# SCI-VOICE TALKING LABQUEST 2 USER MANUAL

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## Important Safety Operation

Caution: Read all safety information and operating instructions included in this Quick-Start Guide prior to using the Talking LabQuest 2.

Water: LabQuest is designed to be splash resistant, however, avoid water immersion and standing liquid on the display. If water gets in the device, immediately shut down the device by holding down the power button for approximately 10 seconds. Remove the battery, connected cables, SD card, and any other accessories. Allow to dry thoroughly before restarting. Do not attempt to dry using an external heat source.

Temperature: Safe operating temperatures are from 0°C or 32°F to 45°C or 113°F. Storage temperatures are -30°C or -31°F to 60°C 140°F. Exposures to low or high extreme temperatures will temporarily reduce battery life. Avoid rapid temperature changes as condensation may form inside the device. Do not leave in a closed car, as temperatures can exceed the maximum storage range.

Battery: LabQuest contains a Lithium-Ion battery. Use only the supplied battery for this device. Do not puncture or expose to excessive heat or flame.

Chemicals: Do not store LabQuest in a chemical closet or in areas of concentrated chemical gases.

For all technical support issues please e-mail support@independencescience.com or call 866-862-9665 extention 2.

## Sci-Voice Talking LabQuest 2 Description

The Sci-Voice Talking LabQuest 2 (TLQ2) is a modified version of the LabQuest 2 sold by Vernier Software & Technology. The TLQ2 is intended for use by the blind and vision impaired. Special software has been installed to allow the TLQ2 to speak. Please note that the U​S​B keyboard (included) needs to be connected to the TLQ2 when it is used by a person who is blind or vision impaired.

### Caution: Please do not update firmware

The special firmware that allows the TLQ2 to talk is specifically designed to work with one version of the Vernier firmware. Updating the TLQ2 will disable the speech capabilities of the TLQ2.

## Physical Layout

Front panel: The TLQ2 is a rectangular device. The front of the device features a touch panel and three buttons along the right edge of the touch panel. From Top to bottom, these are: Collect, Home and Back.

The top edge: Starting at the left end of the top edge, is the power button. The power button is recessed. Press the power button for one half second to turn on the TLQ2. After pressing the button, wait for the TLQ2 to talk. This will take forty seconds. Wait some more until you hear, "LabQuest Application, Sensor page".

To the right of the power button are two rubber covers. The first cover covers two digital inputs. The next cover covers the earphone, microphone and micro SD slot. A powered external speaker can be plugged into the earphone jack.

On the right edge of the TLQ2 toward the top of the unit is a U​S​B connector for connecting the TLQ2 to a PC. Logger Pro software can then be used to control the TLQ2, collect data and produce tactile graphs with a ViewPlus embosser.

The power adapter connection is the round hole at the bottom of the right edge of the TLQ2.

On the left edge is a U​S​B port usually used for connecting U​S​B sensors. B/VI users will need to connect a keyboard to this port to make full use of the TLQ2. If necessary, a multiport U​S​B hub can be used if it is necessary to plug in a U​S​B sensor.

On the left edge of the TLQ2 are three connectors for connecting probes. From top to bottom, they are ch1, ch2 and ch3.

On the bottom of the TLQ2 are four rubber feet.

Near the right front foot is the stylus for operating the touch screen. This is only useful for sighted users and some low vision users.

Toward the back on the right hand side is a sliding latch which opens the battery compartment.

By the rear feet are small fold out legs which will prop the TLQ2 up at a slight angle for better viewing.

## Buttons:

Place the LabQuest flat on a surface with the screen facing up and the side panel with three large connector ports facing left. As you examine the unit you will notice that there are 4 buttons on the LabQuest device, which are named as follows: Power, Collect, Back, and Home. Three of these buttons are located on the upper surface of the unit which is also where you find the screen. Orienting the LabQuest as directed these three buttons are found to the right side of the screen. A fourth slightly recessed button is located on the left end of the edge of the LabQuest facing away from you. This fourth button is the power button.

### The Power button:

The Power button is slightly recessed and is located on the top edge of the device. If the user presses the power button and releases it quickly, it will suspend the device saying "Suspending". Similarly, press it while the device is suspended, and it will resume. If the user holds down the power button for a few seconds, it will shut the device down saying "Starting power down, power down in 10 seconds". Again, pressing it while powered down will power it back up.

