Keysight SR101EDUA Digital Learning Suite

A unified web-based digital learning suite

One Secured Access to All

With new EdTech being introduced almost every day and courses built towards career-focused learning and student-centric blended learning, educational institutes must rapidly transform to keep pace with this megatrend. However, this means that educators may be required to spend more resources on maintaining or managing these assets from different providers.

SR101EDUA offers a solution and a convenient way to make the switch to online learning and manage all engineering lab resources easily. It is a digital learning suite for both educators and students to access industry-relevant learning resources through a secure web interface. This unique digital learning suite transforms the learning experience by providing remote access and control to engineering lab resources as well as tools to visualize, compare, and analyze measurement data. It accelerates lab project completion time by up to 10x and increases up to 3x more lab resource utilization.



SR101EDUA is also able to enrich the learning experience with self-paced learning resources that can accelerate student development and help students explore adjacent fields for a holistic learning journey. Hands-on lab collaborative tools allow both educators and students to work together, learn, and build a lasting knowledge foundation. The digital learning experience starts here.



LTI Compliance



With a built-in Learning Tool Interoperability (LTI) feature, you can easily plug and play the whole SR101EDUA solution into your LMS. Ensuring educational technology tools are IMS Global certified is the best way to establish a plug-and-play ecosystem. Students can navigate seamlessly from the LMS to the Collaborative Learning Module without having to log in separately to different devices. Lecturers can also design the teaching curriculum to include remote lab capability.

Go to https://site.imsglobal.org/certifications/keysight-technologies/pathwave-lab-operations-for-remotelearning to find out more about Keysight PathWave Lab Operations for Remote Learning as an IMS Global certified LTI learning tool.

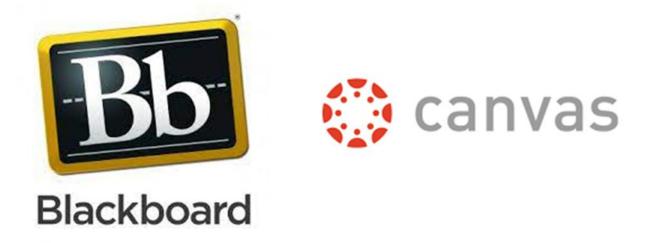


Figure 1. Top 2 LMS Providers in the Market

The Digital Learning Suite is certified with LTI compliance, allowing for seamless integration with the university LMS and providing easy access to a holistic end-to-end education journey from anywhere at any time via a secure SSO web interface. Visit https://site.imsglobal.org/certifications/keysight-technologies/keylab-digital-learning-platform to find out more.



Instrument Control

Control all your instruments from an integrated web interface powered by the Keysight PathWave Test Automation test sequencer.

| 🔠 Ке | eyLab Learning Platform | | | | | ? | \$ \$ | | | | |
|---------|-------------------------|----------------------------------------------------------|---------------|------------------------|-----------------|--------|----------|--|--|--|--|
| ഹ | Home | Instrument Web UI Access Instrument's UI via browser. | | | | | | | | | |
| D:: | Lab Management | | | | | | | | | | |
| | Instrument Web UI | Instrument Model List | | | | Search | | | | | |
| • | Schedule Sessions | Name | Serial Number | Description | IP Address | | | | | | |
| | | 1. Fieldfox | MY58311737 | Fieldfox | | | | | | | |
| | Session Management | 2. Oscilloscope | CN60201232 | Scope | 10.82.102.73 | | | | | | |
| [+ | New User Approval | 3. PNA | MY57252489 | N5245A PNA | 141.183.187.150 | | | | | | |
| Ⅲ | Active Sessions | 4. Power Meter | MY52490017 | N1914A Power Meter | 141.183.186.178 | | ₽ | | | | |
| | | 5. Oscilloscope | CN60201232 | EDUX1052G Oscilloscope | 10.82.102.73 | | | | | | |
| | Learning Resources | | MY60250436 | N9000B - CXA | 10.82.102.225 | | | | | | |
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Figure 2. Lab Instruments connected to SR101EDUA

SR101EDUA can connect to instruments linked to lab benches in the local network or directly connect to the instrument's soft front panel as shown below.

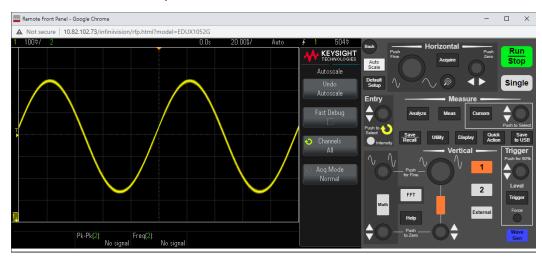


Figure 3. Oscilloscope Web UI

Educators can now take a screenshot, plot measurement data to XY plots, perform math functions to XY plots, and more. These graphical charting tools enable educators to engage with students to visualize, compare, analyze, and share test results.



