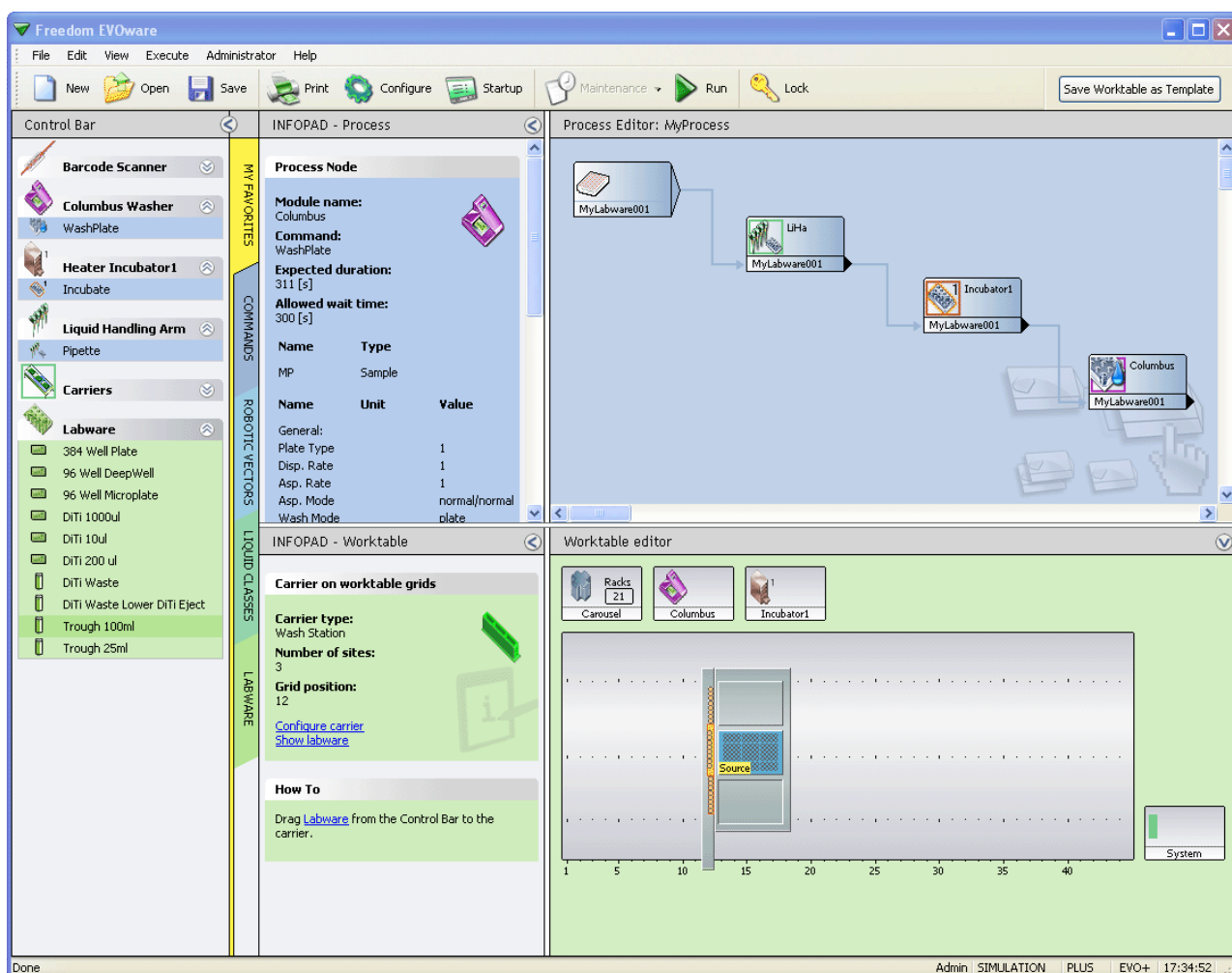


Getting Started Guide

Freedom EVOware[®] Standard Freedom EVOware[®] Plus



The screenshot displays the Freedom EVOware software interface, which is divided into several main sections:

- Control Bar:** Contains icons for File, Edit, View, Execute, Administrator, and Help. Below these are buttons for New, Open, Save, Print, Configure, Startup, Maintenance, Run, and Lock. A "Save Worktable as Template" button is also present.
- Control Bar (Left):** A vertical sidebar with categories: MY FAVORITES (Barcode Scanner, Columbus Washer, WashPlate, Heater Incubator1, Incubate), COMMANDS (Liquid Handling Arm, Pipette), ROBOTIC VECTORS (Carriers), LIQUID CLASSES (Labware), and LABWARE (384 Well Plate, 96 Well DeepWell, 96 Well Microplate, DITI 1000ul, DITI 10ul, DITI 200 ul, DITI Waste, DITI Waste Lower DITI Eject, Trough 100ml, Trough 25ml).
- INFOPAD - Process:** Displays process node details:
 - Process Node
 - Module name: Columbus
 - Command: WashPlate
 - Expected duration: 311 [s]
 - Allowed wait time: 300 [s]
 - Name: MP, Type: Sample
 - General properties table:

Name	Unit	Value
Plate Type		1
Disp. Rate		1
Asp. Rate		1
Asp. Mode		normal/normal
Wash Mode	plate	
- Process Editor: MyProcess:** A flowchart showing the process sequence: MyLabware001 → LHa → MyLabware001 → Incubator1 → MyLabware001 → Columbus → MyLabware001.
- INFOPAD - Worktable:** Displays worktable configuration:
 - Carrier on worktable grids
 - Carrier type: Wash Station
 - Number of sites: 3
 - Grid position: 12
 - Buttons: [Configure carrier](#), [Show labware](#)
 - How To: Drag Labware from the Control Bar to the carrier.
- Worktable editor:** A grid-based editor showing a "Source" on a grid. Above the grid are icons for Racks (21), Carousel, Columbus, and Incubator1. A "System" status indicator is at the bottom right.

The status bar at the bottom indicates: Admin | SIMULATION | PLUS | EVO+ | 17:34:52

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3	7	2020-08-21	Update for Freedom EVOware V2.8 SP4	

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G1 About This Manual

Purpose of This Manual	<p>The Freedom EVOware Getting Started Guide describes how to install and set up the Freedom EVOware software.</p> <p>Please refer instead to the Freedom EVOware Software Manual (Doc ID 393172) for detailed information on using Freedom EVOware, writing pipetting scripts and/or processes etc. The Freedom EVOware Software Manual is provided as a PDF file on the Freedom EVOware installation CD. The Freedom EVOware Software Manual contains all of the information which is included in the Getting Started Guide. See also G1.5 “Context-Sensitive Help System”, G1-5.</p>
Cross References	<p>The Getting Started Guide has a number of cross references to the Freedom EVOware Software Manual:</p> <ul style="list-style-type: none"> ◆ Cross-references within this manual are preceded by a “G”, e.g. G4.2 “Installing Freedom EVOware”, G4-2. ◆ All other cross-references refer to chapters in the Freedom EVOware Software Manual, Document ID 393172, e.g. 13.1 “Overview of Script Commands”, 2 13-1. <p>Note: All cross-references start with the chapter or section number and end with the page number.</p> <p>Note: The context-sensitive help file for Freedom EVOware (Extended Device Support) uses the same chapter and section numbers as the Freedom EVOware Software Manual, Document ID 393172. You can open the help file with the button in Start > All Programs > EVOware as soon as the software has been installed. The manual and help file for Freedom EVOware (Limited Device Support) have less chapters and different chapter numbers.</p> <p>Note: Some of the information in the Getting Started Guide refers to Freedom EVOware features which are only intended for research applications. See G3.4 “Supported Pipetting Instruments and Tecan Options”, G3-5 and G3.2 “Intended Use of the Freedom EVOware Software”, G3-3.</p>
Target Group	<p>This manual is intended for application specialists who need to install the Freedom EVOware software.</p>
For Your Safety	<p>Please read this manual carefully before installing and running the Freedom EVOware software, in particular Chapter G2, “Safety”.</p>
Scope	<p>This manual applies to Freedom EVOware Standard and Freedom EVOware Plus. For additional information on the Freedom EVOware software, see G3.4 “Supported Pipetting Instruments and Tecan Options”, G3-5.</p>

G1.1 Conventions Used in This Manual

The following list provides an overview of the conventions as used throughout this manual:

- | | |
|-----------------------|---|
| Names | <ul style="list-style-type: none">◆ Freedom EVO: To facilitate reading, the term “pipetting instrument” stands for the Freedom EVO series of pipetting instruments. |
| User Interface | <ul style="list-style-type: none">◆ Names of screens (menus, windows, dialog boxes, message boxes) are printed in italic, e.g.: “The <i>Select Components</i> window appears.”◆ Menus and command sequences are printed in bold type and connected with a > sign, e.g., “Start the function with Options > Te-MO > Wash Unit.”◆ Names of controls in dialog boxes, windows or message boxes (command buttons, checkboxes, option buttons etc.) are printed in bold type, e.g. “Select the Automatic checkbox.”◆ Directory and file names are printed as follows:<ul style="list-style-type: none">– Path and file names are quoted directly, e.g.: C:\Program Files (x86)\Tecan\EVOware\database– or a placeholder is given for the directory, e.g: <install_path>, which stands for the “real” directory name (the default installation path for Freedom EVOware is C:\Program Files (x86)\Tecan\EVOware. Also see the next point.◆ Placeholders (for file names, numbers dates etc.) are set in angle brackets < >, e.g.: TeSonic_<serial_number>_<date>_<time>.any.◆ Cross references appear as follows, e.g: “Refer to section 1.1.1,  1-1”<ul style="list-style-type: none">– 1.1.1 refers to the corresponding section number.– The symbol  denotes the page number.– 1-1 stands for the chapter number followed by the page number. |

G1.2 Reference Documents

This section provides a list of documents which are needed or may be useful in connection with the Freedom EVOware software. They either concern the pipetting instrument itself or the optional devices.

G1.2.1 Related Documentation and Software

The following Tecan documentation provides additional information which can be useful when using this manual:

What Does the Doc. ID Tell You?

The Doc. IDs listed below are root numbers. Therefore, they do not contain information about the language, document version or the medium (data storage medium, hardcopy, downloadable file, etc.) of the document.

Check the scope of the corresponding document to make sure that you are in possession of the correct version.

Note: *The Doc. ID does not represent ordering information. For orders refer to the number on the binder, CD casing, etc.*

Operating and Software Manuals

- ◆ Freedom EVOware Software Manual (Doc ID 393172 and 393804)
- ◆ Freedom EVOware Sample Oriented Add-On (Doc ID 394284 and 394285)
- ◆ Freedom EVOware Sample Tracking Add-On (Doc ID 393933)
- ◆ Hit-Picking Wizard for Freedom EVOware (Doc ID 395128)
- ◆ Normalization Software for Freedom EVOware (Doc ID 394288)
- ◆ Freedom EVOware Runtime Controller Manual (Doc ID 394329) ¹⁾
- ◆ Freedom EVO Operating Manual (Doc ID 392886)
- ◆ Carousel Operating Manual (Doc ID 391209)
- ◆ Microplate Auto Sealer Operating Manual (Doc ID 391749)
- ◆ Te-Flow Operating Manual (Doc ID 391584)
- ◆ Te-MagS Operating Manual Doc ID 391237)
- ◆ Te-MO Operating Manual (Doc ID 391733)
- ◆ Te-MO 384 Multichannel Pipetting Option Operating Manual (Doc ID 391352)
- ◆ Te-MO 384 Pipetting Head Operating Manual (Doc ID 391358)
- ◆ Te-MO 384 WRS Operating Manual (Doc ID 391768)
- ◆ Te-MO 3/3 96 Operating Manual Multi-pipetting Option (Doc ID 392553)
- ◆ Te-MO 3/3 384 Operating Manual Multi-pipetting Option (Doc ID 392679)
- ◆ Te-MO Active Positioning Carrier Operating Instructions (Doc ID 391864)
- ◆ Te-Shake Operating Manual (Doc ID 391496)
- ◆ Te-Stack Operating Manual (Doc ID 391862)
- ◆ Te-VacS Operating Manual (Doc ID 391236)
- ◆ WRC Tower Operating Manual (Doc ID 391865)
- ◆ Columbus Washer (Doc ID 30008658)
- ◆ 96PW Washer (Doc ID 30001495)
- ◆ PW384 Washer (Doc ID 30003394)
- ◆ Magellan Data Reduction Software (Doc ID 30001495)
- ◆ Magellan Data Reduction Software, two manuals (Doc ID I 117519)

¹⁾ *This manual is intended for operators of the pipetting instrument. The same information is also contained in the Freedom EVOware Software Manual.*

- ◆ GENios, GENios FL, GENios plus (DocID 1 112904)
- ◆ GENios Pro (DocID 1 112935)
- ◆ Safire Microplate Reader (Doc ID I 112913)
- ◆ SpectraFluor Microplate Reader (Doc ID I 112903)
- ◆ SpectraFluor+ Microplate Reader (Doc ID I 112905)
- ◆ Sunrise Microplate Reader (Doc ID I 137301 and 1 137302)
- ◆ Ultra Evolution Microplate Reader (Doc ID I 112929)
- ◆ Cellernity system Operating Manual (DocID 394070)

Firmware Manuals

- ◆ PosID-2 Command Set (Doc ID 391141)
- ◆ Te-Flow Commands (Doc ID 391845)
- ◆ Te-MagS Command Set (DocID 391294)
- ◆ Te-VacS Command Set SPE (DocID 3912216)
- ◆ Te-Shake ORBI Command Set (DocID 391543)
- ◆ Te-Stack Command Set (DocID 392118)

The following Tecan documentation describes the **Setup & Service software**, which is one of the components of the Tecan Instrument Software:

- ◆ Software Manual, Instrument Software (Doc ID 392888)

The Setup & Service software is used for calibration, adjustment and commissioning of the pipetting instrument. Setup and service must only be carried out by suitably qualified personnel or by the Tecan Field Service Engineer.

The above manuals can be ordered from your nearest Tecan representative (see [19 "Customer Support", 2 19-1](#)).

G1.3 Trademarks

The following product names and any registered and unregistered trademarks mentioned in this manual are used for identification purposes only and remain the exclusive property of their respective owners (for simplicity reasons, the symbols for trademarks, such as ® and ™ are not repeated later in the manual):

- ◆ Freedom EVOware®, Freedom EVO® and Genesis Freedom® are registered trademarks of Tecan Group Ltd. in major countries.
- ◆ Windows® is a registered trademark of Microsoft Corporation.
- ◆ Excel® is a registered trademark of Microsoft Corporation.
- ◆ Roboflask® is a registered trademark of Corning Inc.

G1.4 Abbreviations

See [D.1 "Glossary of Terms and Instrument Options", 2 D-1](#) for information on common abbreviations. You can also search for abbreviations in the index.

G1.5 Context-Sensitive Help System

Freedom EVOware is provided with extensive context-sensitive help (more than 900 pages when printed out). When Freedom EVOware is running, press F1 or click the Help button to get help on the current screen, dialog box or operation you are performing. Some of the dialog boxes do not have a Help button. Press F1 in this case. You can also open the help file with the shortcut in Start > All Programs > Tecan > EVOware.

Note: *The help system contains all of the information which is provided in the Software Manual PDF file on the Freedom EVOware installation CD. It uses the same numbering scheme for chapter headings, figures and tables as the software manual. Help is not provided for standard Windows operations such as Cut and Paste.*

The *Index* tab has the same entries as the index of the printed manual or PDF file. The *Search* tab (full text search function) lets you use the wild cards ? (one additional character) and * (zero or more additional characters). For example, *scan** finds *scan* and *scanner*. The wild cards can also be used at the beginning of the search string. For example, **allbarcodes* will find the ReadAllBarcodes command.

If you specify more than one search term, they are treated as alternatives (OR function). The search terms are not case sensitive. Use quotes "" to search for strings which contain space characters (e.g. "file names").

Refer to the standard Microsoft documentation if you need more information on using Microsoft HTML Help.

The Freedom EVOware Software Manual was written using Adobe FrameMaker. The context-sensitive help was created from the FrameMaker files using a special software tool.

Glossary

The Freedom EVOware Software Manual has an extensive glossary with descriptions of general terms and instrument options (e.g. Te-MagS). The glossary terms are included in the index of the printed manual or PDF file and the Index tab of the online help. They are marked with "overview", for example "Te-MagS (overview)".

Freedom EVOware commands

See [13 "Overview of Freedom EVOware Commands"](#), [2 13-1](#) for an overview of the Freedom EVOware commands in the Control Bar. Also see [G5.4 "Overview of the Main Window in Freedom EVOware"](#), [G5-9](#).

G2 Safety

Purpose of This Chapter

This chapter covers only the general introductory safety instructions applicable to the Freedom EVOware. Specific safety instructions of the hardware devices are laid down in the respective hardware manuals.

Significance of These Safety Instructions

The Freedom EVOware is a pure software product and as such it does not contain any hazardous parts. However, the software is used to control hardware devices and options, which may contain parts that can move with great force and at considerable speed.

As a consequence, the safety of users and personnel can only be ensured if the safety instructions in this Getting Started Guide as well as the safety instructions of the hardware devices controlled with the software described here are strictly observed and followed.

Therefore, all relevant manuals must always be available to all users working with the Freedom EVOware.

G2.1 User Qualification

What Users Must Know

Users must be qualified and trained to run Freedom EVOware.

In particular, they must fulfill the following qualifications:

- ◆ They must have a basic knowledge of the Windows operating system.
- ◆ They must have read and understood the instructions in this Software Manual.
- ◆ Only users that meet the qualifications prescribed here are authorized to run the program described in this Software Manual.

Training Courses

Note: Tecan recommends that users attend a software training course. Please ask your nearest Tecan representative about the available courses.

G2.2 Warning Notices Used in the Manuals

The symbols used for safety-related notices have the following significance:

WARNING Symbols



WARNING notices appear as follows:

WARNING

Generally, the triangular warning symbol indicates the possibility of personal injury or even loss of life if the instructions are not followed.

ATTENTION Symbols



ATTENTION notes appear as follows:

ATTENTION

With the general “Read This!” symbol, ATTENTIONs indicate the possibility of equipment damage, malfunctions or incorrect process results, if instructions are not followed.

G2.3 Use of the Software

Intended Use

The intended use of the Freedom EVOware software is defined in chapter [G3.2 “Intended Use of the Freedom EVOware Software”](#),  [G3-3](#).

The software must not be used for applications other than listed there.

G2.4 Specific Hazards

The following hazards are associated with the use of the Freedom EVOware software:

Cellular Phones



If you have a cellular phone

PROHIBITION

Turn off all cellular phones. Do not use or keep them on standby within the laboratory. The use of cellular phones may cause faulty liquid detection and unreliable results.

Electrostatic Discharge



Care must be taken when it is unavoidable to touch delicate electronic circuits.

ATTENTION

Discharge static electricity from your body. Wear a wrist wrap that is connected to ground when handling delicate electronic circuits.

Risks Through Contamination



Always make sure that the instrument is not contaminated chemically, biologically or radioactively.

WARNING

- ◆ Chemical, biological and radiative hazards can be associated with certain substances used or processed with the instrument.
- ◆ The same applies to waste disposal.
- ◆ Always wear appropriate laboratory safety items such as gloves when working on or operating the pipetting instrument.

Always be aware of possible hazards associated with such substances. Request a filled out and signed Decontamination Declaration before performing any setup and test procedures.

Movable Parts



Keep in mind that arm and pipetting devices can move at great speed and with considerable force.

WARNING

- ◆ Keep your hands off the zone in which pipetting devices move.
- ◆ Never stick your head into the pipetting instrument when the power is switched on.

Laser

Note that barcode readers such as the PosID or Symbol LS-1220 use laser technology for scanning.



WARNING

Laser beam (Laser Class II).
Radiation may be harmful to your eyes.

- ◆ Do not stare into beam.
- ◆ Always switch instrument off before servicing devices containing a laser source.

G2.5 Safety of the Overall System

In addition to the safety instructions in this Getting Started Guide, the safety instructions in the manuals of the hardware devices must also be observed and followed.



WARNING

Hazards originating from the hardware devices controlled with this software. Mind the safety instructions of all instruments and options which are used in connection with Freedom EVOware.

G2.6 Safety Features of the Pipetting Instrument

The Access/Status feature for the Freedom EVO pipetting instruments consists of up to four electrically-operated doorlocks for safety hoods or safety doors which prevent access to the instrument when it is operating, a status lamp and acoustic alarm device which is mounted above the instrument at a conspicuous position to ensure that it is visible to the operator from some distance away and an electrically-operated pause/resume button to stop and then continue the pipetting script.

The Freedom EVO pipetting instrument is always fitted with two doorlocks. Two additional doorlocks can be fitted to support special hardware arrangements.

Freedom EVOware controls the status lamp and acoustic alarm device as follows:

- ◆ Green, red and acoustic alarm are off: Freedom EVOware is idle (not executing a script).
- ◆ Green is continuously lit: A script is running and everything is ok.
- ◆ Green is flashing: The script has been paused by clicking the *Pause* button or the script command “User prompt” or “Set Variable” with user query is currently waiting for user input.
- ◆ Red is flashing and the acoustic alarm is on: An error message is being displayed.

G2.6.1 Safe Operation of the Pipetting Instrument and the Doorlocks

Freedom EVOware supports up to four electrically-operated doorlocks for the pipetting instrument and the doorlocks are arranged in groups. The following mechanisms are used to unlock and lock the doorlocks at the appropriate times. All doorlocks are locked automatically when a pipetting script or process is started. A mechanical interlock ensures that the script or process cannot be started unless the safety hoods are closed and locked. The Doorlock Error is displayed and the script or process will not run if the doorlocks cannot be locked. The doorlocks are unlocked when the script or process is finished, aborted or paused by clicking the *Pause* button.

The doorlocks are locked again when the script or process is continued after being paused by clicking the *Pause* button.

For safety reasons, it is not possible to unlock the doorlocks when the script or process is running.

For additional information on the operation of the doorlocks see [15.39 "User Prompt Command"](#), 2 15-99.

For maximum safety, please observe the following points:

- ◆ If you have fitted additional doorlocks, make sure that they are correctly assigned in the Freedom EVOware configuration (see [8.4.2.7 "Doorlocks"](#), 2 8-31).
- ◆ Above all when the instrument is put into service for the first time, run a test script to check the correct mechanical and electrical function of the doorlocks. Never unplug the electrical connections to the doorlocks.
- ◆ If an error message causes the script or process to pause, the doorlocks are unlocked to allow operator intervention.



WARNING

Risk of injury to operating personnel

- ◆ Take extra care when designing the script or process if you have programmed operations which could cause parts of the instrument to move even when the script or process is stopped. Asynchronous movements can be carried out e.g. by stacker devices.