After being suspended the LabQuest should start talking almost immediately (please note that while in suspended mode this does cause it to consume some power so if it doesn’t start try plugging it in) but from a full shutdown it will be up to 40 seconds before you hear the 1st beep indicating it is initializing the voice, after the beep and about 5 more seconds it should say "Starting Talking LabQuest please wait", with up to 20 seconds following that until it says "starting LabQuest Application please wait" at which point the device is fully on.

### The Collect button:

When the unit is lying flat with the screen pointing up and the three large connector ports facing left you will find a cluster of three buttons on the right side of the front of the TLQ2.

The arrow shaped button (pointing up) closest to the top of the device is the collect button. The collect button is used to begin data collection when in one of the main Pages of the LabQuest Application. These Pages are the Sensor Page, the Graph Page, the Data Table Page, the Lab Instructions Page, and the Notes Page. When the Collect button is pressed anywhere but in one of those pages, it does nothing. When it's pressed within one of those pages, and there is an active sensor attached, it begins data collection for the mode specified in the Sensor Page, and forces the user to the Sensor Page for the duration of collection. Alternatively, the F3 key on the keyboard may be used for the same purpose.

### The Back button

The arrow shaped button (pointing down) at the bottom of the group of three buttons is the back button. The back button closes apps, and returns the user to one screen up from where they were. Alternatively, the escape key on the keyboard may be used for the same purpose.

### The Home button

The center rectangular shaped button of the group of three is the home button. The home button toggles the user between the current active app, and the main desktop. Alternatively, the F4 key on the keyboard may be used for the same purpose.

## Basic navigation

The TLQ2 supports the use of an external keyboard. A U​S​B keyboard is included with the TLQ2. Users are encouraged to navigate with tab and back tab to get from widget to widget. To navigate within a widget, the arrow keys are the most effective means of navigation.

## Keyboard Controls

There are several keys on the keyboard that have specific functions:

* KEY- FUNCTION
* F1- makes LabQuest speak softer.
* F2- makes the LabQuest speak louder.
* F3- starts/stops data collection when within the LabQuest App.
* F4- Toggles between the current active app and the main desktop.
* F5- makes LabQuest speak slower.
* F6- makes LabQuest speak faster.
* F7- announces the current battery status.
* F8- if set properly under the system folder will announce the current time.
* F9- go to Science Resources.
* F10- opens menus.
* F11- toggles high contrast mode on/off.
* F12 and Shift+F12- may be used to toggle between tabs in the LabQuest App.
* Shift+F1- User Guide.
* shift+F2- Speak serial number (for logging and repair.)
* shift+F4- enable/disable speech.
* Shift+F8- if set properly under the system folder will announce the current time and date.
* Ctrl+Down Arrow- Read to end of file from focus in Lab Instructions and Notes Pages.
* Ctrl+Alt+Down Arrow- Move to the next heading in the open file in Lab Instructions and Notes Pages.
* Ctrl+Alt+Up Arrow- Move to the previous heading in the open file in Lab Instructions and Notes Pages.

## Calculator

Numerals may be entered in three ways:

* Using the numeric row on the keyboard.
* Using the numeric keypad. Note: The Numlock must be on for the keypad to work. The numlock key is the top left key in the num pad section of the keyboard.
* Using the keys: 7, 8, 9, u, i, o, j, k, l and m for the numerals 7, 8, 9, 4, 5, 6, 1, 2, 3 and 0.

### Calculator Keymap:

* shift+= or semicolon (;) Plus.
* dash (-) minus.
* shift 8 or Comma (,) Multiply.
* / Division.
* Period (.) Decimal point.
* = or enter =.
* shift 9 left-parenthesis.
* shift 0 right-parenthesis.
* n Change sign.
* backspace-key Backspace
* c Clear.
* Ctrl+C Copy.
* Ctrl+V Paste.

### Trigonometric functions:

* A Sin.
* s Cos.
* d Tan.
* r Toggle between degrees and radians.
* Ctrl+I Trigonometric Inverse toggle.

