med associates inc

*instrumentation and software for research*

# K-LIMBIC

SOF-740

INSTALLATATION & CONFIGURATION MANUAL

**DOC-179**
**Rev. 1.1**



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Step
1
# Introduction

**'K-Limbic'** is a PC based system for the control of animal behavioural experiments. Designed in collaboration with several international pharmaceutical companies K-Limbic has developed into a versatile, flexible and powerful tool for performing any behavioural experiment.

The major component in the K-Limbic system is the user interface, this interface provides all the tools required to develop, edit and run your operant experiments. K-Limbic provides a protocol manager to generate, edit and share experimental protocols, a database manager to create databases with subject details and a run manager to run experiments, the K-Limbic development tools are all contained within one integrated development environment.

This document describes the installation and hardware configuration of the K-Limbic application.

Please read these instructions before commencing the installation/configuration process. If K-Limbic is being installed on a machine running an “Enterprise” version of Windows you will need to have Administrator rights enabled on your PC, contact your local IT support department for this.

A new installation of K-Limbic requires a small amount of configuration, the installer of the system should perform all steps outlined in this document to ensure that the application can be used, this procedure should take approximately 30 minutes. Alternatively, Conclusive are happy to perform the configuration for you, either by visiting your site, or remotely via the internet, (remote access software is required), contact Conclusive to discuss your requirements.

## Supported Hardware

K-Limbic supports the range of interface hardware from Med Associates Inc of Georgia, Vermont, USA.

The Med Associates hardware is a combination of components :-

- A special purpose PCI timer/digital I/O card, (DG704)
- Any of the SG range of interface chassis
- 1 or more digital interface cards from the Med Associates range
- Additional purpose specific hardware, (experiment specific).

The Med Associates range of interface hardware is capable of controlling a wide variety of operant equipment; typical examples would be low-voltage lights, retractable levers, pellet dispensers, solenoid valves and switch inputs. However, interfaces can be provided to control a limitless range of customer specific items, please contact Conclusive if you have a requirement for an unusual piece of equipment.

For a full description of the Med Associates interface hardware, please refer to Med Associates Inc.

Step
2

# Install Hardware & Drivers

If K-Limbic is being installed on a machine previously used with Med PC, then there is no hardware installation required, K-Limbic will be able to utilise the existing drivers on the machine.

If K-Limbic is being installed on a machine not previously used with Med PC, then the user will need to install the DG704 PCI card and drivers. Refer to the documentation provided with the Med Associates DG704 PCI card for details on the installation process.

*Note: K-Limbic has been developed and tested using version 1.13.7 of the DG704 driver. K-Limbic is not guaranteed to operate with older versions of the driver. If you have an older version of the driver than this please use the Med Driver CD to install a newer version of the DG704 driver.*

Step
3

# Install The Security Key

## DO NOT PLUG THE USB KEY INTO THE USB PORT OF YOUR COMPUTER UNTIL TOLD TO DO SO!

K-Limbic requires the presence of a USB security key to operate. The security key was sent as a part of the K-Limbic package.

If you are trying K-Limbic either because someone passed you the K-Limbic installation disk, or you requested an evaluation version of K-Limbic you will not have a security key, you can still use K-Limbic, (for a limited period) without the security key, however you will still have to install the software for the key or K-Limbic will not run. Once the driver files are installed the security key will install automatically when it is plugged into a USB port on the computer.

The K-Limbic installation CD contains a “USB Dongle” folder, run the “Install.exe” file in this folder to install the security key driver files.

The installation starts and presents the “Security Key Installation” window.
Select the “USB Dongle” option and then click on “OK”.
Confirm the action by clicking on the ”OK” button in the “Install” window.
Click on the “OK” button when the installation is complete.

When the install displays a message saying that it is finished, attach the dongle. The windows “New Hardware Found” wizard should start and ask to install the drivers for a USB Security Protection device. Accept all the defaults and let the wizard finish.

If the dongle was inadvertently attached before running the driver install it will be necessary to uninstall and then reinstall the drivers. Follow the instructions below: -

- Remove all dongles from the system
- Run “Install.exe”. When the first screen appears, make sure that the “Uninstall” check box is selected. Click “OK”.
- When the uninstall displays a message that it is finished, reboot the computer
- Make sure that your USB dongle is NOT attached.
- Run “Install.exe” again to install the drivers

**Evaluation**
K-Limbic may be run without the security key, in the absence of the key, K-Limbic runs in an “Evaluation” mode.

