

# Remote Labs – Electrical Engineering Experiments

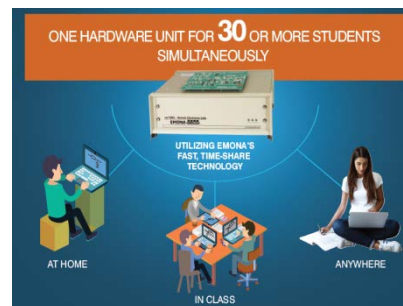
In the next 8 slides you will learn:

What are “Remote Engineering Labs”?

How do they work?

and

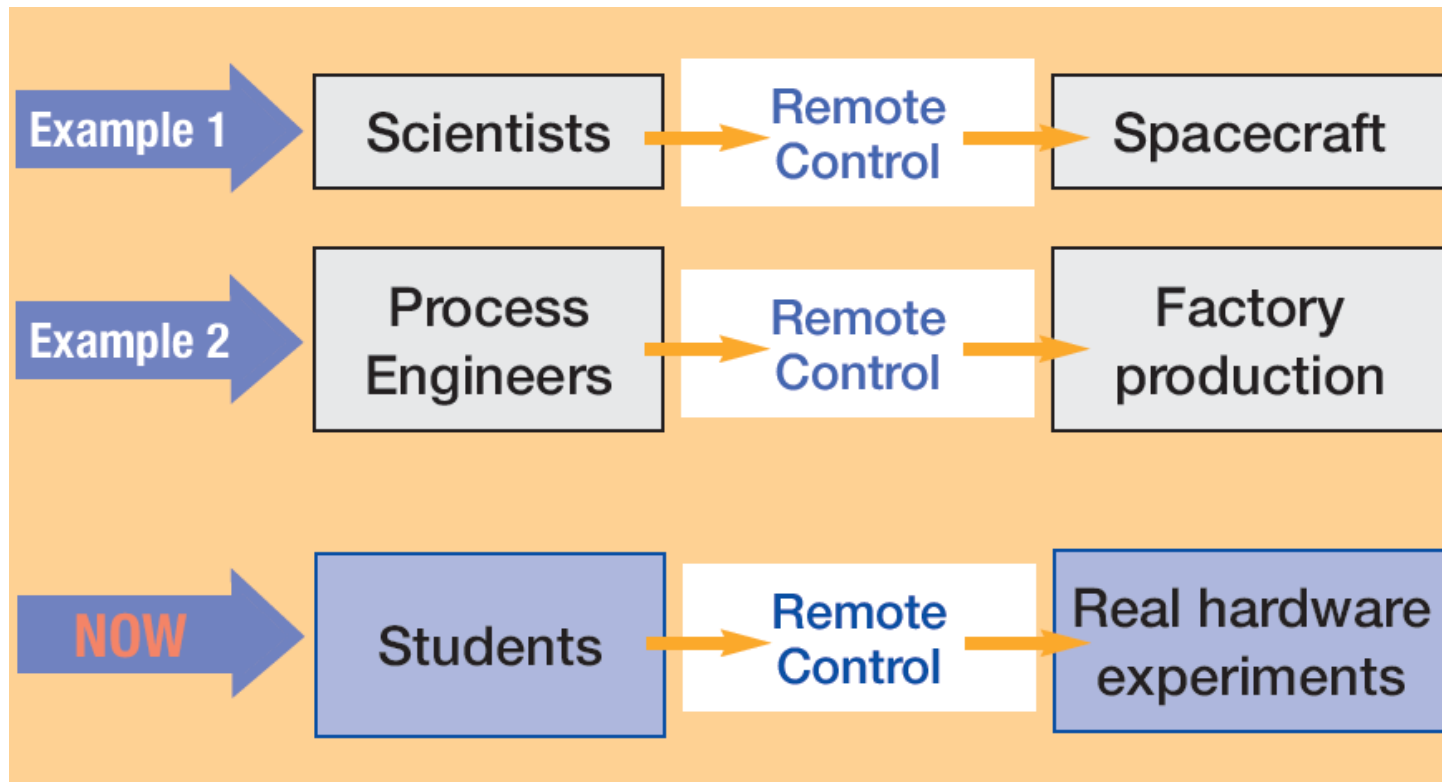
You can try them out for yourself.