### Powers and Logs

* t Log.
* Shift+T (10 to the x).
* e Ln (natural log).
* Shift+E (E to the x).
* w E​E (times 10 to the power of).
* x (X to the y).
* shift+x (X to the −1).
* q Sqrt.

### Numeric Pad Layout

Description from top to bottom, left to right:

* Top row; numlock, divide /, multiply \*, minus dash
* Second row; 7, 8, 9, +
* Third row; 4, 5, 6
* Fourth row, 1, 2, 3, enter
* Fifth row; 0, period

## Periodic Table:

To access the Periodic Table, press F4 to get to the main desktop. Then press either the right arrow or left arrow until you hear, "Periodic table". Then press the enter key.

Within the Periodic Table use the arrow keys or Tab and Shift+Tab to move between elements on the table. Press and hold with the stylus or your finger to slightly magnify the currently selected element if desired. Pressing the Enter key on the keyboard will open up facts about an element including a physical description, melting point, boiling point, and many other facts. To exit out of a selected element fact page simply press Escape on the keyboard to return to the Periodic Table.

## Types of widgets and how to interact with them

Widgets are programs that run in the TLQ2. Two examples of widgets are the Calculator and the Periodic Table.

### Static text or generic Focus-point

Static Text or Focus Points are best tabbed through. Problems arise when the user attempts to left or right arrow through text. This will cause the device to try to navigate within the widget by arrowing through letter by letter without reading any information to the user. Text is not announced as what it is, so chances are if the user doesn't hear a role associated with something the device speaks, they're in text. Text is best Tabbed through. There is no other function associated with text, it's merely informative to the user.

### Text-entry-boxes and Numeric-entry-boxes

Text-entry-boxes have some of the most complex behaviors of a single widget, and demand their own section for explanation. Arrowing left and right will change the cursor position on existing letters just as it would with any word-processing software. At the end of an entry, the device will notify the user by saying "Blank."

Arrowing up and down within an entry-box will allow the user to change the character they're currently positioned on. It will edit based on the currently selected character set. Arrowing up or down when on the "Blank" character will insert a new character at the end of an entry.

Pressing the O.K. key will change the character set currently selected. For Numeric-entry-boxes there's only one character set, and that's numbers. For Text-entry-boxes there are 4 entry modes: Lower case letters, upper case letters, symbols, and numbers.

Pressing the Menu button will bring up the Clipboard menu, where users can delete a character, insert a character into the middle of an entry, select all, copy, cut, or paste their entries.

### Combo-box

Combo-boxes are simple, and pretty unchanged from what one might expect. Pressing up and down on a Combo-box will allow the user to change the option selected within the combo-box without opening it. It will also announce itself in shorthand, without corrected units, meaning that it will say 's' instead of 'seconds' when it isn't open. The user can press O.K. on the combo-box to open it, then navigate up and down through it with fully spoken units. This is the recommended method of using combo boxes. Pressing O.K. again will close the combo-box, then the user is free to Tab away.

### Push-button

There is no special navigation associated with Push-buttons. They are simply a widget that a user navigates to, and presses O.K. on to confirm their selection. Each Push-button on a page is treated as its own widget, and is not skipped by Tab or Back Tab.

### Radio-button

Radio-buttons come in sets, and are treated as a single widget by Tab and Back Tab. However there is never a single Radio-button all by itself. If the user encounters a Radio-button, arrowing left and right will reveal all the other Radio-button options available. The default button that a user will fall on with Tab and Back Tab is whichever Radio-button is currently selected, meaning that the user is not always dropped on the left most button, or the right most button. Other than that, the only other navigation is pressing O.K. on an unselected Radio-button will select it, and deselect all others within the set of Radio-buttons.

### Check-box

Check-boxes do not come in sets. They will tell the user whether they are checked or not. And Pressing O.K. on a Check-box will change whether it is checked or not checked. No other special navigation is required for Check-boxes.

### Expandable Section

Expandable Sections conceal and reveal information. When they are opened, all their information is navigable, and revealed. Conversely, when they are closed, the information within them is inaccessible, and hidden. Opening and closing an Expandable Section is done by simply pressing the O.K. button on it.

There is only one other piece of information on Expandable Sections. Navigating within them is the same as navigating anywhere else, except where the left arrow key is concerned. If the user left arrows all the way to the left side of the inside of the Expandable Section, they will be returned to the Expandable Section’s header.

