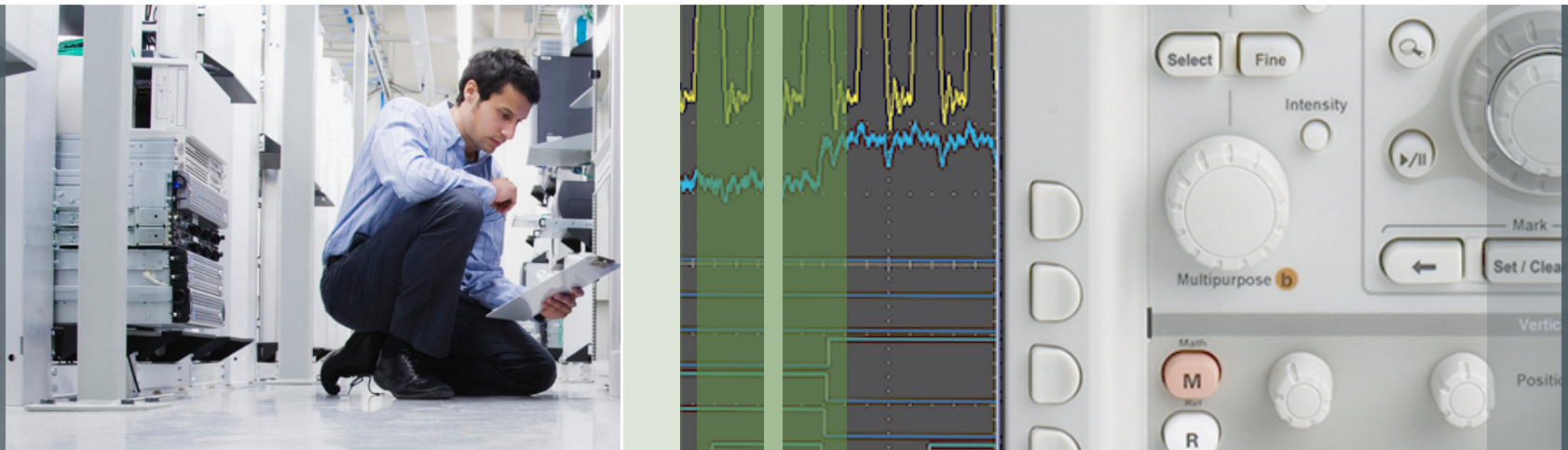


TekSmartLab™ Customer Presentation

Network-based Instrument Management Solution for Increased Lab Efficiency



Agenda

- New Requests from Teaching Labs
- TekSmartLab Introduction
- TekSmartLab Site Introduction
- Pricing/ordering Information
- FAQs
- Summary

New Requests from Teaching Labs

Better Teaching

- Presetting the instruments
- Disabling oscilloscope auto-set
- Assisting students

Better Managing

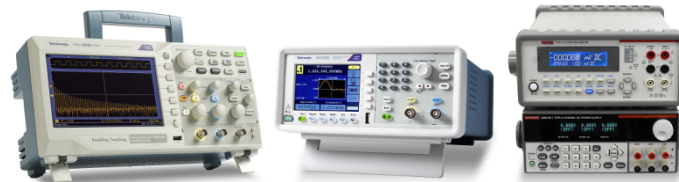
- Recording instrument asset information
- Utilizing statistics

Better Learning

- Saving test results
- Access to test results in the future



- Typical teaching lab has 20 to 40 benches with four instruments on each bench
 - Oscilloscope
 - Arbitrary function generator
 - Digital multimeter (DMM)
 - Power Supply
- Challenged to meet new requests for better teaching, learning, and managing



First Network-based Instrument Management Solution for a More Efficient Teaching Lab

- TBX3000A (Hardware)
 - Reuses oscilloscope platform
 - Supports six instruments via USB
 - LAN standard and WiFi with USB-WiFi dongle
- TSL3000B (Software)
 - Supports 100 benches and 400 instruments
 - Applications for professors and students
- Instruments supported
 - TBS1000B ,TBS1000B-EDU, TDS2000C, DPO/MSO2000B , MDO3000, TBS1000, *TDS1000B, TDS1000C-SC, TDS1000C-EDU, DPO/MSO2000**
 - AFG1022, AFG2021, AFG3000C, *AFG3KB, AFG3K**
 - DMM2110, DMM2100
 - 2220, 2230, 2231A