**NEXT >**

# With Remote Labs, students control real hardware...

in the same way as scientists and engineers control spacecraft and factory processes



# Remote Labs provide a third alternative and enhancement to traditional hardware experiments and simulation experiments

## TRADITIONAL

practical experience with real parts, real signals in realtime

*Hands-on hardware experiments*

*Simulation software*

## CONVENIENT

on-screen experience with ideal parts, ideal waveforms, a valuable design tool

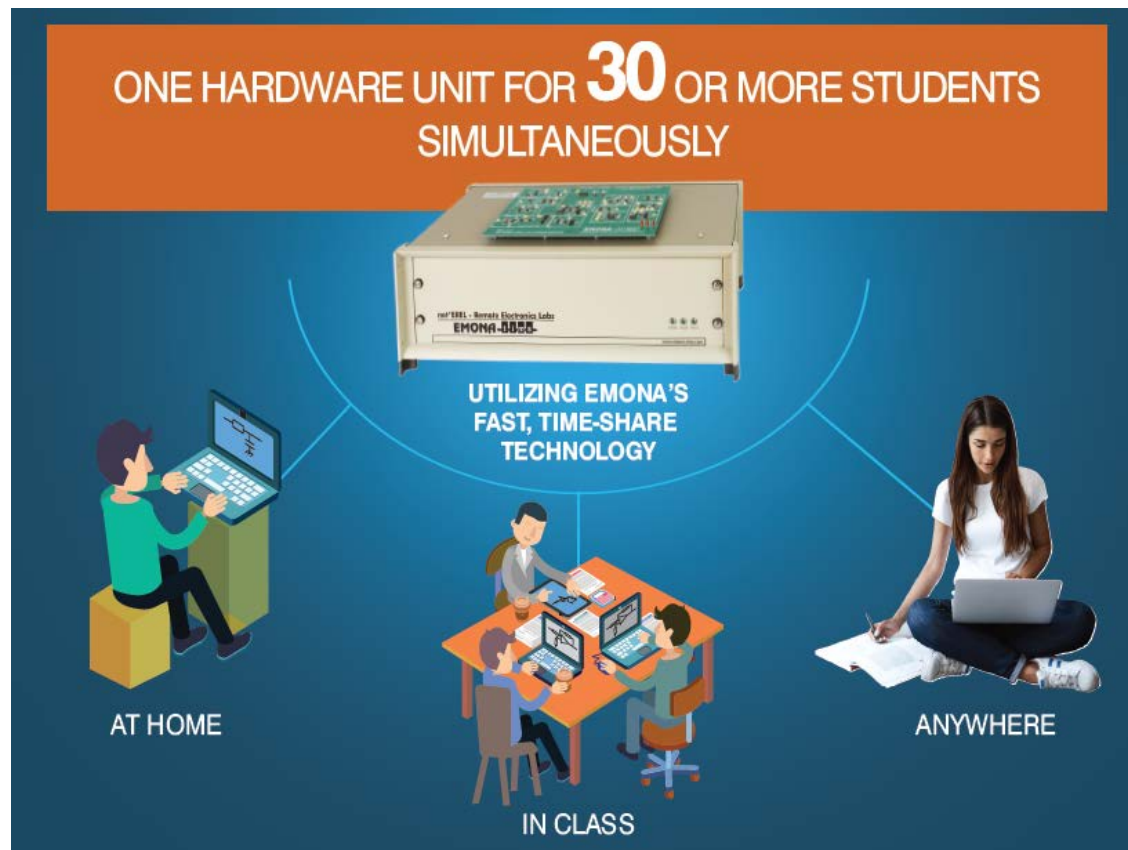
*Remote controlled experiments*

## netCIRCUITlabs - A NEW LAB RESOURCE

- ◆ 24/7 hands-on experiments
- ◆ 30+ users AT THE SAME TIME
- ◆ Simple INTERNET BROWSER access and control
- ◆ Analog & digital electronic circuits

