

HAMILTON®

VENUS

Software Training



Hamilton Sales and Service UK Ltd.

The ML STAR Software VENUS

FOR MORE THAN 50 YEARS,
THE NAME HAMILTON HAS BEEN...

...associated worldwide with uncompromising quality in precision fluid-measuring products. Because of the dedicated nature of the products we supply, it is important to us that our customers have the opportunity to become fully trained on the operation of our products. Our software training covers the needs of both laboratory operators and assay programmers.

TAKE THE MAXIMUM ADVANTAGE OF YOUR INSTRUMENT BY:

- Ensuring the safety of your staff and equipment
- Enabling your staff to adapt the instrument to new protocols or workflows
- Increasing efficiency through optimisation of processes
- Reducing downtime due to erroneous operation

WHAT WE OFFER

- Training PCs for each trainee with Venus installed*
- Small group size (limited to 6) with 2 trainers
- Mix of theory & practical exercises, including hands-on sessions on an ML STAR system
- Availability of trainers for responding to questions after the training
- All training materials and files generated during the training provided for later reference
- Training confirmation (Letter of Attendance) upon successful completion of a training course
- All training courses are run in English

**We are looking forward to welcoming you to one of our trainings
and to sharing our knowledge with you!**



Software Trainings

VENUS

BEGINNER TO
ADVANCED



BASIC TRAINING *

(On-Site at Hamilton/virtual, 2 days)

The course takes you through the key concepts you need to learn in order to programme using Venus. It is ideal for anyone who would like to understand, optimise or create their own methods. We would recommend you have some experience with either running or seeing the STAR in action before attending the course. The training consists of a mixture of presentations and exercises framed around building an example assay. Two hands-on exercises are included on our demo instruments (or videos for the online version) during the course. The topics covered are:

- Hardware and Software Overview
- System Configuration
- Action Editor
- Creating a Deck Layout
- Sequences
- Method Editor
- Programming Pipetting
- Import, Export, Copy
- Labware Definition
- Basic Programming Concepts

ADVANCED TRAINING LIQUID HANDLING **

(On-site at Hamilton, 2 days)

The liquid handling course includes one day focused on the basics of liquid handling including a presentation on all the features within Venus you can use to optimise your pipetting. There is also a hands-on session using the LVK to optimise liquid classes for various types of liquids. Two other topics relevant to liquid handling are introduced on day 2 so the course looks like:

- Liquid handling optimisation (Day 1)
- Advanced Labware definition (Day 2)
- Error handling (Day 2)

* Usually our training courses are held at our offices in Birmingham (Coleshill) and includes a meal out on the first night. Information regarding local hotels can be provided on request. Virtual trainings are also available but please note videos replace the hands-on sessions.

** Requirement for Advanced Training: Participation in a VENUS Basic Training course along with experience gained by applying the basic course knowledge (practice and deepen your basic knowledge first). Please note the third day is for completing the exercises and discussion of your own sample tracking requirements.

ADVANCED TRAINING DATA HANDLING **

(On-Site only, 3 days)

The data handling course focuses on the use of worklists combined with reading sample barcodes to track your samples with the end result being an output file summarising your sample transfers. Other advanced topics covered include:

- Plate Transports
- Advanced Programming Concepts
- Submethods and submethod libraries
- Custom dialogs
- File Handling
- Mapping Files
- Barcode Handling

Microlab STAR

MULTIPLE MODULAR
BASE PLATFORMS



Customized TRAINING

If desired, we can work with you to design customised training, depending on your individual needs.

Please note that the completion of a VENUS Basic Training course is required for participation in customized training. Please contact us to receive further information.

Software Training REGISTRATION

The fee for trainings in Birmingham include lunch, drinks and snacks and excludes travel and accomodation expenses.

We also offer VENUS trainings in a virtual* format.

For dates, availability and registration of our regular On-Site and Online Trainings, please scan the **QR code** or **see here**.

Note: You can cancel a course four weeks before the trainings without cancellation fees.



CONFIRMATION

After booking, a detailed confirmation for the training session will be sent via email. If desired, Hamilton can support you with accommodation arrangements. Please bear in mind that a sufficient number of participants must be confirmed for the training; otherwise, Hamilton is permitted to cancel or postpone the training course. The registered participants will be informed as soon as possible.

