Product Datasheet - Technical Specifications

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PATHWAVE

PathWave Lab Operations for Remote Learning, PW9112EDU

Purpose-built, remote teaching and learning solution for real instrument access and control, anytime and anywhere

The Megatrend of Remote Learning

Online learning has been a part of many educational institutions since the spread of the Internet. Now, new norms such as social distancing and limits on face-to-face interaction is dramatically accelerating the shift from traditional in-building learning to virtual classes offered remotely on digital platforms. The availability of online courses opens the opportunities to international and distance learning students, and remote learning offers students the flexibility of learning anytime, anywhere. With these benefits, online learning is expanding exponentially, and educational institutes must rapidly transform to keep pace with this megatrend.

What's the definition of Remote Learning?

In simple terms, remote learning is the process of teaching and learning performed at a distance. The student and the educator, or information source, are not physically present in a traditional classroom environment.

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What Makes Remote Teaching and Learning Challenges?

If you would have asked most of the educators last year or even before about the terms "remote learning", you will probably receive perplexed or even pessimistic response. However, over the past few months, with the pandemic hit, the landscape of remote learning had changed in the blink of an eye. Most of the educators and students are dealing with new learning methods which has indeed important and have lasting impact.

Challenges for University

One of the unique course structures of an engineering program is the live, hands-on laboratory and design experience. People could start questioning, "How do accrediting organizations assess an online program to determine if the graduate has acquired knowledge and skills sufficient to begin professional practice at the entry level?". If students don't receive a similar quality or experience of learning as they would on-campus, they may be less competitive upon graduation.

Hence, of vital interest to engineering (and to any practice-oriented profession), it is important for the universities to ensure that shifting to online teaching and remote learning does not scarifies the education quality and align to accreditation requirements.

So, if the educational institution doesn't include remote learning, relatively they may not be competitive in the student enrollment. In broader view, the enrollment and student employability after graduation can impact university ranking.

Challenges for the educators/lecturers/lab managers

Ideally, we hope to achieve the goal whereby both the educator and student could have the most effective remote learning attempts which is mirror to the classroom environment as much as possible virtually, when the student and educator are in two different places. However, the fact is that, traditional lesson plans do not always translate digitally.

Making the jump online presents many challenges to educators, especially if you are responsible for engineering courses whose lab sessions hinges on hands-on measurement and testing. Not only does converting your conventional teaching lab to remote learning require time, this had eventually taken up substantial efforts of the educator on the preparation of learning materials and potentially requires a new system to allow remote instrument control and scheduling, you must also ensure that your students receive quality learning similar to the in-person experience they would receive in an on-site lab.

Keysight's Industry-ready Remote Access Lab Solution

The Keysight's industry-ready remote access lab solution offers you a convenient way to make the switch to online learning. This end-to-end solution is designed for complete remote setup of your basic instrument lab and covers your needs from web-based lab management and scheduling administration to instrument control and remote access for measurement and analysis. And since your students continue working with industry-grade test and measurement instruments and software, they will gain the similar practical skills and application knowledge as industry engineers conducting their work in the lab today.

