

Software Installation Guide

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1 Introduction

1.1 General information

The goal of this document is to provide a detailed guide for anybody planning to install and configure Omixon HLA Twin in their environment. The following chapters will explain the possible HLA Twin configurations and the way to configure them properly. For further information and assistance, please contact us at support@omixon.com.¹

1.2 Disclaimer

The concurrent installation and usage of more than one version of HLA Twin is not supported by Omixon.

¹ mailto:support@omixon.com.

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2 Configurations

2.1 General information

This chapter explains the three possible configurations HLA Twin can be used in. Each of them is suitable for laboratories with different throughputs.

Each configuration will require a MySQL 8 database server to be installed either locally or remotely.

2.2 Desktop

- Suitable for smaller laboratories
- One user can be logged in at a time
- One sample can be analyzed at a time

The software runs on one computer, the users have to share the same computer to work with the software. HLA Twin has its own user management system, so it does not matter who is logged in in Windows, the user can work under their own identity in HLA Twin (this is important for audit, workflow and commenting features). If the same software is installed on another computer, the two pieces of software are unable to communicate, so the mentioned user information will be unavailable. We advise against it.

2.3 Server (standalone)

- Suitable for medium-throughput laboratories
- Multiple users can work at the same time
- One sample can be analyzed at a time

The HLA Twin Server (standalone):

- runs sample analyses
- prepares the information for the HLA Twin Client
- holds all user data

The HLA Twin Client

- controls the HLA Twin Server
- shows what the HLA Twin Server sends to it
- is "an empty shell"

Multiple HLA Twin Client software can connect to the HLA Twin Server at the same time.

The license is bound to the HLA Twin Server so the number of HLA Twin Clients is not limited.





2.4 Server (distributed)

- Suitable for high-throughput laboratories
- Multiple users can work at the same time
- Multiple samples can be analyzed at the same time (depending on the number of Typers)

The HLA Twin Server (distributed):

- does not run sample analyses
- controls the HLA Twin Typer instances
- prepares the information for the HLA Twin Client
- holds all user data

The HLA Twin Typer:

- runs sample analyses
- sends the analysis results to the HLA Twin Server

The HLA Twin Client

- controls the HLA Twin Server
- shows what the HLA Twin Server sends to it
- is "an empty shell"

Multiple HLA Twin Typers can be connected to one HLA Twin Server. An HLA Twin Server and an HLA Twin Typer instance can run on the same server.





3 Hardware requirements

HLA Twin Desktop

- CPU: 64bit CPU with at least 4 physical cores (8 threads or vCPUs)
- **OS**: Any 64bit operating system
- RAM: At least 12 GB for the software but 16 GB is recommended
- Video: OpenGL 2.0 compatible video card

HLA Twin Client

- CPU: 64bit CPU with at least 2 physical cores (4 is recommended)
- OS: Any 64bit operating system
- RAM: At least 4 GB for the software but 6 GB is recommended
- Video: OpenGL 2.0 compatible video card
- Network: At least a 100/1000 Mbps connection

HLA Twin Server (standalone)

- CPU: 64bit CPU with at least 4 physical cores (8 threads or vCPUs)
- **OS**: Any 64bit operating system (OSX not supported)
- RAM: At least 18 GB for the software but 26.5 GB is recommended
- Network: At least a 100/1000 Mbps connection
- Video: OpenGL 2.0 compatible video card (optional*)

HLA Twin Server (distributed)

- CPU: 64bit CPU with at least 4 physical cores (8 threads or vCPUs)
- **OS**: Any 64bit operating system (OSX not supported)
- RAM: At least 6 GB for the software but 8 GB is recommended
- Network: At least a 100/1000 Mbps connection
- Video: OpenGL 2.0 compatible video card (optional*)

HLA Twin Typer (distributed)

- CPU: 64bit CPU with at least 4 physical cores (8 threads or vCPUs)
- **OS**: Any 64bit operating system
- RAM: At least 16 GB for the software but 22 GB is recommended
- Network: At least a 100/1000 Mbps connection
- Video: OpenGL 2.0 compatible video card (optional*)

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*The Twin Graphical User Interface (Client or Desktop) requires an OpenGL 2.0 compatible hardware and driver for the visualisation, so if you would like to use the Graphical interface on the server computer, an OpenGL 2.0 compatible hardware and driver are required.

Storage space

Storage space requirements depend on the size of the samples and need to be calculated with regards to legal requirements for storing the data, minimum level of backup and redundancy, as well as on the expected annual volume. Omixon can assist with calculating the storage space requirements, please contact support@omixon.com² if you need any help.

² mailto:support@omixon.com

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4 Database

All editions of HLA Twin will rely on an external **MySQL 8** database that <u>you need to set up before installing HLA</u> <u>Twin</u>. This is a new improvement in HLA Twin to provide a more robust and more responsive user experience. Please follow the instructions in this chapter prior to the installation of HLA Twin.

4.1 Windows

If you have a pre-existing **MySQL 8** server in your environment that you would like to use, please see Configuring a pre-existing MySQL database (see page 59). We suggest using a local instance of MySQL for HLA Twin Desktop users.

Please follow these steps to download and install MySQL 8 for Windows.

- 1. Go to https://dev.mysql.com/downloads/installer/
- 2. Download the actual version of "Windows (x86, 32-bit), MSI Installer" package. For example:

General Availability (GA) Releases			
MySQL Installer 8.0.17			
Select Operating System: Microsoft Windows	T	Looking for proversions?	evious GA
Windows (x86, 32-bit), MSI Installer	8.0.17	18.5M	Download
(mysql-installer-web-community-8.0.17.0.msi)	MD5: 5677	07887fc0d1fad7fc848a8	78a0da2 Signature
Windows (x86, 32-bit), MSI Installer	8.0.17	393.4M	Download
(mysql-installer-community-8.0.17.0.msi)	MD5: 3aa8	d6470fb6b58f517d3efb4	6e5472b Signature
We suggest that you use the MD5 checksum you download.	ns and GnuPG signatures t	o verify the integrity o	of the packages



3. Once downloaded, start the installer, accept the license agreement, and click "Next"



4. Select "Server only" and click "Next"

MySQL Installer		–
MySQL. Installer Adding Community	Choosing a Setup Type Please select the Setup Type that suits you	ır use case.
License Agreement	O Developer Default	Setup Type Description
Choosing a Setup Type	installs all products needed for MySQL development purposes.	Installs only the MySQL Server. This type should be used where you want to deploy a MySQL Server, but will not be developing MySQL
Installation	 Server only Installs only the MySQL Server product. Client only Installs only the MySQL Client products, without a server. Full 	applications.
	Installs all included MySQL products and features. C Custom Manually select the products that should be installed on the system.	< <u>Back</u> <u>N</u> ext > <u>Cancel</u>



5. Click "Execute" (please note, that the installer might state that MySQL Server is not in "Ready to Install" status. Please click on it to see how to resolve the issue)

MySQL Installer			—		×
MySQL. Installer Adding Community	Installation The following products will be installed.				
	Product	Status	Progress	Notes	
License Agreement	MySQL Server 8.0.17	Ready to Install			
Choosing a Setup Type					
Installation					
Product Configuration					
Installation Complete					
	Click [Execute] to install the following pa	ackages.			
		< <u>B</u> ack	E <u>x</u> ecute	<u>C</u> anc	el

6. When the installation is done, you will see a green tick next to the MySQL icon. Click "Next", **and when the** "Product Configuration" window appears, click "Next" again.

