm, artifacts, battery status etc.
- Display of trend curves for CSI, EMG%, BS%, SQI (user selectable).
- Display of CSI high and low alarms.
- Display of processed EEG waveform with online trace function.
- Zoom and scroll option online and offline.
- Trend marker values of all parameters and EEG waveform.
- Case data information.
- Case reporting to screen, printer or PDF file.
- WYSIWYG picturing in popular file formats.
- Export cases to MS Excel® data format.
- Convert old CSM Link Software and CSM Capture files to new CSM file format.
- Set Clock on CSM monitor.
- Smart scan of all communications port(s) available on the computer operating the CSM Link Software™

## 1.2 How it works

Wireless exchange of data takes place between the CSM Monitor™ and the CSM Link™. The CSM Link™ device is connected to a Windows® computer or laptop hosting the CSM Link Software™ through a serial RS232 or USB communication port. All processing of parameters and waveforms takes place in the CSM Monitor™. CSM Link Software™ do not change / delete the data received from the CSM Monitor™.

## 1.3 Compatibility

- CSM Link™ firmware version 2.000.001 or higher is required.
- Full utilization of the CSM Link Software v3.0 features require CSM Monitor™ firmware version 2.000.004 or higher.
- Imports all previous CSM Case files (\*.CSV files) created with CSM Capture and CSM Link Software™ and converts to the new CSM file format .

## 2 I Want To

When the software is idle the “I Want To” screen will be shown. This screen is a quick menu with the main functions in the software.

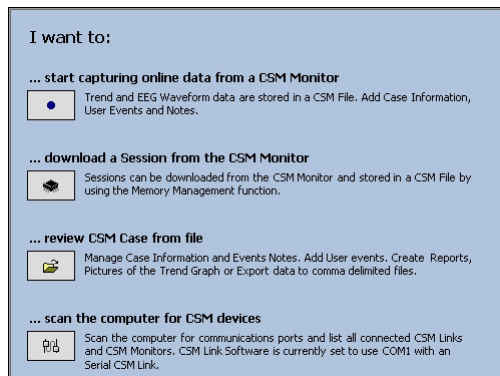


Figure 1: The quick start guide.

### 2.1 Start capturing online data from a CSM Monitor

- Use this function to capture data from a CSM Monitor. Online capturing is done while the CSM Monitor is running. The main difference between downloading and capturing data is that when capturing data the EEG waveform data is captured and stored in the CSM-File. EEG waveform data are not available when downloading data.
- No data from the CSM Monitor are changed/deleted by the software.
- User events can be set/deleted while capturing.
- Notes can be attached to user/monitor events while capturing.
- Case information can be entered while capturing.
- Scrolling data or changing the zoom will not affect the captured data.

### 2.2 Download a session from a CSM Monitor

- Use this function to download sessions from the CSM Monitor.
- EEG waveform data are not available in downloaded sessions.

### 2.3 Review a CSM Case from file

- Use this function to review/update information in a CSM Case
- User events can be set/deleted.
- Notes can be attached to user/monitor events.
- Case information can be attached.
- Case Report can be saved (PDF-file) or printed.
- Data can be exported.
- Images of the trend graph can be created.

### 2.4 Scan the computer for CSM devices

- Use this function to scan the computer for CSM devices.
- It detects where a CSM Device is attached and let you select the communication port to use.

## 3 Settings

In the “Settings” menu it is possible to set the Communication port, Hospital Information and Data Folder. The settings are stored and will be used next time the program is started. The settings can only be changed when the program is not capturing, downloading or reviewing data.

### 3.1 Set/Scan Communication Port

Before running CSM Link Software for the first time a communication port must be selected. If no communication port has been selected the “Communication Settings” dialog will be displayed otherwise the last used communication port is selected.

Use the “Settings | Communication” menu to start the “Communication Settings” dialog.

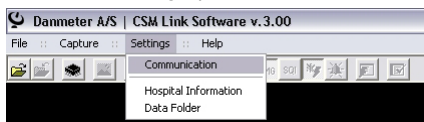


Figure 2: Start the Communication Settings dialog

The “Communication Settings” dialog scans the computer for CSM devices. Use the “Scan Ports” button to execute a new scan of the computer.