* For instruments discontinued

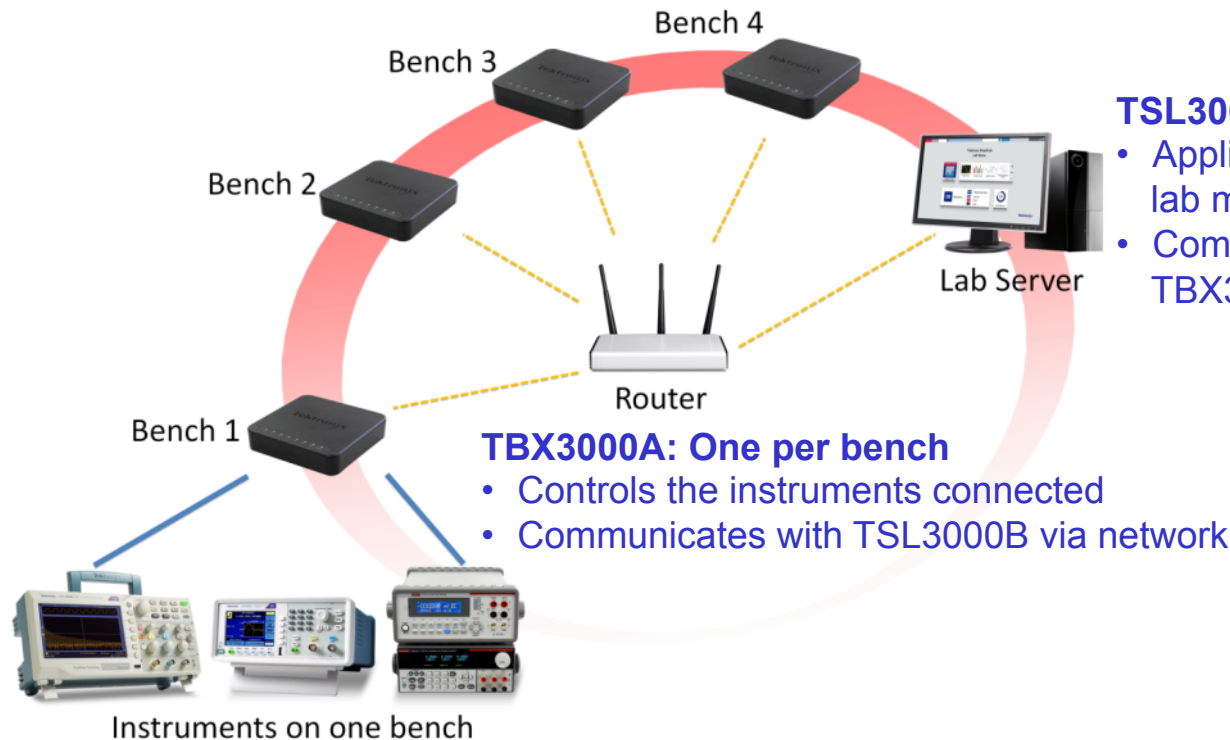
Easy to Setup/Upgrade with Industrial Reliability

Easy to set up and upgrade

- No need to lay LAN cables
- No instrument configuration required
- Supports instruments discontinued within the last five years

Industrial reliability assured by TBX3000A

- Reuses oscilloscope platform
- Firmware is optimized to work seamlessly with Tek/Keithley instruments