MySQL Installer			—		×
MySQL. Installer Adding Community	Installation The following products will be installed.				
	Product	Status	Progress	Notes	
License Agreement	🐼 📐 MySQL Server 8.0.17	Complete			
Choosing a Setup Type					
Installation					
Product Configuration					
Installation Complete					
	<u>S</u> how Details >				
		< <u>B</u> ack	<u>N</u> ext >	<u>C</u> anc	el



7. Select the default "Standalone MySQL Server / Classic MySQL Replication" option and click "Next"



8. Please use the default values on the "Type and Networking" screen, then click "Next"

MySQL Installer		– 🗆 X
MySQL. Installer MySQL Server 8.0.17	Type and Networking Server Configuration Type Choose the correct server configuration type fo define how much system resources are assigne	r this MySQL Server installation. This setting will d to the MySQL Server instance.
High Availability	Config Type: Development Computer	~
Type and Networking	Connectivity	
Authentication Method	Use the following controls to select how you we	ould like to connect to this server.
Accounts and Roles	TCP/IP Port: Open Windows Firewall ports for n	3306 X Protocol Port: 33060
Windows Service	Named Pipe Pipe Name:	MYSQL
Apply Configuration	Shared Memory Memory Name:	MYSQL
	Advanced Configuration Select the check box below to get additional co and logging options for this server instance.	nfiguration pages where you can set advanced
		< Back Next > Cancel



9. Select "Use Legacy Authentication Method (Retain MySQL 5.x Compatibility), then click "Next"

MySQL Installer	– 🗆 X
MySQL. Installer MySQL Server 8.0.17	Authentication Method O Use Strong Password Encryption for Authentication (RECOMMENDED) MySQL 8 supports a new authentication based on improved stronger SHA256-based password methods. It is recommended that all new MySQL Server installations use this method going forward
High Availability	
Type and Networking	of connectors and clients which add support for this new 8.0 default authentication
Authentication Method	(carning_snaz_password autoentication).
Accounts and Roles	Currently MySQL 8.0 Connectors and community arrivers which use itemysqlcules 8.0 support this new method. If clients and applications cannot be updated to support this new subsecticities method the MySQL 8.0 super cap be configured to use the leave MySQL
Windows Service	Authentication Method below.
Apply Configuration	 Use Legacy Authentication Method (Retain MySQL 5.x Compatibility) Using the old MySQL 5.x legacy authentication method should only be considered in the following cases: If applications cannot be updated to use MySQL 8 enabled Connectors and drivers. For cases where re-compilation of an existing application is not feasible. An updated, language specific connector or driver is not yet available. Security Guidance: When possible, we highly recommend taking needed steps towards upgrading your applications, libraries, and database servers to the new stronger authentication. This new method will significantly improve your security.
	< <u>Back</u> <u>Next</u> > <u>Cancel</u>

10. Specify the MySQL Root Password (please make a note of this password), then click on "Add User"

MySQL Installer				-	
MySQL. Installer MySQL Server 8.0.17	Accounts and Ro Root Account Password Enter the password for the place.	les root account. Please	remember to stor	e this password i	n a secure
High Availability Type and Networking Authentication Method	MySQL Root Password: Repeat Password:	Password strength	••• ••• 1: Weak		
Accounts and Roles					
Windows Service Apply Configuration	MySQL User Accounts Create MySQL user accou consists of a set of privile	ints for your users and ges.	d applications. Ass	ign a role to the	user that
	MySQL User Name	Host	User Role		Edit User
			< <u>B</u> ack	<u>N</u> ext >	<u>C</u> ancel



11. Type in "omixon" as the username **and the password** as well, then click "Ok" and "Next"

🔝 MySQL User A	MySQL User Account				
Please specify	the user nar	ne, password, and database role.			
	User Name:	omixon			
Server	Host:	<all (%)="" hosts=""> V</all>			
2000 AL	Role:	DB Admin 🗸			
	Authentication:	MySQL			
MySQL user c	redentials —				
	Password:	•••••			
Confi	irm Password:	•••••			
		Password strength: Weak			
			_		
		<u>O</u> K <u>C</u> ance	el		

12. Please use the default values, and click "Next", then "Execute".

MySQL Installer	- 🗆 X
MySQL. Installer MySQL Server 8.0.17	Windows Service ☑ Configure MySQL Server as a Windows Service
High Availability Type and Networking	Windows Service Details Please specify a Windows Service name to be used for this MySQL Server instance. A unique name is required for each instance. Windows Service Name: [MySQL80
Authentication Method Accounts and Roles Windows Service	✓ Start the MySQL Server at System Startup Run Windows Service as
Apply Configuration	The MySQL Server needs to run under a given user account. Based on the security requirements of your system values on the options below. Standard System Account Recommended for most scenarios. Custom User An existing user account can be selected for advanced scenarios.
	< <u>Back</u> <u>Next</u> > <u>Cancel</u>



13. Click Finish when the configuration is complete, then click "Next" then "Finish".



MySQL is now configured properly. You can proceed to install HLA Twin.



4.2 OSX

If you have a pre-existing **MySQL 8** server in your environment that you would like to use, please see Configuring a pre-existing MySQL database (see page 59). We suggest using a local instance of MySQL for HLA Twin Desktop users.

Please follow these steps to download and install MySQL 8 for OSX.

- 1. Go to https://dev.mysql.com/downloads/mysql/
- 2. Download the actual version of "macOS xx.xx (x86, 64-bit), DMG Archive" package. For example:



3. Once downloaded, open the DMG archive and open the PKG file in it





4. If you see this message, select "Continue"



5. After going through the introduction and the license, select "Install" on the "Installation Type" window



6. OSX might require authentication to continue





7. Select "Use Legacy Password Encryption" and click next

	🥪 Install MySQL 8.0.17-community
	Configure MySQL Server
Introduction	OUse Strong Password Encryption
Licence Destination Select Installation Type Installation	MySQL 8 supports a new, stronger authentication method based on SHA256. All new installations of MySQL Server should use this method. Connectors and clients that don't support this method will be unable to connect to MySQL Server. Currently,
 Summary 	Use Legacy Password Encryption
E	The legacy authentication method should only be used when compatibility with MySQL 5.x connectors or clients is required and a client upgrade is not feasible.
$\langle \rangle$	Next
My <mark>SQL</mark> `	Go Back Continue

8. Specify the MySQL Root Password (please make a note of this password) and make sure that "Start MySQL







9. After the installation is done, open System Preferences (Apple menu on the top left, System Preferences option). Open MySQL in the bottom row



10. Make sure that MySQL is running (green dot next to it in the list to the left) and that the "Start MySQL when your computer starts up" box in checked to the right.