G2.7 General Safety Rules

Legal Regulations	Legal regulations, such as local, state and federal laws which prescribe the use or application as well as the handling of dangerous materials in connection with the Freedom EVOware software must be strictly followed.
Modifications	Modifications to the Freedom EVOware software are not permitted. The manufacturer will decline any claim resulting from unauthorized modifications.

G2.8 Specific Safety Rules

G2.8.1 Unintended or Unexpected Movement of Robot Arms and Other Devices

Safety-relevant situations which can cause unintended or unexpected movement of robot arms and other devices include the following:

- ◆ The operator enters an incorrect value in a user prompt.
- ◆ The operator enters an incorrect value when teaching a robot movement vector.
- ◆ Faulty algorithm in the user application.

Accordingly:

WARNING




Risk of injury to operating personnel

- ◆ Keep your hands off the zone in which pipetting devices move.
- ◆ Never stick your head into the pipetting instrument when the power is switched on.
- ◆ You must not enter the working area of the pipetting instrument when teaching a robot movement vector.

G2.8.2 General Rules When Using the Pipetting Instrument

The following rules must be observed to ensure operator safety, to ensure valid results from the assays or methods and to avoid damage to the equipment:

- ◆ All persons working with the pipetting instrument and/or the Freedom EVOware software must be suitably trained. See [G2.1 “User Qualification”](#),  [G2-1](#) for more information.
- ◆ Users of the pipetting instrument and/or the Freedom EVOware software should be aware of responsibility they carry to ensure that the results obtained are correct and valid. When running Freedom EVOware scripts and processes, users should remain alert and observant at all times to minimize the risk of operator errors and to check for possible equipment malfunctions, e.g. as a result of hardware failures or incorrect set up of the pipetting instrument. See also [C “Validation of Freedom EVOware Applications”](#), 2 [C-1](#).
- ◆ If the pipetting instrument will be used with hazardous or contaminating liquids, it is recommended to fit and activate the LICOS option. The LICOS

option is a device which monitors the liquid level in the waste liquid and system liquid containers. It outputs a warning if the waste container is nearly full or if the system liquid container is nearly empty.

- ◆ If DITIs are dropped by mistake, the pipetting instrument must be checked for contamination.
- ◆ To avoid contamination when DITIs are dropped on purpose (e.g. to pick up new ones), we recommend you to use the Lower DITI Eject option.
- ◆ Always wear appropriate laboratory safety items such as gloves when working on or operating the pipetting instrument.
- ◆ After setting up the pipetting instrument and installing the Freedom EVOware software, use the Configuration Tool to check that the configured dilutor capacity matches the size of the syringe which is fitted to the pipetting instrument. The syringe size is on a label which is attached to the syringe.
- ◆ All scripts and processes must be validated for correct functioning and for correct results before they are used for pipetting with real samples. See [11.4.2.1 “Checking the Pipetting Script for Errors”](#), 2 11-5.
- ◆ Before running a script or process, you must set up the worktable with the carriers, labware and devices which are needed by the application or assay. The administrator or owner of the pipetting instrument must establish standard operating procedures for setting up the worktable and make them available to everyone who carries out pipetting.
- ◆ After setting up the worktable with the carriers, labware and devices which are needed by the application or assay, inspect the paths that the instrument arms (LiHa, RoMa, PnP) will take during the hardware initialization sequence to make sure that there are no obstacles which could obstruct the movements. See also [8.4.2.8 “Arm Initialization”](#), 2 8-31.
- ◆ Make sure that the RoMa will not interfere with the tubing and syringes at the back of the pipetting instrument during the hardware initialization sequence (the path that the RoMa will take depends to some extent on its initial position, see [9.6.4 “Defining the Home Position for a RoMa”](#), 2 9-62).
- ◆ When programming movement vectors for the RoMa and/or PnP, inspect the paths to make sure that there are no obstacles which could obstruct the movements when the vector is used; make sure that the RoMa will not interfere with the tubing and syringes at the back of the pipetting instrument.
- ◆ Manually initialize the arms of the pipetting instrument (e.g. using the Initialize button in the Freedom EVOware toolbar), make a visual check that the initialization sequence has been carried out correctly and check the log file for initialization errors.
- ◆ Only use barcodes with fixed length and check digits for general purpose pipetting applications in a regulated environment. This ensures that incorrectly scanned barcodes are always detected.
- ◆ If you are using the PosID-3 for general purpose applications in a regulated environment, you must always activate the Double Blind Entry feature if you intend to enter barcodes manually when they cannot be read.
- ◆ When setting up an assay for a liquid which can clot, make sure that clot detection is enabled in the liquid classes which are used to handle the liquid. Refer to the Good Usage information in the Operating Manual for the pipetting instrument for additional recommendations.
- ◆ When setting up an assay which uses a trough (container for a reagent liquid), make sure that the liquid classes which are used for aspirating from the trough are configured to immerse the tips in the liquid by at least 3 mm.
- ◆ If the system pauses for any reason when running a script or process, the duration of the pipetting script, process step or procedure may differ from the intended time. For example, sample incubation time may be outside of the

specified limits. Depending on the application, this can make the assay invalid.

- A system pause can be caused e.g. by clicking the Pause button in Freedom EVOware's Runtime Controller dialog box, by pressing the Pause button on the pipetting instrument, by a pipetting error or by an internal timeout if a process step has taken longer than expected or specified.
- System pauses are not shown in the Gantt chart in the Extended View of the Runtime Controller (the Gantt chart is only available in Freedom EVOware Plus).
- ◆ After running a script or process, you must check the log files to make sure that the script or process has completed fully and without errors.
- ◆ The results of an assay are only valid if the entire script or process completed without errors. If this is not the case, the entire script or process must be repeated after rectifying the cause of the error(s).

G3 Product Description

Purpose of This Chapter

This chapter provides a brief overview of the Freedom EVOware software and defines its scope of application. In addition, it describes the features and specifies the PC-requirements for running the software.

G3.1 Overview of Freedom EVOware

Freedom EVOware provides a graphical user interface for controlling Tecan's Freedom EVO series of pipetting instruments that facilitates the liquid handling needs of a wide range of life science applications, including both routine and research activities.

The Freedom EVOware software allows the user to develop pipetting programs (which are called *scripts*) and to quickly visualize how a laboratory process or experiment can be implemented. Commands are provided for a wide range of Tecan hardware options and third-party devices and the scripting system is designed for maximum flexibility when developing complex custom processes.

When the script or process is ready, Freedom EVOware controls the pipetting run by sending control signals to the pipetting instrument and optional laboratory devices through a data connection. If operator interaction is necessary, Freedom EVOware can display a dialog box on the display of the workstation which prompts for the information which is needed.

Freedom EVOware has an external programming interface (API) which allows you to integrate Freedom EVOware into third party products or custom applications or to use Freedom EVOware components within other Tecan products running on the same computer or on a different computer in the network.

Freedom EVOware's modular device driver concept allows a wide range of Tecan and third-party devices and options to be supported; a plug-in concept allows new or updated drivers to be easily added to existing Freedom EVOware installations. The Freedom EVOware CD contains drivers for the most commonly used devices. Contact Tecan for information on additional drivers which are available for special applications and third-party hardware.

In addition, the device driver API allows external software specialists to develop and integrate custom device drivers for third party hardware. Furthermore, the modular help system lets you integrate your own HTML Help components within the existing, extensive context-sensitive help system.

Please contact the Tecan software specialists for information on the device driver API and on extending the modular context-sensitive help.

It is instructive for new users of Freedom EVOware to load the example scripts and processes which are provided and to work through each of them by reviewing the on-line help (see [G6.4.6 "Example Scripts and Example Process"](#), [G6-7](#)).

In addition, Freedom EVOware's "Infopads" give useful tips for new users (see [5.4.2 "Infopads"](#), [2 5-15](#)). Click the hyperlinks in the *How To* section of the Infopad area to run short animations (films) which demonstrate various commonly needed tasks. The animations are stored in AVI format and will be shown e.g. in Windows Media Player.

Also see [D.1 "Glossary of Terms and Instrument Options"](#), [2 D-1](#).

This manual instructs the user how to:

- ◆ Install the Freedom EVOware software,
- ◆ Set up instrument and configuration data,

- ◆ Define the pipetting worktable,
- ◆ Define the pipetting scheme,
- ◆ Set up pipetting scripts and processes,
- ◆ Run pipetting scripts and processes.

G3.1.1 Freedom EVOware Standard and Freedom EVOware Plus

Freedom EVOware Plus groups pipetting scripts and device commands into processes. This concept makes it possible to optimize the efficiency and thus maximize the throughput of the pipetting instrument through the use of multi-tasking and scheduling. This feature is not available for Freedom EVOware Standard.

In addition, Freedom EVOware Plus allows you to run several processes in parallel. You can run several copies of the same process and/or several different processes in parallel.

The Freedom EVOware installation copies files for both versions of Freedom EVOware to your PC. Activation of the appropriate Freedom EVOware version is done using a hardlock (dongle).

G3.1.2 Hardlocks for Freedom EVOware Standard and Freedom EVOware Plus

Freedom EVOware is available with two different feature levels - Freedom EVOware Standard and Freedom EVOware Plus. In addition, a special version is available for the Freedom EVO 75 pipetting instrument. Whereas the software on the Freedom EVOware CD is the same in all cases, the additional features provided by Freedom EVOware Plus are enabled by purchasing and fitting the appropriate hardlock (an intelligent USB plug or “dongle”).

Four different hardlocks are available:

- ◆ Freedom EVOware Standard
- ◆ Freedom EVOware Standard for Freedom EVO 75
- ◆ Freedom EVOware Plus
- ◆ Freedom EVOware Plus for Freedom EVO 75

The hardlock version you are currently using is shown in the Freedom EVOware status bar (see [6.7.3 “Status Bar”, 2 6-20, Dongle type](#)). The Freedom EVOware Plus hardlock also allows you to use Freedom EVOware Standard (but not vice versa).

Note: Freedom EVOware will run in offline mode if it cannot detect a hardlock when it starts (see [G5.1.4 “Instrument and Hardlock Detection”, 5 G5-3](#)).

Firmware commands such as movement commands are not sent to the pipetting instrument in offline mode (i.e. pipetting does not take place).

It is not necessary to fit a hardlock if you want to run Freedom EVOware in offline mode or if you are using the 3D simulation program EVOSim.

Several software add-ons are available for Freedom EVOware which must be purchased separately. They extend the functionality with special features (see [G3.1.3 “Tecan Software Add-ons for Freedom EVOware”, 3 G3-3](#)). To allow the use of the add-ons, the Freedom EVOware hardlock must be upgraded. This is usually done using an activation tool (software). After purchasing the add-on software, the activation tool is normally sent to you by eMail. The activation tool is

specifically coded for the serial number of your hardlock and will not carry out the upgrade if the serial number does not match.

G3.1.3 Tecan Software Add-ons for Freedom EVOware

Several software add-ons are available for Freedom EVOware which extend the functionality with special features. The following add-ons are currently available:

- ◆ Freedom EVOware Sample Oriented Add-On
- ◆ Freedom EVOware Sample Tracking Add-On
- ◆ Hit-Picking Wizard for Freedom EVOware
- ◆ Normalization Software for Freedom EVOware

See [D “Glossary”, 2 D-1](#) for an overview of these products. See the help files and/or software manuals of these add-ons for full details (see [G1.2.1 “Related Documentation and Software”, 1 G1-3](#)).

G3.1.4 3D Simulation Tool for the Pipetting Instrument

The Freedom EVOware setup program lets you install a 3D simulation tool (EVOSim) which can be used to visualize the movements which are carried out by the arms of the Freedom EVO pipetting instrument (LiHa, RoMa, PnP and MCA) when running Freedom EVOware scripts and processes. It can also be used to visualize several other devices such as the Te-MO and the PosID-3.

EVOSim interprets the firmware (hardware) commands which are sent to the pipetting instrument and sends the appropriate responses to Freedom EVOware. To do this, the RS232 connection to the pipetting instrument is configured to communicate with EVOSim instead.

Using an additional tool, EVOSim can also be used to monitor the communication between Freedom EVOware and the pipetting instrument.

For more information, see [A.14 “Configuring and Using the 3D Simulation Tool EVOSim”, 2 A-105](#).

G3.2 Intended Use of the Freedom EVOware Software

Certain hardware options are only intended for research applications. If you install device drivers which are not part of the general purpose configuration, you will see a warning message during the installation that your Freedom EVOware installation is now only suitable for research applications.

Choose About in the Help menu to get information on the current configuration of your Freedom EVOware installation. Refer to [G3.4 “Supported Pipetting Instruments and Tecan Options”, 1 G3-5](#) for a list of the options which are supported by the current configuration. Refer to the Getting Started Guide for a list of all of the options which are supported by the Freedom EVOware software.

G3.3 What's New in Freedom EVOware V2.8 SP4

Besides some detail improvements, the main changes and additions in Freedom EVOware version 2.8 SP4 are as follows:

General and Usability

- ◆ Windows 7 replaced by Windows 10 64-bit (Win 7 is not supported anymore)

Supported operating systems are now as follows:

- ◆ Microsoft Windows 10 LTSC 64-bit
- ◆ Inclusion of IoT client in Freedom EVOware installer, to enable Introspect, Tecan Connect and Remote Support.

G3.3.1 Brief Overview of Earlier Versions of the EVOware Software

G3.3.1.1 New in Freedom EVOware V2.8

Besides some detail improvements, the main changes and additions in Freedom EVOware version 2.8 are as follows:

General and Usability

- ◆ Windows XP replaced by Windows 10 64-bit (Win XP is not supported anymore)

Supported operating systems are now as follows:

- ◆ Microsoft Windows 7 64-bit
- ◆ Microsoft Windows 10 LTSC 64-bit

Labware and Carrier

- ◆ General corrections of default carrier definitions
- ◆ New default liquid classes

G3.3.1.2 New in Freedom EVOware V2.7

Besides some detail improvements, the main changes and additions in Freedom EVOware version 2.7 are as follows:

General and Usability

- ◆ Improve general stability and stability of error handling
- ◆ Improvements relating safe pathways
- ◆ Allow FW Command in GP EVOware

Labware and Carrier

- ◆ Support new Wide Bore Tip
- ◆ New LC for 10µl tips
- ◆ Additional Air LiHa liquid classes
- ◆ Include PMP Easy liquid classes

G3.3.1.3 New in Freedom EVOware V2.6

Besides some detail improvements, the main changes and additions in Freedom EVOware version 2.6 are as follows:

Labware and Carrier

- ◆ Support for Nested LiHa DiTi
- ◆ Support of Named Pipe functions for the PnP arm

G3.3.1.4 New in Freedom EVOware V2.5

Besides some detail improvements, the main changes and additions in Freedom EVOware version 2.5 are as follows:

Liquid Handling

- ◆ Support for the Air LiHa

G3.3.1.5 New in Freedom EVOware V2.4 SP2

Besides some detail improvements, the main changes and additions in Freedom EVOware version 2.4 SP2 are as follows:

General & Usability

- ◆ Windows Vista replaced by Windows 7 64-bit.
Supported operating systems are now as follows:
 - Microsoft Windows XP Professional (Service Pack 3)
 - Microsoft Windows 7 64-bit
- ◆ New advanced worklist command “GetDIT2”
- ◆ New MCA384 wash settings in Evoware.ini file
- ◆ Updates in Evoware.opt file

G3.3.1.6 New in Freedom EVOware V2.4:

In addition to a large number of detail improvements, the new Freedom EVOware key features in version 2.4 are as follows:

General & Usability

- ◆ Support and new commands for the Common Gripper Module (CGM) of the MCA384 pipetting arm.

G3.4 Supported Pipetting Instruments and Tecan Options

Freedom EVOware is intended for the following Tecan pipetting instruments:

- ◆ **Freedom EVO 100, 150, 200**
- ◆ **Freedom EVO 75**

Freedom EVOware supports the following optional devices, instrument options and systems:

- ◆ Liquid Handling Arm (LiHa), liquid displacement, with 2, 4 or 8 tips
- ◆ Liquid Handling Arm (Air LiHa), air displacement, with 4 or 8 tips

- ◆ 8 Plus 1 Access option for the Freedom EVO 75 pipetting instrument
- ◆ Multi Channel Arm (MCA) with 96 tips ¹⁾
- ◆ Multi Channel Arm 384 (MCA384) with 96 or 384 tips ¹⁾
- ◆ CGM option (Common Gripper Module) for the MCA384 ¹⁾
- ◆ Tecan Pressure Monitored Pipetting (PMP) option
- ◆ XP dilutor
- ◆ XLP dilutor
- ◆ XMP dilutor (for the Freedom EVO 75 pipetting instrument)
- ◆ Standard tips, low volume tips and disposable tips (DITIs)
- ◆ Te-PS (Tecan Positioning System) for the Freedom EVO pipetting instrument ¹⁾
- ◆ Low Volume Option ¹⁾
- ◆ Te-Fill Option ¹⁾
- ◆ Lower DITI Tip Eject option
- ◆ Robot Manipulator (RoMa), standard and long version
- ◆ Pick and Place arm (PnP) ¹⁾
- ◆ PosID-2 Barcode Scanner
- ◆ PosID-3 Barcode Scanner
- ◆ Fast Wash Option (FWO)
- ◆ Monitored Pump Option (MPO)
- ◆ SPO (Sensored Pump Option)
- ◆ Liquid Container Supervisor (LICOS)
- ◆ Vacuum Assisted Waste option for viscous liquids ¹⁾
- ◆ Te-MO 3/3 and Te-MO 5/3 (Tecan Multi-pipetting Option) ¹⁾
- ◆ Te-MO 96-tip pipetting head ¹⁾
- ◆ Te-MO 384-tip pipetting head ¹⁾
- ◆ Wash & Refill Center for the Te-MO ¹⁾
- ◆ 6 or 10 x Te-MO Active Positioning Carriers, depending on Te-MO version (2 solenoids) ¹⁾
- ◆ 1 x Te-Stack Labware Stacker for the Te-MO (up to 3 stacks per stacker) ¹⁾
- ◆ 4 x Te-Stack Labware Stacker, stand-alone (2 stacks per stacker) ¹⁾
- ◆ Te-VacS (Tecan SPE Vacuum Separator) ¹⁾
- ◆ Collector plate repositioner and de-salter valve options for the Te-VacS ¹⁾
- ◆ Te-MagS (Tecan Magnetic Bead Separator)
- ◆ Te-Shake (Orbital Shaker)
- ◆ MIO (Monitored Incubator Option) with or without shaking option
- ◆ Carousel/Carousel HS with or without barcode scanner ¹⁾
- ◆ Carousel NT ¹⁾
- ◆ Connection Box for the Te-Flow (In Situ Hybridization) option ¹⁾
- ◆ Lauda Waterbath for the Te-Flow (In Situ Hybridization) option (GenePaint chamber racks) ¹⁾
- ◆ Symbol LS-1220 Barcode Scanner
- ◆ Symbol MS-954 Barcode Scanner
- ◆ Hettich Centrifuge ¹⁾
- ◆ Te-Link (transfer rail / conveyor system) ¹⁾
- ◆ Mettler Balance ¹⁾
- ◆ Mettler WM pooling balance (for the Liquid Arrival Check feature)
- ◆ 96PW Washer ¹⁾

1) This option is only intended for research applications.

- ◆ PW384 Washer (via WinWash Plus software) ¹⁾
- ◆ PW384 Washer (via PW384GP driver)
- ◆ Columbus Plate Washer
- ◆ REMP Reatrix 2D barcode reader for REMP sample tubes ¹⁾
- ◆ REMP PHS Portrait Heat Sealer for microplates ¹⁾
- ◆ REMP ACD Automatic Capper Decapper ¹⁾
- ◆ Tecan Safety features (4 x doorlocks and pause/resume button)
- ◆ Tecan Access/Status feature (status lamp and acoustic alarm device)
- ◆ Tecan Magellan data reduction and analysis software for Tecan microplate readers.
- ◆ Tecan microplate readers (raw data mode):
 - Sunrise ²⁾
 - SpectraFluor ¹⁾
 - SpectraFluor+ ¹⁾
 - Genios ¹⁾
 - Genios Pro ¹⁾
 - Safire ¹⁾
 - Ultra ¹⁾
 - Ultra Evolution ¹⁾

G3.4.1 Supported Combinations of Robot Arms

The Freedom EVO 100, 150 and 200 pipetting instruments can be configured with a maximum of three robot arms on the X slide as follows:

- ◆ Up to two liquid handling arms (LiHa, Air LiHa [max. 1x])
- ◆ One Multi Channel Arm (MCA) ³⁾
- ◆ One Multi Channel Arm 384 (MCA384), optionally fitted with one Common Gripper Module (CGM) ¹⁾
- ◆ Up to two plate robot (RoMa) arms
- ◆ Up to two tube robot (PnP) arms ¹⁾

The total number of arms of all types is three (e.g. 1 x LiHa and 2 x RoMa or 1 x LiHa, 1 x RoMa and 1 x PnP).

The Freedom EVO 75 pipetting instrument can only be fitted with one liquid handling arm.

G3.4.2 Supported Firmware Versions for the Optional Devices

The *Device Information* tab in the *Devices* section of the Configuration Tool lists the device firmware version for which each of the Freedom EVOware device drivers was originally developed. In many cases, the device driver will control the device correctly even if the stated firmware version and the actual firmware version of the device are not identical. See [8.4.1.1 “Device Information Tab”, 2 8-21](#).

Some devices have a firmware command (e.g. Get_Version) which allows you to interrogate their firmware version using the Freedom EVOware Configuration Tool (see [8.4.3.4 “Test Tab”, 2 8-37](#)). For descriptions of the pre-configured firmware

1) This option is only intended for research applications.

2) The TW (Tuneable Wavelength) feature of the Sunrise reader is only intended for research applications.

3) This option is only intended for research applications.

commands which are available for each device, see the section “Firmware commands” for the device (see [8.5 “Device Driver Configuration”](#), 2 8-39).

G3.5 Computer Requirements


The PC on which Freedom EVOware will be installed must meet the following minimum requirements:

Operating System

Freedom EVOware is compatible with the following operating systems:

- ◆ Microsoft Windows 10 LTSC 64-bit


Hardware

- ◆ Win 10: A CPU that is suitable for running the selected operating system¹⁾. Recommended minimum specification: Processor or SoC with minimum 1 GHz; optimum dual core or multi processor system running at 2.33 GHz.
- ◆ Win 10: A CPU that is suitable for running the selected operating system¹⁾. Recommended minimum size: 2 GB RAM for 64-bit.
- ◆ Virtual memory as required by the operating system
- ◆ An SVGA monitor with 32,768 colors or more and a minimum resolution of 1024x768 pixels (optimum 1280x1024 or higher). To ensure correct display of the dialog boxes, we recommend you to configure your display settings in the Control Panel for *Small Fonts*
- ◆ Mouse
- ◆ CD-ROM drive
- ◆ Hard disk with about 5 GB of unused space for the Freedom EVOware software, optional software components, scripts and log files.
- ◆ One serial interface for the data interface to the pipetting instrument (if you intend to connect the pipetting instrument via RS232).
- ◆ Additional serial interfaces are required by some of the instrument options (e.g., the Mettler balance).
- ◆ A hardlock (dongle) for either Freedom EVOware Standard or Freedom EVOware Plus (a hardlock is a copy protection device which is plugged into the USB port of your PC). See [G3.1.2 "Hardlocks for Freedom EVOware Standard and Freedom EVOware Plus"](#),  [G3-2](#).
- ◆ One USB port for the hardlock
- ◆ One USB port for the data interface to the pipetting instrument (if you intend to connect the pipetting instrument via USB).
- ◆ Printer (optional)



ATTENTION

Risk of the script or process aborting.