### Menu

When the user encounters a Menu, it means that arrowing Right will reveal new Menu Items. Subsequently, if the user has arrowed right to get to the items inside a Menu, they can then arrow Left to get back out. Arrowing up and down will take the user to other Menus and Menu Items within the current Menu.

### Menu Item

Menu Items are aptly named, as they are items within a Menu. Pressing O.K. on a Menu Item means the associated action will be taken.

### Slider

Sliders range from 1 to 100, and by left and right arrowing on them, the user can change the value. Left lowers the value, while right raises it.

### Page-tab

Page-tabs are at the top of some dialogues. Page-tabs come in sets of two or more, meaning that to Tab they are treated as a single widget. Arrowing left and right when on a page-tab will reveal the other Page-tabs available. Once arrowed to, the page below the tab will have changed, and options will be different.

### Toggle-button

Toggle buttons are used exactly like Check-boxes. They have two states, and pressing O.K. on them will change the state. There is no other navigation associated with them, and they do not come in sets.

### Button

Buttons only exist in one place on the Talking LabQuest. Inside the Calculator Application there are Buttons. These act exactly like Push-buttons, but when you press O.K. on them, they give slightly different feedback. There is no special navigation associated with these widgets and they will accept Tabbing, Back Tabbing, and arrowing through them without any issues.

## Other New Features

### Live Tone Play

Adds a tone with a pitch that increases as the sensor readings go up and decreases as sensor readings go down giving an auditory idea of where the data is. This may be useful when waiting for a sudden rise in temperature or other defining data point. May be activated in the LabQuest App by going to the Readout menu when in the Sensor Page. To enable during Data Collection only, the "Live Tone Only During Collection" checkbox must be checked and you must select the sensor you want the live tone for in the "Live Sensor Tone" submenu also.

### Bluetooth Sensor Compatibility

In the "Sensors" menu of the LabQuest App go to "Wireless Device Setup" and choose "Go Direct". Each Go Direct sensor has a unique serial number you will need to know prior to entering the menus. Press the Enter key when you hear the proper serial number read then tab until you hear "Okay" and then press the Enter key again. Note if you have several temperature sensors in one area such as in a classroom setting, it may be best to use an analogue sensor or have a specific order for turning the sensors on in order to ensure that you are collecting the data from the correct experiment and not someone else’s.

### Graph Sonification

Once you have data recorded you may go to the Graph Page in the LabQuest App then select the Sonify menu and start sonification.

### Plot Details Box

In the Graph Page of the LabQuest App, you may tab around until you hear "Plot Details box" then press Enter on the keyboard. Use the up and down arrow keys to get pre-calculated statistics including delta x, delta y, samples, standard deviation, mean, max, and min of your data set.

### High Contrast Mode

The high contrast mode may be turned on by pressing F11 on the keyboard. In high contrast mode, the background of the Talking LabQuest is black with yellow lettering. In the menus, a yellow background with black lettering will highlight the location of the virtual cursor. This is useful both for users with low vision as well as anyone who may be doing experiments outdoors at night or in locations such as caves. An example of an experiment where high contrast mode is suggested is a motion detection experiment in Biology of animals as it will cause less light pollution for surrounding wildlife whose vision is adapted to low light environments. If speech is being used during such an experiment, we also suggest pairing with headphones to reduce noise pollution on the environment. Please contact Independence Science staff for more examples of when this feature is suggested.

The Talking LabQuest will also speak while high contrast mode is in use. If you wish to only use the visual display you may press shift+F4 to disable or re-enable speech at any time. You may also press F11 at any time to disable the high contrast mode as some pages such as the data table pane may be easier to differentiate the lines of the table for some low vision users. If you would like to use high contrast mode with a larger screen but do not have a CCTV or portable magnifier handy, the LabQuest Viewer may also be an option. Please see the section on LabQuest Viewer for more details.

## Science Resources

Several new resources have been placed in the Science Resources Folder. To access this folder, press F9, or go to the Lab Instructions Page within the LabQuest App, then select View from the menus and then select View Lab Instructions. Scroll down until you get to the Science Resources folder. You may also access some cool experiments from Vernier in this folder.