11. If everything is in order, please close this window



12. Open Terminal in OSX (Finder - Applications - Utilities)

$\langle \rangle$			Q Search	
Favourites	Name	 Date Modified 		
St Drophoy (O	w Time Machine	2019. May 27. 9:02	1.3 MB Application	
Stopbox (0	Tunnelblick	2019. September 20. 17:40	31.7 MB Application	
(independence) AirDrop	🔻 📴 Utilities	2018. November 30. 6:49	Folder	
Recents	Activity Monitor	2019. August 9. 0:59		
A	AirPort Utility	2019. August 9. 0:59	Application	
mations // Applications	Audio MIDI Setup			
🕚 Downloads	🕹 Bluetooth File Exchange	2019. August 9. 0:59	Application	
Shared	😫 Boot Camp Assistant			
ondred	🕂 ColorSync Utility	2019. May 27. 9:02		
janostoth	Console			
SXFUSE V	👰 Digital Colour Meter	2019. May 27. 9:02		
Masintesh	📓 Disk Utility			
Macintosh	🧔 Grapher			
iCloud	🕺 Keychain Access			
Deskton	🌆 Migration Assistant	2019. May 27. 9:02		
i besitop	🐼 Screenshot			
Documents	📝 Script Editor			
iCloud D 🕐	🛆 System Information			
	Terminal	2019. August 9. 0:59	Application	
Locations	VoiceOver Utility			
🧾 ВООТСАМР	😒 Visual Studio Code			
mvsal-8 🔺	🛓 VLC			
	San VMware Fusion	2018. November 21. 10:53		
MySQL ≜	🍓 Voice Memos			
Remote Disc	Webex			
	🖲 WebTorrent			

- 13. Run the following commands in sequential order
 - a. cd /usr/local/mysql/bin
 - b. ./mysql -u root -p
 - c. type in the MySQL root password you have set in the installer
 - d. CREATE USER 'omixon'@'localhost' IDENTIFIED BY 'omixon';
 - e. GRANT ALL PRIVILEGES ON omixon_database . * TO 'omixon'@'localhost';
 - f. FLUSH PRIVILEGES;
 - g. quit

Image: Second
Last Sogin: Tue Of 8 1859:34 on ttys00 Janus-Heddook-Freijanstott 6 divs/Joel/Mysql/bin/ Janus-Heddook-Freijanstott 6 divs/Joel/Mysql/bin/ Janus-Heddook-Freijan Janustot 6 divs/Joel/Mysql/bin/ Janus-Heddook-Freijanstot 7 divs/Joel/Solidanstot 7 d
Copyright (c) 2000, 2019, Oracle and/or its affiliates. All rights reserved.
Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective ommets.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
imysql> CREATE USER 'omixon'Q'localhost' IDENTIFIED BY 'omixon'; Query DK, 0 roms affected (0.00 sec)
imysql> GRANT ALL PRIVILEDES ON * . * TO 'omixon'@'localhost'; Query DK, 0 rows affected (0.00 sec)
Imysql> FLUSH PRIVILEGES; Query OK, 0 rows affected (0.00 sec)
ingssl> quit janoss-MecBook-Pro:bin janostoth\$ ∎

If the output looks the same as the screenshot, everything is configured properly.

You can proceed to install HLA Twin now.



4.3 Linux

If you have a pre-existing **MySQL 8** server in your environment that you would like to use, please see Configuring a pre-existing MySQL database (see page 59). We suggest using a local instance of MySQL for HLA Twin Desktop users.

Since there are a plethora of Linux repositories with different MySQL packages, this document will only provide a list of settings you will need to look out for during configuration:

- HLA Twin only works with version 8 of MySQL
- MySQL needs to use Legacy Password Encryption
- You might need to change the password policy in MySQL for allowing HLA Twin to connect

After you have installed the MySQL 8 server, make sure that you create a new user named omixon with the following commands typed in the terminal:

- 1. mysql -u root -p
- 2. CREATE USER 'omixon'@'localhost' IDENTIFIED BY 'omixon';
- 3. GRANT ALL PRIVILEGES ON omixon_database . * TO 'omixon'@'localhost';
- 4. FLUSH PRIVILEGES;

After setting the MySQL server up, you can proceed to install HLA Twin.



5 Desktop

5.1 Installing HLA Twin Desktop

You will need to install a MySQL 8 database server before being able to install HLA Twin! Please refer to Database chapter for installation guides. (see page 8)

- 1. This step depends on the operating system you are using.
- Windows users: Open the installer
 (omixon_hla_twin_XXX_windows-x64_with_jre-desktop.exe)
- Linux users: Open a terminal window, get permissions to the installer (chmod +x omixon_hla_twin_xxx_unix_with_jredesktop.sh) then run the installer.
- OSX users: Open the installer

 (omixon_hla_twin_xxx_macos_with_jre-desktop.dmg) (if you are using OSX 10.14.6
 Mojave or above, you might get an error message. If so, please contact us at support@omixon.com³)

🛃 Setup - Omixon HLA Twin	Desktop 4.	-		×
	Welcome to the Omixon HLA Twin Desktop Setup Wizard			
	This will install Omixon HLA Twin Desktop on your computer. The wizard will lead yo the installation.	iu step b	y step th	ough
	Click Next to continue, or Cancel to exit Setup.			
		Next >	G	ancel

³ mailto:support@omixon.com

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2. Accept the license agreement.



3. Select an installation folder.

Windows users, please keep in mind that you might want to change the destination directory so other users in Windows can access the software (the same applies to the other installation folders in the next steps as well).

👷 Setup - Omixon HLA Twin Desktop 4.	-		×
Select Destination Directory Where should Omixon HLA Twin Desktop be installed?		-	
Select the folder where you would like Omixon HLA Twin Desktop to be installed, then dick Next.			
C: \Users\Omixon\OmixonHlaTwin		Browse .	
Required disk space: 430 MB			
Free disk space: 31 GB			
install4j			
< Back	Next >	- C	ancel



4. Select a folder for reference database files.

🛃 Setup - Omixon HLA Twin Desktop 4. 🔤	-		×
Data directory The directory where the application will store its permanent data files.			
This directory should be readable and writable by the user who will be running the application.			
C: \Users\Omixon\.omixon-hla_twin_RUOv4		Browse .	
install4) < Back	Next >	C	ancel

5. Select a folder for temporary files.

	X
Temp directory The directory where the application will store its temporary data files.	
This directory should be readable and writable by the user who will be running the application.	
C:\Users\Omixon\AppData\Local\Temp Browse	
install4j	
< Back Next > C	ancel



6. Specify the IP address and the port number for the MySQL database (the default settings should work fine if you have installed MySQL locally). Please refer to Database chapter for installation guides. (see page 8)

👷 Setup - Omixon HLA Twin Desktop 4.		-		\times
Persistence provider MySQL settings				
Host: localhost Port: 13306				
Test Connection				
Julieso: Fredse ja Vieelu mui u e liskaladuli.				
install4j				
	< Back	Next >	C	ancel

You cannot proceed until you get a successful connection test!

7. Configure the memory settings.

ዷ Setup - Omixon HLA Twin Des	iktop 4.		-		×
Memory setup You can set how much memory th	e application will use				
Omixon Application memory [Mb]: Minimum required: 12288 Maximum available: 32660 Recommended: 16384	ļ6384				
install4j		< Back	Next >	Ca	incel

8. Select Start Menu folder.

👷 Setup - Omixon HLA Twin Desktop 4.	-		\times
Select Start Menu Folder		-	
Where should Setup place the program's shortcuts?			
Select the Start Menu folder in which you would like Setup to create the program's shortcuts, then click Next.			
Create a Start Menu folder			
Omixon HLA Twin Desktop			
7-Zip			^
Accessibility			
Accessories			
Administrative Tools			
AnyDesk			
Blackmagic Design			
DragonDisk			
Dropbox			
Git			
Java			
Java Development Kit			
JetBrains			~
Dubula			
Create shortcuts for all users			
install4j			
< Back	Next >	C	ancel



9. Click Finish.





6 Installation and configuration

The scale of the HLA Twin version 4.9.0 update was so large, that reinstallation will be necessary for users who have HLA Twin version 3.1.3 below.