- ◆ The PC must be configured to prevent it from going in to Sleep Mode even if no user inputs take place for an extended period of time.
- ◆ The USB power management in Windows must be switched off to avoid losing the connection to the pipetting instrument, which may otherwise occur in rare cases. See [G4.5.1 "USB Power Management Setting"](#),  [G4-14](#) for more information.

If you want to connect the pipetting instrument via USB, it should be connected directly to the PC. This also applies to USB connections from hardware options, if they have their own cable. The use of an external USB hub should be avoided. If an external USB hub is absolutely necessary, use an active USB hub (i.e. with its own power supply). Data transfer problems may occur if you use a passive USB

¹⁾ As per the Windows 10 System Requirements from Microsoft

hub, especially if you are also using the PMP option. Please note that some port replicators for laptops contain a USB hub.

Security

The following table shows which permissions are needed for installing and running the Freedom EVOware software.

Tab. G3-1 *Minimum Security Permissions*

Activity	Windows (10 LTSC 64-bit)
Program installation	MS Windows Local Administrator
Running the program	MS Windows User

Freedom EVOware has four user levels – Administrator, Application Specialist, Power User and Operator. The Freedom EVOware user levels are independent of the MS Windows user levels.

All four Freedom EVOware user levels need read/write access to the Freedom EVOware directory and its subdirectories during program runtime. The Freedom EVOware user level Operator cannot create or modify scripts or processes, but Freedom EVOware still needs read/write access to write log and export files and audit trail data.

G4 Installation

Purpose of This Chapter This chapter describes the installation of the Freedom EVOware software on a target computer. Read it carefully before starting the installation.

G4.1 Before You Start

Cross References

List of cross references to information provided in other sections:

Information	References
Supported pipetting instruments and Tecan options	See section G3.4 , G3-5
Computer requirements	See section G3.5 , G3-9

Target Computers

Freedom EVOware must be installed on target computers that are or will be connected to the pipetting instrument

Other Requirements

The PW384 Plate Washer driver requires the Tecan WinWash Plus software, which must be installed separately. It is normally provided with the washer. WinWash Plus is not necessary for the PW384GP Plate Washer driver. Drivers for microplate readers (e.g. photometers) require the RdrOLE and XFluor4 software, which must be installed separately. It is normally provided with the reader. Freedom EVOware can also control microplate readers using the Magellan software.

The Magellan driver requires the Tecan Magellan software, which must be installed separately. The Magellan software has built-in drivers for Tecan microplate readers. If you intend to use the Magellan software, it is not necessary to install the driver for your reader when you install Freedom EVOware unless you also want to use the reader in raw data mode.

Note: You cannot run the FACTS 5.x dynamic scheduling software and Freedom EVOware on the same computer. Please un-install FACTS before you install Freedom EVOware.

Who Should Install?

The Freedom EVOware software must be installed by a properly trained specialist.

Access Rights

To install Freedom EVOware on the target computer, you need local administrator access rights for the Microsoft Windows operating system. Refer to the Microsoft documentation for further information on access rights.

For information on the access rights which are required to use Freedom EVOware, see [G3.5 "Computer Requirements"](#), [G3-9](#), Security.

Saving User Data

If Freedom EVOware is already installed on your PC, before running the installation program we recommend you to back up your Freedom EVOware data files, scripts and processes to exchangeable media or to a network or temporary

directory (not within the Freedom EVOware <install_path>). See [8.2 “Backing Up and Restoring Your Configuration”](#), 2 8-3. You can also use the Export Import tool to save your scripts and processes and other configuration data (see [A.9.4 “Export/Import Tool”](#), 2 A-40).

Saving these files is especially recommended in the following cases:

- ◆ Before un-installing (removing) the Freedom EVOware software.
- ◆ Before installing a newer version of Freedom EVOware.
- ◆ Before modifying an existing Freedom EVOware installation.

Saving Audit Trail Data

If you are required to comply with the FDA regulations, make sure you keep archive copies of all audit trail, trace and log files. These files are located in the <install_path>\AuditTrail directory. They are not backed up by the Backup function - you should use the Audit Trail Archiving function instead. See [A.9.6 “Audit Trail Archiving tool”](#), 2 A-49 and [B “Appendix B - FDA 21 CFR Part 11 Compliance”](#), 2 B-1.

G4.2 Installing Freedom EVOware

Installation Directory

By default, Freedom EVOware will be installed into the <windrive>\Program Files (x86)\Tecan\Freedom EVOware directory. <windrive> is the drive in which the Windows operating system is installed.

We recommend you to accept this directory. However, you may install Freedom EVOware into a different drive/directory if you want.

The First Steps

To install Freedom EVOware:

- 1 Finish all Windows programs that are currently running.
- 2 Make sure that anti-virus programs (if installed) are not running and that all processes associated with anti-virus programs are stopped. Anti-virus programs can cause the installation of Microsoft .NET Framework and .NET Framework components to fail.
- 3 Make sure that you are logged in as the local administrator.
- 4 Insert the installation CD in the computer's CD-ROM drive.
- 5 In the Windows Explorer, open your CD-ROM drive and change to the Freedom EVOware\Disk1 directory.

Certain hardware options are only intended for research applications. Refer to “Supported pipetting instruments and Tecan options” in the Getting Started Guide for a list of all of the options which are supported by the Freedom EVOware software.

- 6 To install Freedom EVOware with the device drivers which are intended for general purpose applications, run **Setup.exe** in the Disk1 directory.
- 7 To install Freedom EVOware with all available device drivers (including drivers for devices which are only intended for research applications), run **Setup_ro.exe** in the Disk1 directory.
- 8 The **Welcome** window appears.

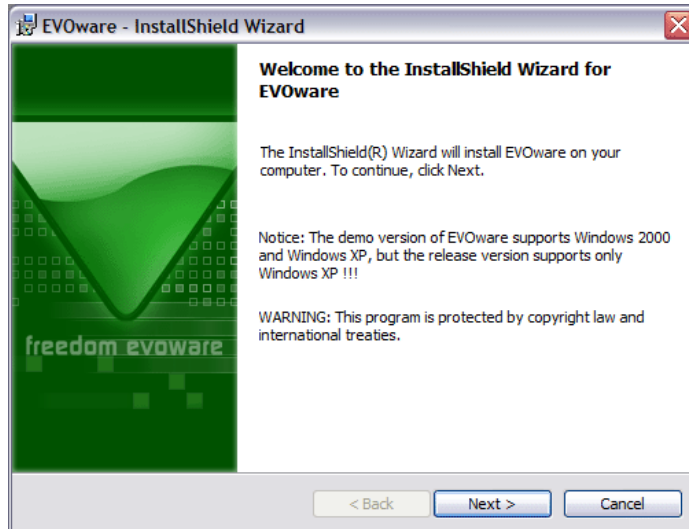


Fig. G4-1 Welcome window

- 9 Click **Next** to continue.

You are then shown a window displaying the license agreement.

Note: *The real window may look slightly different from the one shown below.*

License Agreement



Fig. G4-2 License Agreement window

- 10 Read the license agreement and click **I accept the terms ...** if you are in agreement. Continue with **Next**.

Destination Path

*A destination path for the application is suggested in the **Destination Folder** window.*

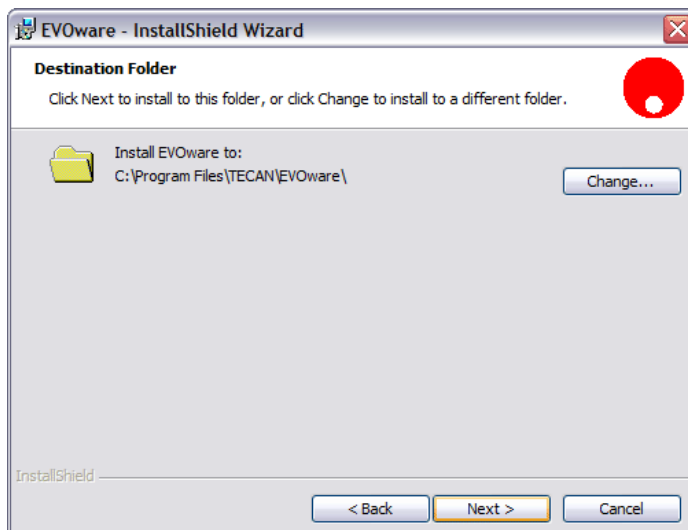


Fig. G4-3 Destination Folder window

11 Do one of the following:

- In most cases, you can accept the suggested destination path. Continue with **Next** in this case.
- If necessary, choose a different destination folder with **Change....** Continue with **Next** when you are ready.

Selecting Components

The **Custom Setup** window appears.

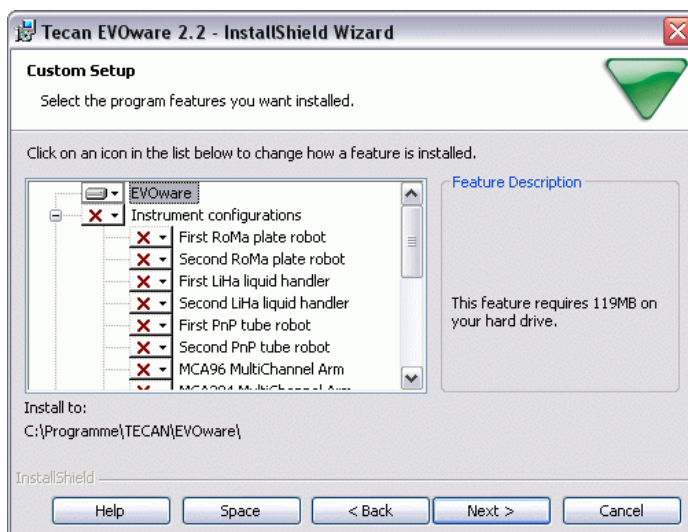


Fig. G4-4 Custom Setup window

The choices you will see in the Custom Setup window depend on whether you are installing the general purpose configuration or the research only configuration. Certain Tecan options are only intended for research applications.

The **Custom Setup** window lets you choose the components you wish to install. You can expand the **Instrument Configurations**, the **Devices and Options** and

the **Software Options** groups by clicking on the '+' box on the left side. This shows the individual components in these groups. Click the '-' box if you want to collapse the group again.

When you highlight a group, additional information about the installation of the group is shown in the **Feature Description** panel on the right side of the window.

- ◆ The **EVOware** group contains components which are always needed.
- ◆ The **Instrument Configurations** group contains the drivers for the robot arms (liquid handling arm, LiHa; plate robots, RoMa; tube robot, PnP; MCA, multi-channel arm; PosID-3, barcode scanner).
- ◆ The **Options** group contains drivers for optional hardware such as the Te-Shake orbital shaker and the Te-MagS magnetic bead separator.
- ◆ The **Storage Devices** group contains drivers for optional hardware such as the Te-Stack plate stacker and the Carousel.
- ◆ The **Incubators** group contains drivers for optional hardware such as the MIO heated incubator.
- ◆ The **Washers** group contains drivers for optional hardware such as the PW384 Power Washer.
- ◆ The **Readers** group contains drivers for optional hardware such as the Sunrise microplate absorbance reader and the interface driver for the Magellan option.
- ◆ The **REMP** group contains drivers for REMF hardware such as the Reatrix 2D barcode scanner for REMF tubes.
- ◆ The **3rd Party** group contains drivers for optional hardware from other manufacturers such as the Hettich centrifuge.
- ◆ The **Software Options** group contains drivers for software options such as Freedom EVOSim 3D Simulation Tool (see [G3.1.4 "3D Simulation Tool for the Pipetting Instrument"](#), [G3-3](#)).
- ◆ The **Legacy Drivers** group contains drivers for optional legacy hardware which is no longer sold by Tecan, such as the Columbus washer, which is now superseded by other Tecan washers.
- ◆ For more information on the optional hardware see [16 "Device Commands"](#), [2 16-1](#).

12 Click on each component you want to install and choose **This feature will be installed on local hard drive**:

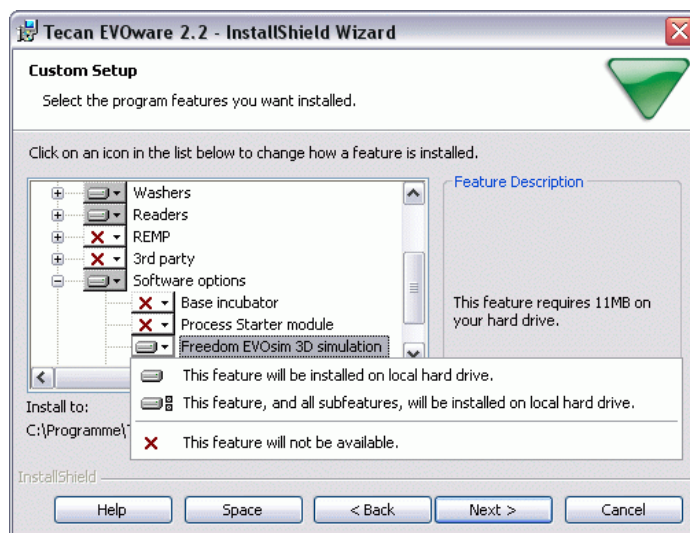


Fig. G4-5 Selecting components

You should select the devices and options that are currently available on your pipetting instrument. In the above example, the first plate robot, the liquid handling arm, the tube robot and the Te-Stack have already been selected for installation. Each pipetting instrument can be configured with a maximum of three robot arms as follows:

- ◆ Up to two liquid handling arms (LiHa, Air LiHa [max1x])
- ◆ One Multi Channel Arm (MCA)
- ◆ One Multi Channel Arm 384 (MCA384), optionally fitted with one Common Gripper Module (CGM)
- ◆ Up to two plate robot (RoMa) arms
- ◆ Up to two tube robot (PnP) arms

The total number of arms of all types is three (e.g. 1 x LiHa plus 2 x RoMa or 1 x LiHa plus 1 x RoMa plus 1 x PnP).

The PW384 Plate Washer driver requires the Tecan WinWash Plus software, which must be installed separately. It is normally provided with the washer. WinWash Plus is not necessary for the PW384GP Plate Washer driver.

Drivers for microplate readers (e.g. photometers) require the RdrOLE and XFluor4 software, which must be installed separately. It is normally provided with the reader. Freedom EVOware can also control microplate readers using the Magellan software.

The Magellan driver requires the Tecan Magellan software, which must be installed separately. The Magellan software has built-in drivers for Tecan microplate readers. If you intend to use the Magellan software, it is not necessary to install the driver for your reader when you install Freedom EVOware unless you also want to use the reader in raw data mode.

If necessary, you can run the Freedom EVOware installation program again at a later time and add missing components or remove components you no longer need.

When you highlight a component, additional information about that component is shown in the **Feature Description** panel on the right side of the window.

13 Click **Next** after you have made your choices.

You will then be asked if you want to begin the installation:

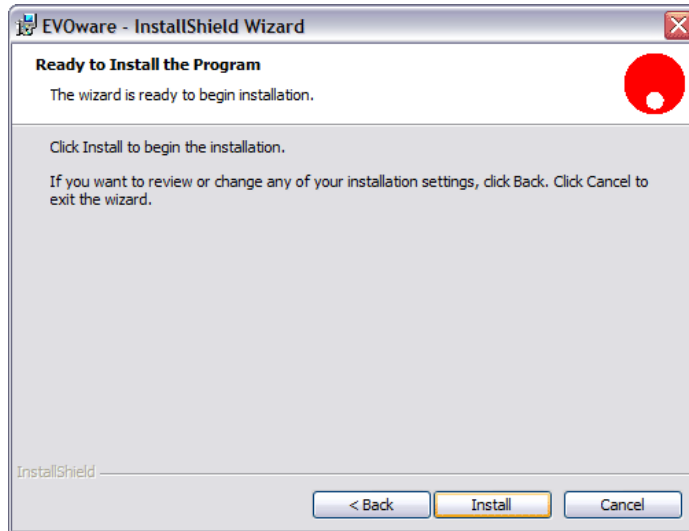


Fig. G4-6 Ready to Install window

Click **Install** if you want to continue.

If you have previously installed Tecan software components on your PC which use the Tecan User Management System (such as Freedom EVOware or the Tecan Magellan software), the Tecan User Management System needs to be updated too and you will be prompted for the name and password of the Administrator account.

After entering the name and password, you will be shown the following window:

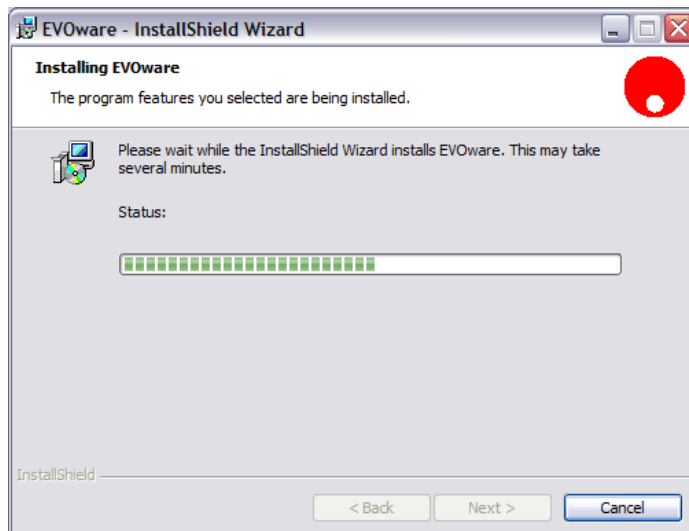


Fig. G4-7 Installing Freedom EVOware window

Installation Complete

When the installation is finished, the **InstallShield Wizard Completed** window is shown:

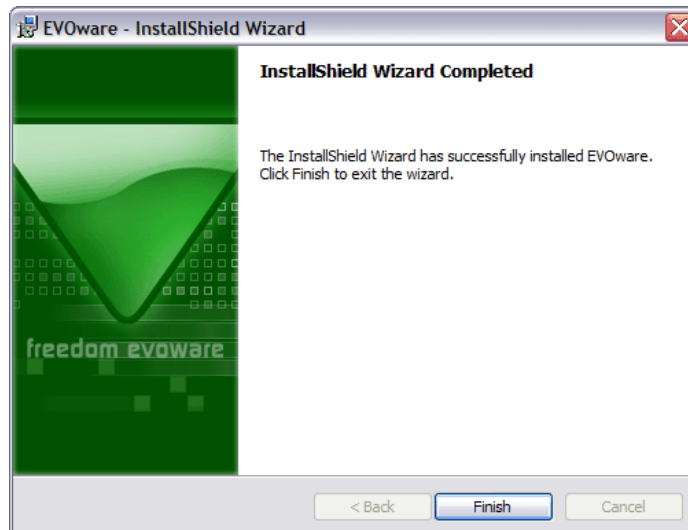


Fig. G4-8 InstallShield Wizard Completed window

- 14** Confirm with **Finish**. The installation of the Freedom EVOware software is now complete.
- 15** Start Freedom EVOware as the Tecan administrator and carry out the following checks:
 - Choose *About* in the *Help* menu and check that you have installed the intended software version (version for general purpose applications or version for scientific research applications with extended device support).
 - Check that the correct hardlock (dongle) is fitted to your PC. The hardlock ID number is shown in the About box. If there is no hardlock fitted, “Non upgradable hardlock” is shown. See also [6.7.3 “Status Bar”, 2 6-20, Dongle type](#).
 - Check that you are running the intended software feature level (Freedom EVOware Standard or Freedom EVOware Plus). This is shown in the status bar and is also dependent on your hardlock (see [6.7.3 “Status Bar”, 2 6-20, Feature level](#)).

Note: If you have made a backup copy of configuration and user data from a previous Freedom EVOware installation, you should now use the Restore function to restore it.

G4.3 Modifying, Removing or Repairing Your Installation

If you run the Freedom EVOware installation program when Freedom EVOware is already installed, you are given the options of modifying, removing or repairing the installation.

Note: You cannot modify, remove or repair Freedom EVOware by choosing **Programs and Features** in the Windows Control Panel.

Insert the Freedom EVOware CD and proceed as described in [G4.2 “Installing Freedom EVOware”, G4-2](#). The installation program automatically detects the

software components which you installed previously and will start the Maintenance Program.

After confirming the **Welcome** window by clicking **Next** you are shown the Program Maintenance window:

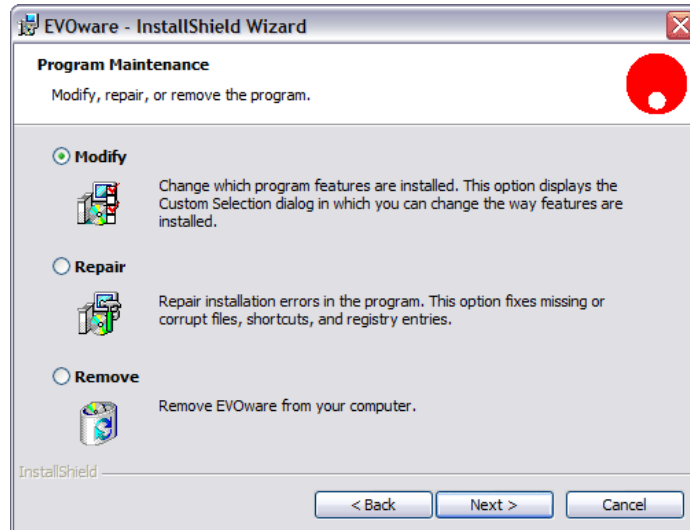


Fig. G4-9 Program Maintenance window

The three options which are provided are as follows:

- ◆ **Modify:** This function allows you to add further software components to the existing Freedom EVOware installation or to remove software components that are no longer needed.
 Certain software components are only intended for research applications. If you use the installation program **Setup_ro.exe** to install options which are not included in the general purpose configuration, you will see a warning message during the installation that your Freedom EVOware installation is now configured for research applications and is no longer intended for general purpose applications.
 If you need to switch back to the general purpose configuration, you must uninstall and then re-install Freedom EVOware.
- ◆ **Repair:** This function reinstalls all components of the current software configuration on the target computer. Note that this option does not allow you to add new functions or remove existing functions. Repairing an existing installation may be necessary if the current installation does not run properly (e.g. due to a corrupt file or a file that was deleted unintentionally).
- ◆ **Remove:** Completely uninstalls (removes) the Freedom EVOware software from the target computer.

