

Keysight Pulse Generator 81133A/81134A

Getting
Started
Guide

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Getting Started with the **Keysight Pulse Generator** 81133A/81134A

You only need a few minutes to get started with the Keysight 81133A and 81134A Pulse Generator.

This Getting Started Brochure helps you to quickly understand the operating principles and set up your first signals.

If you need more detailed information on the Keysight 81133A and 81134A Pulse Generator, check out the Online Help.

For more examples and remote programming information,
please refer to the User Guide and the Programming Guide,
delivered on the product CD.

Notice

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Services and Support

Any adjustment, maintenance, or repair of this product must be performed by qualified personnel. Contact your customer engineer through your local Keysight Technologies Service Center. You can find a list of local service representatives on the Web at

<http://www.keysight.com/find/assist>

Safety Summary

General Safety Precautions

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument.

Keysight Technologies Inc. assumes no liability for the customer’s failure to comply with these requirements.

Before operation, review the instrument and manual for safety markings and instructions. You must follow these to ensure safe operation and to maintain the instrument in safe condition.

General

This product is a Safety Class 1 instrument (provided with a protective earth terminal). The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.

All Light Emitting Diodes (LEDs) used in this product are Class 1 LEDs as per IEC 60825-1.

Environmental Conditions

This instrument is intended for indoor use in an installation category II, pollution degree 2 environment. It is designed to operate at a maximum relative humidity of 95% and at altitudes of up to 2000 meters.

Refer to the specifications tables for the ac mains voltage requirements and ambient operating temperature range.

Before Applying Power

Verify that all safety precautions are taken. The power cable inlet of the instrument serves as a device to disconnect from the mains in case of hazard. The instrument must be positioned so that the operator can easily access the power cable inlet. When the instrument is rack-mounted the rack must be provided with an easily accessible mains switch. General operation advises the mains supply voltage fluctuations are not to exceed 10% of nominal supply voltage

Ground the Instrument

To minimize shock hazard, the instrument chassis and cover must be connected to an electrical protective earth ground. The instrument must be connected to the ac power mains through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

Do Not Operate in an Explosive Atmosphere

Do not operate the instrument in the presence of flammable gases or fumes.

Do Not Remove the Instrument Cover

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified personnel. Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

Installing the Keysight 81133A and 81134A

Check if the Keysight 81133A or 81134A shipping container contains the following standard deliverables:



The Keysight Pulse Generator
81133A or 81134A



power cable



USB cable



The Product CDs



This Getting Started Brochure

If the contents are incomplete, if there is mechanical damage, or if the instrument does not work within its specifications, notify the nearest Keysight office. The Keysight office will arrange for repair or replacement without awaiting settlement.

Once you have plugged in the instrument, you can start using it.

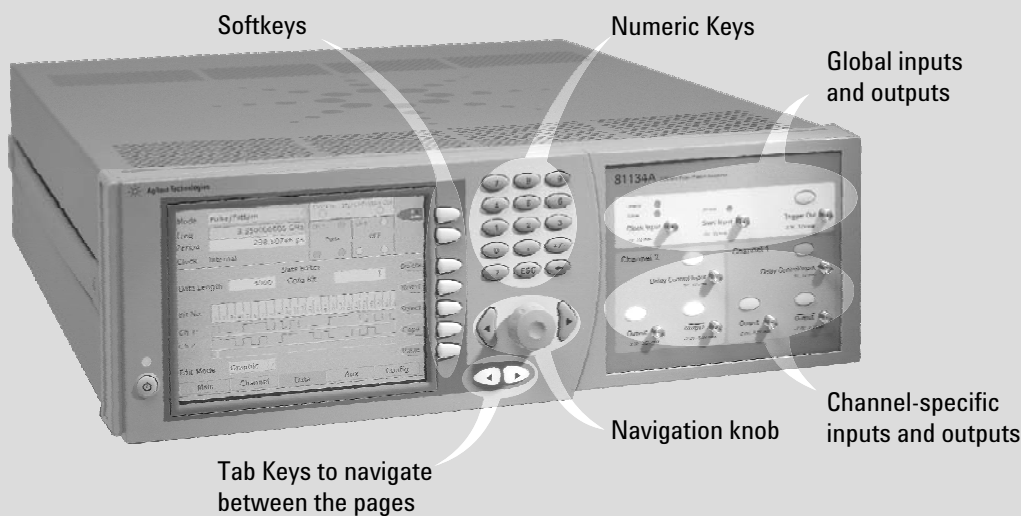
Make sure you keep the ventilation holes free wherever you install the instrument.