HLA Twin 4.x will be installed independently of version 3.1.3 and below, so you might keep the older version as a backup, but you can also uninstall it manually.

Each edition has different factors to consider when updating, this chapter will contain information on those besides the step-by-step installation and configuration guide.



6.1 Server (standalone)

Notes before installation

Database: You will need to install a MySQL 8 database server **before being able to install HLA Twin**! Please refer to Database chapter for installation guides. (see page 8)

Networking: HLA Twin Server will communicate with HLA Twin Clients on ports 4380 and 4381 by default, so please make sure to allow them on your firewall.

HTTPS: For a secure connection between the HLA Twin Server and HLA Twin Clients, please follow the HTTPS configuration chapter after the installation.

Windows Service: The HLA Twin Server will run as the Omixon HLA Twin NG Server service in Windows, which is set to automatic startup by default.



6.1.1 Installing HLA Twin Server

- 1. This step depends on the operating system you are using.
 - Windows users: Open the installer (omixon_hla_twin_XXX_windowsx64_with_jre-serverclient.exe)
 - Linux users: Open a terminal window, get permissions to the installer (chmod
 +x omixon_hla_twin_xxx_unix_with_jre-serverclient.sh) then run the installer.



2. Accept the license agreement.





3. Select an installation folder.

Windows users, please keep in mind that you might want to change the destination directory so other users in Windows can access the software (the same applies to the other installation folders in the next steps as well).



4. Select a folder for reference database files.

👮 Setup - Omixon HLA Twin Server 4 💷	_		×
Data directory The directory where the application will store its permanent data files.			
This directory should be readable and writable by the user who will be running the application.			
C:\Users\Omixon\.omixon-hla_twin_RUOv4	E	rowse .	
Instal P.G.			
< Back Ne	xt >	С	ancel

5. Select a folder for temporary files.





6. Configure the IP address and port number that the HLA Twin Server will use for communication (local IP).

👮 Setup - Omixon H	ILA Twin Server 4		-		×
Network connection You can set the Om	in setup xon Server connection parameters			-	
Clients and Omixon T Please configure Omiz	yper Server must connect to Omixon Server. kon Server connection parameters.				
Omixon Server host:	0.0.0				
Omixon Server port:	4380				
install4i					
· · · · · · · · · · · · · · · · · · ·		< Back	Next >	C	ancel

7. Specify the IP address and the port number for the MySQL database (the default settings should work fine if you have installed MySQL locally). Please refer to Database chapter for installation guides. (see page 8)

🛃 Setup - Omixon HLA Twin Server 4		-	
Persistence provider MySQL settings			
Host: [localhost Port: 3306 Test Connection Success! Please proceed with the installation.			
instal4j	< Back	Next >	Cancel

You cannot proceed until you get a successful connection test!

8. Select the standalone architecture (for the distributed configuration with multiple HLA Twin Typers on separate servers, please follow the Server (distributed) (see page 32) chapter).

👷 Setup - Omixon HLA Twin Server 4		-		×
Typer architecture Select your typer architecture				
Standalone			_	
O Distributed				
install4j				
	< Back	Next >	Ca	incel



9. Configure the memory settings.

👮 Setup - Omixon HLA Twin Server 4		-		×
Memory setup				
You can set how much memory the application will use				-
Online Time Server 1981. bcc24				
Unixon Typer Server Memory [MD]: 20024				-
Minimum required: 18432				
Maximum available: 32660				
Recommended: 26624				
install4j				
	< Back	Next >	Ca	ancel

10. Select Start Menu folder.

Setup - Onlixon HEA IWIN Server 4	-		×
Select Start Menu Folder		-	
Where should Setup place the program's shortcuts?		- 1	
select the Start Menu folder in which you would like Setup to create the program's shortcuts, then click Ne	xt.		
🗹 Create a Start Menu folder			
Omixon HLA Twin Server			
7-Zip			^
Accessibility			
Accessories			
Administrative Tools			
AnyDesk			
Blackmagic Design			
DragonDisk			
Dropbox			
Git			
Java			
Java Development Kit			
JetBrains			~

11. Click Finish.





6.2 Server (distributed)

6.2.1 Notes before installation

Database: You will need to install a MySQL 8 database server **before being able to install HLA Twin**! Please refer to Database chapter for installation guides. (see page 8)

Typers: Please set up the Apache Tomcat server for the HLA Twin Typers (see page 38) before installing the HLA Twin Server for a more convenient installation process. (You can install the Typers after the Server, but then you will need to perform additional configuration steps. Follow the instructions in

Adding new Typers to HLA Twin Server (see page 38) chapter.)

Networking: HLA Twin Server will communicate with HLA Twin Clients on ports 4380 and 4381 by default and with HLA Twin Typers on port 8080 so please allow them on your firewall.

HTTPS: For a secure connection between the HLA Twin Server and HLA Twin Clients AND the Apache Tomcat servers, please follow the HTTPS configuration chapter after the installation.

Windows Service: The HLA Twin Server will run as the Omixon HLA Twin NG Server service in Windows, which is set to automatic startup by default.



6.2.2 Installing HLA Twin Server

The steps below will show you how to install the HLA Twin Server version.

- 1. This step depends on the operating system you are using.
 - Windows users: Open the installer (omixon_hla_twin_XXX_windows-x64_with_jre-serverclient.exe)
 - Linux users: Open a terminal window, get permissions to the installer (chmod
 +x omixon_hla_twin_xxx_unix_with_jre-serverclient.sh) then run the installer.



2. Accept the license agreement.

🛃 Setup - Omixon HLA Twin Server 4 💷	-		×
License Agreement Please read the following important information before continuing.			
Please read the following License Agreement. You must accept the terms of this agreement before continuing with	n the insta	llation.	
SOFTWARE LICENSE AGREEMENT			^
PLEASE READ THIS SOFTWARE LICENSE AGREEMENT CAREFULLY BEFORE DOWNLOADING OR USING THE SOFT	WARE.		
BY LICKING ON THE "ACCERT" BUTTON, OPENING THE PACKAGE, DOWNLOADING THE PRODUCT, OR USING TH EQUIPMENT THAT CONTAINS THIS PRODUCT, YOU ARE CONSENTING TO BE BOWNE BY THIS AGREEMENT. FI'S DO NOT AGREE TO ALL OF THE TERMS OF THIS AGREEMENT, CLICK THE "DO NOT ACCEPT BUTTON HAVE THE INSTALLATION PROCESSI WILL NOT CONTINUE, RETURN THE PRODUCT TO THE PLACE OF PURCHASE FOR A FU REFUND, OR ON ONT DOWNLOAD THE PRODUCT.	HE DU JLL		
Single User License Grant: Omixon Biocomputing Ltd. ("Omixon") and its suppliers grant to Customer ("Customer") a nonexclusive and nontransferable license to use the Omixon software ("Software") no object code form solely on a single central processing unit owned or leased by Customer or otherwise embedded in equipment provided by Omixon.			
Multiple-Users License Grant: Omixon Biocomputing Ltd. ("Omixon") and its suppliers grant to			~
I accept the agreement			
○ I do not accept the agreement			
install4j			
< Back	Next >	Ca	ancel



3. Select an installation folder.

Windows users, please keep in mind that you might want to change the destination directory so other users in Windows can access the software (the same applies to the other installation folders in the next steps as well).

