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TECHNICAL
OVERVIEW

11713B/C
Attenuator/Switch Driver



KEYSIGHT
TECHNOLOGIES

Automate ATE Systems with Keysight 11713B/C Attenuator/Switch Driver

Easy to integrate, easy to use

Key features

- User-friendly interface provides quick set up, switching, and remote control of small-scale automated test equipment (ATE)
- Controls up to 20 SPDT switches[1] concurrently, or a combination of 4 programmable attenuators and 4 SPDT switches
- Multiple connectivity options: GPIB, USB or LAN for easy remote integration
- An integrated, tri-voltage power supply saves rack space (11713C only)
- External VDC port connects any type of switch and provides forward compatibility for switches
- Full backward compatibility with the Keysight Technologies 11713A
- Built-in counter monitors the life cycle of attenuators and switches

Description

The Keysight 11713B/C attenuator/switch drivers provide remote or front panel drive control for programmable attenuators and electromechanical or solid state switches. Designed with both benchtop and ATE environments in mind, these attenuator/switch drivers provide an intuitive user interface, a variety of switching options, software programmability and remote control features for quick, easy design validation and automated testing. Front panel push-buttons and an easy-to-read LCD display simplify setup of functions such as voltage, TTL functions, IP address, etc.

The 11713B/C is a LXI Class C compliant instrument, so it can be easily controlled and triggered remotely using a full-featured graphical web interface. This feature is used in high-volume production environments. Software instrument drivers such as IVI-COM provide programming compatibility with popular application development environments and support PC industry standards such as Component Object Model (COM). Standard GPIB connectivity supports automated programmed scripting and ensures backward compatibility to Keysight 11713A attenuator/switch drivers.

These portable instruments come in a half-rack, 2U design with self-contained current limiting power supplies. The 11713C model also includes integrated tri-voltage supplies of 5, 15 & 24V and a user-defi ned external input voltage capability to ensure 100% biasing compatibility to most relays in the market. The 11713C has two individual banks of outputs each with an independent voltage drive. Fast TTL drive is also available on the 11713C, with either via the Viking connector ports or the S0/S9 ports.

1. The amount of switches and attenuators that can be driven will depend on the type of switch confi guration and attenuator section confi guration. The 11713C is capable of driving twice as many devices as the 11713B; however, the total load current that can be consumed is still 1.7A.

11713B/C comparison chart

Model number	11713B	11713C
Drives up to:	Two programmable attenuators and two electro-mechanical/solid state switches	Four programmable attenuators and four electro-mechanical/solid state switches
Drives up to:	10 SPDT switches[1]	20 SPDT switches[1]
Voltage	24 V	5, 15, & 24 V
Votage drive	1	2 independent banks of outputs
Attenuators types	Any, e.g.: Keysight 8494/5/6/7, Keysight 84904/6/7K/L/M	Any attenuator or switch[2]
Switch types	Any, e.g.: Keysight 8761, 8762, 8765 series, or U9397A/C	Any attenuator or switch[2]
Connectivity	GPIB with options for USB, LAN (LXI Class C)	GPIB, USB, LAN (LXI Class C)
Backwards compatibility with 11713A	Yes	Yes

1. The amount of switches and attenuators that can be driven will depend on the type of switch configurations and the attenuator sections. The 11713C is capable of driving twice as many devices as the 11713B; however, the total load current that can be consumed is still 1.7A.
2. Accepts most attenuators and switches available today.



Figure 1. Software drivers provide compatibility with most common programming environments

11713B/C remote programming

Drive power supply	11713B/C
Interface	GPIB interface operates to IEEE 488.2 and IEC65
	10/100BaseT LAN interface USB 2.0 interface
Command language	SCPI standard interface commands, Keysight 11713A backward compatible
GPIB compatibility	SH0, AH1, T0, TE0, L2, LE0, SR0, RL1, PP0, DC0, DT0, C0

11713B/C supplemental specifications and characteristics

Supplemental characteristics are intended to provide useful information. They are typical but non-warranted performance parameters

