

Installation & Quick Start Guide

Release 2.5

For EL-Software Version 2

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EL-Cell GmbH

Tempowerkring 8 21079 Hamburg - Germany

phone:	+49 40 79012-734
fax:	+49 40 79012-736
e-mail:	info@el-cell.com
web:	el-cell.com

Technical support

phone:	+49 40 79012-734
e-mail:	support@el-cell.com
web:	el-cell.com/support/technical-support/

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1 Introduction

Congratulations on your new PAT-Tester. This document is a quick start guide for setting up your PAT-Tester. Please read it carefully.

The main hardware components are a computer (sometimes known as the LAB-PC) and the PAT-Tester, which are connected via an Ethernet network.



Figure 1: Computer and PAT-Tester Connection

The main software components are the **EL-Software Client** (Client) and the **EL-Software Server** (Server).

In this guide, we will show how to run the client and the server on the same computer, as this is the most straightforward setup

The **EL-Software Client** is software for end users that provides a graphical interface for controlling and working with PAT-Testers. It can be installed on any client PC within the network.

The **EL-Software Server** handles the core operations, stores data in the database, and serves as the interface between the EL-Software Client and the PAT-Tester device. It can be installed on the same computer as the Client or on a dedicated server within the network.

2 Requirements

2.1 Hardware Requirements

These are the minimum requirements for the hardware.

	EL-Software Server	EL-Software Client			
CPU	Intel i5-12400 or comparable Intel	Intel i5 or comparable AMD64			
	Xeon or AMD64 processor	processor			
RAM	16 GB	8 GB			
Free disk space1 GB SATA-SSD		500 MB HDD			
Network 1 Gbit		1 GBit			
Display Resolution	-	1366 x 768 pixels and higher			

PLEASE NOTE

EL-Software is scalable software designed for simultaneous operation with multiple PAT testers. The hardware requirements result from the number of test channels used simultaneously and the measurement data generated by the measurement protocols used and are thus variable depending on the application. Therefore, the EL-Software Server's hardware requirements should only be a guideline for operating a system with up to 16 test channels.

2.2 Software Requirements

	EL-Software Server	EL-Software Client		
Operating	Windows Server 2022	Windows 10 (x64) 21H2 or later		
System	Windows 10 (x64) 21H2 or later	Windows 11		
	Windows 11			
	Linux Ubuntu 18.04*			
Other	Microsoft Visual C++ 2015-2022	WebView2 (must be installed		
	Redistributable (x64)	manually on older Windows 10		
		versions)		

*Only PAT-Tester and Appliance

2.3 Network Requirements

This table is for reference when configuring a firewall and other network equipment. Relevant network ports are:

Device	Port	Protocol	Description
EL-Software Server	4711	HTTP (and	Required for the client to
		WebSockets)	connect to the server.
EL-Software Server	5711	HTTPS (and	Required for the client to
		WebSockets)	connect to the server securely.
EL-Software Server	5432		Database port is used locally
			and can be blocked.
EL-Software Server	445	SMB	Access to script data exports
(on Appliance and PAT-Tester)			
PAT-Tester	22	SSH	Required by the EL-Software
			Server for updates, etc., and
			administration
PAT-Tester	4712	HTTP (and	Required by the server for the
		WebSockets)	connection
PAT-Tester	5712	HTTPS (and	Required by the server for a
		WebSockets)	secured connection

3 EL-Software Server (and Client) Installation

First, we will briefly show you how to set up the server component on a Microsoft Windows Server or Microsoft Windows.

- Please visit the EL-Cell website first to download the EL software: <u>https://www.el-cell.com/products/el-cell-software/el-software/#downloads</u>
- 2. Once the download is complete, start the installation.
- 3. Select "Client" and "Server Components," then click "Next."



Figure 2: Component Selection on Installation

4. Review the predefined settings on the database page first. Suppose you have a separate SSD available for the database. In that case, it is recommended to use it, as the scripts can generate a large amount of data, potentially filling up the system disk. Click "Next" to confirm.