The USB interface will be supported starting spring 2003.
Please visit our Web page for a free update of the firmware.

Please refer to the User Guide delivered on the Product CD if you need more information about working with the instrument.

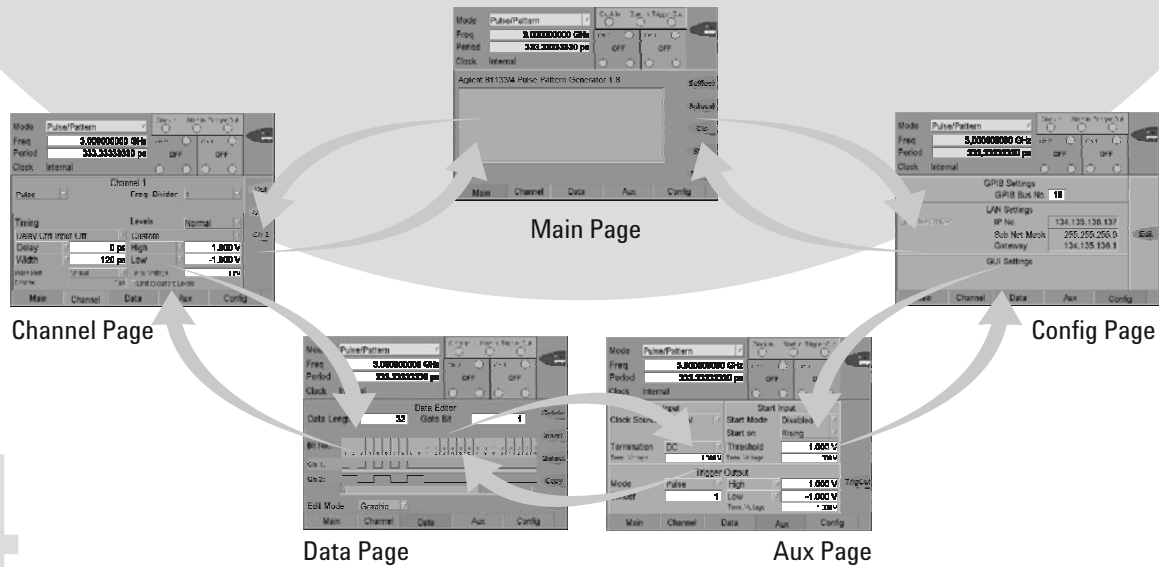
Getting Started with the Keysight 81133A and 81134A

Now that you have unpacked the instrument and plugged it in, let's take a look at the main elements of the front panel.



- Switch on the instrument. You can immediately start playing with the settings.
- Start by pressing the tab keys. You see that only the lower part of the panel page changes. You can switch between five panel pages, which allow you to set parameters for different instrument settings.
- The parameters at the upper part of the panel page are valid for the whole instrument.

Navigate through the pages with the Tab Keys

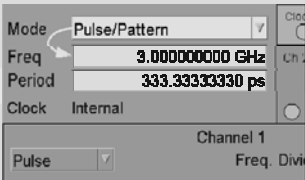


Changing Parameters

The navigation knob makes it easy to move through and set the parameters.



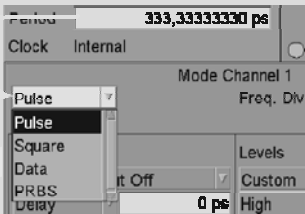
Rotate the navigation knob to move from one parameter to the next.



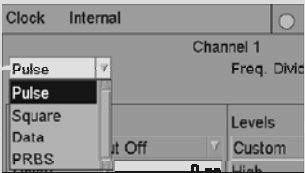
Let's select a parameter from a selection list.