Drive power supply	11713B/C
Line power	100 to 240 Vac, automatic selection, 50/60 Hz 100 VA maximum
Current	1.7 A maximum continuous current Contact pairs 1 through 8, 9, and 0, total maximum current of 1.7 A continuous through all contacts (< 0.7 A per contact)
Driver life	> 2,000,000 switchings at 0.7 A for contact pairs 9 and 0
Maximum load inductance	500 mH
Maximum load capacitance	< 0.01 µF for contact pairs 9 and 0

Physical specifications

Net Weight 3.2 kg (7.1 lbs)	
Dimensions (H x W x D) with handle and rubber bumper	103.8 mm x 232.2 mm x 378.7 mm (4.1 inches x 9.1 inches X 14.9 inches)
Dimensions (H x W x D) without handle and rubber bumper	88.3 mm x 212.7 mm x 364.0 mm (3.5 inches x 8.4 inches X 14.3 inches)

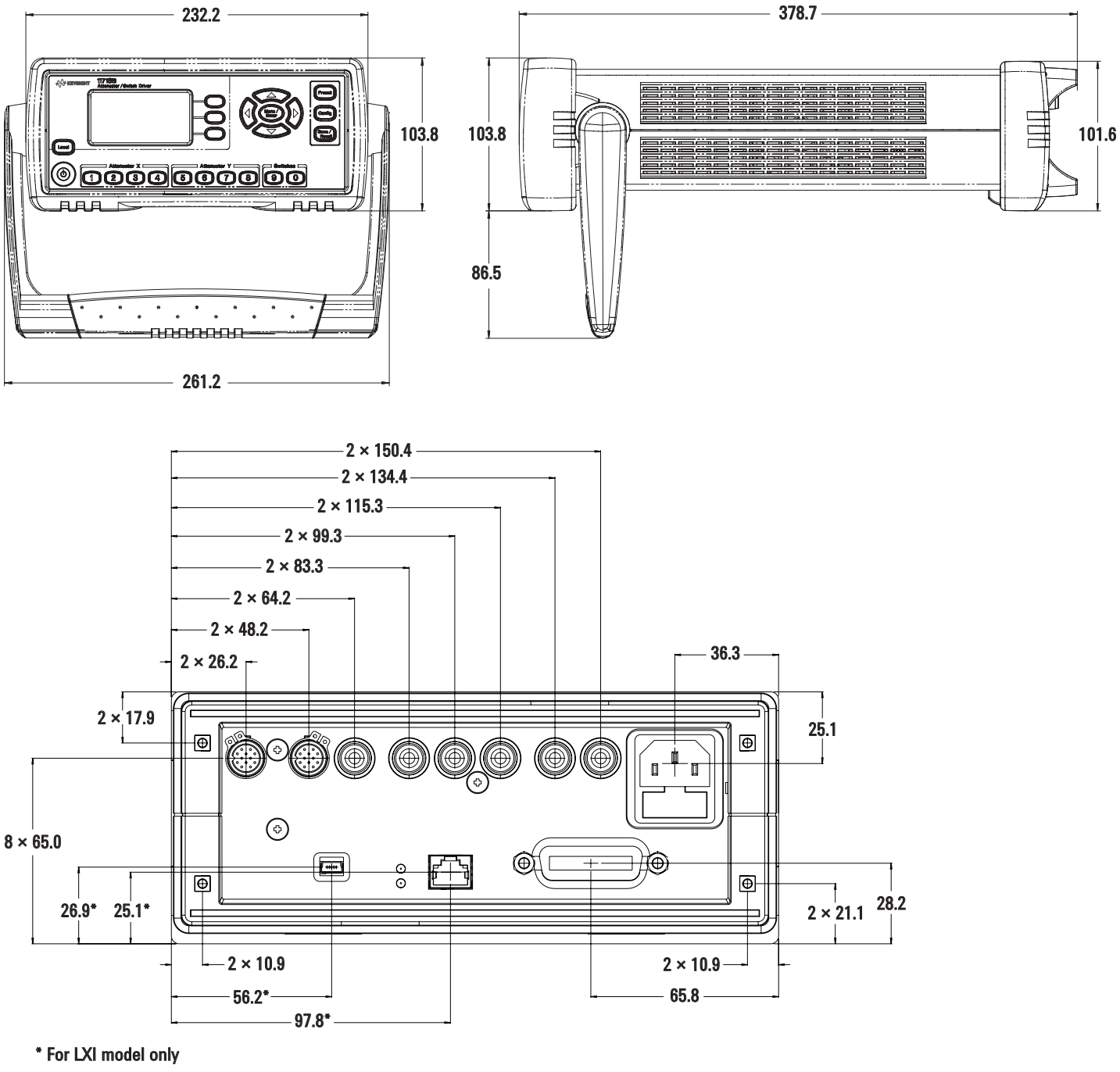


Figure 2. 11713B product outline (with handle and rubber bumper)

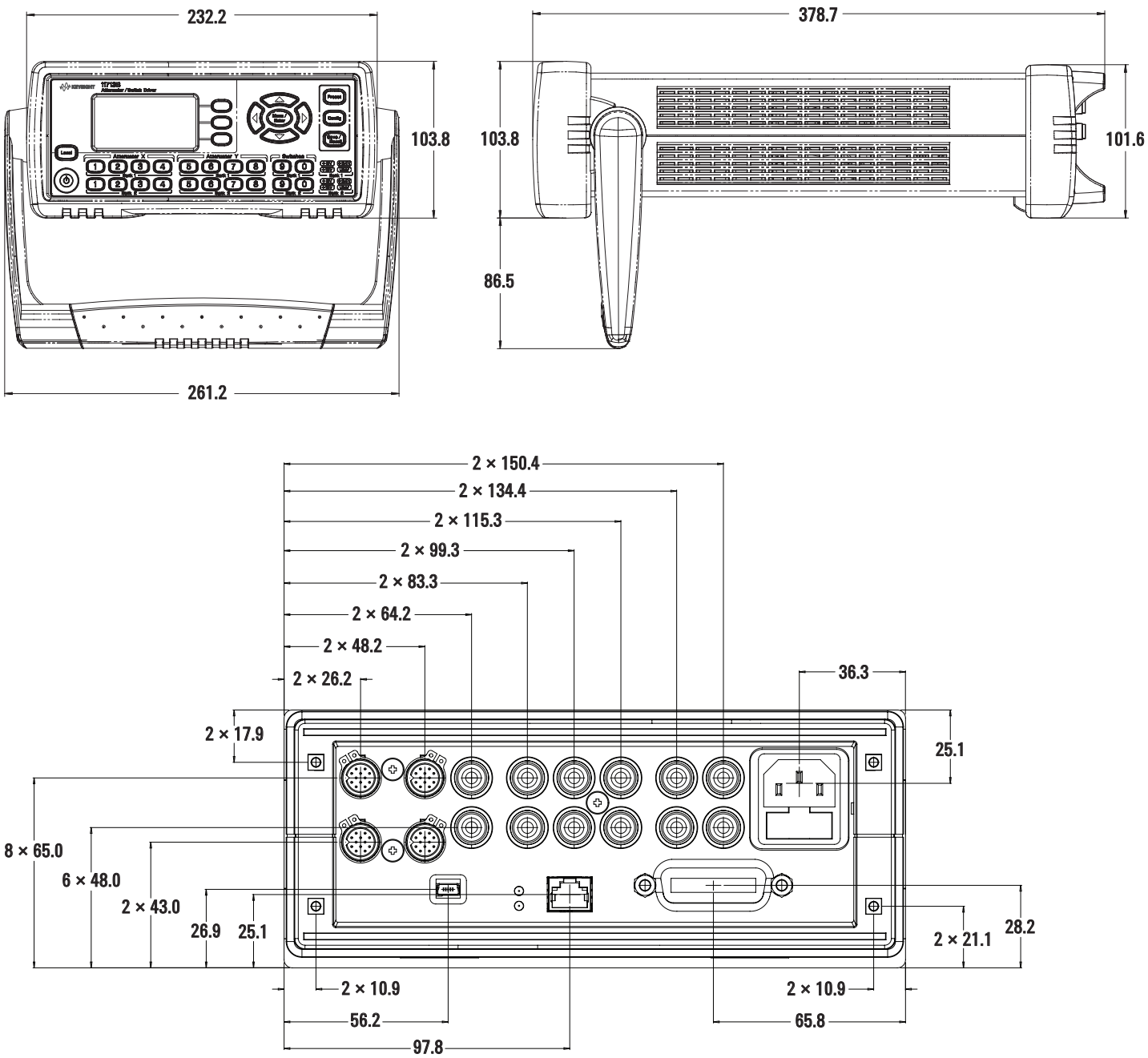


Figure 3. 11713C product outline (with handle and rubber bumper)