Measurement, Plotting, Math Equation

| b3.png.is.keysight.com:8080/?tapUrl=10.66.71.195&tapPort=7000&proto | ol=http&token=aHR0cHM6Ly9zeC1lbGFiMy5wbmcua) | XMua2V5c2InaHQuY29tL2x0a | aT9pY3Rva2VuPWV5SjBiMnRsYn | hUNkltVjVTbWhpUjJO | :FQybEtVMVY2U 🖉 | 2 x x 🛛 |
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| | 505.0000 n 95.1523 m | 1 1 | DeltaX | | | |

Figure 4. Test Sequencer with Charting Tool

SR101EDUA improves the lab workflow by up to 10x faster compared to the traditional lab setting. It also gives educators up to 3x more asset utilization via a streamlined process, as all lab equipment can be seamlessly managed through SR101EDUA.



Figure 5. Calculate Delta Value from the Graph



Adding Non-Keysight Instrument with Python

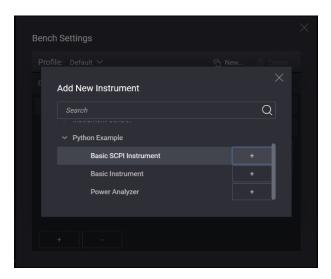


Figure 6. Add-in Non-Keysight Instrument with SCPI

One of SR101EDUA's key strengths is that it does not have instrument restrictions to connect. SR101EDUA supports non-Keysight instruments and achieves the same actions via SCPI commands. The built-in test sequencer allows for repetitive commands like taking multiple screenshots, plotting multiple data points, or performing math operations to be completed with just a touch of a button.

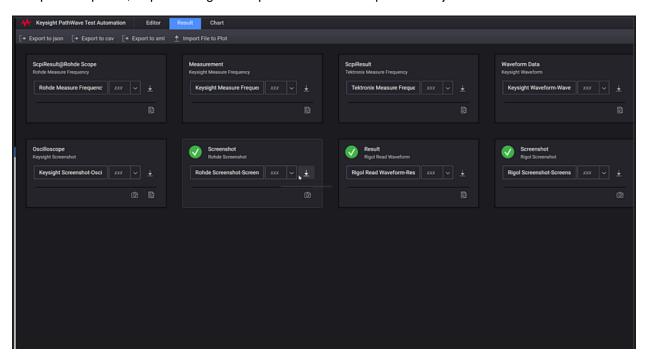


Figure 7. List of Different Brand Instruments Added into Bench



Lab Management

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| œ | Lab Management | Lab Bench | | | | | | | | | | | |
| | Instrument Web UI | 🚯 To ad | id a new bench, download A | gent Installer. | | | | | | Add New Bench Search | | | |
| • | Schedule Sessions | No. | Bench Name | Computer Name | Status | Access Level | | Group Assign | | | | | |
| | Session Management | | QA_W10L011 | kca11-dev-qa | Online | Admin Lecturer Student | | All Student, Testing | Group, Wireless | s Communication Group | | | |
| | account management | | QA_W10L012 | kca12-dev-qa | Online | Admin Lecturer Student | | All Student, Testing | Group, Wireless | s Communication Group | | | |
| [≁ | New User Approval | | QA_W10L013 | kca13-dev-qa | Online | Admin Lecturer Student | | All Student, Testing | Group, Wireless | s Communication Group | | | |
| Ⅲ | Active Sessions | | QA_W10L014 | kca14-dev-qa | Online | Admin Lecturer Student | | All Student, Testing | Group, Wireless | s Communication Group | | | |
| | | | QA_W10L015 | kca15-dev-qa | Online | Admin Lecturer Student | | All Student, Testing | Group, Wireless | s Communication Group | | | |
| | Learning Resources | Items p | perpage: 5 🗸 | | | | | | | 1 – 5 of 45 🛛 🔍 | | 1 | |
| | | Remote Age | ent | | | | | | Instrument Control Lab Files | | | | |
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| | | | kca11-dev-qa | | Online | QA_W10L011 | | | | | | | |
| | | | kca12-dev-qa | | Online | QA_W10L012 | | | | | | | |
| | | | kca13-dev-qa | | Online | QA_W10L013 | | | | | | | |
| | | | kca14-dev-qa | | Online | QA_W10L014 | | | | | | | |
| | | | kca15-dev-qa | | Online | QA_W10L015 | | | | | | | |
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Figure 8. Available Lab Benches to connect

SR101EDUA simplifies teaching in laboratories with multiple test benches. The Lab Management tab allows educators to have custom bench arrangements to configure lab layouts, number of benches, type and number of instruments, and to name of the benches accordingly to mimic the actual lab physical bench positions.