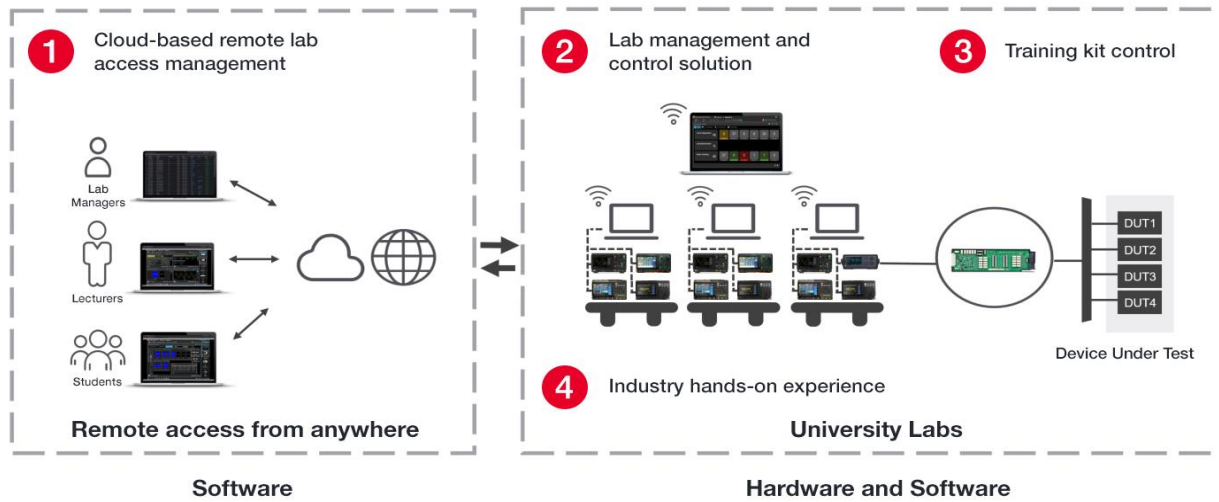## End-to-end Remote Instrument Lab Solution Overview

Figure 1. Keysight Industry-ready Remote Access Lab Solution

1. Secured Cloud-based remote lab scheduling and session booking

2. Centralized lab configuration, and multi-bench lab setup and control

3. Remotely switch between different training kits or measurement points during a lab session

4. Access industry-graded instruments

PathWave Lab Operations for Remote Learning (PW9112EDU)

PathWave Lab Operations for Remote Learning is a cloud-based remote access application software. Key benefits include:

1. **Easily and seamlessly migrate engineering labs online faster**
   The end-to-end solution offers all the elements needed to transform traditional classroom teaching and hands-on labs to a remote environment

2. **Equip students for success in the industry**
   Connect to industry-grade test and measurement instruments and utilize the same software and technology they'll use in their careers

3. **Interact with their students and facilitate group collaboration in real-time to accomplish smart teaching and learning**
   Multi-user access so students, educators and lab administrators can access the lab at any time, from anywhere

4. **Streamline and simplify lab management, saving lab administrators and educators time and freeing them to focus on teaching**
   Centralized control for educators to seamlessly connect to, manage, monitor and troubleshoot all the instruments within a lab

Key Features

1. **Cloud based remote lab access and management**
   By specifying and setup the configured URL to your university or institution, you are able to access and launch the PathWave Lab Operations for Remote Learning Application software through web browser anytime and anywhere in a secured environment. The software comes with standard 10 benches setup which allows up to 50 concurrent users access. Additional licenses can be purchased to enable more benches setup and access.
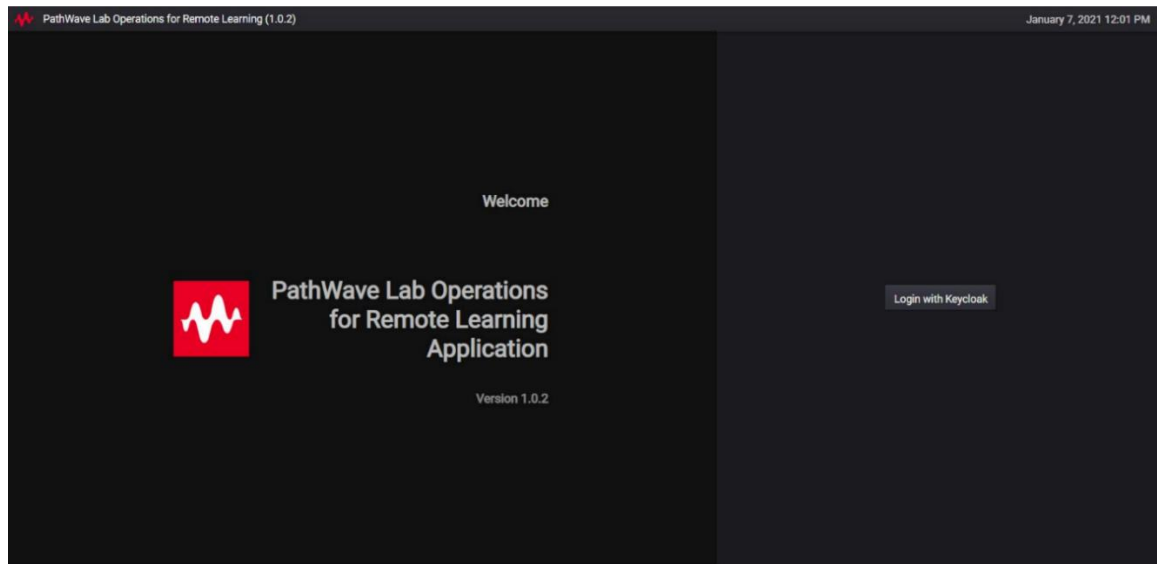