If you choose to un-install Freedom EVOware completely, you will be asked if you also want to delete the user management data. Click *No* if you want to continue using other Tecan software components such as Magellan (or if you plan to re-install Freedom EVOware again). If you click *Yes*, you will have to set up your Tecan users and groups again (see 7 “[Tecan User Management System](#)”, 2 7-1).

Note: Before modifying, repairing or removing Freedom EVOware, we recommend you to back up your Freedom EVOware data files, scripts and processes to exchangeable media or to a network or temporary directory (not within the Freedom EVOware <install_path>). See 8.2 “[Backing Up and Restoring Your Configuration](#)”, 2 8-3.

Decide What to Do

- 16** Click the appropriate option button:
- **Modify** to add or remove components.
 - **Repair** to reinstall the program.
 - **Remove** to uninstall.
- 17** Click **Next** and continue with your section. You should then follow the instructions which are displayed.

If you choose **Modify**, you can choose the Freedom EVOware components which you want to add or remove (see [Fig. G4-5 “Selecting components”](#), [G4-6](#)). The installation program automatically detects the software components which you installed previously.

Maintenance Complete

When the selected operation is finished, the **InstallShield Wizard Completed** window is shown:

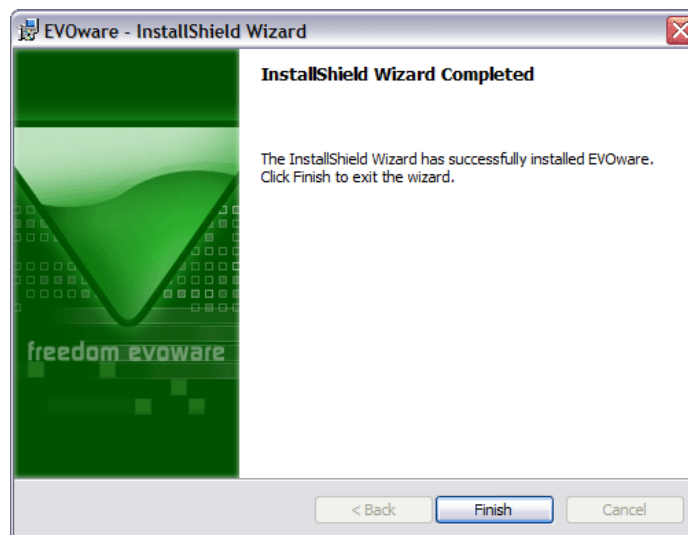


Fig. G4-10 InstallShield Wizard Completed window for an un-install operation

- 18** Click **Finish** to end the installation program.

G4.3.1 Upgrading to the Latest Software Version

To upgrade Freedom EVOware to the latest software version, insert the Freedom EVOware CD and proceed as described in [G4.2 “Installing Freedom EVOware”](#), [G4-2](#). The installation program automatically detects the existing installation and will start the upgrade process.

Additional steps which may be required when upgrading are dependent in part on the pipetting instrument and system options which you are already using. For this reason upgrading is normally carried out by a Tecan representative.

Where applicable, please observe your local regulations for re-certification of your pipetting system following a software upgrade.

We recommend you to back up your Freedom EVOware data files, scripts and processes to exchangeable media or to a network or temporary directory before upgrading (see [8.2 “Backing Up and Restoring Your Configuration”](#), [2 8-3](#)).

G4.3.1.1 Checking the software version which is currently installed

Choose *About Freedom EVOware* in the Help menu if you want to check which version of Freedom EVOware you are currently using. The dialog box shows the Freedom EVOware version, the service pack level and the software build code.

It also shows the intended use of your Freedom EVOware configuration - general purpose applications or research use only. See [G3.2 “Intended Use of the Freedom EVOware Software”](#), [G3-3](#) for more information.

Alternatively, click the Windows Start button and choose Control Panel. Then double-click on *Add or Remove Programs*. Navigate in the list to the entry EVOware and choose *Click here for support information*. You need local administrator access rights for the Microsoft Windows operating system to use the Control Panel.

G4.3.2 Installation of Service Packs and Hotfixes

Service packs are minor upgrades and/or are used to correct small faults in the Freedom EVOware software. To install a service pack, follow the instructions which are provided.

Note: *Some types of service pack require Freedom EVOware to be re-installed. Other types of service pack do not require Freedom EVOware to be re-installed. You must backup up your system and data files before un-installing Freedom EVOware (see [8.2 “Backing Up and Restoring Your Configuration”](#), [2 8-3](#)). Then use the Restore function after Freedom EVOware has been re-installed.*

Hotfixes are used to correct small faults in the Freedom EVOware software. Hotfixes do not required Freedom EVOware to be re-installed. To install a hotfix, follow the instructions which are provided.

Choose *About Freedom EVOware* in the Help menu if you want to check which version of Freedom EVOware you are currently using. The dialog box shows the Freedom EVOware version, the service pack level and the software build code.

G4.4 The Freedom EVOware Hardlock

To use the full functionality of the Freedom EVOware software, you must attach a hardlock (dongle) to a USB port on your PC. Freedom EVOware checks for the presence of the hardlock when it starts and will switch to offline mode if the hardlock cannot be found. See [G3.1.2 “Hardlocks for Freedom EVOware Standard and Freedom EVOware Plus”](#), G3-2.

G4.5 Installing the USB driver for the Freedom EVO pipetting instrument

If you want to connect the Freedom EVO pipetting instrument to the PC which is running Freedom EVOware through USB instead of using the serial (RS232) port, you must carry out the following steps to install the USB driver.

The following steps are only necessary when you connect the pipetting instrument to the PC for the first time.

Please install Freedom EVOware before connecting the USB cable.

Switch on the PC, switch on the pipetting instrument and plug in the USB cable. The following dialog box should appear:



Fig. G4-11 Installing the USB driver, step 1

Click *No, not this time* and click *Next*. The following dialog box is shown:



Fig. G4-12 Installing the USB driver, step 2

Click *Install the software automatically (Recommended)* and click *Next*. The following dialog box is shown while the driver is being installed:

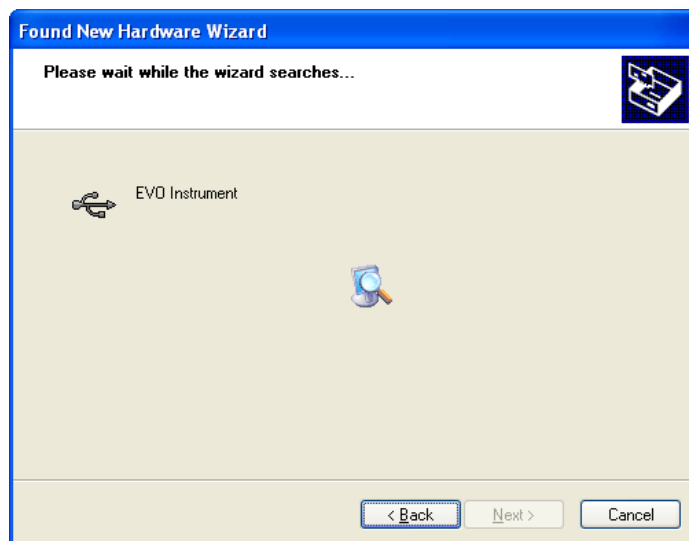


Fig. G4-13 Installing the USB driver, step 3

The following dialog box is shown when installation is nearly finished.:



Fig. G4-14 Installing the USB driver, step 4

Click *Finish* to complete the installation of the USB driver.
The following figure shows a view of the PC's Device Manager with the USB driver correctly installed (at the bottom of the list).

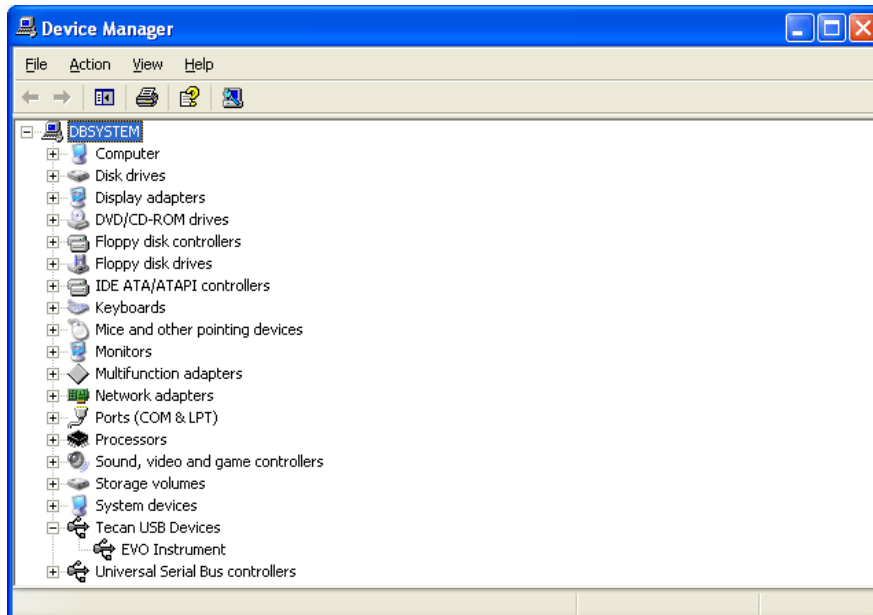


Fig. G4-15 Device Manager showing the correctly installed USB driver

G4.5.1 USB Power Management Setting

The USB power management in Windows must be switched off to avoid losing the connection to the pipetting instrument, which may otherwise occur in rare cases.

To switch off the USB power management in Windows, choose Start -> Control Panel -> System -> Hardware -> Device Manager -> Universal Serial Bus Controllers -> Power Management tab:

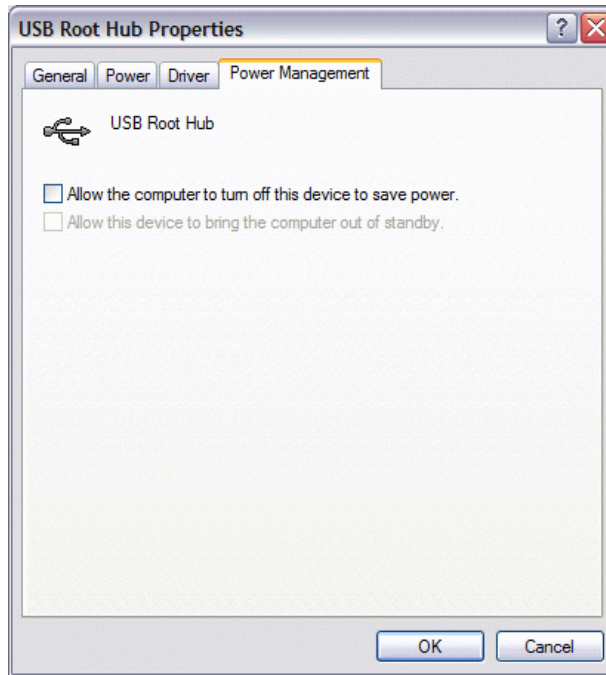


Fig. G4-16 Device Manager, USB Power Management tab

G4.5.2 USB Hubs

If you want to connect the pipetting instrument via USB, it should be connected directly to the PC. This also applies to USB connections from hardware options, if they have their own cable. The use of an external USB hub should be avoided. If an external USB hub is absolutely necessary, use an active USB hub (i.e. with its own power supply). Data transfer problems may occur if you use a passive USB hub, especially if you are also using the PMP option. Please note that some port replicators for laptops contain a USB hub.

G5 Starting Freedom EVOware

This chapter describes how to start Freedom EVOware and gives an overview of the main window.



ATTENTION

Tecan recommends to ensure that virus scanners are not actively scanning hard drives or memory while executing scripts. Please schedule any automatic scans to occur when Freedom EVOware is not running scripts or processes.

G5.1 Login Screen

To start Freedom EVOware, click the Start button in the Windows Task Bar and choose All Programs > Tecan > EVOware > EVOware Standard or EVOware Plus, depending on which version you want to run.

When Freedom EVOware is started Freedom EVOware checks, if there are files in the windows user Virtual Store under "[ApplicationProgramData]\TECAN\" and if the user has sufficient rights (read / write), to run Freedom EVOware. If not, Freedom EVOware shows a warning message box and writes this into log file. This feature does not apply, when Freedom EVOware started by API.

To disable the checks at startup, set the value of xml node CheckAccessRightsAtStartup to 0 in the evoware.xml file. For information on the location of this file see [A.6 "Freedom EVOware Directory Structure and Files"](#), 2 [A-33](#). The parameters in the evoware.xml file should only be changed by specialists.

If all checks are succeeded or they are disabled, you will be shown the Login dialog box:



Fig. G5-1 Login dialog box

Enter you user name and password for Freedom EVOware and click the large green arrow on the right. Contact your Freedom EVOware Administrator if you do not have a user name and password.

Note: When Freedom EVOware is started for the first time after installation, you will be prompted to assign a user name and password for the Freedom EVOware Administrator (see [7 “Tecan User Management System”, 2 7-1](#)).

G5.1.1 Loading the device drivers

After clicking the large green arrow you will be shown a progress bar as Freedom EVOware loads all of the software components and device drivers:



Fig. G5-2 Loading the device drivers

G5.1.2 Driver pre-loading

To ensure that Freedom EVOware starts quickly, above all if you have chosen to install and use a large number of device drivers, the installation program installs a shortcut which automatically loads all of the Tecan drivers each time the PC is started. The drivers remain loaded while the PC is running and it is no longer necessary to load them each time you start Freedom EVOware.

To unload the Tecan drivers when you quit Freedom EVOware, choose *Exit, unload drivers* in the File menu. Alternatively, check the *Unload drivers* checkbox in the Startup Wizard and click *Exit*. Driver pre-loading will be available again when you restart your PC.

Remove the shortcut “EVOware Prelaunch” from the MS Windows Autostart folder if you do not want the drivers to be loaded each time the PC is started. If you do this, Freedom EVOware will take somewhat longer to start in future. The driver pre-loading feature can be disabled in the Configuration Tool (see [8.4.1.1 “Device Information Tab”, 2 8-21](#)).

G5.1.3 Driver loading errors

If errors are detected when loading the device drivers, the following dialog box will show status messages:

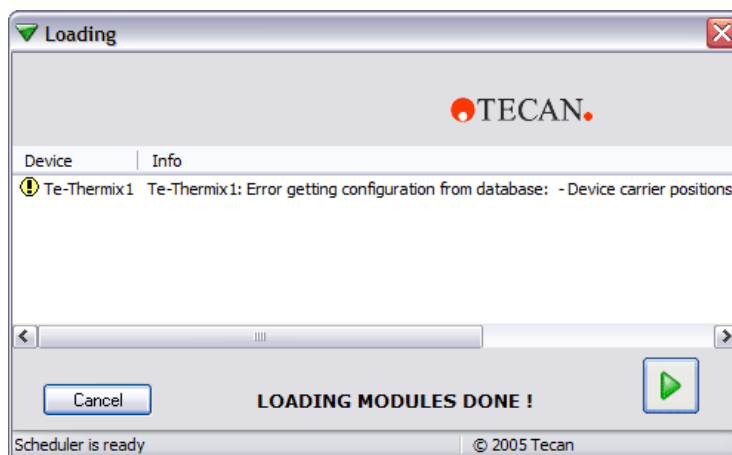


Fig. G5-3 Loading the device drivers - status messages and warnings

Use the scroll bar to inspect last column (Info), which explains the reason for the error.

If one of the error messages is shown truncated because it is too long, lengthen the field in the dialog box and activate the horizontal scroll bar by double-clicking on the divider (short vertical line in the header) at the end of the field.

Some of the device drivers will output errors or warnings during loading if Freedom EVOware detects configuration errors.

G5.1.4 Instrument and Hardlock Detection

Freedom EVOware will run in offline mode if it cannot detect a hardlock (dongle) when it starts. See [G3.1.2 “Hardlocks for Freedom EVOware Standard and Freedom EVOware Plus”](#), [G3-2](#).

It will also run in offline mode if it cannot detect a pipetting instrument on one of the USB ports or on the configured COM port (it checks the USB ports first).

The following dialog box will be shown if Freedom EVOware cannot communicate with the pipetting instrument:

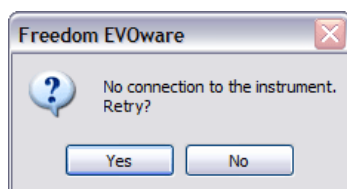


Fig. G5-4 Starting Freedom EVOware - no pipetting instrument detected

Click No to continue with offline mode. See also [G4.5.1 “USB Power Management Setting”](#), [G4-14](#) and [G4.5.2 “USB Hubs”](#), [G4-15](#).

In offline mode, firmware commands such as movement commands are not sent to the pipetting instrument (i.e. pipetting does not take place).

Freedom EVOware's current operating mode is shown in the Status Bar (see [6.7.3 "Status Bar"](#), 2 6-20).

See [8.4.3.3 "Com Ports Tab"](#), 2 8-36 for information on configuring the pipetting instrument's COM port. The USB ports do not need configuring.

G5.2 Startup Wizard, Freedom EVOware Standard

After all of the modules and drivers have been loaded and you have logged in as the Freedom EVOware Administrator or Application Specialist, you will be shown the Freedom EVOware Standard startup wizard.

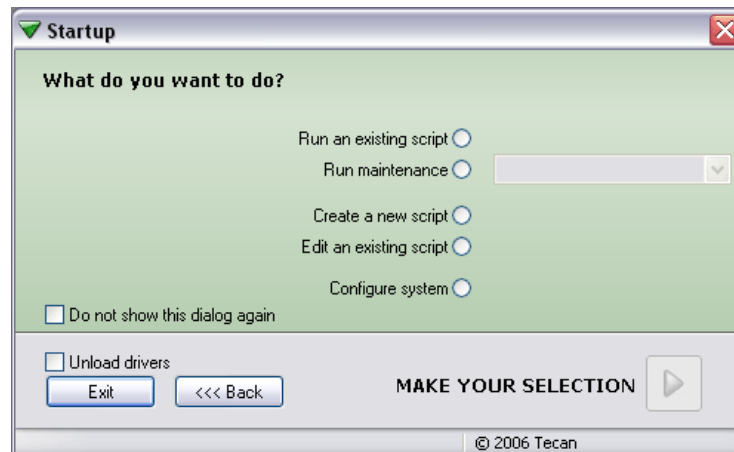


Fig. G5-5 Freedom EVOware Standard startup wizard

This dialog box is also shown if you choose Startup Wizard from the File menu. The options in the Startup Wizard are as follows:

Run an existing script

This option opens the Selection dialog box to allow you to choose the script you want to run. After choosing the script you are shown the Runtime Controller dialog box (see [12.1 "Running a Liquid Handling Script", 2 12-1](#)).

Run maintenance

This option is used to run instrument maintenance tasks.

Create a new script

This option opens the Selection dialog box to allow you to choose a template for the new script. The template contains information on e.g. the worktable layout.

Edit an existing script

This option opens the Selection dialog box to allow you to choose the script you want to edit or view. After loading the script, you can also choose to run it.

Configure system

This option is used to configure general settings for the Freedom EVOware software (see [8 "Configuration Tool", 2 8-1](#)).

Do not show this dialog again

Check this checkbox if you do not want Freedom EVOware to show the Startup Wizard when it starts next time. In this case, Freedom EVOware Standard will start by opening the Script Editor with the pipetting script which was last used. To deactivate this feature again, open the Startup Wizard by choosing Startup Wizard in the File menu or click the Startup button in the Toolbar and uncheck the checkbox.

Unload drivers

To ensure that Freedom EVOware starts quickly, all of the Tecan drivers you have chosen to use are loaded each time the PC is started and remain loaded while the PC is running (see [G5.1.2 "Driver pre-loading"](#), [G5-2](#)). Check this checkbox before you click Exit if you want to unload the drivers when you quit Freedom EVOware. The drivers should be unloaded e.g. if Freedom EVOware reports an internal error. The drivers will be loaded again when you re-start Freedom EVOware.

Note: If you have made configuration changes using the Configuration Tool, the drivers will be unloaded automatically when you quit Freedom EVOware.

Exit

Quit Freedom EVOware.

G5.2.1 Startup Wizard for Freedom EVOware Standard Operators

Operators of Freedom EVOware Standard have less access rights than Administrators or Application Specialists (see [7.2 "Freedom EVOware Access Rights \(User Levels\)"](#), 2 7-3). Accordingly, they are presented with a startup wizard which has less functions:



Fig. G5-6 Freedom EVOware Standard startup wizard for Operators

See [G5.2 "Startup Wizard, Freedom EVOware Standard"](#), [G5-5](#) for a description of the functions.

G5.3 Startup Wizard, Freedom EVOware Plus

After all of the modules and drivers have been loaded and you have logged in as the Freedom EVOware Administrator or Application Specialist, you will be shown the Freedom EVOware Plus startup wizard.

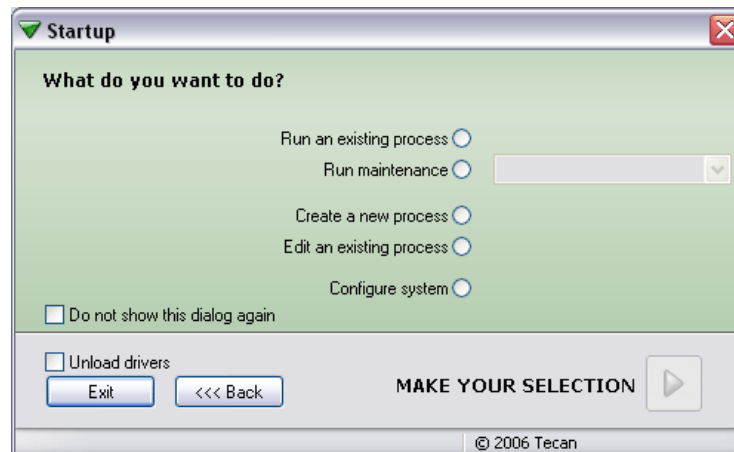


Fig. G5-7 Freedom EVOware Plus startup wizard

This dialog box is also shown if you choose Startup Wizard from the File menu. The options in the Startup Wizard are as follows:

Run an existing process

This option is used to run an existing process or method. Click the large green arrow and choose the process or method you want to run in the Selection dialog box which follows. After choosing the process or method, you are shown the Runtime Controller dialog box (see [12.2 "Running and Optimizing a Process \(Freedom EVOware Plus\)"](#), 2 12-5).

A method is a set of one or more processes to be run together (either sequentially or in parallel). The method file also contains information on the runtime settings. Methods are created and saved in the Runtime Controller.

Run maintenance

This option is used to run instrument maintenance tasks. See [6.4.2 "Run Maintenance"](#), 2 6-10.

Create a new process

This option opens the Selection dialog box to allow you to choose a template for the new process. The template contains information on e.g. the worktable layout.

Edit an existing process

This option opens the Selection dialog box to allow you to choose the process you want to edit or view. After loading the process, you can also choose to run it.