The currently used communication port is shown with an icon to the left. To change the communication port used, select it in the list and click the “Select” button.

If experiencing problems with the connection to the CSM Monitor use the “Communication Settings” to check the status of the communication.

Only Link Types with RS232(High) or USB can be used with the CSM Link Software.

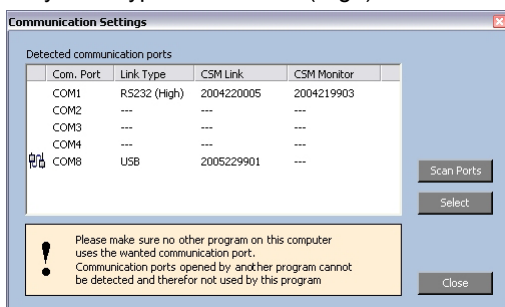


Figure 3: The Communication Settings dialog with scan functionality

### 3.2 Set Hospital Information

Use the “Settings | Hospital Information” menu to change the Hospital Information.

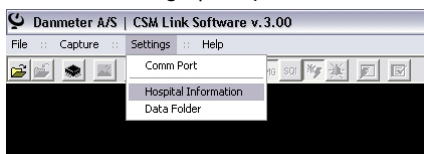
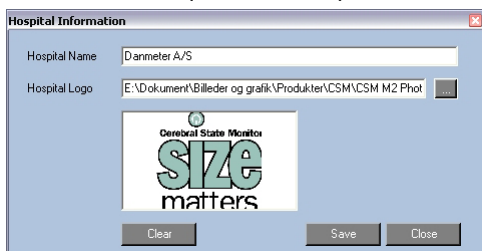


Figure 4: Setting the Hospital Information

If a Hospital/department name is supplied it will appear on the Report. It is also possible to link to a logo picture, which also will appear on the Report. The logo will be resized to a maximum height of 100 pixels and width of 200 pixels. The aspect ratio of the image is maintained.



**Do not use a large picture as logo. This will increase the size of the saved Case Report (PDF) file.**

Figure 5: Apply the Hospital name and logo and it will appear on the Report.

### 3.3 Set Data Folder

If the Data Folder is not available, CSM Link Software will set the Data Folder location to: C:\Program Files\Danmeter\CSM Link Software\Data  
Sessions downloaded from or captured by the CSM Monitor will always be stored to the Data Folder by default.

Use the “Settings | Data Folder” to set the Data Folder.

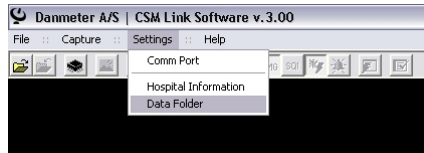


Figure 6: Setting the Data Folder

Select the folder to use as default data folder.

Create a new folder by using the “Make New Folder” button.

All users on the computer use the selected folder. Do not select a folder in your private working area if other users must have access to the CSM Files.

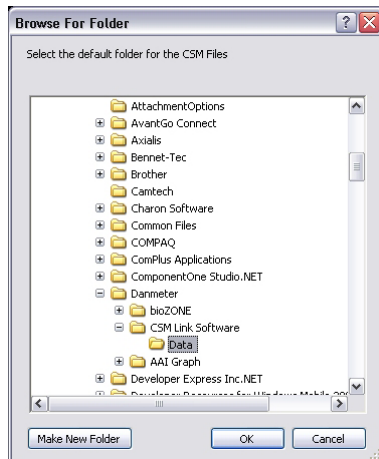


Figure 7: Select folder to use as Data Folder

# 4 Capturing Real-time Data

## 4.1 Start/Stop Capturing

Use the “Capture | Start” menu to start capturing data. If no communication port is selected, the “Communication Settings” dialog is displayed.

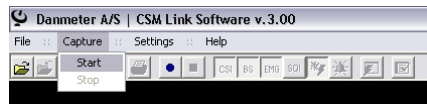


Figure 8: Start capturing data

Use the “Capture | Stop” menu to stop capturing data and save the captured data to a CSM File. The captured data will be saved to the shown file name and will be placed in the Data folder. If the Data Folder has not been set, the CSM File will be saved in the folder where the program is installed.