## Languages

This is available for changing by selecting "System Folder" then "Languages" by using the arrow keys up and down then pressing the Enter key to select. Please note that this is only available if you have purchased additional languages and a change of languages will result in the device needing to reboot. Do not open files or unsaved data from using the LabQuest in one language when the LabQuest is in another language mode. This will trap the LabQuest between languages and you may lose speech temporarily and have to completely restart your device.

## Gender Preference

The LabQuest is defaulted to a male voice as most of our customers find it better for hearing in louder environments, if you prefer to have a female voice simply go to the "Preferences Folder" then "advanced Preferences" press the Tab key until you hear "Edit Preference" then press "0" on the keyboard or press the down arrow once to select "0" then select "Okay" after a few seconds the LabQuest will speak in a female voice and does not require a reboot of the system. In order to change the voice back to male then follow the same steps press "1" on the keyboard or press the up arrow once then select "Okay".

## LabQuest Viewer

The LabQuest Viewer is an add-on purchase that includes a site license for a school. It allows for a teacher, fellow student, or some low vision users to control a LabQuest remotely using a computer monitor over the same Wi-Fi network. This is ideal for several reasons including ease of sharing on larger screens, monitoring class data, the ability to troubleshoot a LabQuest issue from a distance, ability to allow a student control over a lab who would otherwise be prevented from doing so for medical reasons such as a student that uses oxygen and an experiment with an open flame or a student who is pregnant and cannot be in contact with certain materials, and much more. The LabQuest Viewer replicates the image of the LabQuest screen on a monitor, including high contrast mode if enabled. The Talking LabQuest will continue to speak through the Talking LabQuest itself (assuming speech is enabled), but will not speak through the controlling computer. For this reason, the user of the LabQuest Viewer must have the ability to read the screen or in the case of a low vision user be close enough to the Talking LabQuest to hear the speech output response. Please contact Independence Science staff to learn more about how the LabQuest Viewer could help in your specific situation.

## Software License agreement for Sci-Voice Talking LabQuest II ("TLQ2.3") device

Please read this software license agreement ("license") before using the Independence Science TLQ2.3 device ("device"). By using the device, you (or the purchasing organization) agree to be bound by the terms of this license. If you do not agree to the terms of this license, do not use the TLQ2.3 device.

Important note: This device may be used within a school district or school region for educational purposes only. Each device is licensed on a per unit basis for use by an individual within the purchasing organization. Independence Science (ISci) anticipates that future versions of the text-to-speech software will be available for an upgrade fee. Independence Science customers will be required to purchase all intermediate upgrades to maintain the software’s optimal functionality.

1. General. The LabQuest is a hardware device owned and warranted by Vernier Software and Technology. Independence Science has developed software for the LabQuest that provides synthetic speech output to allow non-visual operation of this hardware device. The Sci-Voice TLQ2.3 text-to-speech software ("TTS"), regardless as to whether it was purchased, preloaded and activated or loaded and then activated after initial LabQuest purchase, is purchased under a software licensing agreement. The software and any documentation accompanying this license whether on disk, in read only memory, on any other media or in any other form (collectively the "Independence Science software") are licensed, not sold, to you by Independence Science ("ISci") for use only under the terms of this license, and ISci reserves all rights not expressly granted to you. The rights granted herein are limited to the intellectual property for the TTS produced by ISci for the TLQ2 device and these rights do not include any other patents or intellectual property. You own the hardware device on which the TTS is installed, in accordance with Vernier Software and Technology policies, but ISci retains ownership of the Independence Science software itself. The rights granted under the terms of this license include any software upgrades that replace and/or supplement the original ISci TTS, unless such upgrade contains a separate license. Title, name, and intellectual property rights within and related to any non data content displayed by or accessed through the ISci TTS belongs to the respective content owner. Such content may be protected by copyright or other intellectual property laws and treaties, and may be subject to the terms of use of the third party providing such content. This license does not grant you any rights to use such content in a manner that is not consistent with data collection or analysis.

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## Thank You!

We would like to thank you for your purchase of a Talking LabQuest 2 and your dedication for making science more accessible! Please feel free to contact Independence Science at any time with more questions, consultation needs, and mentorship opportunities at (866) 862-9665 or info@independencescience.com

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