TSL3000B: One per lab

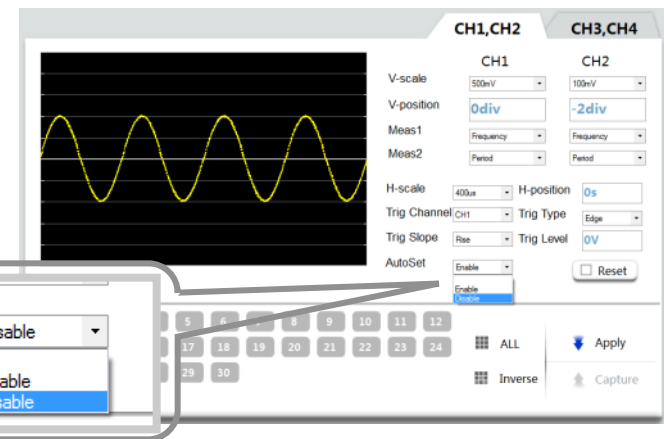
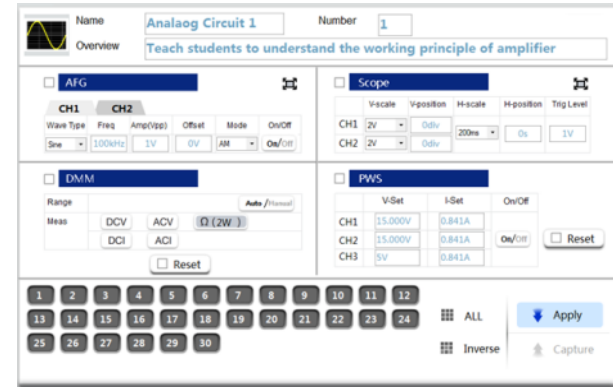
- Applications for instructor, lab manager, and students
- Communicates with TBX3000A via network

TBX3000A: One per bench

- Controls the instruments connected
- Communicates with TSL3000B via network

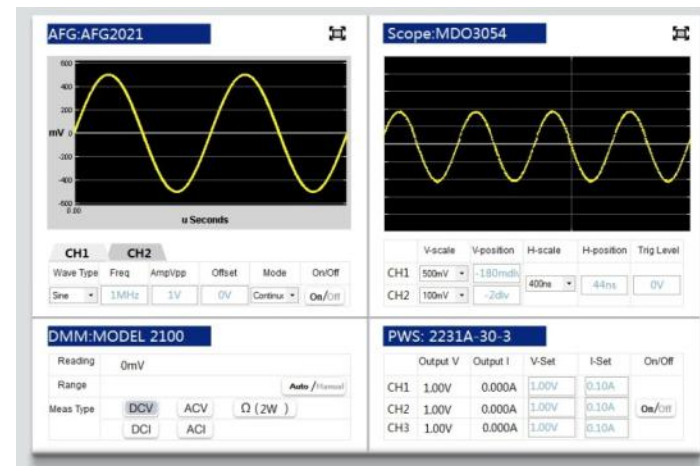
Centralized Configuration

- Load configurations based on different courses and then distribute them to large fleets of instruments with only one click
- Disable the oscilloscope autoset function to encourage students to adjust the correct waveforms themselves
- Update TBS1000B-EDU courseware contents and firmware



Centralized Monitor and Remote Assistance

- Each icon represents one bench equipped with four instruments
- Green means “working,” gray means “no connection,” and red means “error”
- Click on bench icon to check / assist a specific bench



Online Retrieving and Saving Test Results

■ Web Page

- TSL3000B creates a webpage for each bench in local network.
- The webpage can be accessed by bench-specific webpage address
 - Example of Bench 1 webpage address:

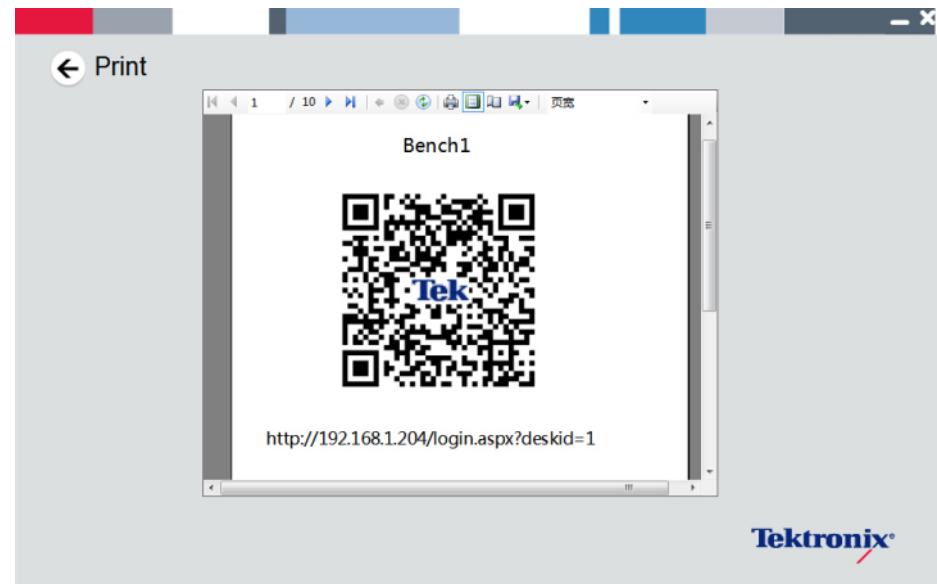
<http://192.168.1.204/login.aspx?deskid=1>

