

BSASWITCH
Tektronix Instrument Switch
Instruction Manual



077-0589-01

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For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.

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Tektronix warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by Tektronix for warranty work may be new or reconditioned to like new performance. All replaced parts, modules and products become the property of Tektronix.

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Important safety information

This manual contains information and warnings that must be followed by the user for safe operation and to keep the product in a safe condition.

To safely perform service on this product, additional information is provided at the end of this section. (See page iv, *Service safety summary*.)

General safety summary

Use the product only as specified. Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. Carefully read all instructions. Retain these instructions for future reference.

Comply with local and national safety codes.

For correct and safe operation of the product, it is essential that you follow generally accepted safety procedures in addition to the safety precautions specified in this manual.

The product is designed to be used by trained personnel only.

Only qualified personnel who are aware of the hazards involved should remove the cover for repair, maintenance, or adjustment.

This product is not intended for detection of hazardous voltages.

While using this product, you may need to access other parts of a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.

When incorporating this equipment into a system, the safety of that system is the responsibility of the assembler of the system.

To avoid fire or personal injury

Observe all terminal ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

The measuring terminals on this product are not rated for connection to mains or Category II, III, or IV circuits.

Do not operate without covers. Do not operate this product with covers or panels removed, or with the case open. Hazardous voltage exposure is possible.

Avoid exposed circuitry. Do not touch exposed connections and components when power is present.

Do not operate with suspected failures. If you suspect that there is damage to this product, have it inspected by qualified service personnel.

Disable the product if it is damaged. Do not use the product if it is damaged or operates incorrectly. If in doubt about safety of the product, turn it off and disconnect the power cord. Clearly mark the product to prevent its further operation.

Use only specified replacement parts.

Do not operate in wet/damp conditions. Be aware that condensation may occur if a unit is moved from a cold to a warm environment.

Do not operate in an explosive atmosphere.

Keep product surfaces clean and dry. Remove the input signals before you clean the product.

Provide proper ventilation. Refer to the installation instructions in the manual for details on installing the product so it has proper ventilation.

Slots and openings are provided for ventilation and should never be covered or otherwise obstructed. Do not push objects into any of the openings.

Service safety summary

The *Service safety summary* section contains additional information required to safely perform service on the product. Only qualified personnel should perform service procedures. Read this *Service safety summary* and the *General safety summary* before performing any service procedures.

To avoid electric shock. Do not touch exposed connections.

Do not service alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect power. To avoid electric shock, switch off the product power and disconnect the power before removing any covers or panels, or opening the case for servicing.

Use care when servicing with power on. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

Terms in this manual

These terms may appear in this manual:



WARNING. *Warning statements identify conditions or practices that could result in injury or loss of life.*



CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Symbols and terms on the product

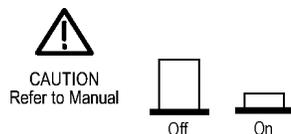
These terms may appear on the product:

- DANGER indicates an injury hazard immediately accessible as you read the marking.
- WARNING indicates an injury hazard not immediately accessible as you read the marking.
- CAUTION indicates a hazard to property including the product.



When this symbol is marked on the product, be sure to consult the manual to find out the nature of the potential hazards and any actions which have to be taken to avoid them. (This symbol may also be used to refer the user to ratings in the manual.)

The following symbol(s) may appear on the product:



Compliance information

This section lists the EMC (electromagnetic compliance), safety, and environmental standards with which the instrument complies.

EMC compliance

EC Declaration of Conformity – EMC

Meets intent of Directive 2004/108/EC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:

EN 61326-1. EMC requirements for electrical equipment for measurement, control, and laboratory use. ^{1 2 3 4}

- CISPR 11. Radiated emissions, Group 1, Class A
- IEC 61000-4-2. Electrostatic discharge immunity
- IEC 61000-4-3. RF electromagnetic field immunity
- IEC 61000-4-4. Electrical fast transient / burst immunity
- IEC 61000-4-6. Conducted RF immunity

European contact.

Tektronix UK, Ltd.
Western Peninsula
Western Road
Bracknell, RG12 1RF
United Kingdom

- ¹ This product is intended for use in nonresidential areas only. Use in residential areas may cause electromagnetic interference.
- ² Emissions which exceed the levels required by this standard may occur when this equipment is connected to a test object.
- ³ For compliance with the EMC standards listed here, high quality shielded interface cables should be used.
- ⁴ Performance in EMC tests applicable to the AC mains input of the host device to which the BSASWITCH is connected by USB is dependent on the performance of the host device. Refer to the documentation for the host device for EMC compliance information.