*Requirements for the participation in an Online-Training (**see also here**):

- Compatible computer with a reliable internet connection via cable, headset and webcam
- Access via Zoom
- Each attendee requires a computer with an appropriate version of Venus installed
- Language and literacy in English
- If possible, use more than one screen

CONTACT

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Software Trainings

APPENDIX

COURSE CONTENTS IN DETAIL

BASIC TRAINING

- **Hardware and Software Overview**
Introduction to the most common pieces of hardware found on the STAR line including the channels, MPHs, CO-RE grips, iSWAP and autoloader. Overview of all the various editors that make up Venus such as Method Editor, Action Editor, Labware Editor, Run Control *etc.* and how they link up.
- **System Configuration**
System Configuration Editor is used to configure the VENUS software to a specific instrument setup and topics covered include System Settings, Error Settings, Step Selection and instrument configuration under the ML_STAR settings.
- **Action Editor**
Shows how you can use the graphically based Action Editor to create a planning framework for your method. Goes into detail of how you can customise an action step and how the schedule view in Run Control can be used to visualise your plan.
- **Creating a Deck Layout**
Attendees will learn how to find the variety of labware contained within Venus including carriers, plates, tips, troughs *etc.* and how to use them to build the deck layout that will be required for the example assay.
- **Sequences**
The key concept for learning how to programme with Venus. Takes you through what is a sequence and what are they used for (Pipetting, transports, tip handling). Goes into further detail by introducing sequence markers for the start and end of a sequence. Finally shows the attendees the various tools for creating a sequence.
- **Method Editor**
Guides you through how to customise the views of the method editor, how to start to add steps to your method, add groups to improve the readability of your code and how to add libraries to your toolbox to vastly increase the number of commands you have available.
- **Programming Pipetting**
Another key presentation that starts to explain how to programme your pipetting by focusing on the Easy Aspirate and Dispense steps. Explains the two dispense modes, surface and jet along with the various options for aspirate or dispense position which includes two modes of liquid level detection (cLLD and pLLD) or using a fixed height. Finishes off with a comparison between the different types of pipetting steps available which are Smart, Easy and Single steps. At this stage the attendees move onto the demo instrument to create and test some simple pipetting routines using both Easy and Smart steps for the channels and the 96head.
- **Import, Export, Copy**
Explains how package files can be created using the export function to either create backups or be used to transfer a method onto another computer via the import function. Takes the attendees through how to copy a method, a key skill for version controlling your methods.
- **Labware Definition**
Goes into significant detail how to define the two main components of labware definitions users would interact with, containers and racks. Introduction into how to teach labware after it has been created. Attendees then move onto the demo instruments to create a new

labware definition and learn how to programme simple plate transports with this new labware definition.

- **Basic programming concepts**
Attendees learn how to add variability to their methods through the use of variables, If statements, loops including an in depth look into how a sequence controlled loop works, user inputs and outputs and timers. Following this last presentation, the rest of the course is then spent on exercises based on these topics.

ADVANCED TRAINING LIQUID HANDLING

The course lasts 2 days and day 1 is focused on liquid handling and day 2 covers advanced labware definition and error handling. The topics covered are as follows

- **Liquid handling**
This large subject is broken down into the following subjects
 - Liquid properties – We go through all the important physical properties of a liquid that affects its pipetting performance *e.g.* Density, surface tension *etc.*
 - Pipetting technology – Goes into more depth on how the air displacement technology works on the STAR
 - Liquid handling methodology – Introduces the different dispense modes, surface and jet, and then goes on to explain liquid classes and all their various parameters you can modify using videos to show the effects of these settings. Finally shows some examples of setting up pipetting steps in Venus using Single, Easy and SMART steps.
 - Liquid handling best practices – Some recommendations for common pipetting scenarios such as low volume, multi-dispensing and serial dilution
 - Monitoring liquid transfers – moves on to the advanced features of the STAR to monitor liquid transfers which are MAD (Monitored Air Displacement) and TADM (Total Aspiration and Dispense Monitoring). Goes through some real example pressure curves, why they can vary significantly and how to activate and use these features
 - Measure liquid transfers – The final section shows several different approaches to measuring liquid transfers and discusses the concepts of Trueness, Precision and Accuracy.There then follows a hands-on session using the LVK

(Liquid Verification Kit) to put everything you have learnt into practice to create or modify liquid classes to handle a range of liquids with differing physical properties.

