

TekSmartLab[™] TBX3000A, TSL3000B Datasheet



TekSmartLab is the industry's first network-based instrument management solution for teaching labs that brings a more efficient lab experience. With the TekSmartLab, instructors can setup configurations of large fleets of instruments conveniently with only one click, while configuring lab instruments had to be done manually before. Students can retrieve and save the test results wirelessly via their smart devices, instead of using the USB thumb drives. And with the TekSmartLab, instrument asset information is recorded automatically with high accuracy, whereas lab managers in traditional teaching labs record that data manually one instrument at a time.

Key features

- Easy to setup with industrial reliability
- Instant remote configuration of large fleets of instruments
- Centralized monitoring and remote assistance
- Online retrieving and saving of test results
- Automatic instrument asset information recording

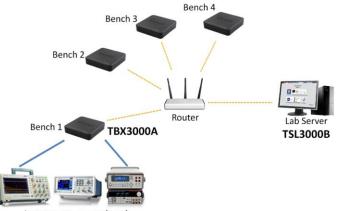
Applications

Basic teaching laboratory

TekSmartLab network diagram

In traditional teaching labs, connecting instruments to a network can be challenging, building an internal network through cables is tedious, and many lab instruments do not have a LAN port.

Tektronix TekSmartLab is different: On each bench, the TBX3000A connects and controls instruments through USB cables, and communicates with the TSL3000B software on the lab server via the wireless network. The TBX3000A has a LAN port (standard), and can support a WI-FI connection when equipped with a compatible USB-WIFI dongle.



Instruments on one bench

On the lab server, the TSL3000B communicates with the TBX3000A on each bench. The TSL3000B gives instructors centralized control of large fleets of instruments and gives students the ability to retrieve and save the test results online.

Easy to setup with industrial reliability

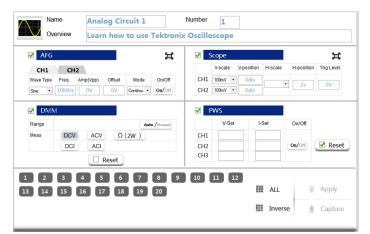
TekSmartLab can be easily setup via WI-FI without laying LAN cables. Without any configuration, instruments are recognized automatically by the system when they are connected to the system.

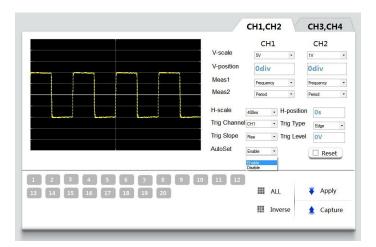
For the labs which have already equipped with Tektronix and Keithley instruments, instructors can smoothly update their labs to TekSmartLab as most of the Tektronix and Keithley teaching lab instruments are supported, even some instruments that have been phased out in the last five years (see *Specifications*).

Instead of controlling all the instruments by lab server directly, the TBX3000A on each bench controls the instruments connected to it. Using the TekSmartLab is an efficient and stable way to work. The TBX3000A, which is based on the Tektronix oscilloscope platform, works seamlessly with Tektronix and Keithley instruments, assuring the industrial reliability of the entire system.

Centralized configuration

Instructors can load instrument configurations based on different courses and then distribute them to over 100 instruments with a single click before a lab exercise. Instrument configuration changes can be made and delivered anytime; for example, the Autoset function can be disabled to encourage students to learn how to manually adjust an oscilloscope to display the correct waveform.





When the TBS1000B-EDU series oscilloscopes are connected to the system, the courseware contents, as well as instruments' firmware, can be updated remotely, while instructors have had to update them one by one manually via USB thumb drives before.

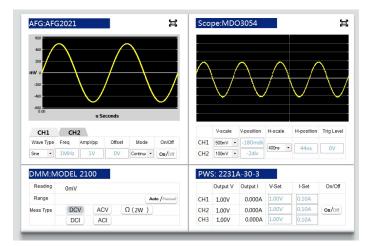
Update Courseware (Support TBS1000B-EDU only)	
Courseware	
1 2 3 4 5 6 7 8 9 10	
11 12 13 14 15 16 17 18 19 20	🐺 Apply
Invers	
	Courseware

Centralized monitoring and remote assistance

With TekSmartLab, professors can easily monitor the status of all instruments during the experiment: Green signifies that the instrument is working, gray signifies no connection, and red signifies error. A instructor can check or help a specific bench by clicking on the corresponding bench icon.