🛃 Setup - Omixon HLA Twin Server 4		-		Х
Select Destination Directory Where should Omixon HLA Twin Server be installed?			ł	
Select the folder where you would like Omixon HLA Twin Server to be installed, then click Next.				
C: \Users\Omixon\OmixonHlaTwin			Browse .	
Required disk space: 510 MB				
Free disk space: 32 GB				
to a state of the				
instail4)	< Back	Next >	Ca	ancel

4. Select a folder for reference database files.

🛃 Setup - Omixon HLA Twin Server 4	-		×
Data directory The directory where the application will store its permanent data files.			
This directory should be readable and writable by the user who will be running the application.			
C: Users Omixon \.omixon -hla_twin_RUOv4		Browse	
nstairij Sadk	Next >	Car	ncel

5. Select a folder for temporary files.





6. Configure the IP address and port number that the HLA Twin Server will use for communication (local IP).

👱 Setup - Omixon H	ILA Twin Server 4		-		×
Network connection You can set the Om	on setup Xxon Server connection parameters				
Clients and Omixon T Please configure Omiz	yper Server must connect to Omixon Server. con Server connection parameters.				
Omixon Server host:	0.0.0.0				
Omixon Server port:	4380				
install4j	<	Back	Next >	G	ancel

7. Specify the IP address and the port number for the MySQL database (the default settings should work fine if you have installed MySQL locally). Please refer to Database chapter for installation guides. (see page 8)

🛃 Setup - Omixon HLA Twin Server 4 📰	-		×
Persistence provider MySQL settings			
Host: localhost			
Port: 3306			
Test Connection			
Success! Please proceed with the installation.			
install4i			
< Bad	Next >	Ca	incel

You cannot proceed until you get a successful connection test!



8. Select the Distributed architecture (for the standalone architecture with only one HLA Twin Type, please follow the Server (standalone) (see page 27) chapter).

Further configuration after this installer is necessary for the Distributed Typer mode! Follow the instructions in Adding new Typers to HLA Twin Server (see page 38) chapter.

Setup - Omixon HLA Twin Server 4			×
Typer architecture			
Select your typer architecture			-
◯ Standalone			
Distributed			
Further configuration after this installer is necessary for the Distributed Type	mode!		
You can find detailed instructions in the Software Installation Guide ("Typer" c	hapter).		
install A(
< Bad	k Next >	C	ancel

9. Configure the memory settings.

🛃 Setup - Omixon HLA Twin Server 4		-		×
Memory setup			-	
You can set how much memory the application will use			- 1	
Omixon Server memory [Mb]: k192				
Minimum and Class				_
Minimum required: 6144				
Maximum available: 32660				
Recommended: 8192				
install4j				
	< Back	Next >	Ca	incel

10. Select Start Menu folder.

👷 Setup - Omixon HLA Twin Server 4	-		×
Select Start Menu Folder Where should Setup place the program's shortcuts?			
Select the Start Menu folder in which you would like Setup to create the program's shortcuts, then click Next.			
Create a Start Menu folder			
Omixon HLA Twin Server			
7-Zip Accessories Administrative Tools Any/Oek Bladmagic Design Dropbox Git Java Development Kit Jetti ains Lawda			~
Create shortcuts for all users			
< Back	Next >	Ca	ancel



11. Click Finish.





6.3 Typer

HLA Twin Server can have multiple HLA Twin Typer instances connected to it to perform multiple analyses at the same time. The Omixon Twin Typer does not have a separate installer, because it is contained in a WAR (Web Application Resource) package that can be deployed through an HLA Twin Server. To deploy this package, an Apache Tomcat server needs to be running on the computer where the HLA Twin Typer is to be deployed to.

6.3.1 Adding new Typers to HLA Twin Server

It is possible to add additional HLA Twin Typers to the HLA Twin Server after installation.

- 1. Open the typer.conf file in the HLA Twin Server installation folder with a text editor
- 2. Add another \${ tomcat10 } line below the existing one(s):

```
typers = [
   ${ tomcat10 } { baseUrl = "http://192.168.0.5:8080/typer1" }
   ${ tomcat10 } { baseUrl = "http://192.168.0.6:8080/newtyper" }
]
```

Where

- a. the IP address is the address of the computer where Apache Tomcat has already been installed
- b. the port number is the port where Apache Tomcat was configured to listen on
- c. "typer1" is a customizable name for the Typer instance that will be visible in the software
- 3. Save the file and restart the HLA Twin Server service

Now the new IP address will be visible in the Typer Manager dashboard in HLA Twin Server.



6.3.2 Configuring Apache Tomcat on Windows

6.3.2.1 Notes before installation

Java: Tomcat requires Java SE 17.0 or OpenJDK 17.0 installed on the server! For licensing information, please check the chapter on Java licensing (see page 59).

Java SE 17.0 can be downloaded from the following link:

https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html

Networking: HLA Twin Server will communicate with HLA Twin Typers on port 8080 so please allow them on your firewall.

Typer deployment: After configuring Tomcat, please continue with the Deploying the Typer (see page 50) chapter.

HTTPS: For a secure connection between the HLA Twin Server and Apache Tomcat, please follow this chapter after the installation.

6.3.2.2 Installing Apache Tomcat on Windows

- 1. Download the latest distribution of Apache Tomcat 10 service installer here⁴.
- 2. Start the installer

🛃 Apache Tomcat Setup	×
e.org	Welcome to Apache Tomcat Setup
pach	Setup will guide you through the installation of Apache Tomcat.
http://tomcat.a	It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer. Click Next to continue.
Apache Tomcat 10	
	Next > Cancel

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⁴ https://tomcat.apache.org/download-10.cgi



3. Accept the license agreement

Apache Tomcat Setup -		×
License Agreement Please review the license terms before installing Apache Tomcat.	X	
Press Page Down to see the rest of the agreement.		
Apache License Version 2.0, January 2004 <u>http://www.apache.org/licenses/</u> TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION 1. Definitions. "License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.	-cont the	Ι
agreement to install Apache Tomcat. Nullsoft Install System v3.09		
< Back I Agree	Can	cel

4. Choose components and click next (we suggest the default configuration for convenience)

💐 Apache Tomcat Setup		– 🗆 ×
Choose Components Choose which features of Apac	he Tomcat you want to install.	
Check the components you war install. Click Next to continue.	nt to install and uncheck the com	ponents you don't want to
Select the type of install:	Normal ~	
Or, select the optional components you wish to install:	Tomcat Variable Start Menu Items Vocumentation V Manager Host Manager Examples	Description Position your mouse over a component to see its description.
Space required: 14.8 MB		
Nullsoft Install System v3.09		
	< Back	Next > Cancel



5. Configure the Tomcat server (the default configurations are suggested, but you might want to change the HTTP/1.1 Connector Port depending on which port you want to use for communication with the HLA Twin Server.

🛃 Apache Tomcat Setup: Cor	figuration Op	tions	_		X
Configuration Tomcat basic configuration.					¥.
Server Shutdown Port		<u> 1</u>			
HTTP/1.1 Connector Port		8080			
Windows Service Name		Tomcat10			
Create shortcuts for all users					
Tomcat Administrator Login (optional)	User Name				
	Password				
	Roles	manager-gui			
Nullsoft Install System v3.09					
		< Back Ne:	xt >	Cance	!