The name format of the saved file depends in the local short date format on the computer. If the local short date format is DDMMYYYY the file will be named: DDMMYYYYhhmmss.csm

- DD : the day when the capturing was started
- MM : the month when the capturing was started
- YYYY : the year when the capturing was started
- hh : the hour when the capturing was started
- mm : the minute when the capturing was started
- ss : the second when the capturing was started

## 4.2 The Capture Window

The capture window has 4 main components: EEG Waveform, Real-time parameters, Trend Graph, Quick Event List.

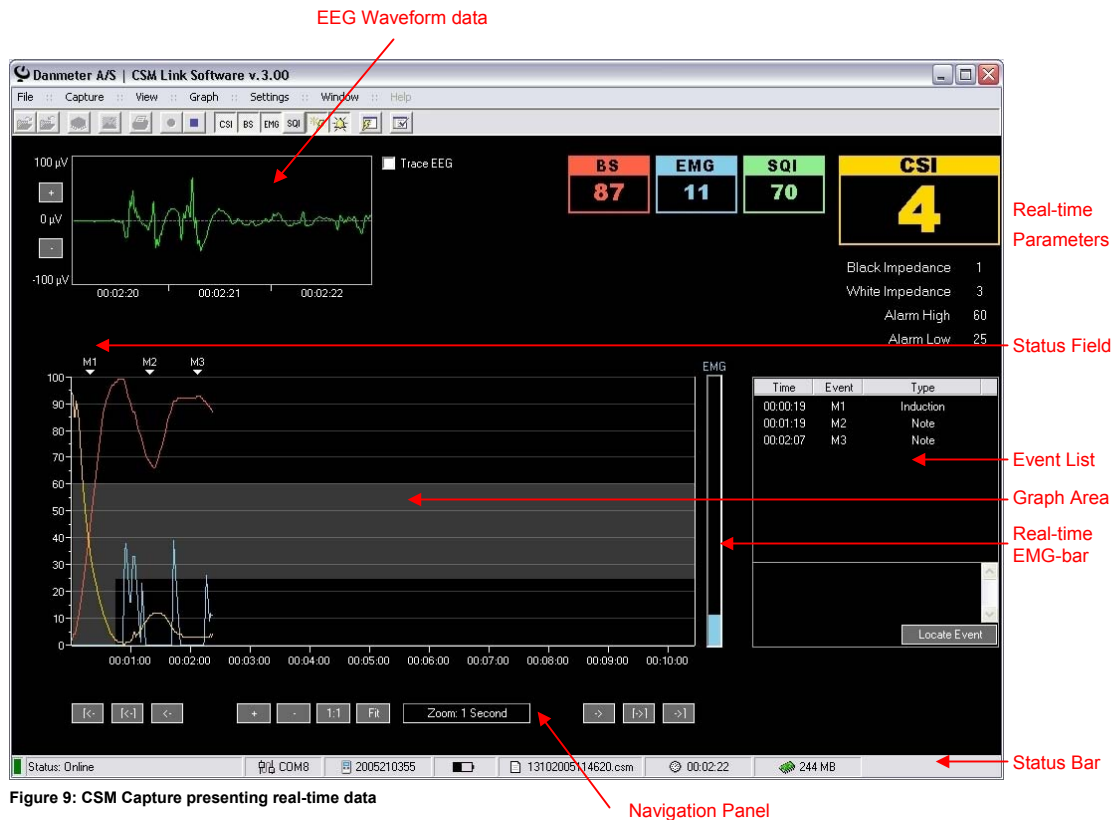


Figure 9: CSM Capture presenting real-time data



### 4.2.1 EEG WAVEFORM

The EEG Waveform shows 3 seconds of processed EEG Waveform data.

If “Trace EEG” is checked, the EEG at the mouse cursor position will be shown in the EEG Graph. EEG is still being recorded when tracing.

### 4.2.2 REAL-TIME PARAMETERS

The Real-time Parameters always show the last received data no matter if the zoom is different from 1 second or the Trend Graph is scrolled back in time.

### 4.2.3 TREND GRAPH

#### **Status Field**

The Status Field displays the current status of data Artifact, Sensor Alarm etc.