Lab server IP

bench 1

■ QR (Quick Response) Code

- Web page address is changed to QR code by TSL3000B automatically
- Instructor can adhere QR code (with web page address information) to corresponding bench permanently

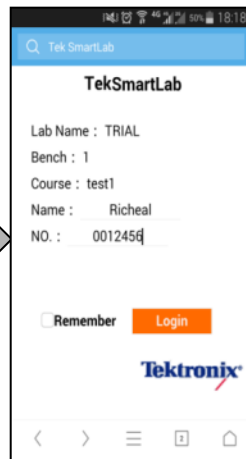
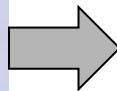


Online Retrieving and Saving Test Results

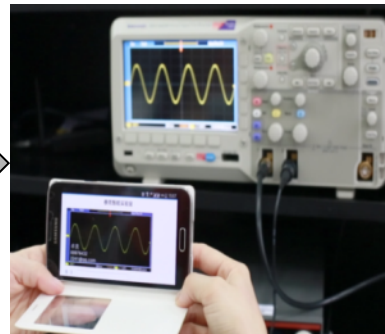
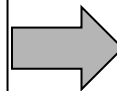
- Login to retrieve the test result
 - Scan QR code via smart device or input webpage address to login to web page and retrieve/save the test results wirelessly



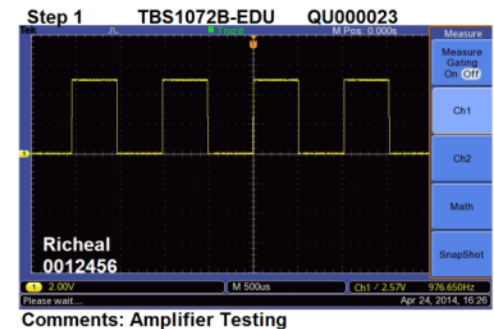
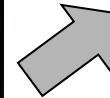
Scan QR code



Bench-specific Webpage



Retrieve Test Result



Save test result to smart device

Automatically Records Instrument Asset Information

- Instrument model number, serial number, and location are recorded automatically
- Instrument utilization time within a certain time interval can be filtered out

Asset Info.

Start: 2015-01-28 11:04 Stop: 2015-01-29 11:04

Bench No. Instrument

Start	Stop	Bench	Instrument	SN	Utility Time
1/29/2015 11:03 AM	1/29/2015 11:04 AM	1	AFG3021B	C036017	0h 1m
1/29/2015 11:03 AM	1/29/2015 11:04 AM	1	MSO2022B	C020109	0h 1m
1/29/2015 11:03 AM	1/29/2015 11:04 AM	1	MODEL 2100	1	0h 1m
1/29/2015 11:03 AM	1/29/2015 11:04 AM	1	2231A-30-3	802196010697020007	0h 1m

Print

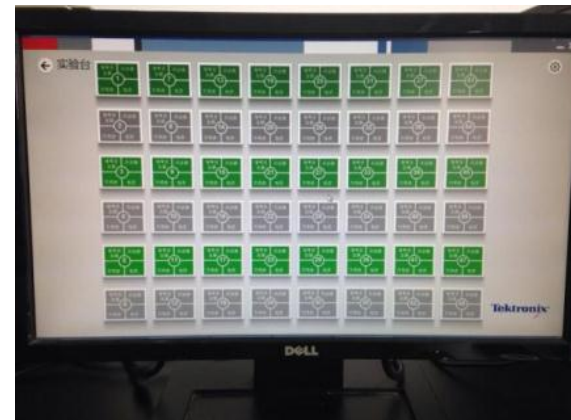
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A More Efficient Lab Experience vs. Conventional Labs