| 📴 Ko | eyLab Learning Platform | | | | | | | | | | ? © | 8 |
|------|-------------------------|---------|----------------------------------------------|--------------|--------------------------|------------|---------------------|--------------|---------|------------------|--------|-----|
| G | Home | | on Management all the scheduled sessions. | | | | | | | | | |
| œ | Lab Management | Schedul | ed Sessions | | | | | | | | | |
| | Instrument Web UI | Acti | ive Sessions 🗸 | | | | | | | Search | | Q |
| | Schedule Sessions | No. | Bench/Scenario Name | Bench Status | Access Level | Date | Time Slot | Scheduled By | Invited | Session Status | | |
| | | | QA_W10L001 🕕 | Online | Admin, Lecturer, Student | 2022-12-06 | 09:00 AM - 09:30 AM | me | | Pending Approval | 📀 Appr | ove |
| ā | Session Management | | QA_W10L002 () | Online | Admin, Lecturer, Student | 2022-12-06 | 08:30 AM - 09:00 AM | me | | Pending Approval | 📀 Appr | ove |
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| Ⅲ | Active Sessions | | | | | | | | | | | |
| | Learning Resources | | | | | | | | | | | |

Figure 9. Admin View of Active Sessions or Past Sessions



Teaching/Learning Resources

There are a lot of hidden operating costs when running a university like headcount, time, and program maintenance. It is not an easy task for the lead program to keep its program up-to-date and on par with Industry standards, especially when resources spent on developing effective programs are not negligible.

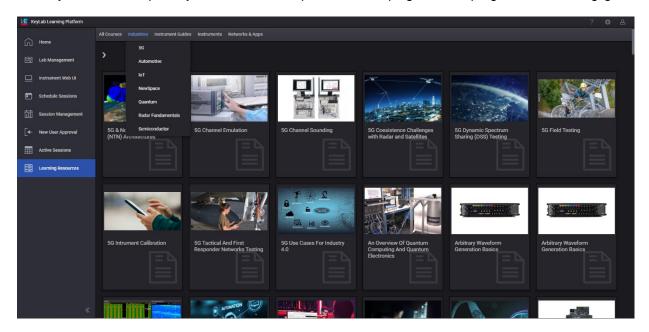


Figure 10. Learning Resources Page in SR101EDUA

With SR101EDUA, educators and students can now have access to thousands of on-demand industriesrelevant learning resources from Keysight technical experts. The Learning Resources tab offers a wide range of premium teaching resources across different industries like 5G, Quantum, IoT, etc. The rich library consists of content in various formats such as videos, application notes, and lab lessons, among others. As a one-stop digital learning suite that provides an end-to-end teaching journey to educators, SR101EDUA allows educators to save time when designing their syllabi through these resources.



Figure 11. Content in Video Format

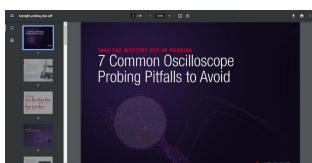


Figure 12. Content in Document Format



System Requirements

| Item | Recommended | Minimum | | | |
|-----------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------|--|--|--|
| RAM | 32 GB RAM or higher | 16 GB RAM or higher | | | |
| Hard Disk Space | 256 GB free disk space for the general operating system | 30 GB free disk space for the SR101EDUA installation directory | | | |
| Processor | 64-bit, Quad-core CPU | | | | |
| Operating System Requirements | Ubuntu Linux 20.04 LTS | | | | |
| Virtual Machine Hypervisor Supported | Oracle VM VirtualBox Manager (Windows 10) | | | | |
| Others | Requires Internet access | | | | |



Software Requirements

SR101EDUA deployment tool (contact your local Keysight representative)

NOTE You will need a Microsoft Windows 10 machine to run the SR101EDUA deployment tool. Use the Keysight SR101EDUA Install Wizard to install all required software.

| Software System requirements | |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required 3 rd party software for installation | Ubuntu ISO (https://releases.ubuntu.com/20.04.5/ubuntu-20.04.5-live-server- amd64.iso) FileZilla (https://filezilla-project.org/download.php?type=client) VirtualBox (https://www.virtualbox.org/) |
| Supported LTI compliant LMS platforms integration | Moodle v3.9 and above Blackboard Canvas For other LTI compliant LMS platforms, please contact Keysight Technologies for further information |
| Supported web browsers | Microsoft Edge v107.0.1418.62 and above Google Chrome v108.0.5359.94 and above Mozilla Firefox v107.0.1 and above |

Ordering Information

| Solution number | Description |
|-----------------|------------------------------------------------|
| PW9300EDU | SR101EDUA Hybrid Collaborative Learning Module |
| KS8400EDU | SR101EDUA Test Sequencing & Control Module |



SR101EDUA – License Types and Terms

| Model number | Description | |
|--------------|-------------|-------------------------------------------------------------------------------------------------|
| PW9300EDU | R-X4Y-002-L | Floating (single site) license, 12-months subscription-based with KeysightCare software support |
| | R-X4Y-002-X | Floating (single site) license, 24-months subscription-based with KeysightCare software support |
| | R-X4Y-002-Y | Floating (single site) license, 36-months subscription-based with KeysightCare software support |
| KS8400EDU | R-X4Y-002-L | Floating (single site) license, 12-months subscription-based with KeysightCare software support |
| | R-X4Y-002-X | Floating (single site) license, 24-months subscription-based with KeysightCare software support |
| | R-X4Y-002-Y | Floating (single site) license, 36-months subscription-based with KeysightCare software support |

Further Information

Please visit our solution page for more information https://www.keysight.com/sg/en

Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.



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