The evaluation mode is fully functional all facilities of K-Limbic are available.

The evaluation mode is subject to a limit on the number of sessions that may be run, i.e. the number of times the “Load Session” menu option is used. The limit is 200 sessions. After the 200 sessions have been used the “Load Session” menu option is disabled and the system can no longer be used for running experiments, (although all other facilities of K-Limbic remain active).

If the evaluation was successful and you wish to buy a license to run K-Limbic simply contact your vendor, who will supply a security key. Plug the security key into your computer, accept the defaults in the windows “New Hardware Found” wizard and the next time you run K-Limbic the “Load Session” menu option will be enabled.

**Take care of your security key, lost keys cannot be replaced!**

Step
4

# Install The K-Limbic Application

Insert the K-Limbic installation CD into the drive. the installation package should start automatically, if the install application does not automatically start, then browse the files on the CD and double click on the “setup.exe” file.

The installer application will start and present the main window of the InstallShield Wizard for the “K-Limbic Operant Control System”.

Click on “Next”
Accept the license agreement and click on “Next”
Enter the User name and Organization fields, ensure the application is installed for all users and click on “Next”
Use the default destination folder, (“C:\Program Files\Conclusive\Klimbic”) and click on “Next”
Click on “Install”

The Install Shield application has two errors, both of which can be ignored, the first appears as…
Internal Error 25001.1615 (Click on the “OK” button)
The second appears as …
Internal Error 25001.6 (Click on the “OK”button).

The rest of the installation proceeds without problem.

When all files have been copied, click on “Finish”.

This completes the installation process for K-Limbic.

*Note: Conclusive extend their apologies for the error messages present on the installation CD, these are caused by factors beyond our control, please just ignore them.*

Step
5
# Configure K-Limbic

The settings outlined in this section will produce a “minimum” configuration of K-Limbic, i.e. a K-Limbic system installed on a stand-alone PC with one user and one user group. Everyone who uses the system will need to log in to K-Limbic under the same user account and will therefore have access to all files held within the system.

It is possible to configure K-Limbic in a more complex fashion, i.e. with multiple users and (possibly), multiple user groups, (refer to the User guide for a definition of these terms). It is also possible to configure K-Limbic so that it can be accessed using central network drives for storage of configuration files, this allows a developer to create protocols and test suites using his desktop machine, then to build installed test suites on the lab machine using the details stored on the network drive[++]. Using multiple users within a K-Limbic system is considered a more secure configuration as user details are hidden beneath password protected accounts. The first stage however is to configure K-Limbic as a stand-alone application, then if a more complex configuration is required refer to the “Guide For Administrators” manual for details of how to create new user accounts and user groups.

++ *Using centrally stored configuration files is now a rather “old-fashioned” method of providing remote access, it is now possible for the user to arrange for the lab machine to grant remote access to the desktop machine over the network, or even the internet. This way the user can run applications on the lab machine from his desktop machine or any other machine, anywhere!*

**Start K-Limbic**

The first time K-Limbic is started after installation, it searches for settings in the Windows registry, the registry settings have been pre-loaded by the installation program and K-Limbic should launch and find the default values, however…

…the registry settings are user-specific, i.e. a separate set of values is maintained for each “user” of the machine, (a “user” here refers to the network account used to log-on to the machine). If K-Limbic was installed by someone else, or this is the first time you are accessing an existing installation of K-Limbic the registry settings will not be accessible and a warning message will appear…

“Warning
The initialisation settings for K-Limbic on this computer are invalid
Please refer to the K-Limbic system administrator before running this application
(The initialisation settings dialog will be presented next)”

This is perfectly normal operation (and nothing to worry about)…

Click on the OK button.

The “K-Limbic System Configuration” window appears.

A set of default registry settings will be created, if the default location for the installation was chosen the default settings are suitable for use. The settings define the location of the “System” Folder, (the folder where the Klimbic.exe file is located), the “Local” folder, where several files appropriate for the local computer are located and the “Import” folder, which is the default location for imported/exported files.