#### **EMG-bar**

The Real-time EMG-bar shows the last received EMG value as a bar no matter if the zoom is different from 1 second or the Trend Graph is scrolled back in time.

#### **Graph**

Displays the CSI, BS, EMG, SQI, Impedances and Alarm values, these parameters always display the current value from the CSM Monitor (also is scrolling the trend graph).

Use the “Graph” menu or the CSI BS EMG SQI buttons to select what to graph. This selection does not affect the Real-time Parameters they are always shown.

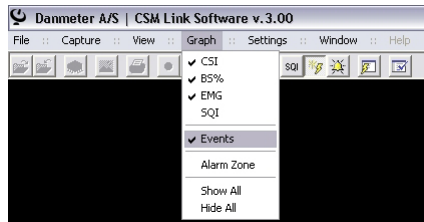


Figure 10: Selecting which parameters to graph

#### **Navigation Panel**

Use the Navigation Panel to review the data or change the zoom.

#### **Zoom**

If the graph is running with a zoom higher than 1-second data is still captured at 1-second interval and all data will be stored.

The zoom can be changed from 1 to 255 seconds. Use the zoom buttons in the Navigation Panel or the keyboard to change the zoom:

- Addition key (+) : Increment the zoom by 1 second
- Subtraction key (-) : Decrement the zoom by 1 second
- Spacebar : Reset the zoom to 1 second

#### **Scroll Data**

The graph can be reviewed while receiving data. Use the scroll buttons in the Navigation Panel or the keyboard to review the data:

- Left Arrow key : Scroll one unit to the left
- Page Down key : Scroll one screen to the left
- Home key : Scroll to the start of the graph
- Right key : Scroll one unit to the right
- Page Up key : Scroll one screen to the right
- End key : Scroll to the end of the graph

#### 4.2.4 QUICK EVENT LIST

The Quick Event List shows all events. Click an Event to display the note for this event. Events can be located on the Trend Graph by selecting an Event and clicking the “Locate Event” button.

### 4.3 Manage Events

Use the “Window | Event List” menu to open the “Event List” window.

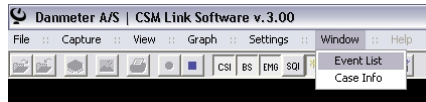


Figure 11: Open the Event List window

In the “Event List” window all events set on the monitor are listed with time of event (session timer), event number, event type and note.

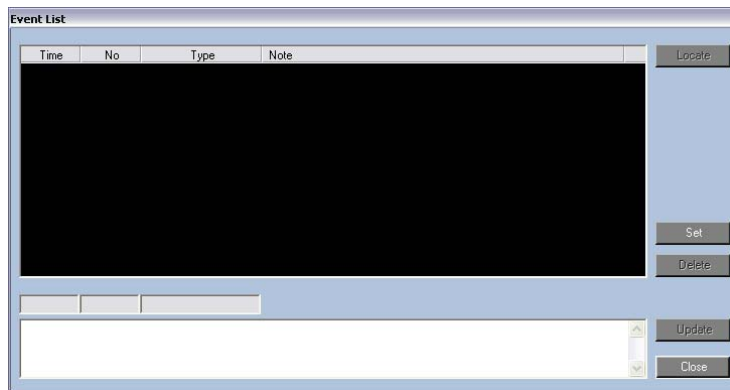


Figure 12: The Event Window shows all events set. Attach notes and locate events

When an event is set on the CSM Monitor it appears in the event list. Click on any event in the list. The event note can now be changed. Enter a note for the event and click the “Update” button to attach a note the event. Notes attached to events will be saved in the CSM File.

Only User Events can be deleted.

If the captured data spans over more than one screen it is possible to locate a specific event by selecting the event in the list and click the *Locate* button. The graph will be adjusted to show the selected event in the middle of the graph.

#### 4.3.1 USER EVENTS

Use the “Set” button in the “Event Window” to set a User Event.

The time of the event must be between the start of the case to the time the “Set” button was clicked.