Australia / New Zealand Declaration of Conformity – EMC

Complies with the EMC provision of the Radiocommunications Act per the following standard, in accordance with ACMA:

- CISPR 11. Radiated Emissions, Group 1, Class A, in accordance with EN 61326-1.

Australia / New Zealand contact.

Baker & McKenzie
Level 27, AMP Centre
50 Bridge Street
Sydney NSW 2000, Australia

Safety compliance

This section lists the safety standards with which the product complies and other safety compliance information.

- EN 61010-1. Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements.
- UL 61010-1. Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements.
- CAN/CSA-C22.2 No. 61010-1. Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements.
- IEC 61010-1. Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements.

Equipment type

Test and measuring equipment.

Pollution degree descriptions

A measure of the contaminants that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated.

- Pollution degree 1. No pollution or only dry, nonconductive pollution occurs. Products in this category are generally encapsulated, hermetically sealed, or located in clean rooms.
- Pollution degree 2. Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.
- Pollution degree 3. Conductive pollution, or dry, nonconductive pollution that becomes conductive due to condensation. These are sheltered locations

where neither temperature nor humidity is controlled. The area is protected from direct sunshine, rain, or direct wind.

- Pollution degree 4. Pollution that generates persistent conductivity through conductive dust, rain, or snow. Typical outdoor locations.

Pollution degree rating Pollution degree 2 (as defined in IEC 61010-1). Rated for indoor, dry location use only.

Environmental considerations

This section provides information about the environmental impact of the product.

Product end-of-life handling

Observe the following guidelines when recycling an instrument or component:

Equipment recycling. Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. To avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.



This symbol indicates that this product complies with the applicable European Union requirements according to Directives 2012/19/EU and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries. For information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com).

Restriction of hazardous substances

This product is classified as an industrial monitoring and control instrument, and is not required to comply with the substance restrictions of the recast RoHS Directive 2011/65/EU until July 22, 2017.

Preface

The Tektronix Instrument Switch is a flexible device usable for general purpose applications and specific inclusion in USB compliance testing. For USB testing, the switch features a pattern generator for generation of Low Frequency Periodic Signaling (LFPS), used to ensure devices achieve loopback.

Features and benefits

The Instrument Switch provides the following features and benefits:

- Manual switching between channels with front panel controls
- Automated control via USB
- Flexible triggering with multiple control choices
- Two main input channels (Ch 1, Ch 2) with >10 GHz analog bandwidth
- Single-ended to differential input channel for easily adding low frequency signal generators to test setups
- USB control and power with no need for additional external power

Related documentation

In addition to this document, the following BERTScope-related documents are available on the Tektronix Web Site at www.Tektronix.com.

- *Tektronix BERTScope Bit Error Rate Analyzers Quick Start User Manual* (Tektronix part number, 071-2869-xx)
- *CR125A, CR175A, CR286A Quick Start User Manual* (Tektronix part number, 071-2852-xx)
- *Tektronix BERTScope Digital Pre-Emphasis Processor Quick Start User Manual*, (Tektronix part number, 071-2846-xx)
- *BSAUSB3 USB 3.0 Receiver Testing Application Installation Instructions*, (Tektronix part number, 071-3047-xx)

Standard accessories

The following standard accessories are available:

- Standard USB 2.0 cable

Prerequisites

The necessary software packages for use with the instrument switch can be downloaded from the Tektronix Web site at www.tektronix.com. The software packages include software, drivers, and related documentation (including this document).

For each package, follow the online instructions to download the software packages.

- Switch Control software; Search for BSASWITCH
 - Switch firmware version (Chip Revision) 33 or higher.

Run the Switch Control software to verify that you have the latest firmware version installed.

- BERTScope software (Release V11.02.1886 or higher)

Optional

- BSAUSB31 USB 3.1 Receiver Test Application Software
- BSAUSB3 USB 3.0 Receiver Test Application Software

Getting Started

The Instrument Switch is intended to be operated in a controlled laboratory environment. It is intended to operate on a bench top, or on top of another instrument such as the BERTScope Analyzer. Four shock-absorbing feet are located on the bottom of the instrument.