Clicking a bench icon displays the readouts and key configuration settings for the instruments on that bench.



Test results online retrieving and saving

In a traditional teaching lab, when students need to save the test results, typically snapshots of oscilloscopes, they use a USB thumb drive or, more often, use mobile device to take the picture. The quality of the test results is not consistent, and test results are difficult to archive for future access.

TekSmartLab provides a more intelligent approach for retrieving and saving test results online: The TSL3000B server software creates a web page available in the local network for each bench. Each web page can be conveniently accessed by bench-specific IP address.

With TSL3000B, instructors can change the IP address to QR (quick response) codes, and place it permanently as a printed sticker on each bench.

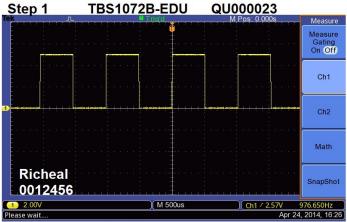
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Students can login in to the web page by using their mobile device to scan the QR code, or by inputting the IP address in the web browser of their laptops. Once they have logged in, students can easily retrieve and save test results online.

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Q Tek SmartLab
TekSmartLab
Lab Name: TRIAL
Bench : 1
Course : test1
Name : Richeal
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Remember Login
Tektronix
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The test results, which include snapshots of the oscilloscope with step number, instruments' S/N, student's name and comments, can be downloaded locally, or archived on the lab server for future access.



Comments: Amplifier Testing

Automatic instrument asset information recording

In conventional teaching labs, the asset manager must manually check and record information such as instrument model numbers, serial numbers, and locations. Detailed information like the length of usage can only be estimated by experience or by keeping usage logs.

The TekSmartLab solution automatically records and displays asset information, including usage time. Just one click archives the asset and usage information. TekSmartLab dramatically increases asset management accuracy compared to previous methods and makes managing lab assets much more efficient.

E	Bench		Instrument			Q
_	Start	End	Bench	Instrument	SN.	Using Time
	12/29/2014 2:33 PM	12/29/2014 3:12 PM		2231A-30-3	802196010	0h 36m
	12/29/2014 2:33 PM	12/29/2014 3:12 PM	1	MODEL 2100	QU0000025	0h 36m
	12/29/2014 2:33 PM	12/29/2014 3:12 PM	1	TDS 2024C	C016555	0h 36m
	12/29/2014 7:46 AM	12/29/2014 4:36 PM	1	MSO20228	C020109	2h 46m
	12/29/2014 7:46 AM	12/29/2014 4:36 PM	1	AFG3051C	QU000002	2h 46m
	12/29/2014 2:33 PM	12/29/2014 3:12 PM	1	AFG3051C	QU000003	0h 36m
	12/29/2014 2:33 PM	12/29/2014 3:12 PM	2	2231A-30-3	C0201093	0h 36m
	12/29/2014 2:33 PM	12/29/2014 3:12 PM	2	MODEL 2110	1407615	0h 36m
	12/29/2014 7:47 AM	12/29/2014 9:24 AM	2	TDS 1012C-EDU	C010006	1h 35m
	12/29/2014 7:47 AM	12/29/2014 9:24 AM	2	AFG3252C	C010726	1h 35m
	12/29/2014 2:33 PM	12/29/2014 3:12 PM	2	AFG2021	PQ000017	0h 36m

Sample TekSmartLab configuration

The following shows a sample setup of a TekSmartLab system with 20 benches and 80 instruments connected through WI-FI.

ltem	Quantity	Supplier	Comments
TSL3000B	1	Tektronix	One per lab, installed on lab server.
TBX3000A	20	Tektronix	One per bench.
Instruments	80	Tektronix	Supported Tektronix or Keithley instruments, one oscilloscope, one arbitrary function generator, one digital multimeter, and one power supply per bench. Option 2231A-001 required for the power supply 2231A-30-3.
USB WIFI dongle	20	Provided by customer	Compatible USB-WIFI dongle, like Netgear WNA1000M. Installed on TBX3000A.
WIFI router	1	Provided by customer	Cisco RV180W or other WIFI Router that can meet WI-FI networking requirements.
Lab server	1	Provided by customer	Refer to system requirements.