Configure system

This option is used to configure general settings for the Freedom EVOware software (see [8 "Configuration Tool"](#), 2 8-1).

Do not show this dialog again

Check this checkbox if you do not want Freedom EVOware to show the Startup Wizard when it starts next time. In this case, Freedom EVOware Plus will start by opening the Process Editor with the process which was last used. To deactivate this feature again, open the Startup Wizard by choosing Startup Wizard in the File menu or click the Startup button in the Toolbar and uncheck the checkbox.

Unload drivers

To ensure that Freedom EVOware starts quickly, all of the Tecan drivers you have chosen to use are loaded each time the PC is started and remain loaded while the PC is running (see G5.1.2 “Driver pre-loading”, G5-2). Check this checkbox before you click Exit if you want to unload the drivers when you quit Freedom EVOware. The drivers should be unloaded e.g. if Freedom EVOware reports an internal error. The drivers will be loaded again when you re-start Freedom EVOware.

Note: If you have made configuration changes using the Configuration Tool, the drivers will be unloaded automatically when you quit Freedom EVOware.

Exit

Quit Freedom EVOware.

G5.3.1 Startup Wizard for Freedom EVOware Plus Operators

Operators of Freedom EVOware Plus have less access rights than Administrators or Application Specialists (see 7.2 “Freedom EVOware Access Rights (User Levels)”, 2 7-3). Accordingly, they are presented with a startup wizard which has less functions:

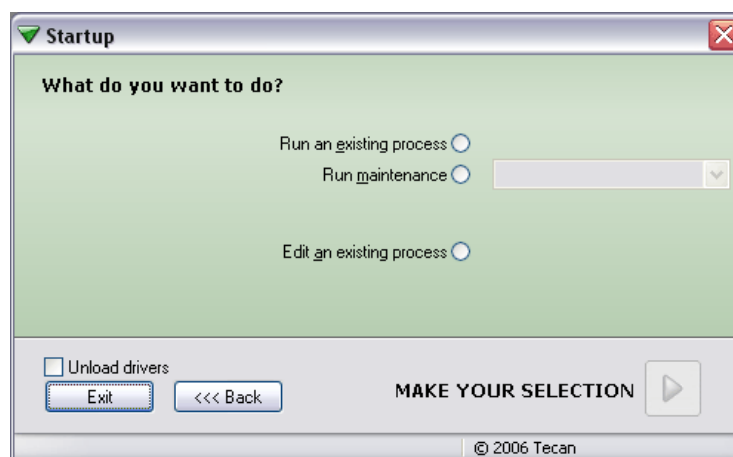


Fig. G5-8 Freedom EVOware Plus startup wizard for Operators

See G5.3 “Startup Wizard, Freedom EVOware Plus”, G5-7 for a description of the functions.


G5.4 Overview of the Main Window in Freedom EVOware

The following section describes the key features of the Freedom EVOware main window. See also 6 “Menus”, 2 6-1 and 13 “Overview of Freedom EVOware Commands”, 2 13-1.

G5.4.1 Control Bar

The Control Bar is the vertical area at the left of the screen. It is used to select the objects and commands which you need to set up your process or script. It is also used to configure the liquid classes for the liquid you want to pipette and to set up robot vectors.

The Control Bar is only visible for the user levels Administrator, Application Specialist and Power User (not for operators).

Six colored tabs can be seen to the right of the Control Bar. Click on the tabs to select the type of object you want to work with. Each of the tabs contains a list of objects which are arranged in groups. For example, the Labware tab contains groups for Microplates, Tips, Wash and Waste, Troughs, Tubes, Miscellaneous and Allowed Labware. Click  in the group’s title bar to collapse the group.

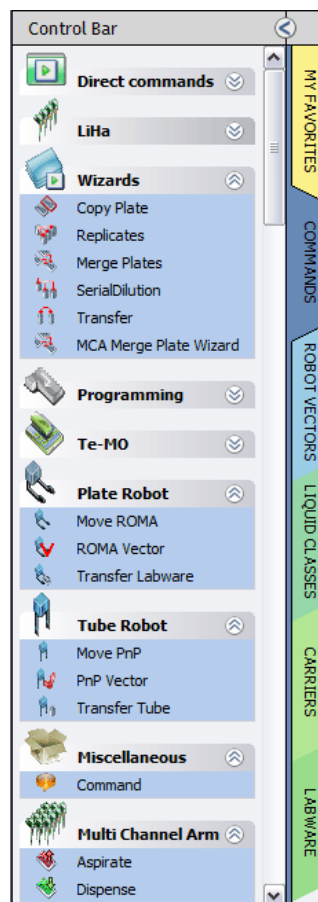


Fig. G5-9 Control Bar showing the Commands tab

If necessary, you can resize the Control Bar by dragging the divider to the left of the colored tabs.

G5.4.1.1 My Favorites

Click this tab to view your favorite direct commands, device commands, liquid handling commands, robot vectors and labware. The list already contains a few standard items when Freedom EVOware has just been installed. To add a copy of an object from another Control Bar group to My Favorites, right-click the object and choose *Add to favorites* from the context menu. To remove the object again from My Favorites, right-click the object (in the My Favorites section or in the section where the object belongs) and choose *Remove from favorites*.

If you click My Favorites and select a carrier, you will not see an Allowed Labware section (below the Labware section) if none of your favorite labware items are compatible with this carrier. Click the Labware tab instead to see all of the allowed labware for this carrier.

G5.4.1.2 Commands

Click this tab to view the available script commands and device commands. The commands are divided into groups (e.g. Liquid Handling Arm commands).

In addition, the Commands tab also contains up to seven direct commands (see [G5.4.1.3 “Direct commands”](#), [G5-10](#)).

In Freedom EVOware Plus, when the Script Editor is open the Commands tab of the Control Bar only shows script commands (commands which are used for writing pipetting scripts, see [13.1 “Overview of Script Commands”](#), [2 13-1](#)). When the Process Editor is open, the Commands tab of the Control Bar only shows device commands (commands for the optional devices, see [13.2 “Overview of Device Commands”](#), [2 13-12](#)).

In Freedom EVOware Standard, the Control Bar always shows both command types (it does not have a Process Editor).

If you cannot find the device that you want to use in the Control Bar, you must run the installation program again and install the respective device driver (see [G4.3 “Modifying, Removing or Repairing Your Installation”](#), [G4-8](#)). Also check whether the driver has been installed but is currently deactivated (see [8.4.1.1 “Device Information Tab”](#), [2 8-21](#), *Start* checkbox).

G5.4.1.3 Direct commands

Direct commands are used for service purposes, e.g. for picking up DITIs or flushing the tips. They provide a convenient alternative to creating and running a pipetting or maintenance script which carries out the same function.

The Control Bar only shows direct commands for devices whose device driver is installed and loaded. For example, the direct command “Load the Te-MO” is only shown in the Control Bar if you have installed and have chosen to load the Te-MO driver. The DITI commands are only shown if the LiHa is configured with DITIs.

To run a direct command, right click on the command and choose Run in the context menu.

Direct commands are only meaningful if you are running Freedom EVOware in real mode and the PC is connected to a pipetting instrument. If Freedom EVOware is running in offline mode, in most cases the dialog box of the direct command will not open when you double-click on the command.

Many of the direct commands have an equivalent script command. In these cases, click the cross-reference link and refer to the script command for a description of the parameters which are required:

- ◆ Prime WRC: This direct command is used to prime the wash block of the Te-MO 96, Te-MO 384 or MCA. Choose the required wash block from the pull down list. The list shows all wash blocks which are currently positioned in the Worktable Editor. Then specify the required priming duration and click Start.
- ◆ Load the Te-MO: See [15.57.12 “Load the Te-MO Command”](#), 2 15-139.
- ◆ Fill Te-MO 384: See [15.57.13 “Fill system \(Te-MO 384\) Command”](#), 2 15-139.
- ◆ Flush: This is used to flush the LiHa. See [15.4 “Wash Tips Command”](#), 2 15-8. Flush is not available for Air LiHa.
- ◆ Prime Te-Fill: See [15.16 “Te-Fill Prime Command”](#), 2 15-26.
- ◆ Drop DITIs: See [15.8 “Drop DITIs Command”](#), 2 15-14. Note: Freedom EVOware automatically opens the dialog box for this command if the Runtime Controller encounters a Get DITIs command when tips are already mounted from a previous pipetting operation.
- ◆ Set DITI Position: See [15.9 “Set DITI Position Command”](#), 2 15-15.
- ◆ Get DITIs: See [15.7 “Get DITIs Command”](#), 2 15-13.
- ◆ LiHa Safe Flush: This direct command is used to discard the contents of the LiHa tips to a specified location (typically into a microplate, tube rack, a trough or the wash station waste). If hazardous liquid is left in the tips after completing a script or process, you can use this command to empty the tips for safety reasons. It can also be used to recover the contents of the tips if the script or process was aborted for some reason before it completed. If your pipetting instrument is fitted with more than one LiHa, choose the one you want to use and select the labware you want to use by clicking on the labware in the Worktable Editor. Then click on the well(s) you want to use. See [15.2 “Dispense Command”](#), 2 15-3 for information on the other parameters you need to specify (e.g. tip selection). LiHa Safe Flush is not available for Air LiHa.
- ◆ Send Firmware Command:
 - **Command:** Specify the firmware command you want to send to the instrument. For example, “A1RPZ0” returns the current Z position of each of the LiHa tips. See the respective instrument manual for a list of firmware commands. Firmware commands are nearly always written uppercase.
 - **Response:** Some firmware commands terminate with one or more return parameters (numeric values) separated by commas. See the respective instrument manual for information on return parameters from firmware commands.
 - **Error Code:** All firmware commands terminate with an error code. The error code is 0 if the command was executed with no errors.




WARNING

Risk of injury to operating personnel or damage to the equipment

- ◆ Take care when sending firmware commands. Sending the wrong commands can damage the instrument or objects in its workspace, hurt yourself or other people.

G5.4.1.4 Direct commands for the MCA96

Direct commands are used for service purposes, e.g. for picking up DITIs or flushing the tips. They provide a convenient alternative to creating and running a pipetting or maintenance script which carries out the same function. For general information on direct commands see [G5.4.1.3 “Direct commands”](#),  [G5-10](#).

- ◆ MCA96 Get Tips: This direct command is used to get MCA96 DITIs or tip blocks. See [15.69.5 “MCA96 Get DITIs Command”](#), 2 15-168 and [15.69.7 “MCA96 Get Tip Block Command”](#), 2 15-171.
- ◆ MCA96 Drop Tips: This direct command is used to put down MCA96 DITIs or tip blocks. See [15.69.6 “MCA96 Drop DITIs Command”](#), 2 15-169 and [15.69.8 “MCA96 Drop Tip Block Command”](#), 2 15-172.
- ◆ MCA96 Safe Flush: This direct command is used to discard the contents of the MCA96 tips to a specified location (typically into a microplate or a trough). If hazardous liquid is left in the tips after completing a script or process, you can use this command to empty the tips for safety reasons. It can also be used to recover the contents of the tips if the script or process was aborted for some reason before it completed.

G5.4.1.5 Direct commands for the MCA384 and the CGM

Direct commands are used for service purposes, e.g. for picking up DITIs or flushing the tips. They provide a convenient alternative to creating and running a pipetting or maintenance script which carries out the same function. For general information on direct commands see [G5.4.1.3 “Direct commands”](#), 2 G5-10.

- ◆ MCA384 Get DITIs: See [15.70.8 “MCA384 Get DITIs Command”](#), 2 15-192.
- ◆ MCA384 Drop DITIs: See [15.70.9 “MCA384 Drop DITIs Command”](#), 2 15-195.
- ◆ MCA384 Get Head Adapter: See [15.70.6 “MCA384 Get Head Adapter Command”](#), 2 15-190.
- ◆ MCA384 Drop Head Adapter: See [15.70.7 “MCA384 Drop Head Adapter Command”](#), 2 15-191.
- ◆ MCA384 Safe Flush: This direct command is used to discard the contents of the MCA96 tips to a specified location (typically into a microplate or a trough). If hazardous liquid is left in the tips after completing a script or process, you can use this command to empty the tips for safety reasons. It can also be used to recover the contents of the tips if the script or process was aborted for some reason before it completed.
- ◆ Dock CGM. This direct command is used to dock the common gripper module of the MCA384. See also [15.70.13 “MCA384 Dock CGM Command”](#), 2 15-205.
- ◆ Undock CGM. This direct command is used to undock the common gripper module of the MCA384 and rotate the gripper to a specified angle (in 0.1 degrees steps). See also [15.70.14 “MCA384 Undock CGM Command”](#), 2 15-205.

G5.4.1.6 Robot Vectors

Click this tab to view the movement vectors which have been defined for the plate robot, the multi channel arm and the tube robot.

This tab only shows home vectors and vectors which were not assigned to carriers or labware items in the Edit Carrier or Edit Labware dialog boxes. Plate robot vectors specify movements to be carried out by the RoMa (Robot Manipulator). Current Tecan pipetting instruments can be fitted with up to two RoMas. See [9.6 “Creating and Editing Plate Robot Vectors”](#), 2 9-55.

Multi channel arm vectors specify movements to be carried out by the MCA. Current Tecan pipetting instruments can only be fitted with one MCA. MCA vectors are very similar to RoMa vectors. See [9.8 “Creating and Editing MCA Vectors”](#), 2 9-69.

Tube robot vectors specify movements to be carried out by the PnP (Pick & Place robot). Current Tecan pipetting instruments can be fitted with up to two PnP arms. See [9.7 “Creating and Editing Tube Robot Vectors”](#), 2 9-63.

Home vectors specify the movements to be carried out by the RoMa and/or PnP in order to move the robot back to its home (parking) position. See [9.6.4 “Defining the Home Position for a RoMa”](#), 2 9-62 and [9.7.4 “Defining the Home Position for a PnP”](#), 2 9-69. You cannot and do not need to define a home vector for the multi channel arm.

To create a new plate robot vector, right-click the group heading *Robot Vectors*, choose *New*, enter a descriptive name of your choice and click OK to open the Teach Plate Robot Vector dialog box (see [9.6.2 “Teach Plate Robot Vector Dialog Box”](#), 2 9-59).

If your pipetting instrument is fitted with more than one plate robot, it is recommended to suffix the vector name with “1” or “2”, e.g. “MoveBlock2” to indicate which RoMa was used for teaching (Note: the vector name does not influence which RoMa is used, either in Freedom EVOware Plus or in Freedom EVOware Standard). In Freedom EVOware Standard, user-defined plate robot vectors can be used in Transfer Labware and RoMa Vector commands. See also [17.3 “Site-specific RoMa vectors”](#), 2 17-13.

To create a new tube robot vector, right-click the group heading *Robot Vectors (Tubes)*, choose *New*, enter a descriptive name of your choice and click OK to open the Teach Tube Robot Vector dialog box (see [9.7.2 “Teach Tube Robot Vector Dialog Box”](#), 2 9-65). Use the name “Home1” to create a home vector for tube robot 1.

To create a new multi channel arm vector, right-click the group heading *Multi Channel Arm Vectors*, choose *New*, enter a descriptive name of your choice and click OK to open the Teach Multi Channel Arm Vector dialog box (see [9.6.2 “Teach Plate Robot Vector Dialog Box”](#), 2 9-59).

To view and/or edit plate robot and multi channel arm vectors which are associated with carriers, double click on the carrier in the Labware section of the Control Bar and click *Edit*. To view and/or edit tube robot vectors which are associated with labware items, double click on the labware item in the Labware section of the Control Bar and click *Edit*.

G5.4.1.7 Liquid Classes

Click this tab to view the available liquid classes. A liquid class is a set of liquid handling parameters. It specifies aspirating and dispensing speeds, airgaps, liquid detection modes, etc. The values of the parameters are dependent on the physical characteristics of the liquid. See [10 “Configuring Liquid Classes”](#), 2 10-1 for information on creating and editing liquid classes.

G5.4.1.8 Carriers

Click this tab to view the available carriers. A carrier is a removable support on the instrument's worktable (i.e. deck) which holds one or more pieces of labware (e.g. a microplate) in place. The carrier name indicates the type of labware for which it is designed. Optional devices which can be placed on the worktable (e.g. the Te-Shake shaker) are also treated as carriers.

Carriers are normally fitted to the instrument's worktable at pre-defined grid positions (see [Fig. G6-8](#), [G6-20](#)).

The Carriers tab is subdivided into groups for Devices, Hotels, Microplate Carriers, DITI Carriers, Wash Stations, Trough Carriers, Tube Carriers (tube racks) and Miscellaneous Carriers.

See [9.5 “Configuring Carriers”](#), 2 9-39 for information on creating and editing carrier templates.

The Freedom EVOware database already contains a large selection of pre-defined carrier types. You only need to create or edit carriers if you cannot find a standard item which is suitable for your needs.

G5.4.1.9 Labware

Click this tab to view the available labware. Labware refers to consumable items such as microplates or sample tubes. Microplates have a regular arrangement of containers or cavities (wells) for holding liquids or samples. To allow pipetting, microplates are normally placed on microplate carriers and tubes are inserted in tube racks.

The Labware tab is subdivided into groups for Microplates, Tips, Wash and Waste, Troughs, Tubes, Miscellaneous and Allowed Labware.

Allowed Labware shows the labware types which are compatible with the currently selected carrier. If you have already put a carrier onto the Worktable Editor, click on it to see which labware types are allowed.


See [9.4 "Configuring Labware"](#), 2 9-15 for information on creating and editing labware templates.

The Freedom EVOware database already contains a large selection of pre-defined labware types. You only need to create or edit labware if you cannot find a standard item which is suitable for your needs.

G5.4.1.10 Search

Click this tab to view the Control Bar objects which were found using the search function.

G5.4.1.11 Searching for objects in the Control Bar

To search for any object or command in the Control Bar, enter the name or part of the name in the text field at the bottom and click . The search results are shown in the Search tab of the Control Bar.

G5.4.1.12 Context Menu for Objects in the Control Bar

Right-click on an object in the Control Bar to open the context menu. The context menu is context sensitive and the options it contains depend on the currently active Control Bar tab and on the object you have selected. The available options in the context menu are as follows:

Edit

Edit the selected object.

Delete

Delete the selected object.

New

Create a new object of the same type.

Duplicate

Duplicate the selected object. You will be prompted for a new name.

Rename

Rename the selected object. You will be prompted for a new name.

Add to favorites

Add the selected object to the My Favorites tab of the Control Bar.

Remove from favorites

Remove the selected object from the My Favorites tab of the Control Bar.

Hide

Hides the selected object. Use this feature if you want to hide items which you do not normally use. Depending on the Show/Hide status of the Control Bar, the object will either disappear immediately or it will be shown in gray. See [G5.4.1.13 “Context Menu for Group Titles in the Control Bar”](#), [G5-15](#).

Show

Shows the selected object (cancels the hidden status). Before you can do this you must make the hidden objects visible (see [G5.4.1.13 “Context Menu for Group Titles in the Control Bar”](#), [G5-15](#)).

Run Command

This option is only available for device commands and is used for service purposes, e.g. to initialize the device manually or to test correct functioning (see [16.1 “Service Functions”](#), [2 16-1](#)). See [6.4.2 “Run Maintenance”](#), [2 6-10](#) for information on instrument maintenance functions. Maintenance functions are scripts which are created using the Script Editor.

G5.4.1.13 Context Menu for Group Titles in the Control Bar

Right click on a group title in the in the Control Bar to open the context menu. The context menu is context sensitive and the options it contains depend on the currently active Control Bar tab and on the group title you have selected (e.g. “Carriers”). The available options in the context menu are as follows:

Edit

Edit the selected object.

New

Create a new object.

Show hidden items

Shows all objects you have marked as hidden in gray. This allows you to cancel the hidden status of an object. To cancel the hidden status, right-click on the object and choose Show.

Hide hidden items

Completely hides all objects you have marked as hidden.

G5.4.2 Infopads

Infopads are small windows which contain prompts, hints or context-related information on the task which is currently being carried out or the object which is currently selected. The Infopads are positioned to the right of the Control Bar.

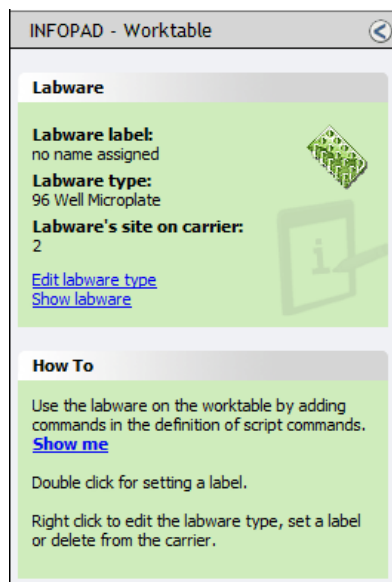



Fig. G5-10 Lower infopad with a labware item selected

If your pipetting script contains Comment commands, the comment texts and the corresponding script line numbers are listed as hyperlinks in the upper Infopad. Click on one of the entries to jump to the script line which contains the Comment command (**script navigation feature**). See 15.38 “Comment Command”, 2 15-98 for more information.

If you need more space for the Process Editor or the Worktable Editor, you can collapse the upper and/or lower Infopad by clicking  in the title bars. You can also resize the windows by dragging the dividers between the windows.

The hyperlinks in the *How To* section of the infopads take you to short animations (films) which demonstrate the currently selected task. The animations are stored in AVI format and will be shown e.g. in Windows Media Player.

G5.4.2.1 Hyperlinks in the Infopads

The infopads are provided with hyperlinks (blue underlined text) which are shortcuts to commonly needed actions. The hyperlinks are context sensitive and the available options depend on what you have selected (e.g. a carrier or labware item in the Worktable Editor):

Edit carrier type

This option is shown when you select a carrier or a carrier which is a device. It opens the Edit Carrier dialog box and is equivalent to double-clicking the selected carrier in the Control Bar.

Edit labware type

This option is shown when you select a labware item. It opens the Edit Labware dialog box and is equivalent to double-clicking the selected labware item in the Control Bar.

Edit liquid class

This opens the Liquid Class Editor and is equivalent to double-clicking the selected liquid class in the Control Bar.

Show labware

This option is shown when you select a carrier or a carrier which is a device. It opens the Labware tab of the Control Panel. Allowed Labware then shows the labware types which are compatible with the selected carrier.

Show me

This runs a short animation (film) to demonstrate the currently selected task. The animations are stored in AVI format and will be shown e.g. in Windows Media Player.

G5.4.3 The Process Editor (Freedom EVOware Plus)

In Freedom EVOware Plus, the sequence of steps which are required to carry out a particular application or experiment, for example to extract the substance you are looking for, is called a process. The process specifies the operations you want the pipetting instrument to execute. Processes are set up in the Process Editor, which is shown at the top right of the screen.

In the Process Editor, each process step (such as centrifuging a plate or pipetting to a plate) is shown as an icon, whereby each icon is associated with a single device such as a centrifuge, a storage device or the liquid handling arm.