Figure 1: Tektronix Instrument Switch

This instrument draws operating power through a USB connection to a host instrument, such as the BERTScope Analyzer or a Windows PC. No other power source is required.

NOTE. *The Instrument Switch drivers must be installed on the host instrument in order to correctly supply power to the switch.*

Manual control

The Instrument Switch can be operated manually, using the pushbuttons and connectors, with power supplied through the USB connection to a host instrument. The Switch Control program and instrument drivers must be installed on the host instrument to properly power the switch.

Switch control program

Software control communication is through USB connection to a host (such as a Windows PC or BERTScope Analyzer).

The Switch Control software provides additional control features, including:

- Duty Cycle setting for LFPS sequences
- LFPS Polling/Ping/Reset selection
- Custom LFPS type setup

Tektronix USB Receiver Testing software

This Tektronix USB Receiver Testing solution software is available for use with the BERTScope Analyzer. Once installed on a PC, the testing software communicates directly with the switch control program, for seamless operation through the user interface.

The USB Receiver Testing software also includes a detailed remote control protocol for automated testing.

Preventing ESD



CAUTION. *A direct electrostatic discharge can damage the instrument input. To learn how to avoid this damage, read the following information.*

Electrostatic discharge (ESD) is a concern when handling any electronic equipment. The instrument is designed with robust ESD protection; however it is still possible that large discharges of static electricity directly into the signal input may damage the instrument. To avoid damage to the instrument, use the following techniques to prevent electrostatic discharge to the instrument.

1. Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while connecting and disconnecting cables and adapters. The instrument provides a front panel connection for this purpose.
2. A cable that is left unconnected on a bench can develop a large static charge. Discharge the static voltage from all cables before connecting them to the instrument or device under test by momentarily grounding the center conductor of the cable, or by connecting a 50 Ω termination to one end, before attaching the cable to the instrument.

Power on status

Connect the Instrument Switch to a BERTScope Analyzer or host PC via the USB connector on the rear panel.

Push the Power button on the front panel. A green LED on the button indicates that power is turned on.

NOTE. *If you will be using a software switch control program, install it on the host PC before connecting the Instrument Switch.*

Setup information

The Instrument Switch serves as a regulated gateway for passing test signals to a DUT.

The switch can be operated in the following methods:

- Physical push buttons and connectors
- Switch Control software, installed on a host
- Tektronix USB Receiver Testing software, installed on a host

Software control communication is through USB connection to a host (such as a BERTScope Analyzer or a Windows PC). The Switch Control program should be installed on this control instrument before connecting the USB cable.

The Switch Control software is available for download from the Tektronix Web site at www.tektronix.com. Search for BSASWITCH and then follow the online instructions to download the software to your control host.

Example setup

The following figure shows an example setup incorporating the Instrument Switch. The DUT adapters are typical adapters not supplied by Tektronix.

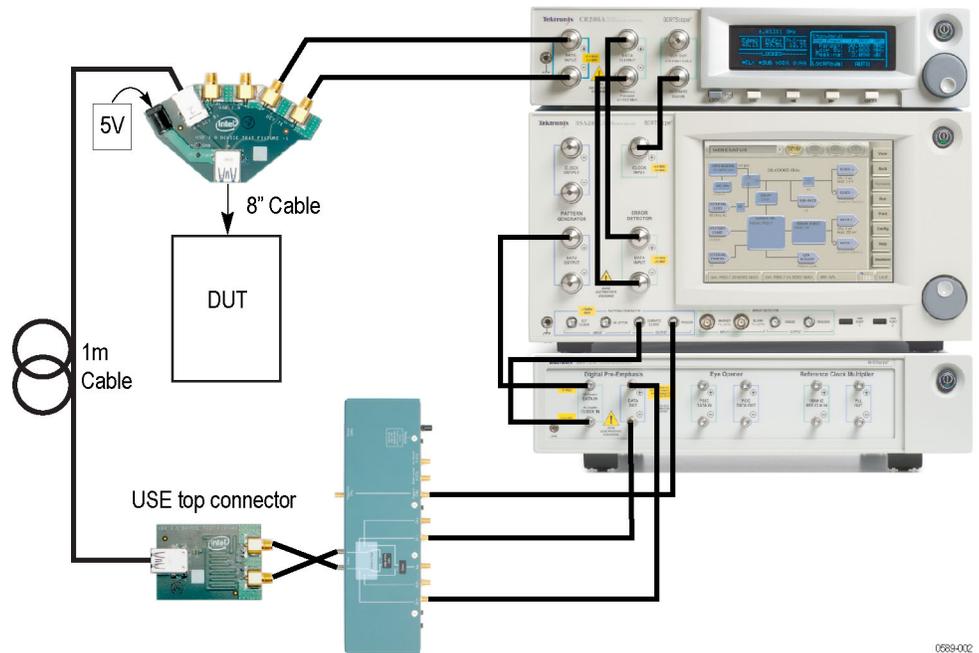


Figure 2: Example test setup – Jitter tolerance test cabling diagram

Switch signal paths

The Instrument Switch allows the selection of one of four RF signals as its output:

- Channel 1, through connectors on the front panel
- Channel 2, through connectors on the front panel

- Single-ended AUX Input, through a connector on the front panel. This single-ended source is split into a differential signal by a balun internal to the switch.
- Built-in Low Frequency Periodic Signal (LFPS) generator, which provides different types of USB LFPS signals that are useful during USB application testing. For example, the USB Receiver Testing solution software uses this fourth source to initiate loop-back training.

After the Primary, Secondary, and Trigger sources are set, the input Primary channel is passed directly to output until a Trigger event occurs, prompting a change to the Secondary channel.

The following figure (which is similar to the markings on the top of the Instrument Switch) is a straightforward depiction of the switching options.

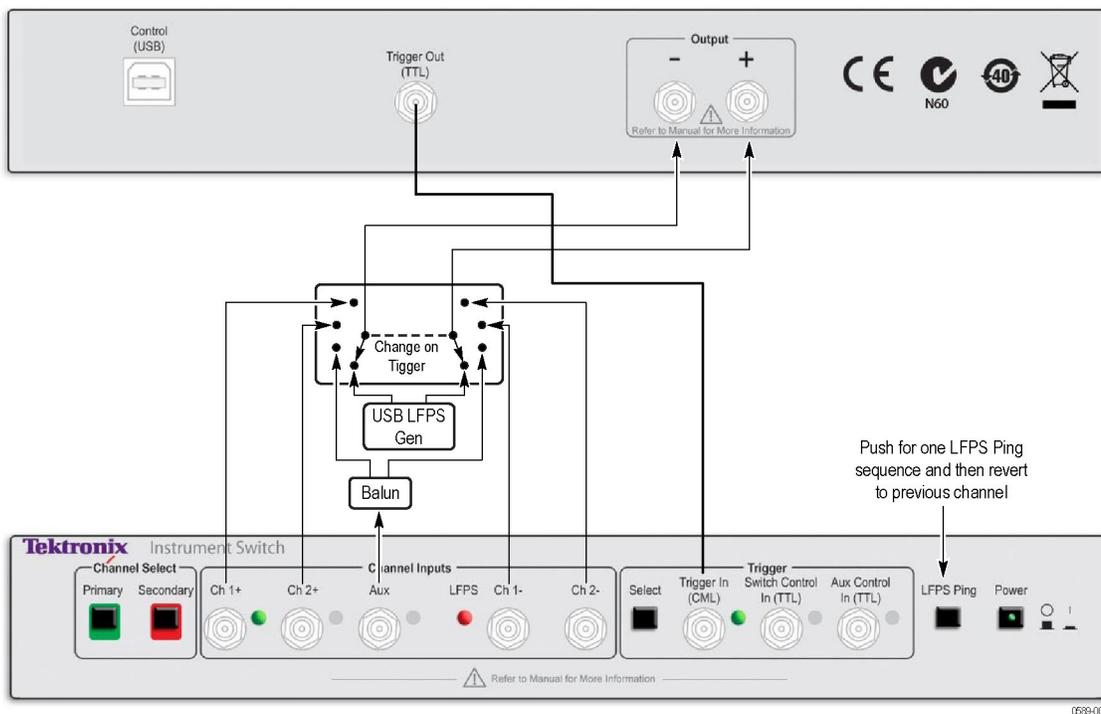


Figure 3: Instrument Switch paths

Operation

Testing signals are routed through the switch using the connectors on the front and rear panels. Use the front panel pushbuttons set the Primary and Secondary channels, select the Trigger source, and insert a one-time LFPS Ping.

The Instrument Switch is powered through USB connection to a host PC or BERTScope Analyzer. The switch software drivers must be installed on the host instrument in order to correctly power the switch.

Front panel controls and connectors

The following figure and table describe the front panel controls and connectors.