11713C Front Panel at a Glance

This section briefly describes the function of the front panel keys of 11713C.

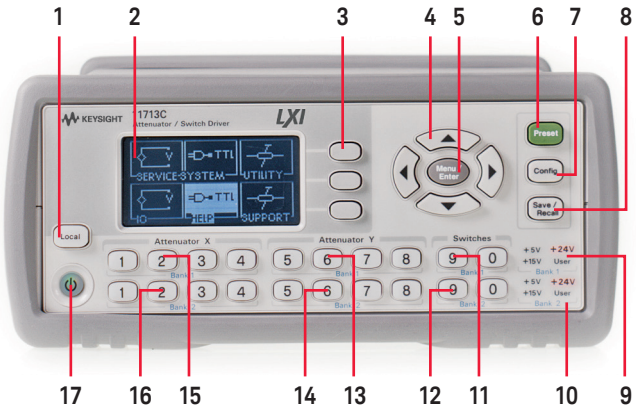


Figure 4. 11713C front panel features

1. **Local.** Press this key to control the driver from the front panel when it is operating via the remote interfaces.
2. **LCD screen.**
3. **Softkeys.** These unmarked keys are referred to by the text on display next to them.
4. **Navigation buttons.** The arrow keys are used to navigate parameters displayed on the LCD screen or change parameters such as GPIB address.
5. **Menu/Enter.** Press this key to select the highlighted parameter On/Off or select the highlighted field or go back to the main menu.
6. **Preset.** Press this key to preset the driver.
7. **Config.** Press this key to access the configuration menu. You can set the atttenuator type, supply voltage and TTL condition through this menu.
8. **Save/Recall.** Press this key to save current settings or recall saved settings.
9. **Supply Voltage for Bank 1.** Indicates supply voltage setting (background LED in red) for bank 1.
10. **Supply Voltage for Bank 2.** Indicates supply voltage setting (background LED in red) for bank 2.
11. **Switches for Bank 1.** In the local mode, pushbutton switches 9 and 0 change the position of a coaxial switch connected to rear panel banana jacks S9 A/B and S0 A/B respectively, for bank 1.
12. **Switches for Bank 2.** In the local mode, pushbutton switches 9 and 0 change the position of a coaxial switch connected to rear panel banana jacks S9 A/B and S0 A/B respectively for, bank 2.
13. **Attenuator Y for Bank 1.** In the local mode, pushbuttons 5, 6, 7, and 8 change the attenuation setting of an attenuator or change the position of coaxial switch(es) connected to the ATTEN Y connector on the rear panel, for bank 1.
14. **Attenuator Y for Bank 2.** In the local mode, pushbuttons 5, 6, 7, and 8 change the attenuation setting of an attenuator or change the position of coaxial switch(es) connected to the ATTEN Y connector on the rear panel, for bank 2.
15. **Attenuator X for Bank 1.** In the local mode, pushbuttons 1, 2, 3, and 4 change the attenuation setting of an attenuator or change the position of coaxial switch(es) connected to the ATTEN X connector on the rear panel, for bank 1.
16. **Attenuator X for Bank 2.** In the local mode, pushbuttons 1, 2, 3, and 4 change the attenuation setting of an attenuator or change the position of coaxial switch(es) connected to the ATTEN X connector on the rear panel, for bank 2.
17. **On/Standby.** Press this key to switch between on and standby. When power is supplied, the background LED is red. Pressing the key once, switches the driver on and the background LED turns to green.

11713C Rear Panel at a Glance

This section briefly describes the function of the rear panel keys of 11713C.