See 13.2 “Overview of Device Commands”, 2 13-12 for a list of device commands which are provided with the standard Freedom EVOware installation. When installing Freedom EVOware, you normally only install the device drivers which you want to use.

There are four basic types of icon - process steps, labware source icons, final position icons and on-the-fly icons:

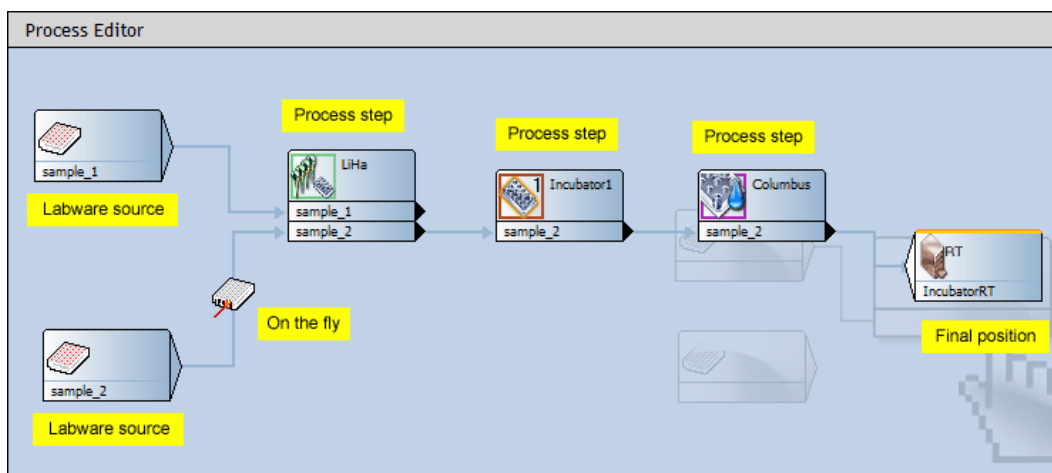


Fig. G5-11 Process Editor showing an example process

If you need more space for the Process Editor, you can collapse the Worktable Editor by clicking in the title bar. In addition, you can collapse the Infopad windows by clicking in the title bars. You can also resize the windows by dragging the dividers between the windows.

Process steps are created by dragging commands from the Control Bar onto the Process Editor. A process is then created by interlinking the process steps to create the workflow which is required by your application or experiment.

The bottom part of each process step icon shows the name or names of the labware items which are involved in the operation (so-called object parameters).

Each process step is associated with a single device, and devices can typically carry out several different functions. For example, a plate washer may have a washing function, a priming function and an initialization function. This is handled by associating the process step with a command. Each device driver contains a pre-configured command for each of the device functions (the available commands are shown in the Commands section of the Control Bar, below the symbol for the device). Many of the commands have one or more execution parameters (such as the duration of the washing operation). When you create a process step by dragging the command onto the Process Editor, you will be prompted to specify the execution parameters.

Each command can be associated with pre-actions and/or post-actions – additional commands which are carried out before and after the main command. For example, if you want to scan a plate in a Tecan Ultra reader with the Measure command, it is necessary to move the plate to the reader using the plate robot (with the RoMa_MoveObject command) and to open the reader door before the plate gets there (with an Ultra_Open command). Another RoMa_MoveObject command and an Ultra_Close command are needed when the scanning operation is finished. The process diagram is simplified by implementing these standard actions using pre-actions and post-actions which are linked to the Measure command. It avoids having to specify additional process steps. In most cases, Freedom EVOware configures suitable pre-actions and post-actions for you automatically. This applies above all to the plate robot (RoMa_MoveObject command).

Freedom EVOware keeps track of the location of the labware on your instrument, and - to take the above example - automatically configures a suitable RoMa_MoveObject command to move the plate from its current location to the reader.

The pipette command for the liquid handling arm has a large number of sub-commands which are used for writing so-called scripts. In Freedom EVOware Plus, if you drag the pipette command onto the Process Editor, this opens scripting mode and the Process Editor is replaced by the Script Editor (see below).

Labware source icons are used at the start of a process to represent the source of the labware items (e.g. microplates or tubes) which are needed by the process. See [G6.6 “Labware Generator \(Freedom EVOware Plus\)”](#), [G6-16](#) for information on creating labware source icons.

Final position icons are used to specify the final position of the labware after the process has finished. They are often associated with a storage device such as a hotel or with a waste position for discarding used labware. Final position icons are not necessary if you want to return the labware to its original position after the process has finished, for example back to a storage device such as a carousel (the “base” location). Final position icons are created by right-clicking on the background of the Process Editor and choosing Choose Final Position from the context menu.

On-the-fly icons represent on-the-fly devices. Such devices always require the use of a plate robot (RoMa) to carry out their function. A typical example of this type of icon is the Symbol barcode scanner which is rigidly fixed to the instrument's deck and cannot move towards the labware to scan it. Instead, a plate robot is used to move the labware past the barcode scanner “on-the-fly” while carrying out something else, for example when moving the labware from one carrier (or process step) to another. The barcode scanner is then instructed to perform a read operation when the plate robot presents the labware. An on-the-fly icon for the barcode scanner is created by dragging the Barcode scanner command from the Control Bar onto a line which links two process steps.

See [G6 “Getting Started - Setting Up a New Script or Process”](#), [G6-1](#) for more information.

G5.4.3.1 Context Menu for the Process Editor

Right-click on the Process Editor to open the context menu. The context menu is context sensitive and the options it contains depend on what you have selected (a process step icon or the background). The available options in the context menu are as follows if you select the background of the Process Editor:

Choose Final Position

This option adds a final position icon for labware. Final position icons are used to specify the final position of the labware after the process has finished. Final position icons are not necessary if you want to return the labware to its original position after the process has finished. See the above description of the Process Editor.

Paste

This option is available if you have selected a process step and choose Copy.

Arrows

This option allows you to choose between Rectangular and Straight arrows for the lines which connect the process steps. The choice you make solely depends on your personal taste.

See [9.10 "Local Settings for Process Steps \(Context Menu\)"](#), 2 9-70 and [9.11 "Local Settings for Labware Source Icons \(Context Menu\)"](#), 2 9-77 for information on the options in the context menu if you select a process step.

G5.4.4 The Script Editor

The Script Editor, which is shown at the top right of the screen, is used to set up a pipetting (liquid handling) script.

Freedom EVOware Plus

To open the Script Editor in Freedom EVOware Plus, select the Pipette command in the Control Bar (Liquid Handling Arm section) and drag it to the Process Editor window.

After creating the script, click the Accept to accept your changes and return to the Process Editor. If you want to edit or view the script later, you can open the Script Editor again by double-clicking on the icon for the Pipette command in the Process Editor.

Freedom EVOware Standard

Freedom EVOware Standard does not have a Process Editor, and displays the Script Editor as soon as it has started.

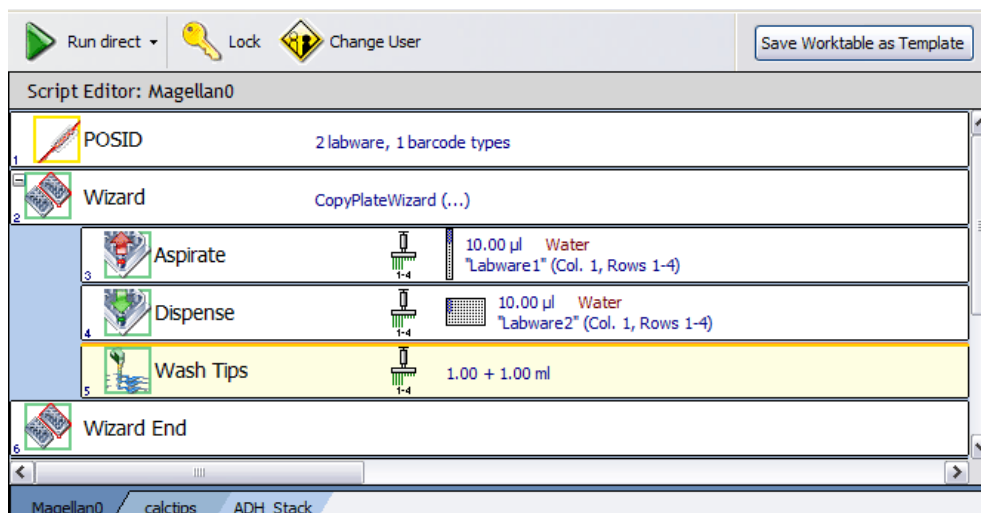


Fig. G5-12 Script Editor with three scripts open

If you have opened more than one pipetting script, click the tabs below the Script Editor window if you want to view, edit, save or close one of the other scripts. If you need more space for the Script Editor, you can collapse the Worktable Editor by clicking in the title bar. In addition, you can collapse the Infopad windows by clicking in the title bars. You can also resize the windows by dragging the dividers between the windows.

G5.4.4.1 Context Menu for the Script Editor

Right-click on the Script Editor to open the context menu. The available options in the context menu are as follows:

Edit

Edit the selected script line.

Delete

Delete the selected script line(s).

Cut

Cut the selected script line(s).

Copy

Copy the selected script line(s).

Paste

Paste the script line(s) in the clipboard at the current cursor position.

Search & Replace

Opens the *Search and Replace* dialog box which allows you to replace strings in the pipetting script (e.g. the string you have specified in the User Prompt command). If you do not specify a string in the *Replace with* field, matching strings are deleted (you cannot carry out a search without replacing).

Context Menu for the Tabs of the Script Editor

Save

Save the selected script.

Close

Close the selected script.

Open

Open an additional script.

G5.4.5 Worktable Editor

The Worktable Editor at the bottom right of the screen is a graphical representation of the pipetting instrument's worktable (deck). It shows the carriers and labware that are physically placed on the worktable. It also shows icons for the devices which are installed.

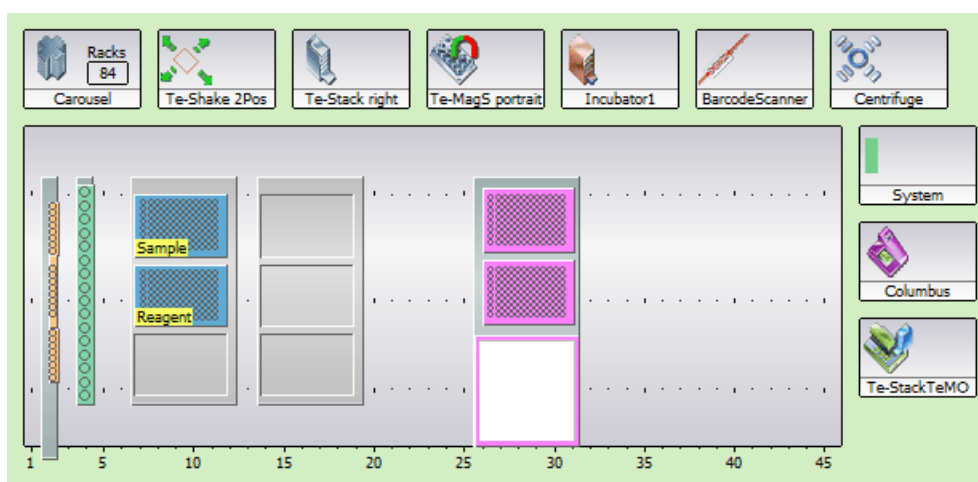



Fig. G5-13 Example worktable showing carriers, labware and labware labels

The gray area in the Worktable Editor represents that part of the worktable which can be accessed by the Liquid Handling Arm. This is called the pipetting area. The real worktable is normally larger than this. For example, hotels (storage shelves for plates) are normally put at the rear of the worktable, behind the pipetting area. The displayed size of the worktable is scaled automatically depending on the size of the Worktable Editor window. The displayed size of the worktable will be very small if the Worktable Editor window is small and/or a large number of device icons are visible (i.e. you have installed a large number of devices).

In the above figure, 84 microplates have been put in the carousel.

If you need more space for the Worktable Editor, you can collapse the Infopad windows by clicking  in the title bars. You can also resize the windows by dragging the dividers between the windows. In addition, you can rearrange the device icons by dragging them to the required position.

Before programming your pipetting operations, you need to place the carriers and labware which you want to use on to the worktable.

The worktable layout is stored in the script or process file together with the information on the script or process.

G5.4.5.1 Shared worktable layouts

Freedom EVOware detects automatically if scripts, processes, maintenance scripts and templates use an identical worktable layout. If you save one of these file types after changing the worktable layout, you will be asked whether you also want to update the worktable information in the other files which share the same worktable.

If you are saving a pipetting script, you will only be prompted about other pipetting scripts, maintenance scripts or script templates which share the same worktable layout. If you are saving a process, you will only be prompted about other processes or process templates which share the same worktable layout.

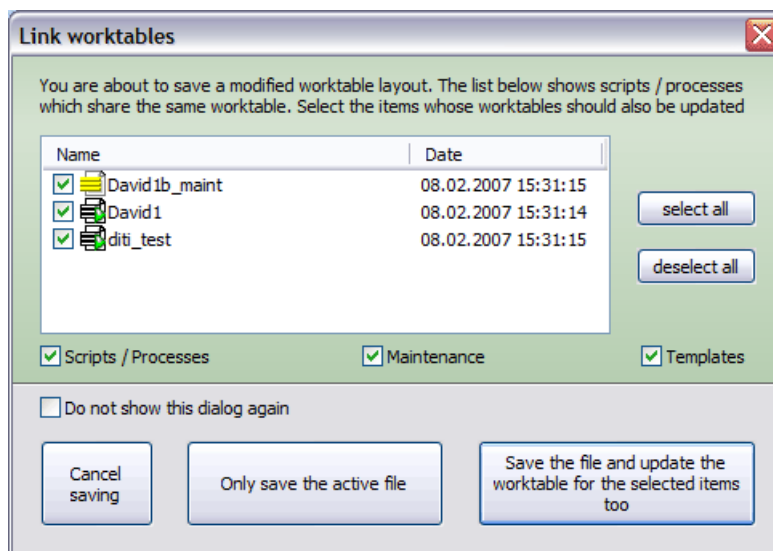


Fig. G5-14 Prompt when saving worktable layouts which are shared

Select the files whose worktable you also want to update or choose *Cancel saving*. The list shows all files of the selected file types (Scripts / Processes), Maintenance and Templates) which share the same worktable layout.

The following options are available:

Cancel saving

Cancel the saving operation.

Only save the active file

Update the file you are saving but do not update the other files which share this worktable.

Save the file and update the worktable for the selected items too

Update the worktable information for the active file and for the files you have selected.

If one of the other scripts which shares the same worktable layout is also currently open in the Script Editor, you will be prompted to save it first before updating.

Do not show this dialog again

Check this checkbox to hide this dialog box in future. In this case, Freedom EVOware will only save worktable layout changes for the current file in future. To make this dialog box appear again (i.e. to uncheck the checkbox), press the Shift key when you choose Save.

G5.4.5.2 Context Menu for the Worktable Editor

Right-click on the Worktable Editor to open the context menu. The context menu is context sensitive and the options it contains depend on what you have selected (a carrier, a labware item or the background). The available options in the context menu are as follows:

Set Grid

This option is used to move a robot-only device (a device which is not accessible to the liquid handling arm) to a new position on the worktable. Choose the required grid position and click OK. Tip: If you click on a device icon in the Worktable Editor, an orange line shows the grid position which is occupied by the device.

To move a carrier to a new position, click the edge of the carrier to select it and drag to the required position.

Modify labware

This option is only available for generated labware (labware in feeder devices or a labware repository on the worktable) and is only for Freedom EVOware Plus. It opens the labware generator to allow you to edit the settings you have made (see [G6.6 “Labware Generator \(Freedom EVOware Plus\)”](#), [G6-16](#)).

Edit labware type

This option is used to edit labware definitions.

Set label

This option is used to assign a label (i.e. a user-defined name) to the selected labware item.

Edit carrier

This option is used to edit carrier definitions.

Delete

This deletes the selected object. You cannot delete carriers if labware is already positioned on the carrier (you must delete the labware first).

Automatic replace

This activates the automatic DITI handling feature for the selected site. This option is only available for Freedom EVOware Plus and is only available for DITI racks. See [17.1 “Using the Automatic DITI Handling feature”](#), 2 17-1.

Waste for DiTi racks

This activates the automatic DITI rack waste feature for the selected site. This option is only available for Freedom EVOware Plus and is only available for the DITI waste site of a DITI carrier with waste. It is intended for discarding empty stackable DITI racks and spacers. See [17.1 “Using the Automatic DITI Handling feature”](#), 2 17-1.

Save worktable as template

This option is used to save the current worktable layout as a template. The template file which is saved contains configuration settings for Freedom EVOware, for example the positions of the devices and the labware in the Worktable Editor. To choose this option, right click on the worktable (but not on labware items).

G5.5 Exiting Freedom EVOware

To exit Freedom EVOware, choose *Exit* or *Exit, unload drivers* in the File menu. In the latter case, you will be shown a progress bar as Freedom EVOware unloads all of the software components and device drivers. If errors are detected when unloading the device drivers, a dialog box will appear with status messages. Use the scroll bar to inspect last column (Info), which explains the reason for the error.

In Freedom EVOware Plus, you must first close the Script Editor before you can exit.

G6 Getting Started - Setting Up a New Script or Process

This chapter describes the steps which are required to set up a new pipetting script (Freedom EVOware Standard) or process (Freedom EVOware Plus). Processes and scripts can only be created and/or modified by users with Freedom EVOware Administrator or Application Specialist rights.

G6.1 First Steps

Freedom EVOware Standard

Start Freedom EVOware and choose *Create a new script* in the Startup Wizard (see [G5.2 “Startup Wizard, Freedom EVOware Standard”](#), ¶ G5-5). This opens the main window of Freedom EVOware. Initially, the Worktable Editor at the bottom right of the screen will be empty (i.e. it does not contain any carriers or labware etc.). The Script Editor at the top right of the screen will also empty be until you add some pipetting commands. Until you save the script for the first time and assign a name of your choice, the title bar of the Script Editor will show a generic name.

Freedom EVOware Plus

Start Freedom EVOware and choose *Create a new process* in the Startup Wizard (see [G5.3 “Startup Wizard, Freedom EVOware Plus”](#), ¶ G5-7). This opens the main window of Freedom EVOware. Initially, the Worktable Editor at the bottom right of the screen will be empty (i.e. it does not contain any carriers or labware etc.). The Process Editor at the top right of the screen will also empty be empty until you add some process steps. Until you save the script for the first time and assign a name of your choice, the title bar of the Process Editor will show a generic name.

The various elements of the Freedom EVOware main window are described in [G5.4 “Overview of the Main Window in Freedom EVOware”](#), ¶ G5-9.

G6.2 Setting Up a New Pipetting Instrument

Please proceed as follows when setting up a new pipetting instrument:

- ♦ Use the *Setup & Service* software to check and calibrate the reference coordinates of the hardware. This is normally done for you by the Tecan Field Service Engineer when installing the pipetting instrument and the optional devices. See [G1.2 “Reference Documents”](#), ¶ G1-3 for information on this software.
- ♦ Edit the settings for the LiHa (see [8.4.2.1 “LiHa \(Liquid Handling Arm\)”](#), 2 8-22) or for the Air LiHa.
- ♦ If necessary, edit the settings for the PosID barcode scanner (see [8.4.2.2, 2 8-28](#)), the MPO/LICOS system (see [8.4.2.3, 2 8-29](#)), the Chemical System (see [8.4.2.5, 2 8-30](#)) and the doorlocks (see [8.4.2.7, 2 8-31](#)).

G6.3 Pre-requirements

Before you can set up a process or script, you have to configure the infrastructure of your system as follows:

- ◆ Check that the optional devices you want to use (such as barcode scanners) are installed on your pipetting instrument and that the devices are present in the Control Bar (Commands section) and/or visible in the Worktable Editor. If the icons are missing, then you need to run the installation program again and install the device drivers which are missing (see [13.2 “Overview of Device Commands”](#), 2 13-12 and [G4.3 “Modifying, Removing or Repairing Your Installation”](#), 2 G4-8). In general, the device drivers are pre-configured during installation with appropriate global settings. For information on configuring the global settings see [8.4 “Device Settings”](#), 2 8-21.
- ◆ Check that the general settings for the Freedom EVOware software are configured appropriately (see [8 “Configuration Tool”](#), 2 8-1). Among other things, check that the COM ports have been configured for the optional devices and that the I/O state is switched ON for the devices that you want to use (this enables the COM interface for the respective device). See [8.4.3.1 “I/O State Tab”](#), 2 8-36.
- ◆ Check that the carriers and labware you want to use for your process are visible in Freedom EVOware in the Control Bar (Labware section). If you are using custom carriers and/or labware items which are not in the list, you need to create them in Freedom EVOware before you can set up your process. See [9.5 “Configuring Carriers”](#), 2 9-39 and [9.4 “Configuring Labware”](#), 2 9-15. In the case of carriers, this involves e.g. specifying the carrier dimensions and how many labware items can be put on the carrier. In the case of labware, this involves e.g. specifying the labware dimensions.
- ◆ Check that liquid classes are available for the liquids you want to pipette (see [10.1 “Liquid Classes Editor”](#), 2 10-1). A liquid class is a set of liquid handling parameters. It specifies aspirating and dispensing speeds, airgaps, liquid detection modes, etc.
- ◆ Rectangular labware such as microplates is moved to and from carriers and other devices such as carousels using a plate robot (RoMa; robot manipulator). Tubes are moved to and from tube racks using a tube robot (PnP; Pick & Place arm). Movement commands for the RoMa and PnP are called robot vectors. The robot vectors for the RoMa are associated with the carrier definitions. The robot vectors for the PnP are associated with the labware definitions. Appropriate robot vectors may already be provided with your Freedom EVOware installation. Check in the respective carrier and labware definitions to see whether the robot vectors you want to use are already present. Otherwise you will need to configure a new vector. See [9.6 “Creating and Editing Plate Robot Vectors”](#), 2 9-55 and [9.7 “Creating and Editing Tube Robot Vectors”](#), 2 9-63.
- ◆ Additional RoMa and PnP vectors are needed to move the RoMa or PnP back to a home (or parking) position when not in use. Such vectors can be seen in the Robot Vectors section of the Control Bar. See [9.6.4 “Defining the Home Position for a RoMa”](#), 2 9-62 and [9.7.4 “Defining the Home Position for a PnP”](#), 2 9-69 for more information.

G6.3.1 Setting Up Carriers on the Worktable

The Worktable Editor at the bottom right of the screen is a graphical representation of the pipetting instrument's worktable (deck). It shows icons for

the devices which are installed and the arrangement of the carriers and labware. See [13.2 "Overview of Device Commands"](#), 2 13-12.

Before programming your process or pipetting script, you need to move the carriers and labware etc. which you want to use on to the Worktable Editor to match the real arrangement of these objects on the pipetting instrument.