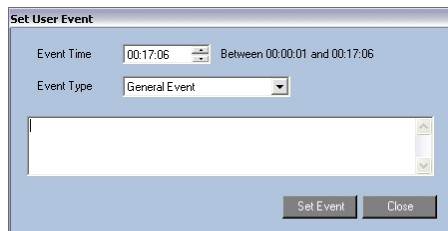


Figure 13: The User Event Window

## 4.4 Case Info

Use the “Window | Case Info” menu to open the “Case Info” window.



Figure 14: Open the Case Info window

The “Case Info” window contains information about the case. Enter data and click the “Save” button to save the data. Case Info data are saved in the CSM File.

The Case Length is not available during Capturing.

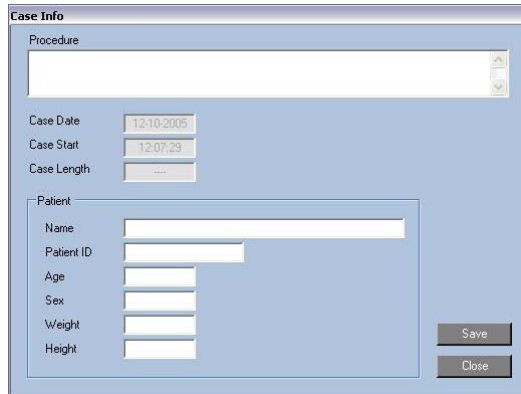
A screenshot of the 'Case Info' window. It has a light blue background and a title bar that says 'Case Info'. The window contains several input fields: a large text area for 'Procedure', a date field for 'Case Date' (12-10-2005), a time field for 'Case Start' (12:07:29), and a disabled field for 'Case Length'. Below these is a 'Patient' section with fields for 'Name', 'Patient ID', 'Age', 'Sex', 'Weight', and 'Height'. At the bottom right, there are 'Save' and 'Close' buttons.

Figure 15: Apply Case Info

# 5 Memory Management

**Before starting Memory Management make sure that the CSM Monitor has been started without sensors being connected and is linked with the CSM Link**

Use the “File | Memory Management” menu to start Memory Management.

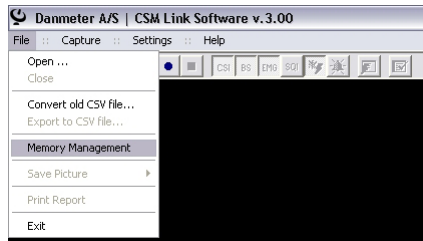


Figure 16: The Memory Management Window

## 5.1 CSM Monitor MK1

The Memory Management module shows the ID (serial number) and firmware version of the CSM Monitor and CSM Link.

A list of the latest 10 completed sessions can be seen. Should there not have been recorded 10 sessions or if the memory has been cleared the number of sessions on the list may vary.

The CSM Monitor MK1 has no internal clock therefore the sessions or marked with numbers. The name of any downloaded file will default to the time when the session was downloaded.

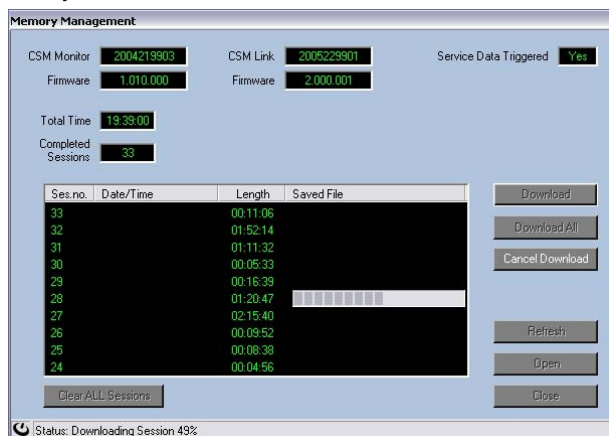


Figure 17: The Memory Management Module for the CSM Monitor MK1

## 5.2 CSM Monitor MK2

The Memory Management module shows the ID (serial number) and firmware version of the CSM Monitor and CSM Link.

The CSM Monitor Clock is shown and can be adjusted by using the “Set CSM Clock” button.

### 5.2.1 SETTING THE CSM MONITOR CLOCK

Use the “Get PC Time” button to retrieve the clock from the computer or adjust the date and time manually. Click the “Save” button to save the settings to the CSM Monitor.