Figure 2. PathWave Lab Operations for Remote Learning Application

Figure 3. Registration and login

Schedule and Manage Remote Lab Session

The built-in remote lab features allow multiple students, lecturers and lab admins to schedule lab sessions simultaneously, anytime and anywhere.

Set the date and month of your lab session. Click the Calendar icon to show the dates of each month

List of benches available for the remote lab session

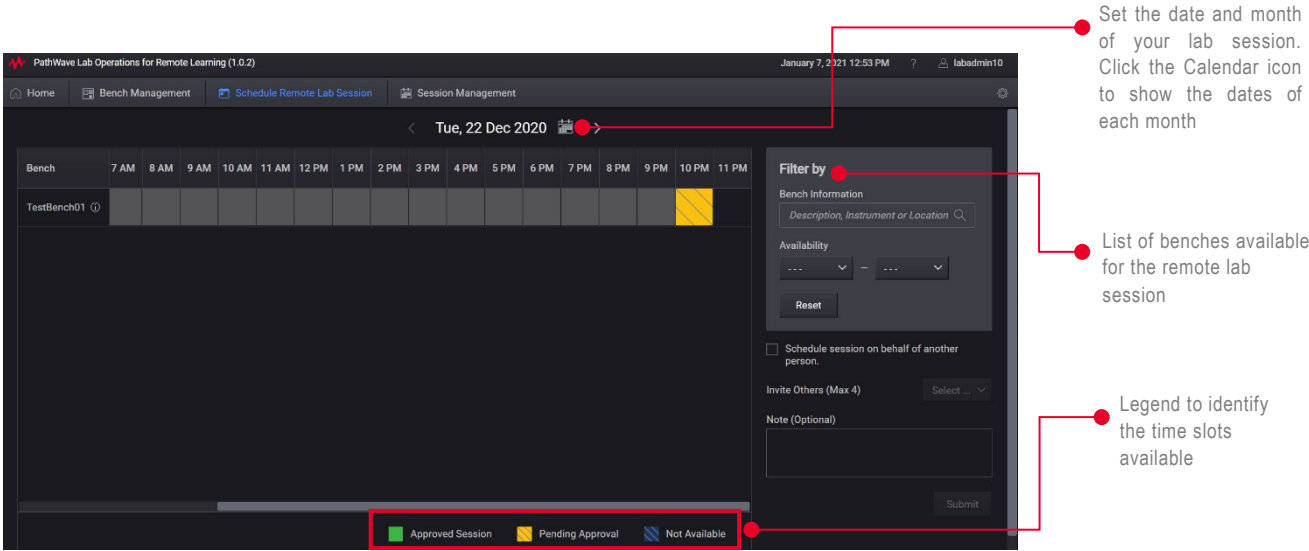Legend to identify the time slots available