This section describes how to add carriers; putting labware on the carriers is described in [G6.4.1 "Choosing Labware for a Pipetting Script"](#), [G6-4](#), [G6.5.1 "Choosing Labware for a Process"](#), [G6-8](#) and [G6.5.4 "Choosing Labware for a Pipette Command"](#), [G6-11](#).

Note: *Each script or process has its own worktable layout, and the worktable layout is automatically saved with the script or process. Click on the worktable and click Save worktable as template if you want to save the worktable layout as a template for use in another script or process. The worktable template contains information on the carriers you have chosen. If you have already put labware onto the carriers, the template also contains information on the labware you have chosen.*

Carriers can only be placed on the Worktable Editor at specified grid positions which correspond to the positioning pins on the instrument's worktable. One grid unit is 25.0 mm. The choice and the positions of carriers and labware are chosen according to the requirements of your application or experiment.

You can change the carrier positions later by dragging with the mouse without needing to change your script or process, for example if it turns out that the carriers are too close together to position additional objects in between.

You can change the size of the Worktable Editor by moving the mouse over the one of the edges until the double arrow cursor appears. Then click and drag until the required size has been reached.

When required by the script or process, Freedom EVOware uses the RoMa (Robot Manipulator) to move labware during runtime to new positions (carrier sites). However, carriers and devices always stay at the same position. Accordingly, you must set up the initial worktable with all of the carriers you need in the correct positions.

There are two basic types of carrier - normal carriers on which you can place labware for pipetting and carriers which are devices. The latter type are used as placeholders on the worktable for devices such as the orbital shaker or the incubator. Depending on the type of device, such carriers are often not available for pipetting, even though you can place labware on (or into) them. When the carrier is configured, this is specified by unchecking the *Accessible for liquid handling arm* checkbox.

To create the worktable layout, select the required carrier type from the Control Bar (Labware section) and drag it onto the worktable at the required position. Make sure that there is enough space on the worktable for the carrier. If necessary, drag already positioned objects to the left or right to make space. Remember that the final positions you choose must correspond to the actual position of the objects on the pipetting instrument. Large objects such as the TeMO need a lot of space to allow them to be positioned.

Repeat this process to add all of the carriers to the worktable that you need. The choice and the positions of the carriers is based on the requirements of your application or experiment.

To move a carrier to a new position, click the edge of the carrier to select it and drag it to the required position. When dragging the carrier, the current grid position is shown in the small yellow tab at the bottom left. To delete a carrier, click on it and drag it off of the worktable.

To make a copy of a carrier which is already on the worktable, press the Ctrl button, click on the carrier and drag the cursor to the required grid position.

When adding, deleting or moving carriers, a special cursor is shown to indicate the action you are performing (“+”, “del” or “move”).

If you click on a carrier (click on the edge, not on the labware on the carrier), information on the carrier is shown in the lower infopad.

Carrier types can be assigned unique colors in the Freedom EVOware configuration make it easier for you to identify them in the Worktable Editor (see “Color”, 2 9-41).

Carriers which are designed for one type of labware only (such as tube racks and the wash station) are put on the worktable with a full complement of labware. For other carrier types, you need to add the labware by hand (see later).

See also [G6.7.2 “Example of a Worktable With Several Carriers and Labware Items”](#),  [G6-20](#).

G6.4 Setting Up a Pipetting Script in Freedom EVOware Standard

After setting up the worktable with the carriers and devices you want to use, before you write the pipetting script you must to choose the labware you need.

G6.4.1 Choosing Labware for a Pipetting Script

Select the required labware type from the Labware section of the Control Bar and drag it onto the required carrier site on the worktable. To help you, Freedom EVOware highlights all carrier sites which are suitable for the chosen labware item.

Note: *If you click on the carrier and scroll down to Allowed Labware, Freedom EVOware will show you the labware types which are compatible with the selected carrier.*


Repeat this process to add all of the labware to the worktable that you need. The choice and the positions of the labware is based on the requirements of your application or experiment.


To move labware to a new position, click on the labware to select it and drag to the required carrier site. To delete labware, click on it and drag it off of the worktable.

To make a copy of a labware item which is already on the worktable, press the Ctrl button, click on the labware and drag the cursor to the required carrier site.

When adding, deleting or moving labware, a special cursor is shown to indicate the action you are performing (“+”, “del” or “move”).

Labware types can be assigned unique colors in the Freedom EVOware configuration make it easier for you to identify them in the Worktable Editor (see “Color”, 2 9-19).

In addition, labware items can be assigned labels (names) to make it easier to identify them in the Worktable Editor (see [G6.7.1 “Assigning a Label \(Name\) to the Labware”](#),  [G6-19](#)). Labware labels are shown in yellow.

If you click on a labware item, information on the item is shown in the lower infopad. See [Fig. G6-8](#),  [G6-20](#) for an example of a worktable.

G6.4.2 Creating a Pipetting Script

The pipetting program (or *script*) is created by choosing script commands in the Control Bar and dragging them to the Script Editor window (see [G5.4.4 “The Script Editor”](#), [G5-19](#)). See [13.1 “Overview of Script Commands”](#), [2 13-1](#).

Because Freedom EVOware normally executes a script in a linear sequence, you should add the commands in the order that you want the script to be executed. Each script is associated with its own worktable layout (carriers, devices and labware), which must be specified before you write the script.

When you drag a script command to the Script Editor, a blue line helps you to choose where the new command should be inserted.

When you drop the command onto the Script Editor, a dialog box is opened where you can specify the command parameters. After making your entries, click *OK* to add the command to the script. To change the command parameters later, double-click the script line to open the dialog box again (or click on the script line and press *Enter*).

If your script uses device commands, it is also necessary to put labware of the correct type onto the device icon(s). This is shown by a grey rectangle inside the icon. This is not necessary in Freedom EVOware Plus. Tip: If you click on the grey rectangle, the chosen labware type is shown in the lower Infopad.

The currently selected script line is highlighted in orange. The associated object in the Worktable Editor is highlighted using the same color. The cursor keys can be used to move through the script one line at a time.

The *Cut*, *Copy*, and *Paste* functions in the *Edit* menu (and in the Script Editor's context menu) can also be used when creating a script. Select one or more script lines, choose *Cut* or *Copy*, select where you want to insert the command(s) and then choose *Paste*.

To select several script lines, click on the first line you want to select and shift-click on the last line (click while pressing the *Shift* key). To clear the selection, click on a line outside of the selected range. To move a line, click on it and drag it to the required position.

See also [17 “Special Features, Example Scripts and Processes”](#), [2 17-1](#).

G6.4.2.1 Checking the Pipetting Script for Errors

Each time you insert a new command in your script or edit an existing command, Freedom EVOware validates the entire script to check for errors and shows all commands which have errors in red. If you select a faulty command, the infopad will show information on the error. Double-click on the command in the Script Editor to open a dialog box where you can change the command parameters.

Choose Auto-Validation in the *Edit* menu if you want to switch off automatic validation of pipetting scripts (see [6.2.5 “Auto-Validation”](#), [2 6-9](#)). You then need to validate the script manually (by choosing *Validate Script* in the *Edit* menu).

If your script contains conditional jumps or branches, validation only checks those parts of the script which are executed with the default values of the *IF* variables in *Condition* commands. For this reason, it is not recommended to declare variables (e.g. with the *Set Variable* command) within conditional parts of the script (see [14.1.12 “Validating a Script Which Contains Variables”](#), [2 14-18](#)).

If your script contains conditional jumps or branches, you should separately validate those parts of the script which are not executed with the default values of the *IF* variables. To do this, temporarily modify the values of the *IF* variables to ensure that all of the script branches have been tested.

Freedom EVOware chooses multi-dispensing mode automatically if the pipetting script specifies an aspirate command followed by several consecutive dispense commands. In turn, this influences the liquid class parameters which are used.

The decision between single dispensing mode and multi-dispensing mode is made when the script is validated and not when the script is run. Scripts are validated when they are modified and also when they are opened for running without being modified. Validation is done using default values for the variables. If the number of consecutive dispense commands is controlled by a variable whose value can change during runtime, it is recommended to design the script with branches or separate groups of commands for single-pipetting mode (one dispense operation) and multi-pipetting mode (more than one dispense operation). This ensures that the correct pipetting mode and liquid class parameters will be chosen at runtime.

See also [14.3.4 "Validating a Script Which Contains Sub-Routines"](#), 2 14-22.


See also [C "Validation of Freedom EVOware Applications"](#), 2 C-1.

G6.4.3 Adding Robot Movement Commands to the Script

Plate Robot

Movement commands for the plate robot (RoMa vectors) are associated with carriers. They are specified in the carrier definition (see [9.6 "Creating and Editing Plate Robot Vectors"](#), 2 9-55).

In Freedom EVOware Standard, RoMa movements are initiated by script commands (see [15.59 "RoMa Vector Command"](#), 2 15-142 and [15.60 "Transfer Labware Command"](#), 2 15-144). Simple RoMa movements are carried out with the Move RoMa command, which does not need a RoMa vector (see [15.58](#), 2 15-141).

For Freedom EVOware Plus see [G6.5.3 "Adding Robot Movement Commands to the Process"](#),  [G6-11](#).

Tube Robot

Movement commands for the tube robot (PnP vectors) are associated with labware such as tube racks. They are specified in the labware definition (see [9.7 "Creating and Editing Tube Robot Vectors"](#), 2 9-63).


In both Freedom EVOware Standard and Freedom EVOware Plus, PnP movements are initiated by script commands (see [15.62 "PnP Vector Command"](#), 2 15-147, and [15.63 "Transfer Tube Command"](#), 2 15-149). Simple PnP movements are carried out with the Move PnP command, which does not need a PnP vector (see [15.61](#), 2 15-146).

In Freedom EVOware Plus, you first must use a special process step to open the script editor (see [16.25.1 "Tube Robot - ExecuteScript Command"](#), 2 16-83).

Multi channel arm (MCA)

Movement commands for the MCA96 or the MCA384 (MCA vectors) are associated with carriers. They are specified in the carrier definition (see [9.8 "Creating and Editing MCA Vectors"](#), 2 9-69). MCA vectors are very similar to RoMa vectors.

In Freedom EVOware Standard, MCA movements are initiated by script commands (see [15.69.11 "MCA96 Vector Command"](#), 2 15-176, [15.69.12 "MCA96 Transfer Labware Command"](#), 2 15-178, [15.70.11 "MCA384 Vector Command"](#), 2 15-200 and [15.70.12 "MCA384 Transfer Labware Command"](#), 2 15-202). Also see [9.8 "Creating and Editing MCA Vectors"](#), 2 9-69.

For Freedom EVOware Plus see [G6.5.3 "Adding Robot Movement Commands to the Process"](#),  [G6-11](#).

G6.4.4 Saving the Script

Save the script you have created by clicking Save in the toolbar or by choosing Save from the File menu. Then enter a name for the script in the Save File dialog box or select an existing script which you want to overwrite and click the green arrow. You can also save the script as a script template by choosing Save As from the File menu and clicking the Template button in the Save File dialog box.

G6.4.5 Running the Script

See [12.1 "Running a Liquid Handling Script", 2 12-1](#).

G6.4.6 Example Scripts and Example Process

Freedom EVOware is provided with a number of example scripts which illustrate various aspects of script programming. It is instructive for new users of Freedom EVOware to load the scripts which are provided and to study each command while looking at the on-line help. For learning purposes, some of the scripts can also be run in offline mode. The scripts are stored as script templates. To load them, click New and select the required template. Script templates have a yellow icon.

Note that scripts will indicate errors (marked in red in the Script Editor) if the configuration of the pipetting instrument is unsuitable. For example, if the script uses DITIs, errors will be shown if the liquid handling arm is not configured with DITIs. Conversely, if the liquid handling arm is configured with DITIs, Aspirate commands must be preceded by Get DITI commands. Errors will also be shown if the script uses liquid classes or volume ranges which are not currently available. In many cases, the purpose of each of the scripts is explained in a Comment command at the start of the script.

The Freedom EVOware installation contains a number of maintenance scripts (see [6.4.2 "Run Maintenance", 2 6-10](#)). Maintenance scripts can be run by both Freedom EVOware versions but can only be created and edited with Freedom EVOware Standard. Script files and maintenance scripts have a green icon.

Freedom EVOware Plus is also provided with an example process template, which is for the ELISA test (Enzyme immunoassay). Process templates have a blue icon.

G6.5 Setting Up a Process in Freedom EVOware Plus

In Freedom EVOware Plus, the sequence of steps which are required to carry out a particular application or experiment, for example to extract the substance you are looking for, is called a process. The process specifies the operations you want the pipetting instrument to execute. Processes are set up in the Process Editor, which is shown at the top right of the screen (see [G5.4.3 "The Process Editor \(Freedom EVOware Plus\)", 2 G5-17](#)).

G6.5.1 Choosing Labware for a Process

After setting up the worktable with the carriers and devices you want to use, you then need to choose the labware you need. There are several ways to do this depending on the situation:

☒ The labware will always stay at the same position and does not need to be moved when you run the process

This option is typically used for reagent troughs.

Select the required labware type in the Control Bar (Labware section) and drag it onto the required carrier site on the worktable. To help you, Freedom EVOware highlights all carrier sites which are suitable for the chosen labware item.

Note: *If you click on the carrier and scroll down to Allowed Labware, Freedom EVOware will show you the labware types which are compatible with the selected carrier.*

Repeat this process to add all of the labware to the worktable that you need. The choice and the positions of the labware is based on the requirements of your application or experiment.

To move labware to a new position, click on the labware to select it and drag to the required carrier site. To delete labware, click on it and drag it off of the worktable.

To make a copy of a labware item which is already on the worktable, press the Ctrl button, click on the labware and drag the cursor to the required carrier site.

When adding, deleting or moving labware, a special cursor is shown to indicate the action you are performing (“+”, “del” or “move”).

Labware types can be assigned unique colors in the Freedom EVOware configuration make it easier for you to identify them in the Worktable Editor (see “Color”, 2 9-19).

In addition, labware can be assigned labels (names) to make them easier to identify in the Worktable Editor (see G6.7.1 “Assigning a Label (Name) to the Labware”, 6 G6-19). The label is shown in yellow.

If you click on a labware item, information on the item is shown in the lower infopad.

☒ You want to create a repository of labware in a feeder device such as a carousel

Before you run a process which contains a pipetting script, you must put all of the labware on the worktable that the pipetting script will need. You also need to tell Freedom EVOware how many labware items you will be using. When you run the process, Freedom EVOware will take labware items from the feeder device as and when needed by the pipetting script and move them using the RoMa to the empty carriers which you have put aside for the pipetting operations.

Proceed as follows to create a labware repository in a feeder device: Select the required labware type in the Control Bar (Labware section) and drag it onto the icon for the carousel (or another feeder device or a hotel) in the Worktable Editor.

This opens the Labware Generator dialog box, which allows you specify how many labware items you need. See G6.6 “Labware Generator (Freedom EVOware Plus)”, 6 G6-16.

The Labware Generator will insert a labware source icon in the Process Editor.

Notes:

- ◆ The chosen number of labware items is shown in the carousel device icon (see [Fig. G6-8 “Example worktable showing carriers, labware and labware labels”](#), [G6-20](#)).
- ◆ Repeat the above procedure to create additional labware source icons if the carousel will be filled with different labware types in different towers.
- ◆ The number of towers and the storage capacity of the feeder device are configured in the Edit Carrier dialog box for the feeder (see [9.5, 2 9-39](#)). See also [9.5.5.3 “Carousel Carrier Attributes”](#), [2 9-50](#) and [16.33 “Commands for the Te-Stack Te-MO”](#), [2 16-105](#).

☒ You want to create a repository of labware on the worktable

This option is only used for special applications; labware repositories (storage areas) are normally created in feeder devices.

Before you run a process which contains a pipetting script, you must put all of the labware on the worktable that the pipetting script will need. You may decide to use, say, the left side of the worktable as a storage area for all of the labware which you will need and the right side of the worktable for pipetting. You also need to tell Freedom EVOware how many labware items you will be using. When you run the process, Freedom EVOware will take the required labware items from the storage area when needed by the pipetting script and move them using the RoMa to the carrier sites which you have chosen to use for the pipetting operations.

Proceed as follows to create a labware repository on the worktable: Make sure that you have already put enough carriers in the Worktable Editor, select the required labware type in the Control Bar (Labware section), press Ctrl and drag the labware icon onto one of the carriers in the Worktable Editor.

This opens the Labware Generator dialog box, which allows you specify how many labware items you need and which carriers to place them on. See [G6.6 “Labware Generator \(Freedom EVOware Plus\)”](#), [G6-16](#).

The Labware Generator will insert a labware source icon in the Process Editor.

☒ The labware will be used dynamically by a pipetting script

When you run a process with a pipetting script, Freedom EVOware Plus will take the required labware items from the storage device or storage area when needed by the pipetting script and move them using the RoMa to the carrier sites which you have chosen to use for the pipetting operations. Labware which is used dynamically by the pipetting script should be positioned in the Worktable Editor when you create the script. See [G6.5.4 “Choosing Labware for a Pipette Command”](#), [G6-11](#).

Note: Labware which you position when the Script Editor is open is shown in grey when you return to the Process Editor. This is because it is only moved to the pipetting position during process runtime and is initially kept elsewhere (typically in a carousel).

G6.5.1.1 Labware in the Worktable Editor of Freedom EVOware Plus

In the figure below, the labware on sites 1 and 2 of the first carrier (at grid position 2) will always stay at the same position. The labware was dragged from the Control Bar to the carrier directly.

Sites 1 and 2 of the second carrier (at grid position 10) are used as a labware repository. The labware was dragged from the Control Bar to the carrier while pressing the Ctrl button to open the Labware Generator.

Sites 1 and 2 of the third carrier (at grid position 18) show (in grey) labware which will be used dynamically by a pipetting script and will be moved to this position

during process runtime. The labware was dragged from the Control Bar to the carrier when the Script Editor was open.

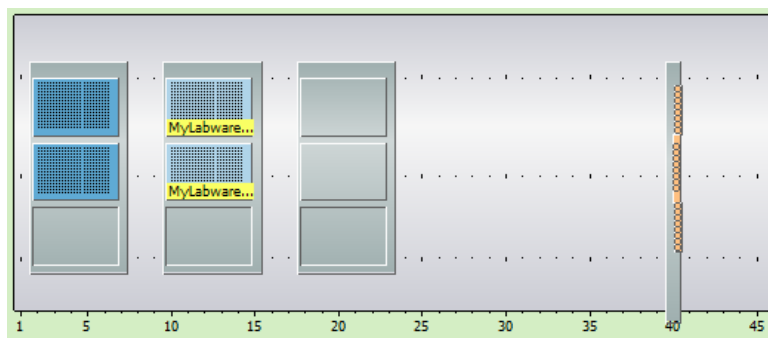


Fig. G6-1 Labware in the Worktable Editor of Freedom EVOware Plus

See [Fig. G6-8](#), [G6-20](#) for a worktable example where the labware is taken from a carousel.

G6.5.2 Adding Device Commands to the Process

To add a device command to your process, click the Commands tab in the Control Bar, look for the device you want to use and drag the command from the Control Bar onto the Process Editor window. If you need to specify any execution parameters for the command, the Parameters dialog box will open automatically when you do this. For example, the MoveToCartridge command for the Carousel requires you to specify the number of the required tower. The Pipette command of the Liquid Handling Arm requires you to specify a pipetting script.

The device command is then shown as a process step icon in the Process Editor.

You can change the position of a process step icon by dragging it to the required location.

To edit the execution parameters of the command (or the pipetting script) later, double-click on the icon (or right click on the icon and choose Edit Parameters). The Parameters dialog box will only be shown if the command has parameters.

To edit the runtime parameters for the command, right click on the icon and choose Adjust Time/Error handling. See [9.10.2 "Adjust Time/Error handling"](#), 2 9-71. These parameters are set automatically to appropriate values and do not normally need to be changed.

To edit the pre-actions and post-actions for the command, right click on the icon and choose Pre-actions / Post-actions. See [9.10.3 "Pre-actions / Post-actions \(Custom\)"](#), 2 9-72. The pre-actions and post-actions are normally configured through the global settings of the device driver and only need to be changed for special applications.

To delete a process step, select the icon and press Del (or right click on the icon and choose Delete in the context menu).

G6.5.3 Adding Robot Movement Commands to the Process

Plate Robot	<p>Movement commands for the plate robot (RoMa vectors) are associated with carriers. They are specified in the carrier definition (see 9.6 "Creating and Editing Plate Robot Vectors", 2 9-55).</p> <p>In Freedom EVOware Plus, RoMa vectors are mainly used by pre-actions and post-actions of device commands. The pre-actions and post-actions and thus the RoMa movements are executed automatically when the process step is executed. If your process involves pipetting to a plate which is initially stored in a carousel, Freedom EVOware first uses the robot vector associated with the carousel to take the plate from the carousel and then uses the robot vector associated with the carrier to put the plate on the carrier. You do not need to specify the RoMa vectors - Freedom EVOware gets them from the carrier and device definitions. You only need to make sure that the RoMa vectors which you want to use are already set up in the Freedom EVOware configuration.</p>
Tube Robot	<p>Movement commands for the tube robot (PnP vectors) are associated with labware such as tube racks. They are specified in the labware definition (see 9.7 "Creating and Editing Tube Robot Vectors", 2 9-63).</p> <p>In both Freedom EVOware Standard and Freedom EVOware Plus, PnP vectors are executed using script commands (see 15.62 "PnP Vector Command", 2 15-147, and 15.63 "Transfer Tube Command", 2 15-149). Simple PnP movements are executed with the Move PnP command, which does not need a PnP vector (see 15.61, 2 15-146).</p> <p>In Freedom EVOware Plus, you first must use a special process step to open the script editor (see 16.25.1 "Tube Robot - ExecuteScript Command", 2 16-83).</p>
Multi channel arm (MCA)	<p>Movement commands for the MCA96 or the MCA384 (MCA vectors) are associated with carriers. They are specified in the carrier definition (see 9.8 "Creating and Editing MCA Vectors", 2 9-69).</p>

G6.5.4 Choosing Labware for a Pipette Command

Script (e.g. pipetting) commands are carried out by the liquid handling arm and are defined in the Script Editor. To open the Script Editor, select the Pipette command in the Control Bar (Liquid Handling Arm group) and drag it to the Process Editor window.

Before you can specify script commands such as Aspirate or Dispense, you must put the labware you want to use onto the carriers. When you run the process, Freedom EVOware Plus will take the specified labware items from the storage device or storage area as and when needed and move them using the RoMa to the carrier sites which you allocated for the pipetting operations.

Select the required labware type from the Labware section of the Control Bar and drag it onto the required carrier site on the worktable (you cannot choose sites which are already occupied by labware). To help you, Freedom EVOware highlights all carrier sites which are suitable for the chosen labware item.

Note: *If you click on the carrier and scroll down to Allowed Labware, Freedom EVOware will show you the labware types which are compatible with the selected carrier.*

Repeat this process to add all of the labware to the worktable that you need. The choice and the positions of the labware is based on the requirements of your application or experiment.