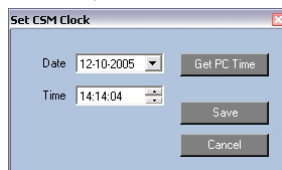


Figure 18: Setting the CSM Monitor clock

A list of the latest 10 completed sessions can be seen. Should there not have been recorded 10 sessions or if the memory has been cleared the number of sessions on the list may vary.

Sessions on the monitor can be identified by a timestamp applied to the session when it was recorded or by the session number.

If the CSM monitor is running DMX, the sessions left on the monitor is shown.

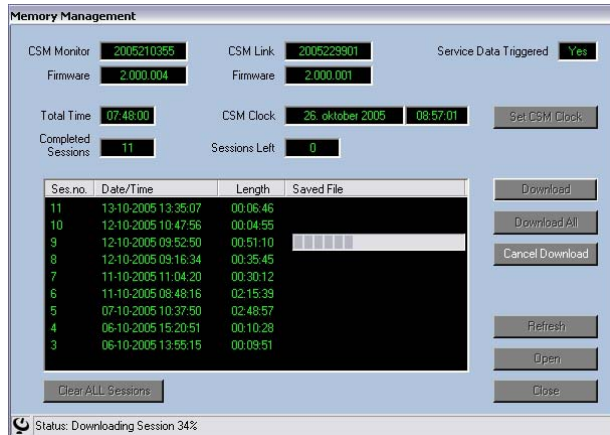


Figure 19: The Memory Management Module for the CSM Monitor MK2

## 5.3 Downloading Data

**Downloaded sessions are not deleted in the CSM Monitor after download**  
**If closing the Memory Management module and opening it again, earlier downloaded sessions will not be show with a file name.**

### **Download a specific session**

To download a session – select the session on the list and click the “Download” button. A progress indicator is shown for he selected download.

When the session is downloaded a default name is suggested and the CSM File will be saved in the default “Data Folder”. After saving the CSM File the filename appears on the list. To open and review the session in CSM Link Software, select the session on the list and click the “Open” button. The session is saved as a CSM File in the default “Data Folder”.

### **Download All sessions**

Click the “Download All” button to download all sessions from the CSM Monitor. The sessions are downloaded one by one, named with a default name and saved to the default “Data Folder”.

## 5.4 Clear Memory

The memory of the CSM Monitor can be cleared (ALL recorded sessions will be lost). The Completed Session and Total Time counter are not cleared when clearing the memory.

To clear the memory of the CSM Monitor, click the “Clear Memory” button.

## 6 Review Data

Data recorded with the CSM Monitor can be reviewed with the CSM Link Software.

### 6.1 Open CSM File for Review

Use the “File | Open” menu to review a CSM File.

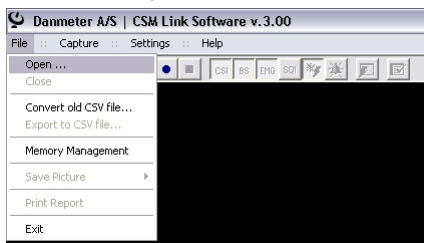


Figure 20: Open a CSM File for review

Events, Case Information and navigation behave as when capturing data.

When moving the mouse over the graph the corresponding parameters are shown. The exact time/time interval at the mouse cursor is shown below the time axis.

### 6.2 Export data to CSV file

Use the “File | Export to CSV file” menu to export data to a comma delimited file.

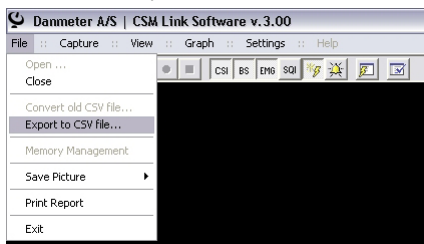


Figure 21: Export data to CSV file

Select the data to export and click the “Export” button.

The “EEG” and “Alarm Values” checkboxes are disabled if the data in the CSM File does not support these values.