	Conventional Teaching Lab	TekSmartLab
Instructors	<p>Paper; walk; routing jobs</p> <ul style="list-style-type: none">• Works 30 minutes to preset 60 instruments, difficult to disable Autoset	<p>Efficiency</p> <ul style="list-style-type: none">• One click to configure hundreds of instruments instantly, centralized monitoring disable Autoset remotely
Students	<p>Hand drawing; thumb drive</p> <ul style="list-style-type: none">• Use mobile to take picture of test result, bad quality and easy to be copied	<p>Innovation</p> <ul style="list-style-type: none">• Use mobile to scan QR code to retrieve, save, and archive the test results
Lab Managers	<p>Physically time consuming</p> <p>Instruments utilization rate is estimated by experience</p>	<p>Productivity</p> <ul style="list-style-type: none">• Automation, accuracy, instruments' utilization time is recorded every 30 seconds

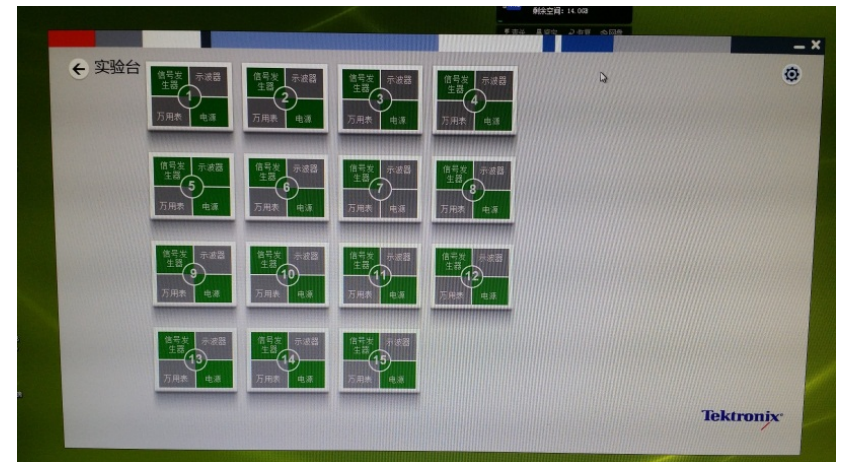
TekSmartLab Site Introduction - EE lab (SJTU, China)

- Background
 - 24 benches/ 96 instruments are connected to TekSmartLab network
 - Plan to upgrade the lab with another 24 benches cause he can manage a lab with more benches with TekSmartLab
 - Site setup in Jun '14
- Benefit: Efficiency
 - Prior to TekSmartLab, professor had spent more than 30 minutes configuring all instruments, but now it can be done with just one click
 - Professor can archive all test results on the lab server for future access



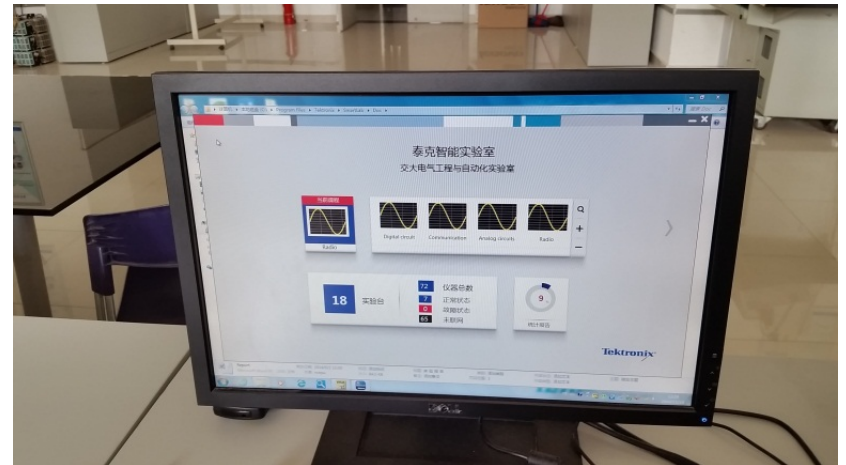
TekSmartLab Site Introduction - Internet of Things Lab (DLMU, China)