- **Advanced Labware Definition**
Again, this is split into three sections as follows
 - Templates – Explains the basics of a carrier definition, how to use the 3D Labware Assistant to make template files and finishes with an in depth look at the vacuum station (BVS and CVS) labware definition.
 - Racks – covers standard plate definitions but shows how to create lid definitions, calculate stack heights and definitions for tilted plates (*e.g.* on a tilt module). Looks into some of the more advanced settings in the Regular Rectangular Rack definition and how sample carrier definitions are set up. Moves onto Irregular Rectangular Rack definitions which are used for non-standard labware, highlighted through an example.
 - Containers – Demonstrates how you can get back the measured volume in a container following a pipetting step using cLLD.
 - Exercises – the exercises for the above are all done on the demo instrument.
- **Error handling**
The final section covers the following topics
 - Pre-release testing – What testing needs to be performed before you can release your method to be run routinely.
 - Error handling in runtime – Explains what happens during runtime based on how the error handling has been configured.
 - Errors in runtime operator experience – Examples of real runtime errors and how to handle them.
 - Automatic error handling in steps – how to set up automatic error handling and discussion of the Exclude option.
 - Using the Error Handling by the User Step – moves onto advanced error handling introducing the Error Handling by the User step. Demonstrates its use with some examples.
 - Error reporting – looks into how errors are reported in mapping files and how to control what errors are seen in mapping files.
 - Exercises – again the exercises are performed on our demo systems to see real runtime errors and use the strategies learnt to deal with them.

Software Trainings

APPENDIX

COURSE CONTENTS

IN DETAIL

ADVANCED TRAINING

DATA HANDLING

The course lasts three days with days 1-2 taken up with covering all the topics below and the final day is used for the main cherrypicking exercise. There is also a normalisation exercise available that can be tackled if time permits. The topics covered by the course are as follows

- **Transports**
Takes attendees through all the parameters for both Easy CO-RE grip and iSWAP transports. Finishes with some information on how to teach an off-deck position (e.g 3rd party reader or incubator) using the iSWAP. Includes a hands-on session on our demo instruments to use these concepts to transport a plate using the CO-RE grips and iSWAP.
- **Advanced programming concepts**
Some recap from basic training but goes into more detail regarding assigning variables and introduces the important concept of variable scope. Other topics covered include use of return values and recap on sequence controlled loops. The final topic is an in depth look into arrays, how to create them, various use cases including how to use an array of volumes for pipetting and retrieving information from an array.
- **Submethods**
Shows how to create them, what they are used for, how to pass parameters into and out from them and how to create a return value for them. Introduces submethod libraries and compares them to submethods.

- **User Dialogs**
Starts with a brief recap of User Inputs and User Outputs from basic training but the main focus is on Custom Dialogs. We take a close look at some of the input controls such as check box, radio buttons, path input, numerical input and text input. Advanced options such as how to bind a variable to a control, events (e.g selecting a check box reveals another input control) and using expressions to limit what can be entered into a text input control.
- **File Handling**
Demonstrates the use of file handling commands in relation to reading worklists. Includes an example of how to use the information contained within the worklist to create a sequence, an array of volumes and how to use them in a method to generate the pipetting specified in the worklist.
- **Mapping File**
Mapping files allow you to create a report of a pipetting action based on information automatically stored in the sample tracking database during a run. We show attendees how to create them, configure them and various use cases.
- **Barcode Handling**
The last presentation breaks down this large subject into the following topics
 - Why samples are barcoded
 - Summary of our approach for dealing with barcodes and worklists

- Using the built in Load and Match SMART step functions including an exercise on our demo instrument
- A summary of the programming tools available that are used in the programming approach to handling barcodes and worklists
- How to use these tools in a worked example where the worklist is read into a series of arrays, barcodes are read on the deck, the barcodes are then retrieved from the sample tracking database and put into a series of arrays, the worklist and read barcode deck arrays are compared to check they match and finishes with how to use these arrays to create the pipetting steps required. There are also some tips on how to get this to work in simulation.

REQUIREMENTS

- Windows-based computer skills
- For Advanced Training: completion of Basic Training and sufficient practical experience
- Language skills in English
English literacy (presentation slides are written in English)

IMPORTANT NOTICE

The content of these training programs is subject to change without notice. Every effort has been made to ensure the accuracy of this brochure's contents. Should any errors be detected, Hamilton Sales and Service UK Ltd would greatly appreciate being informed of them. The above notwithstanding, Hamilton Sales and Service UK Ltd. can assume no responsibility for any errors in this brochure, or for changes to training dates or the consequences thereof.



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