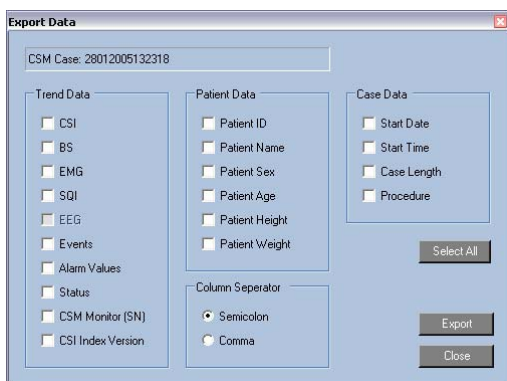


Figure 22: The Export data window

## 6.3 Save Picture of Graph

Pictures of the graph can be extracted to various image formats.

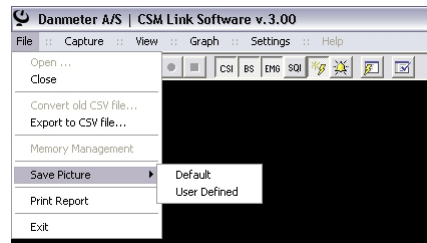


Figure 23: Save picture the graph

### 6.3.1 WHAT YOU SEE IS WHAT YOU GET

Use the “File | Save Picture | Default” menu to save a picture of the graph as shown on the screen.

### 6.3.2 USER DEFINED

Use the “File | Save Picture | User Defined” menu to save a picture with user defined parameters.

- Select a time interval for the graph or select the complete case.
- Select parameters to graph.
- Select the height (pixels) of the picture – the width (pixels) depends on the selected time interval and zoom.
- Select the zoom – has influence on the width of the picture
- Select whether to save the picture in colour or greyscale.

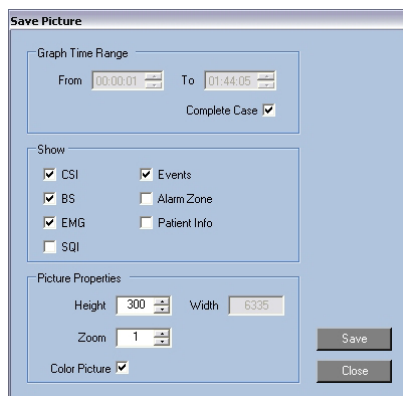


Figure 24: Save a user defined picture

## 6.4 Create Report

Use the “File | Print Report” menu to print or save a report for the complete case.

The report can be saved as a PDF file. To preview or print the report Adobe Reader is required.

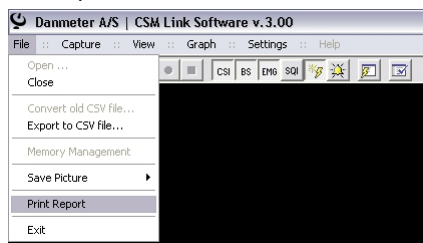


Figure 25: Print Report

The report contain the following sections:

- Case Info – Hospital/department name and logo if applied. Serial number for the CSM Monitor(s) used for the recording and physical name for the stored CSM File. Information typed in the Case Info window

- Event list – detailed list of all events in the case
- Graph – graph with the selected parameters (CSI, EMG, BS, SQI, Event Markers, Alarm Zones). The Graph can split at every 30 minutes, 1, 2 or 3 hour and shown in colour or greyscale. Split Graph = 1 hour will show 1 hour of data across the page.  
A Graph Split of 30 minutes will have the same resolution as a graph on the screen with zoom set to 4. A Graph Split of 1 hour = zoom 8 on the screen etc.

### Report Profiles

The last used Report Profile will be used by default when creating a Report. Select another Report Profile in the Report Profile combo box to change the used Report Profile.

To create a new Report Profile – use the “New Report Profile” button and enter the Report Settings for the new Report Profile in the following window.

To change the current Report Profile – make the changes and click the “Update Report Profile” button.

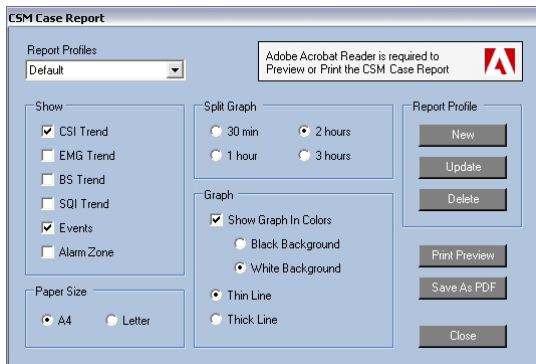


Figure 26: The Report window

### 6.4.1 REPORT SAMPLE

In this sample report the Graph Split time is set to 1 hour. Black Background and Thin Line is set.