EL-Software Setup	_		×
Select database locations and server hostname Database files will be stored in the following folders. We recommend insta database on a different physical drive.	alling the		
Remove old Databases in the paths below (This is equivalent to a factory reset. Your measurement data will be preser Postgres database path:	ved.)		
C:\EL-CELL\database\pgsql			
Change			
Specify the hostname or IP of the server to which this client should connect			
localhost			
Reset Test Connection Back	Next	Са	ncel

Figure 3: Database Settings on Installation

5. After installing, you can start the EL-Software Client from the Windows Start Menu.

∎ ÷	EL-Software Client 2.0.2.5694 - Server 2.0.2.11075 Overview	- PAT-Testers	
	PAT-Testers [0] Experiments [0]	← 💽 😕 👘 💭 +← 🏦 Back Connect PAT-Tester Open Delete Reload PAT-Tester IP Update	=
0	Scripts [36] Test Cells [13]	Y Search	×
0	Components	Name Connection Channels Total Channels Available Channels Testing Ter	nperature
		Server URL: http://	

Figure 4: EL-Software Client

4 EL-Software Client (Only) Installation

If you use a dedicated server for the EL-Software Server, the EL-Software Client must be installed separately on a client PC.

Repeat the EL-Software Server installation, but do not select the "Server Component."

On the database page, enter the server's IP address to which the client should connect.

5 Prepare Network for PAT-Tester Connection

To ensure a smooth connection to the PAT-Tester, it is essential to configure the network correctly before proceeding with the installation. The PAT-Tester can be easily connected to your network through a direct LAN connection, a switch, or a router with DHCP enabled. This chapter provides simplified guidelines to help you understand and establish a connection to the PAT-Tester.

Understanding IP Configuration

Predefined IP: Starting in 2025, the PAT-Tester has a predefined static IP address set to 192.168.67.67. This is typically used for a single PAT-Tester **directly connected** to a computer. If multiple PAT-Testers are used, or if the PAT-Testers need to be integrated into an existing network, DHCP (as explained in the next section) is already prepared and should be used.

DHCP: Alternatively, the PAT-Tester can receive an IP address automatically from a DHCP server, typically provided by your network **router**. This method is preconfigured and is recommended for flexibility and ease of configuration. To determine the assigned IP, check the router's admin page or consult your IT administrator.

Hint: In some cases, the assigned IP address may change. Configuring a static lease on the DHCP server/router can prevent changes to the IP address.

5.1 Setting Up a Direct Connection using the Predefined IP

To set up a direct connection to the PAT-Tester, start by configuring the IP address of the client PC connecting to the device. For example, you can set the computer's IP address to 192.168.67.2, using a subnet mask of 255.255.255.0 (or alternatively, /24 or just 24). It's important to ensure that this IP address does not conflict with other devices on the network, allowing for smooth communication with the PAT-Tester.

	~
	~

Figure 5: Network Configuration for Direct Connection on Windows 11

Connect the PAT-Tester to the client PC using a standard network cable for a direct connection. This method bypasses the need for additional network hardware, such as routers.

Alternatively, if you prefer, you can connect the PAT-Testers through a switch, allowing multiple devices to be connected within the same network.

5.2 Setting Up With a Router Using DHCP

When using DHCP, the DHCP server automatically assigns the PAT-Tester's IP address, eliminating the need for manual IP configuration and simplifying the setup process.

The process for finding the PAT-Tester's assigned IP address varies depending on the model.

- For the **PAT-Tester i16**, the current IP address is displayed directly on its screen, making it easy to locate.
- For the **PAT-Tester x8**, check the connected router's administrative interface to find the device's IP address.

Alternatively, if network discovery is available on your computer, you can explore your network environment for discovered PAT-Testers. The assigned IP address can be found by opening the device's settings.



Figure 6: Network Devices discovered by Windows

5.3 Testing the Connection

Begin by checking the LEDs on the network ports being used. If they are blinking, it indicates that a physical connection has been successfully established.

Once connected—whether through a direct setup or DHCP—you can test the connection to the PAT-Tester. To do so, open a web browser and navigate to http://[PAT-Tester-IP]:4712, replacing [PAT-Tester-IP] with the actual IP address of your PAT-Tester. This will take you to a special administration page, which will be explained later.

If you can access the administration page, the connection is correctly established.

PLEASE NOTE

Starting with Version 2.4, there will be a redirect to **https**://[PAT-Tester-IP]:5712. You may encounter a security warning due to an unknown certificate, but this can be safely confirmed in this case.

5.4 Troubleshooting

IP Conflicts: If you encounter IP conflicts, refer to the later chapter, "Connecting the PAT-Tester," for instructions on changing the PAT-Tester's IP.

If the DHCP Lease expires and the PAT-Tester IP has changed: Consider using a static lease or setting up a static IP, as detailed in "Connecting the PAT-Tester."

Using Router WAN or ETH1 Port: Use other ports designated for LAN connections.