6. Select the path of the Java JRE. Please note that the 64-bit version of Java is needed. If the default path points to C:\Program Files(x86), you have the 32-bit version installed. In that case, please install the 64-bit version.

Apache Tomcat Setup: Java Virtual Machine path selection	-		×
Java Virtual Machine Java Virtual Machine path selection.		X	H
Please select the path of a Java 11 or later JRE installed on your system			
C:\Program Files\Java\jdk-17			
Nullsoft Install System v3.09	>	Са	ncel



7. Select the install location

Apache Tomcat Setup	_		×
Choose Install Location Choose the folder in which to install Apache Tomcat.		X	
Setup will install Apache Tomcat in the following folder. To install in a Browse and select another folder. Click Install to start the installatio	a different fo	older, click	
Destination Folder <u>C:\Program Files\Apache Software Foundation\Tomcat 10.1</u>	Brov	wse	
Space required: 14.8 MB Space available: 154.7 GB			
Nullsoft Install System v3.09	Install	Can	cel

- 8. After the installation, restart the computer
- 9. After the restart, navigate to <Tomcat root>\conf\ in File Explorer and open tomcat-users.xml with a text editor. You will need admin privileges.

Add the following before </tomcat-users>

tomcat-users.xml <role rolename="manager-gui"/> <role rolename="manager-script"/> <user username="omixon" password="omixon"</pre> fullName="omixon" roles="manager-gui,manager-script"/>



Save the file.

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10. Navigate to <Tomcat root>\conf\Catalina\Localhost\ and create a new document with the name manager.xml. You will need admin privileges. If you are unable to create the file in this location, create it somewhere where you have rights to create a file then copy it over to the specified location.

The contents of the file should be the following:

```
manager.xml

<Context privileged="true" antiResourceLocking="false">
 <Valve className="org.apache.catalina.valves.RemoteAddrValve" allow="^.*$" />
 </Context>
```

Save the file.

11. Navigate to <Tomcat root> \webapps\manager\WEB-INF\ in File Explorer and open web .xml with a text editor. You will need admin privileges.

Set the max file size and max requested size to at least 150MB (see the example below).

```
web.xml

<servlet>
<servlet-name>HTMLManager</servlet-name>
<servlet-class>org.apache.catalina.manager.HTMLManagerServlet</servlet-class>
<multipart-config>
<max-file-size>154857600</max-file-size>
<max-request-size>154857600</max-request-size>
<file-size-threshold>0</file-size-threshold>
</multipart-config>
</servlet>
```

- 12. Open Tomcat Manager ("Configure Tomcat" in the Start Menu)
- 13. Open the Java tab and change the Maximum memory pool value.
 - Minimum value: 20480 MB
 - Recommended value: 24576 MB

Please keep in mind that Windows will require at least 2 GB memory to efficiently!

14. Start (or Restart) the Tomcat service in the General tab.

Software Installation Guide



To test if Tomcat is up and running, open a web browser and try to reach http://localhost:8080⁵ (or the port number you have selected). You should see the following site if Tomcat is running:

To test if the Tomcat server is reachable from another computer, you can also try this method with the server's IP.

Typer deployment: After configuring Tomcat, please continue with the Deploying the Typer (see page 50) chapter.



⁵ http://localhost:8080/

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6.3.3 Configuring Apache Tomcat on Linux distributions

6.3.3.1 Notes before installation

Java: Tomcat requires OpenJDK 17.0 installed on the server!

Networking: HLA Twin Server will communicate with HLA Twin Typers on port 8080 so please allow them on your firewall.

Typer deployment: After configuring Tomcat, please continue with the Deploying the Typer (see page 50) chapter.

HTTPS: For a secure connection between the HLA Twin Server and Apache Tomcat, please follow this chapter after the installation.

6.3.3.2 Installing Apache Tomcat on Linux

1. Create a new user for Tomcat

bash
sudo useradd -r -m -U -d /opt/tomcat -s /bin/false tomcat

2. Download the latest distribution of Apache Tomcat 10 core. You can find the link here⁶.

wget LINK -P /tmp

3. Extract the downloaded archive to /opt/tomcat

bash	
<pre>sudo tar xf /tmp/apache-tomcat-10*.tar.gz -C /opt/tomcat</pre>	

4. Create a symlink for handling different versions of Tomcat more easily

sudo ln -s /opt/tomcat/apache-tomcat-10.* /opt/tomcat/latest

5. Change the ownership of the directory to the user and group tomcat

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⁶ https://tomcat.apache.org/download-10.cgi

Software Installation Guide



bash
<pre>sudo chown -RH tomcat: /opt/tomcat/latest</pre>

6. The scripts inside the bin folder must have the executable flag

bash	
<pre>sudo sh -c 'chmod +x /opt/tomcat/latest/bin/*.sh'</pre>	

7. We want Tomcat to run as a service, so we need to create a new unit file.

bash	
<pre>sudo nano /etc/systemd/system/tomcat.service</pre>	



The contents of this file should be the following. Be careful with line breaks while copying this: the line that ends with dev/urandom needs to have the next line (-Djava.awt...) after it. Also, the CATALINA_OPTS and its parameters (the -XX parameters) should be in the same line.

tomcat.service
[Unit] Description=Tomcat 10 servlet container After=network.target
[Service] Type=forking
User=tomcat Group=tomcat
Environment="JAVA_HOME=/usr/lib/jvm/default-java" Environment="JAVA_OPTS=-Djava.security.egd=file:///dev/urandom -Djava.awt.headless=true"
Environment="CATALINA_BASE=/opt/tomcat/latest" Environment="CATALINA_HOME=/opt/tomcat/latest" Environment="CATALINA_PID=/opt/tomcat/latest/temp/tomcat.pid" Environment="CATALINA_OPTS=-Xms512M -Xmx24576M -server -XX:+UseParallelGC -XX:+CrashOnOutOfMemoryError -XX:+HeapDumpOnOutOfMemoryError -XX:+PrintGCDetails -XX:+PrintGCTimeStamps -XX:+PrintGCDateStamps -Xloggc:gc.log -XX:+PrintReferenceGC -XX:+PrintTenuringDistribution -XX:+PrintGCApplicationStoppedTime -XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=10 -XX:GCLogFileSize=10M"
ExecStart=/opt/tomcat/latest/bin/startup.sh ExecStop=/opt/tomcat/latest/bin/shutdown.sh
[Install] WantedBy=multi-user.target

Please note that the -Xmx value is the memory configuration for the software. The minimum value is 20480 MB but we recommend 24576 MB. Keep in mind that Linux will require at least 2 GB of memory to work efficiently.

8. Reload the system manager

bash	
<pre>sudo systemctl daemon-reload</pre>	



9. Edit the following file with a text editor: /opt/tomcat/latest/conf/tomcat-users.xml

Add the following before </tomcat-users>

```
tomcat-users.xml
<!-- ... -->
<role rolename="manager-gui"/>
<role rolename="manager-script"/>
<user username="omixon" password="omixon" fullName="omixon" roles="manager-gui,manager-script"/>
```

Save the file!

10. Navigate to /opt/tomcat/latest /conf/Catalina/Localhost/ and create manager.xml (add the folders manually if they are missing).