The installation provides the following root location for these folders:
C:\Program Files\Conclusive\Klimbic

Therefore the default values for the K-Limbic folders are:

| | |
|---|---|
| System Folder: | C:\Program Files\Conclusive\Klimbic\System |
| Local Folder: | C:\Program Files\Conclusive\Klimbic\Local |
| Import Folder: | C:\Program Files\Conclusive\Klimbic\Import |

If an alternative location to the default was specified then you will need to browse to the appropriate locations using each of the three buttons.

If new locations have been specified click on the “Apply” button.

If the settings are OK, the “Apply” button will be disabled and the “Status” of the four files in the lower section of the window will be “OK”.

Select File / Exit from the menu.

Ignore the warning messages.

***A Note on Registry Settings***
*The registry settings are stored in the “Current User” area of the registry, therefore they are local to whichever user logged onto Windows. K-Limbic presents the above warning whenever it is started from a user who has not previously used K-Limbic. Simply follow the instructions above each time a new user starts K-Limbic for the first time.*

K-Limbic presents the K-Limbic User Login window.

The configuration files installed by the installation process identify a single K-Limbic user, titled “Operant”, this user has a default password of “klimbic”, (all lower case). The “Operant” user will be presented in the User List, simply type the password into the password box and click on the “Log In” button.

K-Limbic now presents the K-Limbic main screen…

**Configure The Interfaces**
The first item to configure is the interface hardware connected to the computer. The most likely scenario is that you will have a rack populated with either DIG716 or DIG716B cards. The installation program places two hardware configuration files in the "Import" folder of the system, these files can be used as a quick method of configuring the interfaces.

From the K-Limbic Main Menu select the options
Configure / Hardware…
This will present the "Configure Hardware (Med Associates)" window.

By default the configured hardware consists of 16 DIG716B cards in a single rack with each card controlling a single animal chamber. The rack details will contain a list of 16 DIG716B cards,

**If you have DIG716B SmartCtrl cards…**
If this arrangement corresponds to your hardware then everything is OK. If you have DIG716B cards, but have fewer than 16 chambers then delete the unwanted entries.

**If you have DIG716 SmartCtrl cards…**
Click on the "Import" button, this presents the "Import Hardware Configuration" window,
Click on the "Select Source" button to present a list of hardware configuration files, select the file "DIG716.rgr" and click on the "Open" button.
In the "Import Hardware Configuration" window, click on "Import Configuration" and then click on the "OK" button.

The hardware configuration now consists of 16 DIG716 cards in a single rack, with each card controlling a single chamber. If this arrangement corresponds to your hardware then everything is OK. If you have DIG716 cards, but have fewer than 16 then delete the entries for empty slots.

**If you do not have SmartCtrl cards…**
If, for instance, your hardware consists of Superport cards, then you need to edit the hardware configuration manually. Select the entry for rack 1, slot 1, and click on the "Edit" button. In the "Edit Card Details" window select the "Card Type" and "Chamber" appropriate for the card in rack 1, slot 1 and click on "OK". Repeat this process for all cards in your system, delete entries for empty slots.

When your hardware list is complete, click on the "OK" button, this closes the "Configure Hardware (Med Associates)" window and saves the configuration. You will not need to repeat this process again unless you change your interface hardware, e.g. add more cards to the rack.

**Define The Chamber Resources**
The chamber resources are the items of stimulus/response equipment within each chamber. K-Limbic must be configured so that it has information on which item is present on which channel of the interface cards. K-Limbic maintains a list of resource items such "Light <1>", "Light <2>, "Lever Control <1>" etc, each resource may also be given a user defined name, e.g. "House Light", "Magazine Light", "Left Lever Control" etc, making the list more readable.

Before an experiment is run, K-Limbic examines each resource listed in the protocol file and checks its configured resource list to see which channel controls that resource, if a protocol uses a resource that is not present in the configured resource list K-Limbic will not know how to control the resource and a warning message will appear. *Don't panic though it's not as bad as it sounds!*

The resources present in a chamber may be connected in any sequence, but the sequence used must be the same for all chambers in a system.

The contents of the "Chamber Resources" list will depend entirely on the system that you are using, if you are in any doubt about which items you have in your system please contact Conclusive Marketing for advice, if you have requested a specific protocol when you purchased K-Limbic refer to the protocol documentation for a list of the resources that you require for that protocol and example resource lists.