Check Network: If the PAT-Tester Administration Page does not show up, perform a network ping test to check connectivity.

This overview should assist you in setting up and troubleshooting your PAT-Tester connection, ensuring the device's efficient and effective use in your network environment.

6 Connecting the PAT-Tester

To begin, launch the client from the Start menu.

Make sure to remember the IP address of the PAT-Tester from the network setup.

Next, click "PAT-Testers" in the left navigation menu in the client interface. After that, click "Connect PAT-Tester" in the toolbar to initiate the connection.

Overview	C PAT-	Testers >	<u>x</u> 8-1321					
 PAT-Testers [1] x8 x8-1321 	Bace Co	nnect PAT-Teste	日本 前 Ppen Delete f	Reload Update				
Experiments [2] 2024-03-28-E23-EIS-LOOP-test	T Sea	rch				×	Details	
ECE1-00-0297-A	Name	Connection	Channels Total	Channels Available	Channels Testing	Temp	General	
Test Cells [13] Components	x8-1321	Connected	1	1	0		IP Address	192.168.1.12
- ,							Туре	x8
								Cer
								and the

Figure 7: Connect PAT-Tester

To connect, select a discovered PAT-Tester from the list. You can manually enter the name and IP if the search does not yield any results.

Connect PAT-Tester	
Available Devices	
<u>x8-696</u>	http://x8-696:4711 () 2.1.2.296
x8-696	http://x8-696:4711 () 2.1.2.296
x8-696	http://x8-696:4711 12.1.2.296
Name	Searc
x8-696	
192.168.3.249	

Figure 8: Select PAT-Tester to Connect

To administrate the PAT-Tester, please visit the administrator web user interface through the URL: http://[PAT-Tester-IP]:4712



6.1 Changing the PAT-Tester IP

If a different configuration is needed, it can be prepared as shown.

Go to *PAT-Testers*, select the device, and open the "Connect PAT-tester" dialog.

Then click on "Set PAT-Tester IP with USB Stick."

Connect PAT-Tester	×
Available Devices	
x8-696	http://x8-696:4711 🚯 2.1.2.2968
x8-696	http://x8-696:4711 (1) 2.1.2.2968
x8-696	http://x8-696:4711 🚺 2.1.2.2968
	Search
Name	
x8-696	
IP Address	
192.168.3.249	
• Set PAT-Tester IP with USB Stick	Connect Close

Figure 9: Change PAT-Tester IP

In this dialog, enter the IP address, for example, 192.168.67.67. The subnet mask should be set to 255.255.255.0.

IP Configuration	×
DHCPStatic	
IP Address: Gateway: 0.0.0.0	
Select USB device USB stick must be formatted with NTFS.	~
After creating the configuration file on the USB device, th device must be plugged into the powered-on PAT-Tester for approximately one minute to apply the new network configuration.	ie
Create]

Figure 10: Enter New IP for the PAT-Tester

After the configuration is prepared, the USB stick must be inserted into the PAT-Tester and left there for approximately one minute until the configuration takes effect. Then, unplug the USB stick.

6.2 Decoupling a connected PAT-Tester

If you want to disconnect a connected PAT-Tester, open the device's administration website (http://[PAT-Tester-IP]:4712). Then, navigate to the settings and click on "Decouple." Note that the position of the "Decouple" button changes in Version 2.1 and later.

💽 InPrivate 🗖 🖬 Settings 🛛 🗙 🕂							
← C				ר ל	æ	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
				PAT-Tester	version:	2.1.2.2	968
 electrochemical test equipment Home PAT-Tester Restart Factory Reset Settings 	Settings PAT-Tester 'x8-696' is coupled to server: x8-695 If you decouple all experiments will be stopped. Decouple						
	Log Level Information	``	/				
	<u>Download logs</u>						

Figure 11: Decouple PAT-Tester from other Server

7 Create Your First Experiment

Once the PAT-Tester is connected, you can create an experiment. Click on *Experiments* in the left navigation menu and then "New Experiment" in the menu bar.

Overview	C Experin	nent	> 3964	1. 百姓 安东 第三十					
PAT-Testers [1]	← Back New E	+ kperime	nt Edit Deta	ඏ 🕅 ails Open Delete	C Reload	D uplicat	e Start Experiment		
Experiments [0] Scripts [36]	Search					×	3684.67.69	807	
Test Cells [13] Components	Name 🔺	No.	State	Progress	Created	•	Name	Second Second	
				30%	Rent Rent Parts		No.	199	
	Sectore and	18.2	5.900 8 05-				Created	abits pays and	
	and the second sec	124	- Share	199029 199020	 State State (State) 		Description		
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	10246391-004		(chiadian)	1070	tion desirede				
	2016-06	16	- States	A.	ANTA DAMAS (MA				

Figure 12: Create an Experiment

Make sure to insert a PAT-Cell in the PAT-Tester first. If the PAT-Cell has no PAT-Button, create a PAT-Cell manually in the client (to do this, click on *Test Cells* in the left menu, then on "Create" in the menu bar). Add at least one test cell to the experiment.