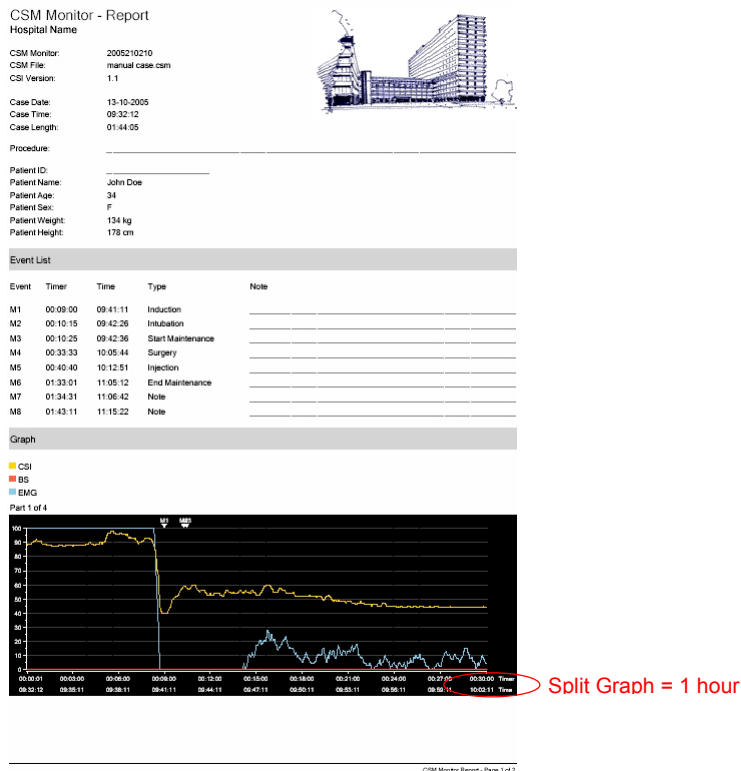
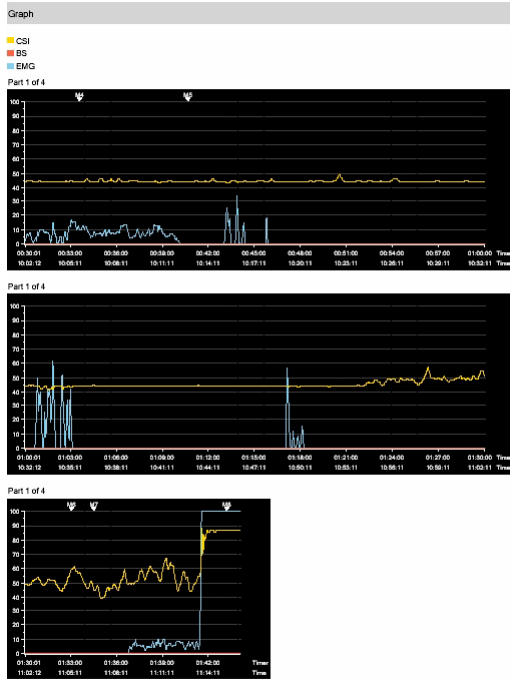


Figure 27: The Printed Report – Page 1 of 2





CSM Monitor Report - Page 2 of 2

Figure 28: The Printed Report – Page 2 of 2

## 6.5 Convert old CSV file

Data files (CSV) created with older versions of CSM Capture or CSM Link Software can be converted to the new binary format.

Use the “File | Convert old CSV file” to convert an old “data file. The file will be converted when closing the file.

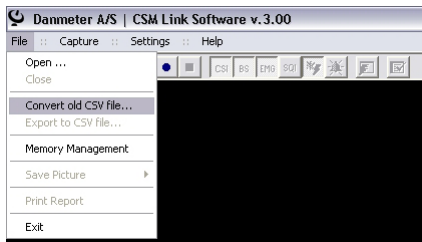


Figure 29: Convert old CSV file