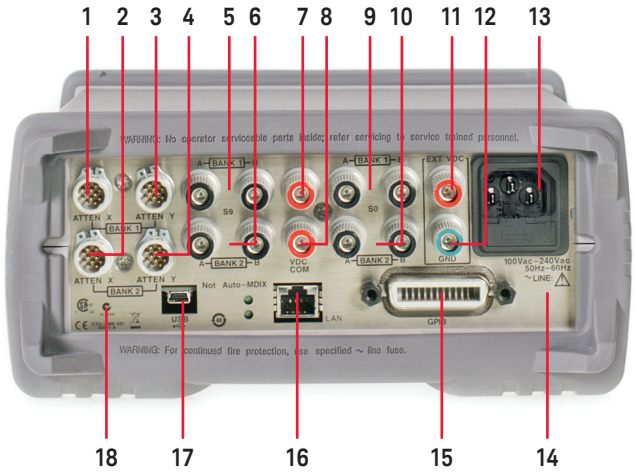


Figure 5. 11713C rear panel features

1. **ATTEN X Bank 1.** Viking connector for connection to attenuator or switch(es), for bank 1.
2. **ATTEN X Bank 2.** Viking connector for connection to attenuator or switch(es), for bank 2.
3. **ATTEN Y Bank 1.** Viking connector for connection to attenuator or switch(es), for bank 1.
4. **ATTEN Y Bank 2.** Viking connector for connection to attenuator or switch(es), for bank 2.
5. **S9 A/B Bank 1.** Banana jack connectors for connection to coaxial switch, for bank 1.
6. **S9 A/B Bank 2.** Banana jack connectors for connection to coaxial switch, for bank 2.
7. **VDC COM Bank 1.** Banana jack connector to provide common Vdc in driving the coaxial switches connected to S9 and/or S0, for bank 1.
8. **VDC COM Bank 2.** Banana jack connector to provide common Vdc in driving the coaxial switches connected to S9 and/or S0, for bank 2.
9. **S0 A/B Bank 1.** Banana jack connectors for connection to coaxial switch, for bank 1.
10. **S0 A/B Bank 2.** Banana jack connectors for connection to coaxial switch, for bank 2.
11. **External VDC.** Banana jack connector to provide user- defi ned Vdc, for both banks.
12. **Ground.** Banana jack connector to provide grounding, for both banks.
13. **Receptacle.** Matches transformer primary to line voltage via power cable.
14. **Alert symbol.** This symbol is used to point out a necessary reference for the user.
15. **GPIB Connector.** The interface connector from a source device to a listening device for the remote mode of operation.
16. **LAN Connector.** The interface connector for LAN cable.
17. **USB Connector.** The interface connector for Type mini B 5-pin USB cable.
18. **Instrument Markings.**

Environmental specifications

Keysight 11713B/C attenuator/switch drivers are designed to fully comply with Keysight Technologies' product operating environmental specifications shows in table below.

Temperature	
Operating	0 °C to +50 °C
Storage	–40 °C to +70 °C
Humidity	
Operating	95% RH at 40 °C, 5 days cyclic
Storage	90% RH at 65 °C, 24 hours
Condensing	95% RH at 40 °C, 5 hours (condensation 15 minutes)
Shock	
End-user handling	Half-sine: 2 to 3 ms duration, 60 in/s (1.6 ms) delta-V
Bench Handling	Half-sine: 11 ms duration, 30 grms
Functional	Trapezoidal: 18-22 ms duration, 337 in/s (8.56 ms) delta-V
Transportation	Per MIL-PRF-28800F
Vibration	
Operating	Random: 0.21G rms, 5 to 500 Hz, 10 min/axis
Survival	Random: 2.09G rms, 5 to 500 Hz, 10 min/axis
	Swept-sine: 0.5 G rms, 5 to 500 Hz, 10 min/axis
Altitude	
Operating	< 4,000 meters (13,080 feet)
Non-operating	< 15,300 meters (50,000 feet)