Figure 4: Front panel controls and connectors

Table 1: Front panel controls and connectors

Item	Description
Channel Select buttons	Use these buttons to select Primary and Secondary input channels. The Primary channel is the source normally passed to the switch outputs. Upon a trigger event, the input switches to the Secondary channel, if one is selected.
Primary 	Push the button to advance to the next channel in sequence: Channel 1 – Channel 2 – AUX – LFPS Generator. Hold the button down to cycle through the channels. The switch will not physically change position until the button is released, allowing you to make changes, for example, Channel 1 to AUX, without enabling Channel 2 in between.
Secondary 	Pushing the Primary Channel Select button <i>clears</i> any Secondary channel selection, effectively locking the switch to the Primary channel until a new Secondary channel is selected. When the switch is powered on, Channel 1 is selected as the Primary channel and the LFPS generator as the Secondary channel.
Channel LEDs	A green LED indicates the Primary Channel. A red LED might be turned on, indicating the Secondary channel if one is selected.
Ch 1+ input	SMA connector for a single-ended or differential (+) Channel 1 input, internally AC-coupled.
Ch 2+ input	SMA connector for a single-ended or differential (+) Channel 2input, internally AC-coupled.
Aux input	SMA connector; internally AC-coupled. This input is limited to a maximum frequency of 100 MHz; an internal balun converts the single-ended signal to a differential pair of signals for transmission to the switch outputs. This is intended for use with a Tektronix AFG or AWG instrument, to generate custom low-speed signaling.
LFPS LED	This LED identifies the internal LFPS generator as the channel source.

Table 1: Front panel controls and connectors (cont.)

Item	Description
Ch 1- input	SMA connector for a single-ended or differential (-) Channel 1 input, internally AC-coupled.
Ch 2- input	SMA connector for a single-ended or differential (-) Channel 2 input, internally AC-coupled.
Trigger Select 	This button selects a trigger input: Trigger In – Switch Control – AUX Control. Only one trigger is enabled at a time, indicated by a green LED. Push the button to enable the next trigger in sequence. Hold the button down to cycle through the sources; the switch will not enable a new trigger until the button is released, allowing you to make changes, for example, Trigger In to AUX Control, without enabling Switch Control in between.
Trigger LED 	One of three green LEDs is to indicate the active Trigger Input.
Trigger In (CML)	SMA connector. A rising edge causes a switch to the Secondary channel, if one has been selected. Expected signal levels are CML, with nominal input voltages of 0 V for V(ih) and - 400 mV for V(il). This input has protection circuitry that prevents the 3.3 V TTL input trigger signal from causing damage to the switch.
Switch Control In (3.3 V TTL)	SMA connector. A rising or falling edge of this 3.3 V TTL-level input causes a switch to the Secondary channel, if one has been selected.
Aux Control In (3.3 V TTL)	SMA connector. A rising or falling edge of this 3.3 V TTL-level input causes a switch to the Secondary channel, if one has been selected.
LFPS Ping 	The Ping button immediately switches the output to the internal LFPS generator, transmits a single LFPS sequence (a Ping), and immediately returns to the previously selected Primary channel. If the LFPS generator is selected as the Primary channel, a ping causes the Instrument Switch will go from tri-state to LFPS to tri-state output. If the LFPS generator is selected as the Secondary channel, a ping will switch from whatever state the primary channel is in to LFPS, and then back to the previous state of the Primary channel.
Power button 	Push the button to turn the power on. A green LED in the button will turn on. Push the button again to turn the power off.

Rear panel connectors

The following figure and table describe the rear panel connectors.



Figure 5: Rear panel connectors

Table 2: Rear panel and connectors

Item	Description
Control (USB)	A USB B-type connector on the rear panel provides power and software control through the USB 2.0 connection to a host instrument.
Trigger Out (3.3 V TTL)	The Trigger Out connector on the rear panel outputs a 3.3 V TTL-level signal that has been internally converted from the CML-level Trigger In. Use this to trigger additional external equipment. The source of the output signal(s) is determined by the Primary, Secondary, and Trigger selections.
Output (-)	The Output (-) connector on the rear panel outputs a differential (-) signal. SMA connector; internally AC-coupled.
Output (+)	The Output (+) connector on the rear panel outputs a differential (+) signal. SMA connector; internally AC-coupled.

USB Switch control

Through the USB connection, software programs installed on a host instrument can be used to manage switch operation.