EL-Software Client 2.1.2.5805 - Server 2.1.2.11412		- 🗆 ×
Conversion C PAT-Testers [1] ■ 38.9-1321 SN-0202 C310063 Experiments [3] ■ Low 2024-04-09-E25 ■ C Cell Group C 2024-04-09-E25 ■ C Cell Group C 2024-03-28-E32-E15-LOOP-test C Cell C-100-0297-A Scripts [20] Test Cells [12] C Components	Experiments > 2024-04-09-E25 > 2024-04-09-E25 Back Experiments List Reload Create Group Edit Group Delete Group Start Experiment Stop Experiment Close Experiment Close Experiment Cose Exper	?
	Composition No composition Scripts Assign script from database: Select script V V V V V V V V V V V V V	

Figure 13: Select a Test Cell

Now, add a script to the experiment.

			_	
EL-Software Client 2.1.2.5805 - Server 2.1.2.11412		-	U	×
\leftarrow Overview $\qquad \qquad \mathcal{C}$	Experiments > 2024-04-09-E25 > 2024-04-09-E25			
PAT-Texters [1] ■ AT-Texters [1] ■ A*-1321 SN-0020 (2) 10063 ■ Experiments [3] ■ C2040-04-02-25 ■ C2040-03-28-22-315-LOOP-test ■ C2040-03-28-22-315-LOOP-test		A 1001 PAT-Cell		-
	Composition N/A N/A N/A			=
	Scripts			٦I
	Assign script from database: Select script		ļ	
0	Serv	er URL: <u>http://x8-1321.el-cell.lo</u>	cal:4711	1 5

Figure 14: Select a Script

The experiment can be started now.

Figure 15: Start the Experiment

Click on a script name in the Test Cell section to enter the Data View. Here, you can see the measurement data.

I EL-Software Client 2.1.2.5805 - Server 2.1.2.11412		- 0	×
← Overview 🕫	Experiments > 2024-04-09-E25 > 2024-04-09-E25		
PAT-Testers [1] ■ 20.7-Testers [1] ■ 20.202 (25) T0063 Experiments [3] ■ ≤ 20.204 (-4-0+2:5) ■ Cell Group ■ Cell Group ■ Co-tasic © CC-basic © ≤ 20:4-03-28:+22:=EIS-LOOP-test © ≤ CE-10-0027-A	Constraint and the second		÷
C Scripts [20] Test Cells [12] C Components	C PO107 = 1 (st ps-lac, preddat w C Image: start start start M Solid start start Solid start start Image: start	A 1001 PAT-Cell	
			=
	Scripts Script from database: Select script)
	Server	URL: http://x8-1321.el-cell.local:47	11/

Figure 16: Open Data View



Figure 17: Data View

8 Access Administration Pages

All PAT-Tester devices and EL-Software Server installations can be administered via a built-in website.

8.1 Access the PAT-Tester Administration Page

Access via web browser:

Before Version 2.4:

http://[PAT-Tester-IP]:4712 (Example: http://192.168.1.126:4712)

Since Version 2.4:

https://[PAT-Tester-IP]:5712 (Example: https://192.168.1.126:5712)

Access via EL-Software Client

To access the PAT-Tester administration page, go to *PAT-Testers* and select a device from the list. Click on the link on the right side to open it in a web browser:

Conversion Control	I EL-Software Client 2.1.2.5805 - Server 2.1.2.11412	-		×
PMT-Tester:11 Back Connect MiT-Tester: Open Deckte Relad Update Sector:10:1003 Sector:10:1003 Deck: Connect MiT-Tester: Open Deckte Relad Update Deckins Sector:10:1003 Sector:10:1003 Deck: Connect MiT-Tester: Open Deckte Relad Update Deckins Sector:10:1003 Sector:10:1003 Deck: Connect MiT-Tester: Open Deckte Relad Update Deckins Sector:10:1003 Connects Available Channels Available Channels Available Channels Mit Tester: Open Deckte Relad Update Sector:10:1013 Connects Mit Tester: Open Deckte Relad Update Sector:10:1013 Connects Content Version Sector:10113 Connects Available Channels Testing Tester: Teste: Tester: Tester: Tester: Tester: Teste: Tester: Tester:	← Overview 2	PAT-Testers > x8-1321		
sk-002 CÉ 10063 Epriminiti [2] Epriminiti [2] Consection Channels Tetal Channels Available Channels Tetal Channels Channels Tetal Channels Tetal Channels Channels Tetal Ch	 PAT-Testers [1] x8-1321 	← E E E Back Connect PAT-Tester Open Delete Reload Update		Ţ
Image: Contracted 1 0 0 Script[2] Connected 1 0 0 Image: Components Image: Components Image: Components Image: Components Image: Com	SN-0202 🗁 T0063 Experiments [2] Curve 2024-03-28-E23-EIS-LOOP-test	▼ Search_ ➤ Details Name Connection Channels Total Channels Available Channels Testing Temp ■ General		^
Components Type x8 Image: Second	 CE1-00-0297-A Scripts [20] Test Cells [12] 	x8-1321 Connected 1 0 0 IP Address 192.168.1.126		
Name x8-1321 Channels to tak1 Available: 0 Testing: 0 Technical Details Controller Version 2.12.2960 Hostname x8-1321 IP Address 192.168.1.265 CPU 2.% (28*C) RM 2.%	Components	Туре х8		
Name x8-1321 Channels Total 1 Available: 0 Testing: 0 Technical Details Controller Version 2.1.2.2960 Hustiname x8-1321 IP Address 192.168.1.225 CPU 2% (28°C) RAM 8%				
Name x8-1321 Channels Totak 1 Available: 0 Testing: 0 Technical Details Controller Version 2.12.2960 Hostname x8-1321 IP Address 192.168.1.126 CPU 2% (28 °C) RAM 8%				
Name x8-1321 Channels Total: 1 Available:0 Testing:0 Technical Details Controller Version 2.1.2.2960 Hostname x8-1321 IP Address 192.168.1.265 CPU 2% (28°C) RAM 8%				
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■ Technical Details Controller Version 2.12.2960 Hostname x8-1321 IP Address 192.168.1.126 CPU 2% (28 °C) RAM 8%		Channels Total: 1 Available: 0 Testing: 0		
Controller Version 2.1.2.2960 Hostname x8-1321 IP Address 192.168.1.265 CPU 2.% (28 °C) RAM 8.%		E Technical Dataire		
Hostname x8-1321 IP Address 192.168.1.26 CPU 2% (28*C) RAM 8%		Controller Version 2.1.2.2960		
CPU 2% (28 °C) CPU 2% (28 °C) RAM 8%		Hostname x8-1321		
RAM 8%		CPU 2 % (28 °C)		
Server Orici http://xxx-iszine-celliocalis/i/ii/		< RAM 8 % Server URL: http://x8-1321.el-cell	local:471	

Figure 18: Open PAT-Tester Administration Page from the Client



Figure 19: PAT-Tester Administration Page

8.2 Access the EL-Software Server Administration Page

Access via web browser:

Before Version 2.4:

http://[Server-IP]:4711 (Example: http://192.168.1.126:4711)

Since Version 2.4:

http**s**://[Server-IP]:**5**711 (Example: https://192.168.1.126:5711)

Access via EL-Software Client

To open the EL-Software Server Administration page, click the link in the footer.

I EL-Software Client 2.1.2.5805 - Server 2.1.2.11412	-		×
← Overview 🕄	PAT-Testers > x8-1321		
■ PAT-Testers[1] ■ x8 x8-1321 SN-0202 ČĎ T0063 ■ Experiments[2]	← Image: Connect PAT-Tester Connect PAT-Tester Back Connect PAT-Tester Open Delete Reload Update		÷
	T Search X Details		^
Image: Content of the second secon	Name Connection Channels Total Channels Available Channels Testing Temp General		
Scripts [20]	x8-1321 Connected 1 0 0 IIP Address 192.168.1.126		
Components	Type x8		
	the second se		
	Name x8-1321		
	Channels Total: 1 Available: 0 Testing: 0		
	Technical Details		
	Controller Version 2.12.2960		
	Hostname x8-1321		
	IP Address 192.168.1.126		
	CPU 2% (28°C)		
-	RAM 8%	1.4711	, i

Figure 20: Open EL-Software Server Administration Page

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Figure 21: EL-Software Server Administration Page