Product configuration and ordering information

11713B	
Connectivity options	
Option STD	Standard configuration, full compatibility to 11713A
Option LXI	LXI class-C configuration, additional USB/LAN connectivity
Cable options	
Option 001	Viking connector to 10-pin DIP connector
Option 101	Viking connector to viking connector
Option 201	Viking connector to 12-pin conductor cable, bare wire
Option 301	Viking connector to (4) ribbon cables
Option 401	Dual-viking connector to 16-pin DIP connector
Option 501	Viking connector to (4) 9-pin Dsub connectors
Option 601	Viking connector to 16-pin DIP connector
Option 701	Viking connector to 14-pin DIP connector
Option 801	Viking connector to (4) 10-pin DIP connectors
Rack mount kit options (optional)	
Option 908	Rack mount kit for one instrument
Option 909	Rack mount kit for two instruments

Note: The cable options are also orderable as standalone products. The maximum quantity orderable for each cable option is 9.

Product configuration and ordering information (continued)

11713C	
Cable options	
Option 001	Viking connector to 10-pin DIP connector
Option 101	Viking connector to viking connector
Option 201	Viking connector to 12-pin conductor cable, bare wire
Option 301	Viking connector to (4) ribbon cables
Option 401	Dual-viking connector to 16-pin DIP connector
Option 501	Viking connector to (4) 9-pin Dsub connectors
Option 601	Viking connector to 16-pin DIP connector
Option 701	Viking connector to 14-pin DIP connector
Option 801	Viking connector to (4) 10-pin DIP connectors
Rack mount kit options (optional)	
Option 908	Rack mount kit for one instrument
Option 909	Rack mount kit for two instruments

Note: The cable options are also orderable as standalone products. The maximum quantity orderable for each cable option is 9.

The 11713B/C attenuator/switch drivers are designed to drive the following Keysight attenuators and switches. If you are using attenuators and switches made by another supplier, check the switching characteristics against those specified in Chapter 3,"Specifications" of the 11713B/C Attenuator/Switch Drivers Operating and Service Manual. Refer to Keysight 11713B/C Configuration Guide, literature number 5989-7277EN, for the most up-to-date list.

Compatible Keysight switches

Keysight model number	Description*
8761A/B, 8765A/B/C/D/F (33314A/B/D), N1810UL	SPDT, unterminated
8762A/B/C/F (33311A/B/C), N1810TL	SPDT, terminated
8763A/B/C (33312A/B/C), N1811TL	Bypass, 4-port, terminated
8764A/B/C (33313A/B/C), N1812UL	Bypass, 5-port, unterminated
8766K (33366K)	SP3T, unterminated
8767K (33367K), 8767M, L7204A/B/C	SP4T, unterminated
87104A/B/C/D, 87204A/B/C, L7104A/B/C	SP4T, terminated
8768K (33368K), 8768M	SP5T, unterminated
8769K (33369K), 8769M, L7206A/B/C	SP6T, unterminated
87106A/B/C/D, 87206A/B/C, L7106A/B/C	SP6T, terminated
87222C/D/E, L7222C	DPDT (transfer), unterminated
87406B	Matrix, 4-port, terminated
87606B	Matrix, 6-port, terminated
U9397A/C	SPDT, terminated, solid state

* Electromechanical switches unless specified

Compatible Keysight attenuators

Keysight model number	Description*
8494G/H (33320G/H), 84904K/L/M (33324K/L)	11 dB, 1 dB steps
8495G/H/K (33321 G/H/K), 84907K/L (33327K/L)	70 dB, 10 dB steps
8496G/H (33322G/H)	110 dB, 10 dB steps
8497K (33323K), 84906K/L (33326K/L)	90 dB, 10 dB steps
84905M	60 dB, 10 dB steps
84908M	65 dB, 5 dB steps

Related Literature

Keysight 11713B/C Attenuator/Switch Driver Configuration Guide,
literature number 5989-7277EN

Keysight 70611A and 87130A Switch Attenuator Drivers Configuration Guide,
literature number 5963-2038E

Keysight 11713B/C Attenuator Switch Driver Operating and Service Manual,
literature number 11713-90024

Keysight RF and Microwave Switch Selection Guide,
literature number 5989-6031EN

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