- Background
 - 15 benches / total 45 instruments are connected to TekSmartLab
 - Site setup in Aug '14
- Benefit: Innovation
 - Network-based architecture meets instructor expectation for the future lab



TekSmartLab Site Introduction - EE and Automation Lab (SJTU, China)

- Background
 - Professor purchased 18 TDS1000-EDU oscilloscopes three years prior
 - Lab upgraded to TekSmartLab in Nov '14
- Benefit: Easy to upgrade
 - Easy to upgrade w/o laying LAN cables or purchasing new instruments
 - Centralized monitoring



Pricing / Ordering Information

P.N.	US MSRP
TBX3000A (Hardware)	\$199
TSL3000B (Software)	\$6,000

Sample setup of a TekSmartLab System with 20 benches and 80 instruments via WI-FI

Item	Qty	Supplier	Comments
TSL3000B	1	Tektronix	1 per lab
TBX3000A	20		1 per bench
Instruments	80		Tek/Kei instruments: 1 Oscilloscope + 1 Arbitrary Function Generator + 1 Digital Multimeter + 1 Power Supply on each bench
USB WiFi dongle	20	Provided by customer	Compatible USB-WiFi dongle, like Netgear WNA1000M (\$20 on amazon.com)
WiFi router	1		Cisco RV180W (\$200 on amazon.com) or other WiFi Router that can meet WI-FI network requirement (refer to datasheet)
Lab server	1		Win 7 Pro, CPU 2.3 dual core, DDR3 4GB, 200G hard disk etc. (refer to datasheet)

Frequently Asked Questions

- How many instruments/benches can be supported by TekSmartLab?
Up to 100 benches/400 instruments are supported. Contact Tektronix if more are required.
- Which instruments are supported by TekSmartLab?
Most Tektronix/Keithley teaching lab instruments are supported, even those discontinued within the last five years.
- Can TekSmartLab support instruments from other vendors?
Not at the moment. Products from other vendors are not at the same level of stability; additionally, Tektronix would need their source code to integrate their products.
- Can other information, such as arbitrary function generator parameters, be added in the test result?
Yes. Other information will be added in the future via free software upgrading.
- Can the software running on the lab server be monitored remotely when the instructor is not in the lab?
Yes. The lab server can connect to the TekSmartLab network via WiFi and the department network via LAN. So, the instructor can access the lab server remotely to monitor and control the instruments when outside the lab.
- Can there be more than one oscilloscope on each bench to connect to the TBX3000A?
No. Only one unit of one type of instrument is supported on each bench.

Frequently Asked Questions

- Which USB-WiFi dongles are supported by the TBX3000A?
Netgear WNA1000M, Netgear WNA3100M, and TP-LINK TL-WN823N.
- Which WiFi routers are supported?
Any off-the-shelf WiFi router that meets the WiFi networking requirement is supported.
- Why does the TBX3000A have six USB ports while it can only support up to four instruments?
The other USB ports are expected to support other instrument types in the future.
- Can TekSmartLab be setup in the existing network, like department network?
Yes, but using a dedicated router is recommended.
- When setup via WiFi, will TekSmartLab interfere with the existing network, like the department network?
Interference can be minimized. The TekSmartLab network is setup within the lab, so its interference with the existing network is limited. Also, try to use different Wi-Fi channels and adjust the antennas of router to minimize interference to existing network.
- What can be done if there are requests that TekSmartLab cannot meet?
Please contact Tektronix so new features can be considered to meet the requests.

Summary

- Network brings a more efficient lab experience
- Easy to setup and upgrade
- Centralized configuration and monitoring up to 400 instruments
- Online retrieving and saving of test results
- Consider TekSmartLab for your next lab

For more information, please visit www.tektronix.com/teksmartlab



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