To move labware to a new position, click on the labware to select it and drag to the required carrier site. To delete labware, click on it and drag it off of the worktable.

To make a copy of a labware item which is already on the worktable, press the Ctrl button, click on the labware and drag the cursor to the required carrier site.

When adding, deleting or moving labware, a special cursor is shown to indicate the action you are performing (“+”, “del” or “move”).

Labware can be assigned unique colors in the Freedom EVOware configuration make it easier for you to identify them in the Worktable Editor (see “Color”, 2 9-19).

In addition, labware can be assigned labels (names) to make them easier to identify in the Worktable Editor (see G6.7.1 “Assigning a Label (Name) to the Labware”, 2 G6-19). The label is shown in yellow.

If you click on a labware item, information on the item is shown in the lower infopad.

Note: Labware which you position when the Script Editor is open is shown in grey when you return to the Process Editor. This is because it is only moved to the pipetting position during process runtime and is initially kept elsewhere (typically in a carousel).

Since the labware is only moved to the pipetting position during process runtime, if your process has more than one pipetting script you can specify the same carrier sites for pipetting operations in different scripts. The carrier sites you choose are used as placeholders. When you run the process, Freedom EVOware Plus may decide to use different sites to maximize the throughput (efficiency) of the process.

See Fig. G6-8, 2 G6-20 for an example of a worktable.

G6.5.5 Creating a Script for the Pipette Command

Script (e.g. pipetting) commands are carried out by the liquid handling arm and are defined in the Script Editor (see G5.4.4 “The Script Editor”, 2 G5-19). To open the Script Editor, select the Pipette command in the Control Bar (Liquid Handling Arm group) and drag it to the Process Editor window.

The pipetting script is then created by choosing script commands in the Control Bar and dragging them to the Script Editor window.


Note: In Freedom EVOware Plus, when the Script Editor is open the Commands tab of the Control Bar only shows script commands (commands which are used for writing pipetting scripts). When the Process Editor is open, the Commands tab of the Control Bar only shows device commands (commands for the optional devices).

The procedure to follow to create a script is the same for Freedom EVOware Plus and Freedom EVOware Standard See G6.4.2 “Creating a Pipetting Script”, 2 G6-5 for more information.

See also 13.1 “Overview of Script Commands”, 2 13-1.

G6.5.6 Closing the Script Editor

When you have finished adding all of the script commands you need, click Accept at the top right of the Script Editor window to return to the Process Editor. This stores the script in memory and creates a Pipette process step icon. To

permanently save the script you must save the process as described in [G6.5.10 "Saving the Process"](#),  [G6-15](#).

Click Reject if you do not want to keep the changes you have made to the script. Click Save as template if you want to save the script as a template for use in another process or process step.

Labware which you positioned when the Script Editor was open is shown in grey when you return to the Process Editor. When you run the process, Freedom EVOware Plus will move the labware to these carrier sites automatically.

If your process uses more than one pipetting script, insert another Pipette command in your process using the procedure described above.

To edit an existing pipetting script, double-click the Pipette process step to open the Script Editor again. Alternatively, select the Pipette process step and click Edit Parameters in the Infopad.

G6.5.7 Adding Final Position Icons to your Process

Final position icons are used to specify the final position of the labware after the process has finished. They are often associated with a storage device such as a hotel. Final position icons are not necessary if you want Freedom EVOware to return the labware to its original position after the process has finished, for example back to a storage device such as a carousel (the "base" location). Final position icons are created by right-clicking on the background of the Process Editor and choosing Choose Final Position from the context menu.

G6.5.8 Linking the Process Steps in the Order of Execution

After adding all of the process steps you need in the Process Editor, you must specify the order in which you want to execute them by linking the icons together. Start by clicking the pointed end of a labware source icon. Then drag and drop the arrow cursor which appears onto the labware field ("object parameter") of the first process step that will handle this labware. A connecting line will be drawn from the labware source icon to the process step to visualize the connection and the default labware name "MP" in the labware field changes to the labware name of the source labware (e.g. "sample_1").

If the process step can handle more than one labware item at a time (for example if the LiHa command needs two microplates), repeat this process to connect more labware source icons to the labware fields.

Then drag the next process step to be adjacent or close to the first process step and link them together in the same way. Click the black arrow on the labware field of the first process step and drag and drop the arrow cursor onto the labware field of the second process step.

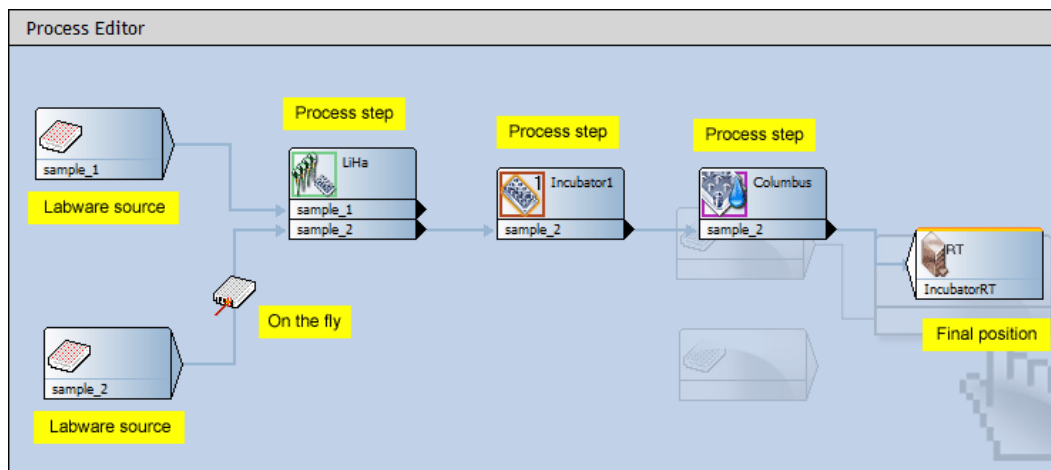


Fig. G6-2 Process Editor showing process icons

Proceed until you have connected all of your process steps in the order you want.

Note: You cannot save the process until you have connected all of the process steps (Freedom EVOware will display an error message).

Note: If you make a mistake when connecting the process steps or change your mind, right-click on the connecting line and choose Delete.

Note: Make sure that the labware source icons and labware fields which you connect together use the same physical labware type. For example, do not connect a labware source icon for a microplate to a labware field for a deep well plate. Freedom EVOware does not check the labware types when you make the connections. However, you are allowed to connect landscape and portrait versions of the same physical labware together (e.g. 96 Well Microplate and 96 Well Microplate portrait). In this case, Freedom EVOware will automatically use the RoMa to rotate the labware by 90° if necessary.

G6.5.8.1 Reserving and Linking Devices

Some process steps, typically initialize or prime commands for devices, do not need labware and do not have labware fields. In such cases, click the right edge of the process step and drag and drop the arrow cursor onto the icon of the following process step:

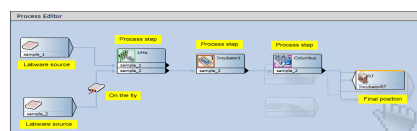


Fig. G6-3 Linking a process step which does not have a labware field

In the above example, the connecting line makes sure that priming takes place before the plate washer is used to wash the plate.

This type of connection can also be used to reserve a device. In the following example, a magnetic separation is carried out using the Te-MagS and a pipetting operation is then carried out. The plate is then returned to the Te-MagS for another separation step. The line linking the two Te-MagS process steps makes

sure that the Te-MagS is reserved and thus immediately available for use when the pipetting operation has finished:

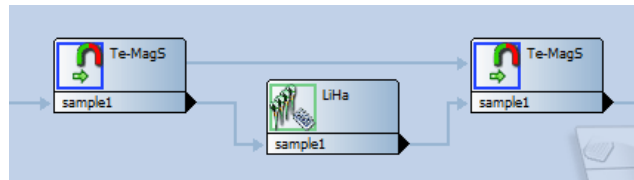


Fig. G6-4 Reserving a device

Freedom EVOware Plus lets you run several processes in parallel. If you don't reserve the Te-MagS, it may be occupied by another process when the first process wants to use it. The first process will then have to wait until it becomes free again. Depending on your application or experiment, the waiting may be unacceptable.

G6.5.9 Adding On-the-fly Actions

Some devices require the use of the RoMa (plate robot) to carry out their function. A typical example of this is the Symbol LS-1220 barcode scanner which is rigidly fixed to the instrument's deck and cannot move towards the labware to scan it. Instead, the RoMa is used to move the labware past the barcode scanner "on-the-fly" while carrying out something else, for example when moving the labware from one carrier to another. The barcode scanner is then instructed to perform a read operation when the RoMa presents the labware. Such devices are called on-the-fly devices.

Add an on-the-fly device to your process by dragging it from the Control Bar onto the line which links two process steps. The corresponding actions will then be executed when the labware moves between the two process steps.

For example, If you want to read the barcodes of your labware items as they move from the washer to the pipetting station, drag the Barcode Scanner device onto the line which links these two process steps.

See [Fig. G6-2 "Process Editor showing process icons"](#), [G6-14](#).

G6.5.10 Saving the Process

Save the process you have created by clicking Save in the toolbar or by choosing Save from the File menu. Then enter a name for the process in the Save File dialog box or select an existing process which you want to overwrite and click the green arrow. You can also save the process as a process template by choosing Save As from the File menu and clicking the Template button in the Save File dialog box.

G6.5.11 Running the Process

See [12.2 "Running and Optimizing a Process \(Freedom EVOware Plus\)"](#), [2 12-5](#).

G6.6 Labware Generator (Freedom EVOware Plus)

The labware generator is used to specify the type and quantity of labware items which you will need for the pipetting script commands in your process (LiHa Pipette process steps).

G6.6.1 Creating a labware repository in a feeder device

Select the required labware type in the Control Bar (Labware section) and drag it onto the icon for the feeder device (e.g. carousel) in the Worktable Editor. If the chosen labware type is allowed for the feeder device, this opens the labware generator dialog box:

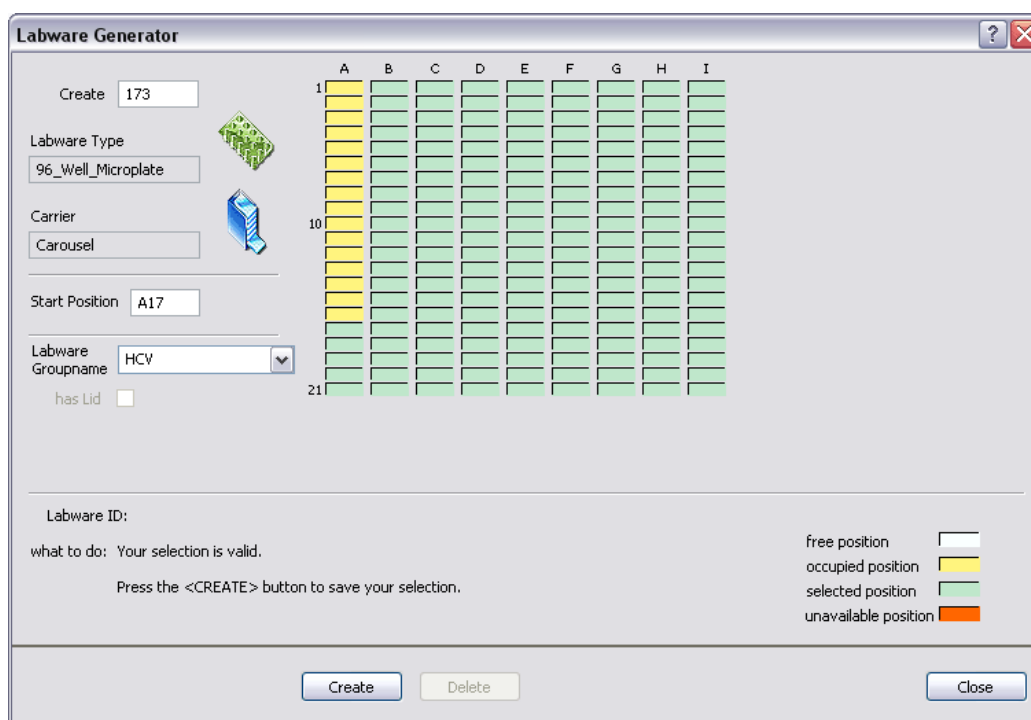


Fig. G6-5 Labware generator when generating labware for the carousel

The rectangles at the top of the dialog box show all of the labware storage positions (sites) in the feeder device. For the carousel or Te-Stack stacker, each column is one tower (cartridge).


The number of towers and the storage capacity of the feeder device are configured in the Edit Carrier dialog box for the feeder (see [9.5, 2 9-39](#)). See also [9.5.5.3 “Carousel Carrier Attributes”, 2 9-50](#) and [16.33 “Commands for the Te-Stack Te-MO”, 2 16-105](#).

Storage positions which are yellow (occupied) or red (unavailable) cannot be used for generating labware since they are already in use.

Enter the number of labware items you want to create in the Create field and click on the first site you want to use. The message area at the bottom of the labware generator will tell you if sufficient sites are available for the chosen number of items. Adjust your entries until the labware generator indicates that your selection is valid and click Create to create the specified labware. The newly created

labware changes color from green (selected position) to yellow (occupied position). This creates a labware group (a set of labware associated with a labware source icon in the Process Editor).

If you move the cursor over the colored rectangles, the Labware ID field shows the ID (internal labware name) of the selected labware item. If you click on a labware item (yellow rectangle), the starting position and the name of the associated labware group are shown. Click Delete if you want to delete all of the labware in the group.

Right click a labware item to open the context menu (see [G6.6.3 “Context Menu of the Labware Generator”](#),  [G6-19](#)).

Repeat this process if you want to create further labware of a different type or using a different group name (i.e. an additional labware source icon).

Click Close when you have created all of the labware you need. This closes the labware generator. The labware you have created is shown as one or more labware source icons in the Process Editor and the total number of storage positions containing labware is shown in the icon for the feeder device.

Note: *When the Process Editor is open, right-click on the icon for the feeder device and choose Modify Labware in the context menu if you want to subsequently edit the settings you have made.*

G6.6.2 Creating a labware repository on the worktable

This option is only used for special applications; labware repositories are normally created in feeder devices such as the carousel.

Make sure that you have already put enough carriers in the Worktable Editor, select the required labware type from the Control Bar (Labware section), press Ctrl and drag the labware icon onto a suitable carrier type in the Worktable Editor. This opens the labware generator dialog box:

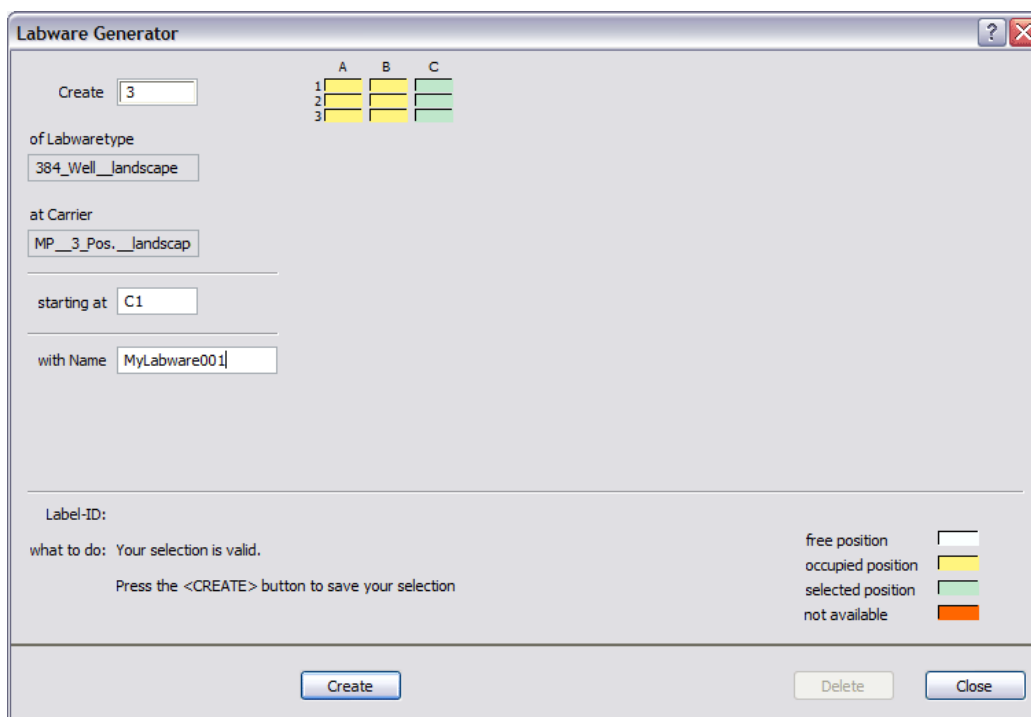


Fig. G6-6 Labware generator when generating labware for three microplate carriers on the worktable

The rectangles at the top of the dialog box show the sites of all of the suitable carriers on the worktable. Sites marked *occupied* or *not available* cannot be used for generating labware since they are already in use. If you have already created a pipetting script, sites which are used by the pipetting script must not be used either. Freedom EVOware will put the labware onto these sites during process runtime, and they must not be occupied by a labware repository.

Note: Labware which you position when the Script Editor is open is shown in grey when you return to the Process Editor.

Note: Carrier sites which are used for a labware repository cannot be used in your script for pipetting. Make sure you have kept enough unused sites for your pipetting script. Put another carrier on the worktable if necessary.

Enter the number of labware items you want to create in the Create field and click on the first site you want to use. The message area at the bottom of the labware generator will tell you if sufficient sites are available for the chosen number of items. Adjust your entries until the labware generator indicates that your selection is valid and click Create to create the specified labware. The newly created labware changes color from green (selected position) to yellow (occupied position). This creates a labware group (a set of labware associated with a labware source icon in the Process Editor).

If you move the cursor over the colored rectangles, the Labware ID field shows the ID (internal labware name) of the selected labware item. If you click on a labware item (yellow rectangle), the starting position and the name of the associated labware group are shown. Click Delete if you want to delete all of the labware in the group.

Right click a labware item to open the context menu (see [G6.6.3 “Context Menu of the Labware Generator”](#), G6-19).

Click Close when you have created all of the labware you need. This closes the labware generator. The labware you have created is shown as a labware source icon in the Process Editor and is also visible on the worktable.

Note: When the Process Editor is open, right-click on the generated labware and choose *Modify Labware* in the context menu if you want to subsequently edit the settings you have made.

If you use labware barcodes to specify source and/or destination positions in the worklist, do not use a labware repository on the worktable if the labware will be moved during runtime to another worktable position for pipetting. This can lead to pipetting at the wrong worktable position. Use a labware repository in a feeder device (e.g. hotel or carousel) instead.

G6.6.3 Context Menu of the Labware Generator

Right click a labware item (yellow rectangle) in the labware generator to open the context menu. The menu items are as follows:

Enter barcode

Choose this option to enter a barcode manually for the selected labware item. This option is mainly used for testing since it is inflexible in a production environment to store barcodes within the process. You should normally use a barcode scanner instead.

Read barcodes from file

Choose this option to import a list of barcodes for the selected labware group. This feature is mainly intended for testing or training. For information on the syntax see [A.2.4 "Barcode File for the Labware Generator", 2 A-14](#).

Rename labware

Choose this option to change the name of the labware group.

Delete labware

Choose this option to delete all of the labware in the group.

G6.7 Additional Information on Labware and Carriers

G6.7.1 Assigning a Label (Name) to the Labware

You can assign a label (i.e. a user-defined name) to each labware item by double clicking on the labware in the Worktable Editor and typing the required name in the Name field of the Edit Labware Name dialog box:

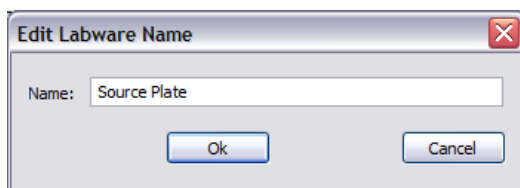


Fig. G6-7 Specifying labels for objects on the worktable

The label is shown in yellow. The label for the currently selected labware item is also shown in the Infopad together with the other properties.

Labware labels can be used in scripts and worklist files to make them easier to understand for other persons (see [15.25 "Worklist Command"](#), 2 15-37). They are also used by Freedom EVOware in log files. If you don't specify labware labels, the scripts, worklists and log files contain the generic labware name instead, e.g. *Microplate, landscape*.

G6.7.2 Example of a Worktable With Several Carriers and Labware Items

The following figure shows an example worktable with carriers, labware and labware labels:

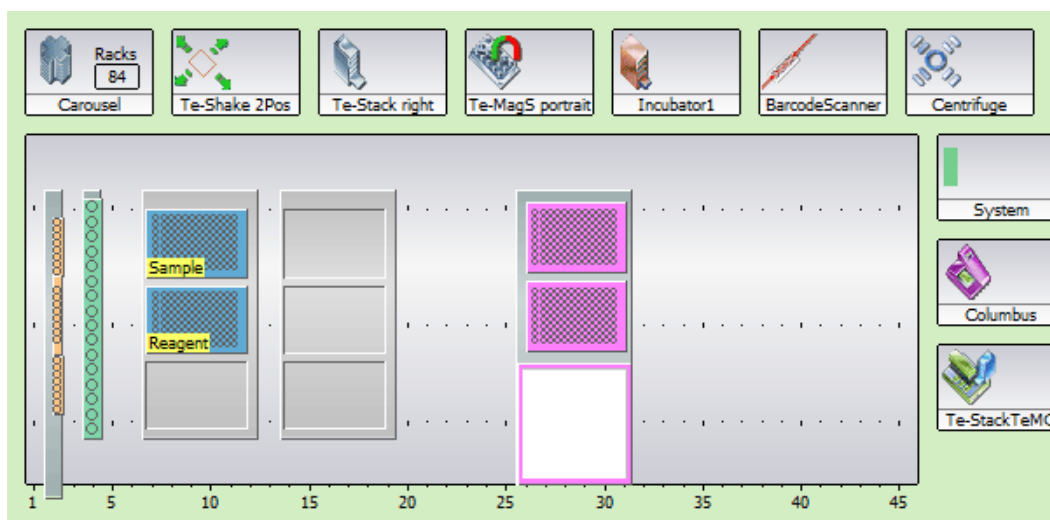


Fig. G6-8 Example worktable showing carriers, labware and labware labels

In this example, the labware generator was used to assign 84 microplates to the carousel.

G6.7.3 System Liquid Icon

When you specify a script command which involves aspiration, click on the System icon at the bottom right of the Worktable Editor if you want to aspirate the system liquid. If you need to aspirate large volumes of the system liquid, this avoids having to place a trough on the worktable. See [8.4.2.5 "System Liquids"](#), 2 8-30 for further information.

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Purpose of This Chapter This chapter contains an alphabetical index which offers you help in finding information more quickly.

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