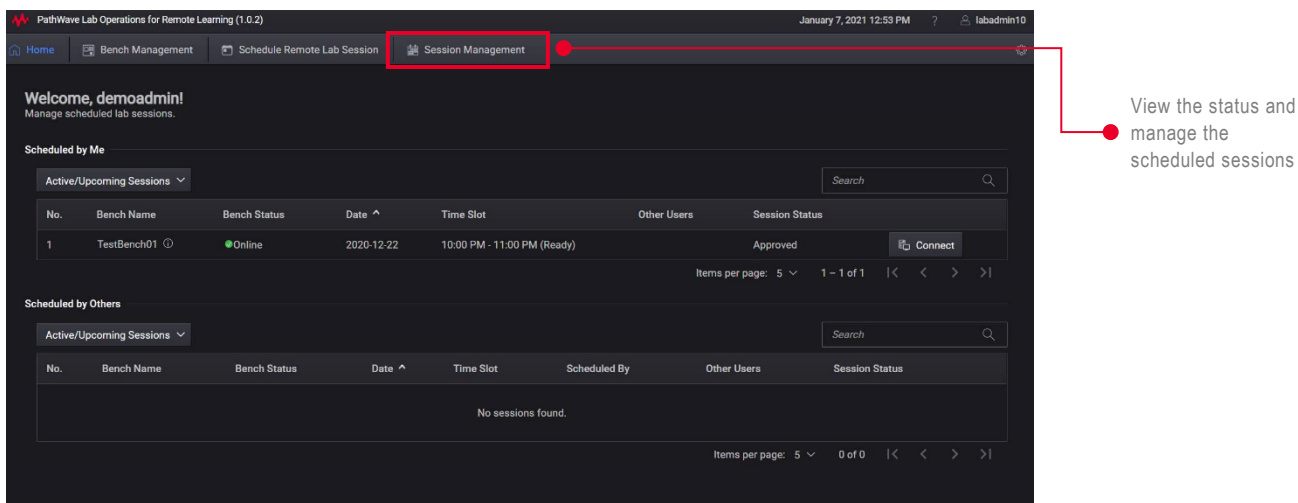Figure 4. Students with Student Access are able to book lab sessions at their preferred time.

Figure 5. Lecturer or Lab Admin with Administrator Access can view to approve or reject the class and managed scheduled lab sessions.

2. Intuitive to use interaction tool for smart teaching and learning

PW9112EDU provides you a few other controls that you can access during the Remote Lab Session, which are the chat and file transfer functions.