Switch control software

The included Switch Control software program provides options in addition to manual operation, including:

- Duty Cycle setting for LFPS sequences
- LFPS Polling/Ping/Reset selection
- Custom LFPS type setup

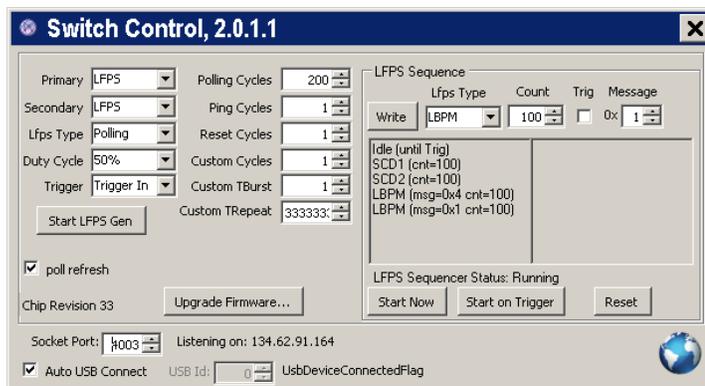


Figure 6: Switch Control software user interface

USB testing software

The Instrument Switch is an integral part of the Tektronix USB Receiver Testing solution. The USB Receiver Testing software communicates directly with the Switch Control program, managing all aspects of switch operation through one interface.

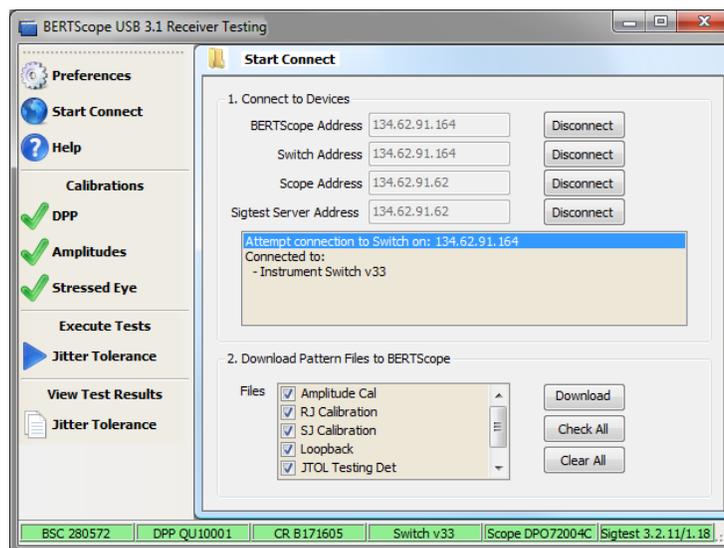


Figure 7: BERTScope USB Receiver Testing user interface

The USB Testing software includes a detailed remote control protocol for automated USB receiver testing.

Remote control commands specifically for configuring and controlling the Instrument Switch are listed in the following table. A complete command protocol is included in the USB Receiver Testing software online Help System.

Table 3: Remote control commands

Protocol	Type	Description	Parameter(s)
CONN:SWITCH [bool]	R/W Property	Connects or disconnects TCP/IP communications to Switch using default IP address and port	Boolean value indicating whether to connect (1) or disconnect (0)
PREF:SAVE	Command	Save Preferences	
PREF:SW:IP "text"	R/W Property	Instrument Switch communications TCP/IP Address	String IP address in the form 192.168.99.99
PREF:SW:PORT <int>	R/W Property	Instrument Switch communications TCP/IP Port	Decimal integer port number
PREF:SW:TO <int>	R/W Property	Instrument Switch communications Timeout	Decimal integer representing seconds

User service information

This section describes high-level service information and procedures for your instrument.

Service offerings

Tektronix provides service to cover repair under warranty and other services that are designed to meet your specific service needs.

Whether providing warranty repair service or any of the other services listed below, Tektronix service technicians are well equipped to service the your instrument. Services are provided at Tektronix Service Centers and on-site at your facility, depending on your location.

Warranty repair service

Tektronix warrants this product as described in the warranty statements at the front of this manual. Tektronix technicians provide warranty service at most Tektronix service locations worldwide. The Tektronix product catalog lists all service locations worldwide.

Maintenance

Protect the instrument from adverse weather conditions. The instrument is not waterproof. Do not store or leave the instrument where the display will be exposed to direct sunlight for long periods of time.