The contents of the file should be the following:

manager.xml <Context privileged="true" antiResourceLocking="false"> <Valve className="org.apache.catalina.valves.RemoteAddrValve" allow="^.*\$" /> </Context>

11. Navigate to /opt/tomcat/latest/ webapps/manager/WEB-INF/ and open web .xml with a text editor. Set the max file size and max requested size to at least 150MB (see the example below).

```
web.xml

<servlet>
<servlet-name>HTMLManager</servlet-name>
<servlet-class>org.apache.catalina.manager.HTMLManagerServlet</servlet-class>
<multipart-config>
<max-file-size>154857600</max-file-size>
<file-size>threshold>0</file-size>threshold>
</multipart-config>
</servlet>
```

12. Start the Tomcat service

bash

sudo systemctl start tomcat

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- To check the status of the Tomcat server, run sudo systemctl status tomcat
- To have Tomcat run on startup, run sudo systemctl enable tomcat

To test if Tomcat is up and running, open a web browser and try to reach http://localhost:8080/ (or the port number you have selected). You should see the following site if Tomcat is running:

To test if the Tomcat server is reachable from another computer, you can also try this method with the server's IP.

Typer deployment: After configuring Tomcat, please continue with the Deploying the Typer (see page 50) chapter.





6.3.4 Deploying the Typer

After you have configured the Apache Tomcat server in the previous chapter, you need to deploy the HLA Twin Typer WAR from the HLA Twin Server.

- 1. Open an HLA Twin Client and connect to the HLA Twin Server
- 2. Open Typer Manager

👪 Omixon HLA Twin RUO - using 'Omixon Server'					- 🗆	×
Genotyping Typers	Nandor Varga@Technical Support	📌 Typer Sched	uler 📋	Event Log	\$ 9 €⊐	٩
Genotyping dasl	Database date Holotype Kit versio	17/04/2019 n Holotype HLA v3.0	Database version	3.36.0_8 (extension	3	0
Simple Advanced Genetyping Genotyping	alysis Analysis State filter Filter Files Files Tigs	Application Settings	Sorting files by name	(combined ascendin	g/descending).	Displa Displa Displa
Navigate to folder containing sample fastq files or previously analyzed results / Work [W:]	Click on sample to select. Ctrl/Shift click of C	trl+ato select multiple.			Hidem	hessage
.						
\$RECYCLE.BIN					Select Folder	
Contraction Audio					Select Folder	
<u> </u>						
No property to display						

3. Click on Deploy for the server you want to set up an HLA Twin Typer. This will take approximately a minute (the HLA Twin Server sends the WAR file to the Tomcat server)

🝓 Omixon HLA Twin RUO - using 'Omixon Server'			- 🗆 X
Genotyping Typers	Nandor Varga@Techni	ical Support 🥠 Typer Scheduler	🖹 Event Log 🏟 🖨 🕧
Color Typer Mana	ager dashboard	Application Omixon HLA Twin RUO Version	3.20
Address	Version Status	Manage Typer status	Progress Actions
http://192.168.0.150:8088/typer1	N/A UNDEPLOYED	Deploy Undeploy N/A	Stop
		ſ	



4. If the deployment was successful, you will see the following:

🛃 Omixon HLA Twin RUO - using 'Omixon Server'						– 🗆 X
Genotyping Typers	Nando	r Varga@Technical Support	Ivper Schedu	ıler 🗎	Event Log	🔄 🕫
Cooo Typer Man	ager dashl	Doard Application	in Omixon HLA Twin RUC			30
Address	Version	Status N	lanage Tyj	per status	Progress	Actions
http://192.168.0.150:8088/typer1	N/A DEPLOY	ED Deploy	Undeploy	G		Stop

Now HLA Twin is ready for analysis.



6.4 Client

Notes before installation

Networking: HLA Twin Server will communicate with HLA Twin Clients on ports 4380 and 4381 by default, so please make sure to allow them on your firewall.



6.4.1 Installing HLA Twin Client

- 1. This step depends on the operating system you are running.
 - Windows users: Open the installer (omixon_hla_twin_XXX_windows-x64_with_jre-client.exe)
 - Linux users: Open a terminal window, get permissions to the installer (chmod
 +x omixon_hla_twin_xxx_unix_with_jre-client.sh) then run the installer.
 - OSX users: Open the installer (omixon_hla_twin_xxx_macos_with_jre-client.dmg) (if you are using OSX 10.14.6 Mojave or above, you might get an error message. If so, please contact us at support@omixon.com⁷)

👮 Setup - Omixon HLA Twin	Client 4	-		×
	Welcome to the Omixon HLA Twin Client Setup Wizard			
	This will install Omixon HLA Twin Client on your computer. The wizard will lead you installation.	step by s	tep throu	gh the
	Click Next to continue, or Cancel to exit Setup.			
		Next >	Ca	incel

2. Accept the license agreement.

Stup - Omixon HLA Twin Client 4 Calcases Stup - Omixon HLA Twin Client 4 Calcases Calcase Calcase Calcase Calcase Calcase Calcase Calcase Calcas				
Leense Agreement Image: Comparison of the series of the installation. Please read the following license Agreement. You must accept the terms of this agreement before continuing with the installation. SOFTWARE LICENSE AGREEMENT PLASE READ THIS SOFTWARE LICENSE AGREEMENT CAREFULLY BEFORE DOWNLOADING OR USING THE SOFTWARE. EVICIONING ON THE 'ACCEPT' BUTTON, OPENING THE PACKAGE, DOWNLOADING OR USING THE SOFTWARE. EVICIONING ON THE 'ACCEPT' BUTTON, OPENING THE PACKAGE, DOWNLOADING OR USING THE SOFTWARE. EVICIONING ON THE 'ACCEPT' BUTTON, OPENING THE PACKAGE, DOWNLOADING OR USING THE SOFTWARE. EVICIONING ON THE 'ACCEPT' BUTTON, OPENING THE PACKAGE, DOWNLOADING THE PRODUCT, OR USING THE SOFTWARE. EVILUATION PROCESS WILL NOT CONTINUE, RETURN THE PRODUCT TO THE PLACE OF PURCHASE FOR A FULL RETURN, OR DO NOT DOWNLOAD THE 'REDUCT. Single User License Grant: Omixon Biocomputing Ltd. ('Omixon') and its suppliers grant to Customer 'or otherwise embedded in equipment provided by Omixon. Multiple-Users License Grant: Omixon Biocomputing Ltd. ('Omixon') and its suppliers grant to I do not accept the agreement I do not accept the agreement Contour other wise embedded in equipment provided by Omixon. Multiple-Users License Grant: Omixon Biocomputing Ltd. ('Omixon') and its suppliers grant to Castaff StadW <th>Setup - Omixon HLA Twin Client 4</th> <th>-</th> <th></th> <th>Х</th>	Setup - Omixon HLA Twin Client 4	-		Х
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Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation. SOFTWARE LICENSE AGREEMENT PLEASE READ THIS SOFTWARE LICENSE AGREEMENT CAREFULLY BEFORE DOWNLOADING OR USING THE SOFTWARE. BY CLICKING ON THE "ACCEPT" BUTTON, OPENING THE PACKAGE, DOWNLOADING THE PRODUCT, OR USING THE EQUIPMENT THAT CONTAINS THIS PRODUCT, YOU ARE CONSENTING TO BE BOUND BY THIS AGREEMENT, LF YOU DO NOT ACREE TO ALL OF THE TEMES OF THIS AGREEMENT, CLICK THE "DO NOT ACCEPT" BUTTON AND THE INSTALLATION PROCESS WILL NOT CONTUNE, RETURN THE PRODUCT TO THE PLACE OF PURCHASE FOR A FULL REFUND, OR DO NOT DOWNLOAD THE PRODUCT. Single User License Grant: Omixon Biocomputing Ltd. ("Omixon") and its suppliers grant to Customer" on onexclusive and nontransferable locense to use the Omixon software ("Software") in object code form solely on a single central processing unit owned or leased by Customer or otherwise embedded in equipment provided by Omixon. Multiple-Users License Grant: Omixon Biocomputing Ltd. ("Omixon") and its suppliers grant to I do not accept the agreement I do not accept the agreement I do not accept the agreement	Please read the following important information before continuing.		_	-
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	< Back	Next >	C	ancel