These functions enabled lecturer to interact with their students and facilitate group collaboration in real-time, "keeping students engaged digitally" and "student participation" besides the accessibility of education technology or tools during remote learning process.
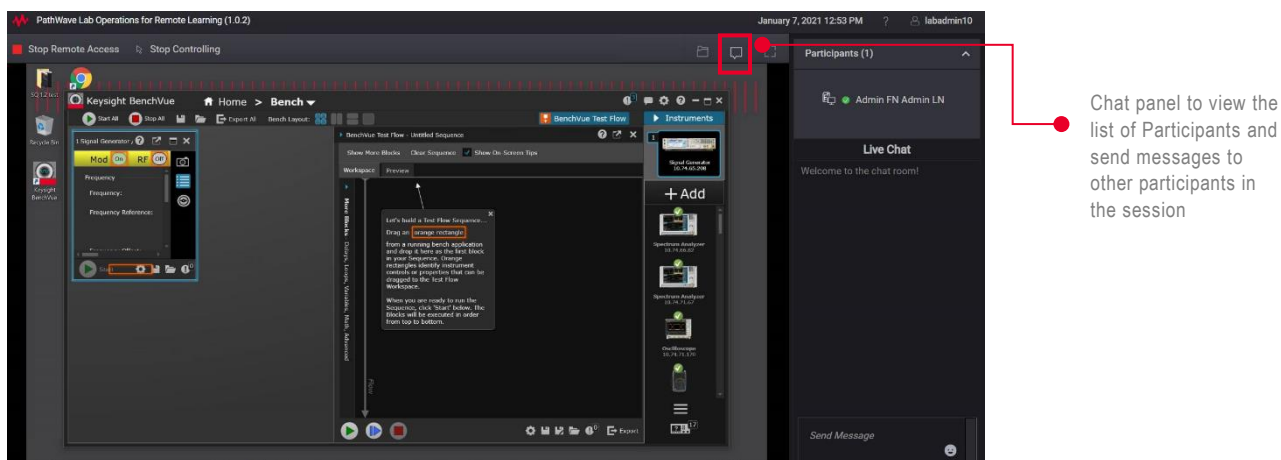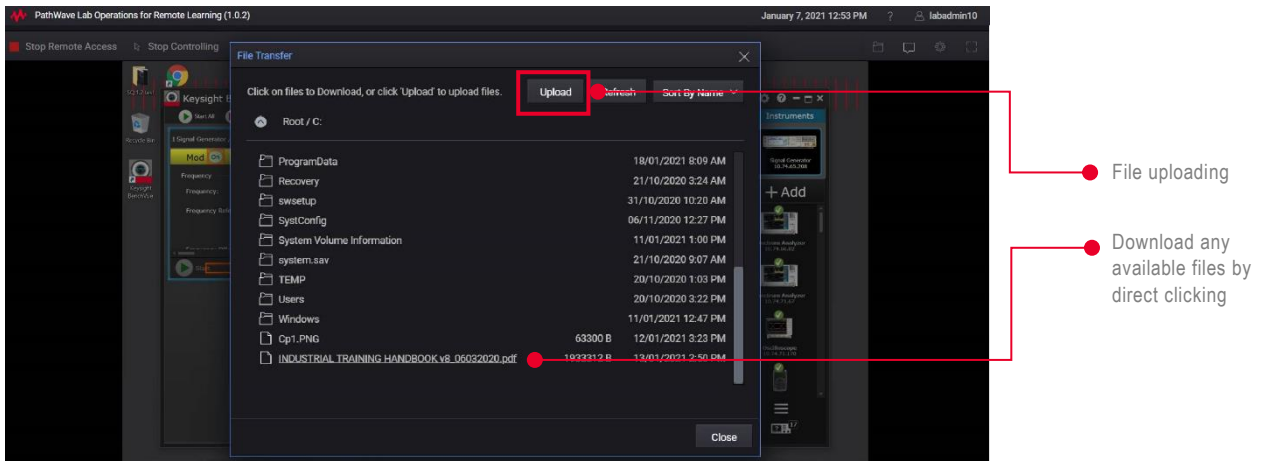

Figure 6. Chat room

Figure 7. File transfer

3. Remote desktop control, configure and measure

To effectively let the students gained the same learning experience remotely vs physical on-site lab experience, PW9112EDU provides remote desktop control, configure and measure function.

When student login to PathWave Lab Operations for Remote Learning Application software, they are able to remotely access the lab bench PC. They are able to view the lists of the instruments available to this bench, connect to the bench and begins the remote lab session control.
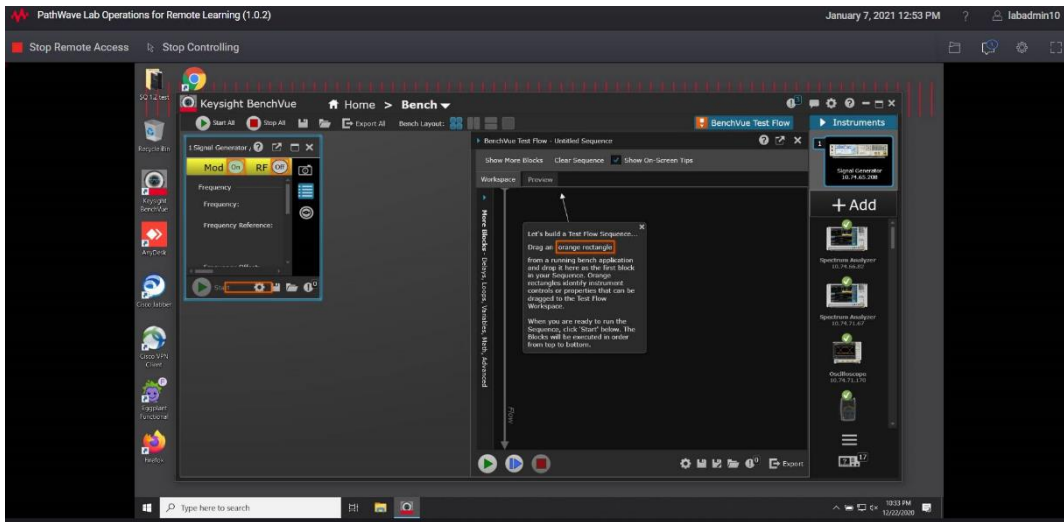