Specifications

TBX3000A characteristics

General characteristics					
Max instruments connected	6, by USB cables				
Compatible USB-WIFI dongle	Netgear WNA1000M, WNA3100	DM, TP-LINK TL-WN823N			
LAN Port	1				
LED	6 – Instrument status indicators				
	1 – Wi-Fi connection status indi	cator			
	1 – System status indicator				
Environmental characteristics					
Temperature	Operating. 0 °C to 40 °C				
	Non-operating20 °C to +60 °	C			
Humidity	Operating. (Low) 0 °C to 40 °C, 10% to 90% relative humidity				
	Non-operating. (High) 40 °C to	60 °C, 5% to 60% relative humidity; (_ow) 0 °C to 40 °C, 5% to 90% relative humidity.		
Altitude Operating. Up to 3,000 m (10,000 ft.)					
	Non-operating. Up to 15,240 m	n (50,000 ft.)			
Regulatory compliance					
EMC compliance	EN61326, Class A.				
Power consumption	Maximum 15 W				
Physical characteristics	Dimension	mm	in		
	Height	31	1.22		
	Width	127	5.0		
	Depth	127	5.0		
	Weight	kg	lb		
	Net	0.24	0.53		
	Shipping	1.07	2.36		

TSL3000B general characteristics

Maximum benches supported	45, standard
	Up to 100 with a software upgrade
Maximum instruments supported	180, standard (four instruments per bench: one oscilloscope, one arbitrary function generator, one digital multimeter, one power supply)
	Up to 400 with software upgrade
Laboratory layout emulation	Add, Delete, Bench Number
Large fleet configuration	By course, By instrument type

Datasheet

TSL3000B general characteristics

OscilloscopesFektronix TBS1000B seriesFektronix TBS1000B-EDU seriesFektronix TDS2000C seriesTektronix DPO/MS02000B series (oscilloscope function only)Arbitrary function generatorTektronix AFG1022Tektronix AFG300C seriesTektronix AFG300C seriesDigital multimetersKeithley DMM2110Keithley DMM2100Keithley 220G(J)-30-1Keithley
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Tektronix AFG3251
Tektronix AFG3252
General functions Check status, preset, record model number, S/N, time of use and location
Oscilloscope functions Set/Check horizontal/vertical resolution and scale
Set/Check trigger level (support Edge trigger only)
Set/Check measurement (Frequency, Period, Rise, Fall,Maximum, Minimum, Positive Width, Negative Width)
Check/save snapshot
Waveform update
Autoset Enable/Disable
Autoset
Courseware contents and firmware remote update (support for the TBS1000B-EDU series only)

TSL3000B general characteristics

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Signal to noise >= 35 dB	WI-FI networking requirements (for labs with 20 benches)	802.11n, 2.4 GHz, 300 MHz bandwidth
-	Signal level	>= -50 dBm
Max clients accessed >=41 (20 clients are TBX3000A, 20 clients are students' mobile devices, and one for the lab server)	Signal to noise	>= 35 dB
	Max clients accessed	>=41 (20 clients are TBX3000A, 20 clients are students' mobile devices, and one for the lab server)

Ordering information

TekSmartLab™

TBX3000A	TekSmartLab [™] hardware
TSL3000B	TekSmartLab [™] software

TBX3000A power plug options

A0	North America
A1	Universal EURO
A2	United Kingdom
A3	Australia
A4	240v North America
A5	Switzerland
A6	Japan
A10	China
A11	India
A12	Brazil
A99	No Power Cord or AC Adapter

TBX3000A service options

R5

Repair Service 5 years

TBX3000A warranty

Warranty

3 years



Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.

Datasheet

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