You can manually edit the default list until the resources in your system are configured or you can import a pre-configured resource list. The resource configuration process is simplified by the use of "stock" resource configuration files, these contain example configurations that you can import and adjust if required. Alternatively, contact Conclusive Marketing Ltd with details of your system, we will produce a configuration file for you, email it to you and you can import it into your system.

**Open the resource configuration window…**
From the K-Limbic Main Menu select the options
Configure / Define Chamber…
This will present the "Display Chamber Resources" window.

The default resource list represents an operant chamber with:
- Two retractable levers
- Two cue lights, (lights above the levers)
- One house light
- One magazine light, (pellet receptacle light)
- One pellet dispenser
- One tone generator, (Sonalert)
- One shock control, (foot shock trigger)
- Two lever press sensors
- One magazine sensor, (pellet receptacle sensor)

Use the default list as a starting point if your chambers contain items very close to those shown in the list above. You will probably need to edit the values accordingly, (see later).

If your chambers are nothing like the default list you can either:
- Edit the list manually or
- Import a more suitable list, (e.g. a list for a five choice chamber)

**To import a resource list…**
Click on the "Import Resources…" button, this will present the "Import Resource List" window.
Click on the "Select Source" button, then select the suitable list from the options given, e.g. "FiveChoiceList.asn" and then click on the "Open button.
This opens the resource list file, but it is not yet imported.
Click on the "Import Resource List" button to import the list and then click on the "OK" button.

The list of resources in the "Display Chamber Resources" window updates to the values held in the new list.

**To edit the Resource List values…**
The "Display Chamber Resources" window provides facilities for editing the resource list. The user can add new resources to the list, delete resources from the list and edit the values of existing resources.

To edit the settings of any of the resources, simply select the resource in the list and click on the “Edit” button, this presents the “Configure Resource” window.

Each resource has the following settings:

**Class**

The resource class specifies whether K-Limbic controls the state of the resource, or if the state of the resource is reported to K-Limbic.

K-Limbic controls stimulus items such as lights, lever positions, pellet dispensers etc by assigning a “Driver” channel to them. Any stimulus item should be assigned the class “Driver”. The exception to this rule is the niche lights in a five choice or nine choice chamber, these lights are of the class “Varilux Driver”, (for compatibility with other versions of K-Limbic).

K-Limbic senses response items such as head entry detectors, lever press sensors etc, by assigning a “Sensor” channel to them. Any response item should be assigned the class “Sensor”.

**Channel**

The channel value corresponds to the channel number on the inter-connection panel into which the item is plugged. These are normally 1-16 for drivers, (outputs) and 1-8 for sensors (inputs).

**Resource Type**

K-Limbic defines a range of items that are available for control, the range is presented in the “Resource Type” list. Select the type of resource that is required.

**Index**

The Index value is used to differentiate between items of the same type, e.g. in a chamber with two retractable levers the first lever should be “Lever Control <1>” and the second lever should be “Lever Control <2>”.

**User Defined Name**

This can be any text value, setting this value appropriately results in a resource list that is more intuitive.

The “List Entry” section simply presents the title that the resource will have in the full resource list.

*Note: In a protocol file resources are represented as a resource type, index and user defined name. K-Limbic resolves the channel reference by checking that the configured resource list contains one entry of each resource type and index, the user defined name in the protocol and the user defined name in the resource list do not need to be the same.*

Step
6
# What To Do Next

K-Limbic is now installed and configured for your hardware. You are now ready to prepare your system to run your experiments. K-Limbic is a flexible system and there are a number of options that can be used to prepare your system for use.

Option 1: Import a ready-to-use “Installed Test Suite”
Comment: This is the quickest way to get up and running, however you will need a test suite that is suitable for your purposes. Conclusive are happy to supply installed test suites, there are a number of these on the installation CD, if none are suitable for your needs, contact Conclusive with your requirements and we will supply a custom test suite for you.

Option 2: Import the protocol files that you require, generate your own Development Test Suites, build your own “Installed Test Suites”.
Comment: Probably the best way to proceed, you will be able to produce a customised test suite for your system and be able to organise your sessions in your preferred fashion. Refer to section 3 of the “K-Limbic Operators Manual” which provides a tutorial guide with full instructions on this process.

Option 3: Start from scratch, write your own protocols, and create your own test suites.
Comment: Recommended for experienced users only… probably not a good place to start.