Figure 8. Bench setup and control

Maximum 5 students accessing the same lab bench for interaction while control is limited to 1 user at a time.

The lab session provides student to access instruments and connected to the target DUT for actual test and measurement. After the lab session, students can save their lab measurement results for submission, the Remote Lab access will manage the next lab session.

Manage Remote Benches

The Bench Management tab allows lecturer and lab admin which has the administrator's role to view a list of test benches which can be sort according to their names, status or access levels.

For each of the test bench, administrator have the option to Edit or Remove it from the table. The Connect button will only appear when the specific test bench is Online.
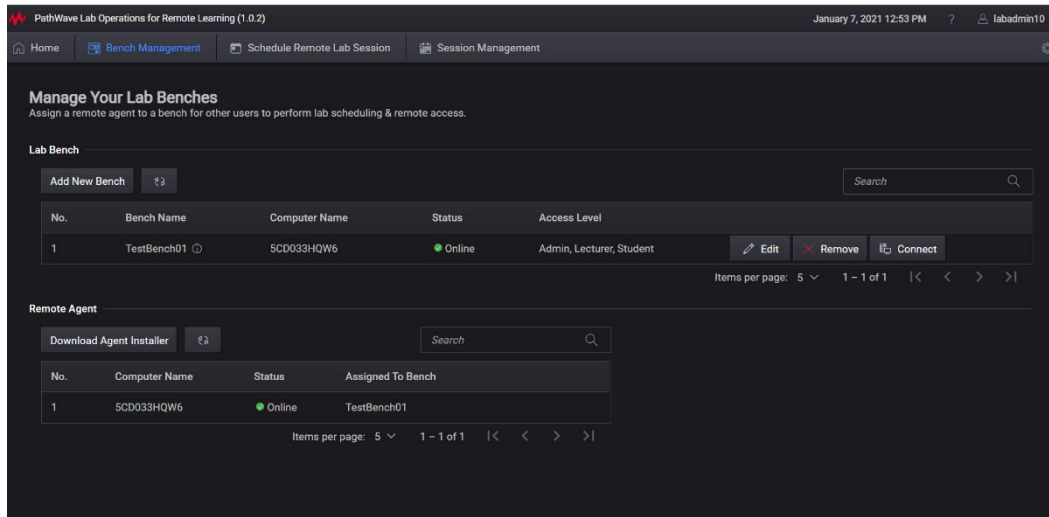

Figure 9. Manage remote benches

PathWave Lab Operations for Remote Learning at A Glance

What It Offers:		
For Educators	To manage student lab access, maintain lab benches systematically and monitor multiple remote lab sessions	
For Students	To remotely access lab setup and perform collaborative lab work through a web browser	

System Installation

Students: Need no installation

University: Agent file installation for remote bench setup

System Specification and Requirements

The following are the minimum requirements for a PC to be used with the PW9112EDU solution.

Operating system	Windows 10 Enterprise with Internet access
CPU	Intel Core i3 or better, minimum 2 GHz.
Internet speed	Standard-definition video streaming: 4 Mbps minimum
Supported web browsers	Google Chrome and Firefox

Ordering Guide and Information

Model number	Description
PW9112EDU	PathWave Lab Operations for Remote Learning

PW9112EDU – License Types and Terms

Software subscription license	
R-X4Y-002-L	12 months, floating (single site) subscription license

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