# Remote Labs offer

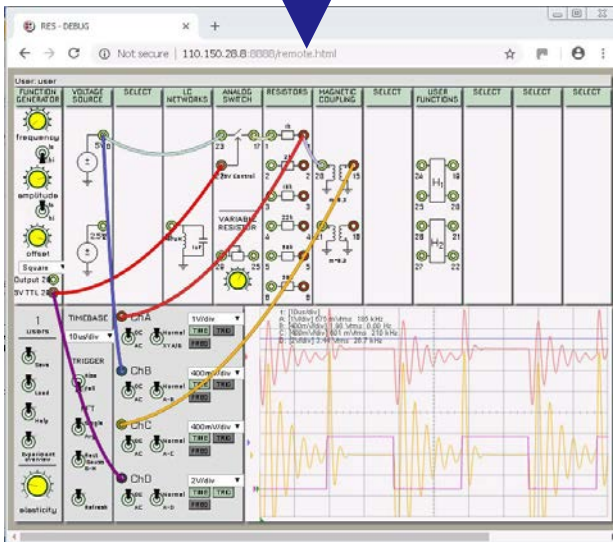
- Lab programs for multiple classes, with one piece of hardware
- Providing hands-on hardware experiments
- 24/7 access to experiments for up to 70 students AT A TIME



# Remote Lab Attributes



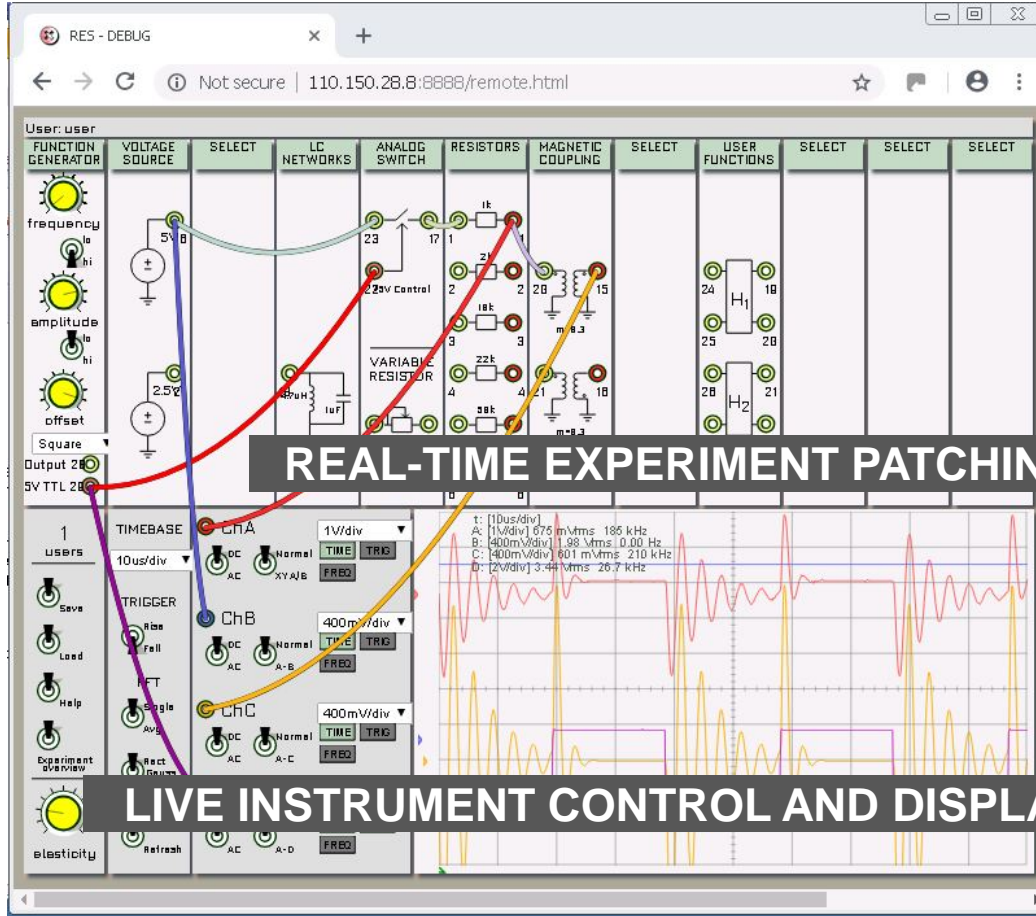
INTERNET



- 1 – DIRECT EXTENSION OF THE PHYSICAL LAB
- 2 – FAST RESPONSE
- 3 – REAL “non-ideal” PARTS
- 4 – MULTIPLE EXPERIMENTS: all students can do the same OR different experiments, AT THE SAME TIME