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⁷ mailto:support@omixon.com



3. Select an installation folder.

Windows users, please keep in mind that you might want to change the destination directory so other users in Windows can access the software (the same applies to the other installation folders in the next steps as well).

👮 Setup - Omixon HLA Twin Client 4		-		×
Select Destination Directory Where should Omixon HLA Twin Client be installed?			-	
Select the folder where you would like Omixon HLA Twin Client to be installed, then click Next.				
C:\Users\Omixon\OmixonHlaTwin			Browse	
Required disk space: 281 MB				
Free disk space: 32 GB				
install4j	< Back	Next >	•	Cancel

4. Select a folder for temporary files.

😒 Setup - Omixon HLA Twin Client 4	-		×
Temp directory The directory where the application will store its temporary data files.			
This directory should be readable and writable by the user who will be running the application.			
C: \Users\Omixon\AppData\Local\Temp		Browse	
install <i>i</i>			
<pre>soury </pre>	Next >	Cano	el



5. Configure the memory settings.

👮 Setup - Omixon HLA Twin Client 4		-		×
Memory setup You can set how much memory the application will use				
Application memory [Mb]: 5144			_	
Minimum required: 4096				
Maximum available: 32660				
Recommended: 6144				
install/4i				
- State 1)	< Back	Next >	Ca	ancel

6. Select Start Menu folder.

😒 Setup - Omixon HLA Twin Client 4 🔤	-		×
Select Start Menu Folder Where should Setup place the program's shortcuts?			
Select the Start Menu folder in which you would like Setup to create the program's shortcuts, then click Next.			
Create a Start Menu folder			
Omixon HLA Twin Client			
7-Zip Accessibility Accessiones			^
Administrative Tools AnyDesk			
DragonDisk Dropbox			
Git Java Java Development Kit			
JetBrans Jubula			
Maintenance Microsoft Office 2013			~
r buarry Sada	Next >	С	ancel

7. After the installation finishes, click on Finish.

👤 Setup - Omixon HLA Twin	Client 4	-		×
	Completing the Omixon HLA Twin Client Setup Wizard			
	Setup has finished installing Omixon HLA Twin Client on your computer. The applic selecting the installed icons.	ation ma	y be laund	hed by
	Click Finish to exit Setup,			
			Fi	nish



6.5 HTTPS configuration

In a client-server architecture edition, the software supports secure SSL communication between the components of the software. The software achieves secure communication with the use of public and private keys that are stored in a Java Keystore file.

(i) The keytool command in this section uses the Keytool application of Java. The software comes with a built-in Java Runtime Environment (JRE), so this application should already be on the computer. Navigate to the <Omixon Software installation folder>\jre\bin folder using the Command Prompt (or the Terminal on Linux).

Password

In the following chapters we are going to use the same password 'changeit' everywhere. Please update this password to your own secure password.

Self-signed certificates

In the following chapters we are going to show you how to generate self-signed certificates. Self-signed certificates are generally NOT SECURE, therefore we do not recommend you to use these files in production environment. Ask your own Certificate Authority to generate the necessary secure certificates. This description is only meant to show you how you can set-up the application components in possession of the secure key stores.

Hostname verification

In the following chapters we are creating certificates for 'localhost' servers. If your server is hosted in a different network you must change the scripts. You can also decide to skip hostname verification by setting *disableHostnameVerification* property to true but we strongly recommend you not to do this!



6.5.1 Client-Server Communication

6.5.1.1 Generate Key-Stores

Run the following script to generate the necessary files.

Description

The script:

- 1. Generates server keystore which contains the server's certificate and private key
- 2. Exports the certificate into a separate file
- 3. Generates client truststore that contains the server's certificate

Script

keytool -genkey -v -alias omixon-server -keyalg RSA -keysize 2048 -keystore omixon-server.pfx -validity 365 -keypass changeit -storetype PKCS12 -storepass changeit -dname "CN=Server, OU=Software, 0=Omixon Ltd." -ext SAN=dns:localhost,ip:127.0.0.1,ip:0.0.0.0

keytool -export -keystore omixon-server.pfx -alias omixon-server -file omixon-server.cer -keypass changeit -storepass changeit

keytool -keystore omixon-client.truststore.pfx -alias omixon-server -import -file omixonserver.cer -storetype PKCS12 -storepass changeit -noprompt



6.5.1.2 Configure Components

You have to specify the necessary files and passwords in the *vmoptions* configuration file of the Client and Server components.

Client
omixon.truststore= <folder files="" generated="" of="" the="">/omixon-client.truststore.pfx omixon.truststore.password=changeit omixon.ssl.disableHostnameVerification=false</folder>
Server
server.ssl.enabled=true server.ssl.key-store-type=PKCS12

server.ssl.key-store=<folder of the generated files>/omixon-server.pfx

server.ssl.key-store-password=changeit

server.ssl.key-alias=omixon-server



7 Configuring a pre-existing MySQL database

HLA Twin Server has the ability to store its internal database (containing user data, reference databases, and audit information) in an already existing **MySQL 8** database. This way you would not need to set up a separate MySQL server for HLA Twin.

Please note that the responsiveness of the HLA Twin UI will depend on the network speed between MySQL and HLA Twin.

Your MySQL server needs to use Legacy Password Encryption for HLA Twin to interface with it.

You need to create a new user in your pre-existing database to allow HLA Twin to use it. For this, run the following commands:

- CREATE USER 'omixon'@'localhost' IDENTIFIED BY 'omixon';
- 2. GRANT ALL PRIVILEGES ON omixon_database . * TO 'omixon'@'localhost';
- 3. FLUSH PRIVILEGES;

Now HLA Twin will be able to create its own database in MySQL.

8 Additional guides

8.1 Java licensing

This section describes options for customers that use the <u>distributed typer (see page 38)</u> configuration of HLA Twin, more specifically the JRE that is needed for Apache Tomcat.

Oracle has changed its licensing scheme⁸ for Java SE on April 16, 2019. Because of this, commercial usage of Java SE is limited to versions prior to the licensing change.

An open-source alternative that is up to date and supported by Apache Tomcat is OpenJDK⁹. For easy installation, we suggest downloading a prebuilt installer from AdoptOpenJDK¹⁰ (OpenJDK 8 with HotSpot JVM).

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⁸ https://www.oracle.com/technetwork/java/javase/overview/oracle-jdk-faqs.html 9 https://jdk.java.net/ 10 https://adoptopenjdk.net/