Preventive maintenance mainly consists of periodic cleaning. Periodic cleaning reduces instrument breakdown and increases reliability. Clean the instrument as needed, based on the operating environment. Dirty conditions may require more frequent cleaning than computer room conditions.

Clean the exterior surfaces

Clean the exterior surfaces with a dry, lint-free cloth or a soft-bristle brush. If dirt remains, use a cloth or swab dampened with a 75% isopropyl alcohol solution. A swab is useful for cleaning in narrow spaces around the controls and connectors. Do not use abrasive compounds on any part of the instrument.



CAUTION. *To avoid damage to the instrument, do not expose it to sprays, liquids, or solvents.*

To avoid damaging the instrument follow these precautions:

- Avoid getting moisture inside the instrument during external cleaning and use only enough solution to dampen the cloth or swab.
- Do not wash the front-panel power switch. Cover the switch while washing the instrument.
- Use only deionized water when cleaning. Use a 75% isopropyl alcohol solution as a cleanser and rinse with deionized water.
- Do not use chemical cleaning agents; they may damage the instrument. Avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Connector replacement

The Channel and Trigger inputs and outputs use 3.5 mm SMA connectors. Should a connector become damaged, replacements can be ordered from Tektronix.

Troubleshooting

Use the following guidelines to eliminate possible problems.

**Power button pressed,
green power LED does not
turn on**

This normally means that the switch is not receiving power from the USB port to which it is connected. Verify that the USB cable is securely connected between the host PC/BERTScope Analyzer and the Tektronix Instrument Switch, and that the host instrument is not in a low power (suspend) state.

**Power button pressed,
green power LED turns
on but the Channel 1 LED,
LFPS LED, and/or Trigger
In LED do not turn on**

When the Tektronix Instrument Switch is first powered on, the default configuration is as follows:

- The Primary channel is set to Channel 1.
- The Secondary channel is set to the LFPS Generator channel.
- The Trigger In (CML) input is selected.

The selection LEDs for these inputs should be lit. If the green power LED is the only LED lit, this normally means that the Tektronix Instrument Switch was not recognized and configured correctly by the host PC, typically because the switch driver has not been installed on the host PC. Verify that the switch driver has been installed on the host PC, or if necessary, reinstall the driver on the host system.

**Two of the Channel Input
Select LEDs are orange**

This behavior occurs if the currently selected trigger input is receiving a fast, repeating trigger signal. The switch will continuously oscillate between the primary and secondary channels in this case, and their LEDs will be perceived as orange (actually oscillating between green and red).

Repack the instrument for shipment

If the instrument is to be shipped to a Tektronix service center for repair, attach a tag showing the following information:

- Name of the product owner
- Address of the owner
- Instrument serial number
- A description of the problems encountered and/or service required

When packing an instrument for shipment, use the original packaging. If it is unavailable or not fit for use, contact your Tektronix representative to obtain new packaging.

Specifications

Table 4: General specifications

Item	Description
Analog Bandwidth (Ch 1, Ch 2)	>10 GHz
Max. Input Voltage (Ch 1, Ch 2, AUX)	3 V p-p per channel
Insertion Loss (Ch 1, Ch 2)	3 dB
Impedance	50 Ω
Switching Speed	400 ns (typical)
Input/Output Connectors	SMA 3.5 mm female
Power Supply	USB connection to a host (BERTScope Analyzer or Windows PC)
Software Control	USB connection to a control host

Table 5: Inputs

Item	Description
Channel 1+	Single-ended / Differential (+) Internally AC-coupled
Channel 2+	Single-ended / Differential (+) Internally AC-coupled
AUX In	Internally converted to differential output, Internally AC-coupled
Max. Frequency	100 MHz
LFPS	Internal LFPS generator
Max. Frequency	100 MHz
Channel 1-	Differential (-) Internally AC-coupled
Channel 2-	Differential (-) Internally AC-coupled
Trigger In	CML
Nominal Voltage	V(ih) 0 V V(il) -400 mV
Switch Control	3.3 V TTL
AUX Control	3.3 V TTL

Table 6: Outputs

Item	Description
Output -	Differential (-)
Output +	Single-ended / Differential (+)
Trigger Out	3.3 V TTL (internally converted from CML Trigger In)

Table 7: Environmental

Item	Description
Temperature, Operating	+10 to 40 °C
Humidity	Non-condensing at 40 °C, 15 to 95%

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