*Student transition from a traditional lab to a remote lab is seamless*

# Student experiment access via web browser



netCIRCUITlabs includes a webcam so students can see the hardware



# Two EMONA TIMS – Remote Lab Experiment Platforms

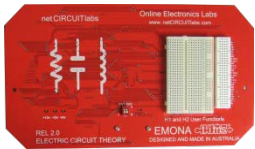
## 1. ELECTRONICS CIRCUITS EXPERIMENTS:

### netCIRCUITlabs Control Unit:

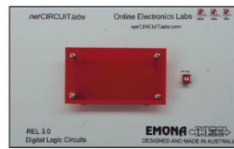


The **experiment board** plugged-in, contains a number of experiments.

### netCIRCUITlabs Experiment Boards:



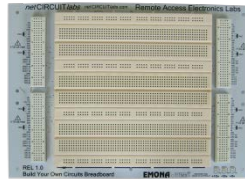
**CIRCUIT THEORY**



**DIGITAL LOGIC**

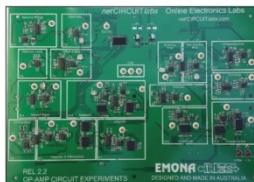


**TRANSISTORS**



**CUSTOM CIRCUITS**

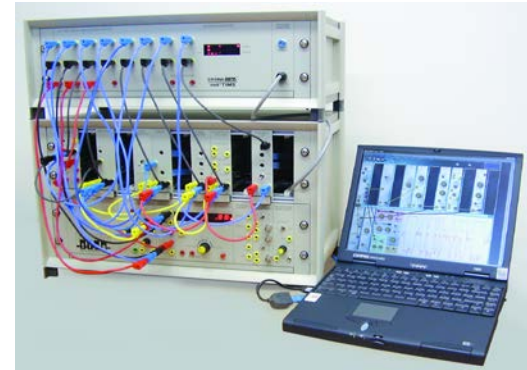
Professor built, analog or digital custom circuits for students to control remotely.



**OP-AMPS**

## 2. TELECOMS EXPERIMENTS:

### netTIMS-System:



net\*TIMS for ADVANCED Telecoms and signals & Systems experiments.

### netTIMS-FreeWire:



netTIMS-FreeWire for FUNDAMENTAL Telecoms experiments.

## Recapping - the Benefit for Institutions:

- **With one piece of equipment**

**30 students at one time carrying out multiple experiments.**

- **24 x 7, 365 days**

**Extreme flexibility for students, teachers and course schedules.**

- **Savings**

**Save cost, save storage space, increase lab time.**

# TEST DRIVE REMOTE LABS TODAY

Go to [www.emona-tims.com](http://www.emona-tims.com) and click on "IoT BASED HARDWARE LABS"

The screenshot shows the Emona Tims website interface. At the top, the browser address bar displays 'emona-tims.com'. The website header includes the Emona Tims logo (Wireless Signals Lab Equipment) and navigation links: HOME, ABOUT TIMS, BLOG, CONTACT US, and FAQ. A 'LOGIN / REGISTER' button is visible for Professors, Customers, and Distributors. A main navigation bar contains: PRODUCTS & SOLUTIONS, CURRICULUM, EXPERIMENTS LIST, SAMPLE MANUALS, WATCH VIDEO, and NEW FROM TIMS. A dropdown menu is open under 'EXPERIMENTS LIST', showing options: NET CIRCUIT LABS – ANALOG & DIGITAL ELECTRONICS, TELECOMS ONLINE LABS – NET\*TIMS, and NETTIMS FREEWIRE. The 'IOT BASED HARDWARE LABS' option is highlighted with a red arrow. Below the navigation, a banner features the text 'SER Hardware labs' and 'Telecoms and Electronics'. It displays two pieces of equipment: a smaller unit with a circuit board on top and a larger unit labeled 'TIMS-FreeWire 100A-8825'. A callout box states: 'One piece of equipment for 30+ students simultaneously!'. At the bottom of the banner, there is a section for a 'Quick 2 minute TIMS Video' with a 'WATCH VIDEO' button and a link to 'Download brochure & watch this short 2 minute video Now!'. The URL at the bottom of the page is 'https://www.emona-tims.com/emona-product/emona-online-labs/distance-learning-labs/'.