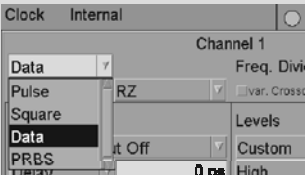
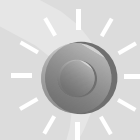
Press the navigation knob to open the selection list (like clicking with the mouse).



Rotate the navigation knob to scroll through the list.



Select an item by pressing the navigation knob.



You have three options for using the navigation knob.



rotate



press



press and rotate

Changing Parameters



Now let's change a number field

Press the navigation knob once to focus at the number field.

Mode	Burst	1
Freq	3,000000000 GHz	
Period	333,33333330 ps	
Clock	Internal	



When you rotate the navigation knob the value changes. You can do this in run time. It let's you immediately see the changes on a scope.

Turn the navigation knob to set the number



Press the navigation knob once when you are done.

Or, to change one digit



Press and rotate the navigation knob to select the digit.

You can also press the arrows next to the navigation knob.

Freq	3.000000000 GHz	CH
------	-----------------	----



Release the navigation knob. Now when you rotate it, the number changes.

Freq	3.300000000 GHz	CH
------	-----------------	----



Press the navigation knob once when you are done.

Freq	3.300000000 GHz	CH
------	-----------------	----

You can also:

Use the arrows next to the navigation knob to select a digit.



Enter a value with the key pad.

Setting Up a Data Pattern

Imagine, you have designed a new digital circuit with ECL logic and 3.3 GHz clock, and you want to check its correct behavior.

To test it, you decide to simulate a 32-bit pattern signal with NRZ data output format:

11110011100110010010100100000000

Protect the DUT

Whenever you change a parameter, the generated signal immediately changes. To protect your DUT, make sure you disconnect the channel outputs first.

Do this by pressing the softkey next the following function:



The open contactor shows you that your DUT is now disconnected

Now let's set the instrument parameters

These define the signal that will be generated.

4

GHz

Select the Unit

3

3.3 MHz
50.000000 ns

Enter the Frequency value using the keypad

2

Pulse/Pattern

Choose the Pulse/Pattern Mode for the Signal

1

First, disconnect the outputs to protect the DUT

Mode	Pulse/Pattern	Clock In	Start In	Trigger Out
Freq	3.3 MHz	ch 2	ch 1	Unit
Period	50.000000 ns	OFF	OFF	OFF
Clock	Internal	☒	☒	☒

Agilent B1133/4 Pulse Pattern Generator 1 8

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Setting Up a Data Pattern

You can now set the channel mode, timing and level parameters for the channel

1. Switch to the Channel Page

2. Select Pulse Mode Data

3. Select Pulse Type NRZ

4. Select the ECL level format

5. Enable the Channel 1 normal Output by pressing the respective softkey

Indicates that the Parameters are set for Channel 1

The LEDs show the status of the outputs
gray = disabled, green = enabled, crossed out = all outputs disconnected

You can switch between the two channels by pressing this softkey

Now let's set the data

1. Switch to the Data Page

2. Switch to the Numeric Edit Mode

3. Enter a data pattern length of 32 bits

4. Enter your data pattern

Setting Up a Data Pattern

Reconnect the DUT

When you are done, you can reconnect the DUT by clicking the following softkey:



If you attach a scope (as DUT), you can immediately see the signal

You can use the generator's trigger output to trigger the scope.

The LEDs tell you which outputs are enabled

1

Switch to Aux Page

2

Enable the Trigger Output ...

... or press the Trigger Out softkey

Now you can view the data pattern and the trigger output signal on your oscilloscope

What Else You Can Do

The Keysight 81133A and 81134A Pulse/Pattern Generators are high-end, easy-to-use tools for generating pulses, patterns and data at speeds up to 3.35 MHz. They are ideal instruments for testing logic devices (for example, ECL, LVPECL, LVDS) and other digital devices with clock rates from 15 MHz to 3.35 GHz.

You can use the Pulse/Pattern Generators for applications where timing and performance are critical and full control over signal jitter is required. The instruments are ideal data and pattern sources for eye diagram measurements.

Your advantages are

Fast rise times, low jitter and full parameter flexibility

When timing is critical, the 81133/34A's fast rise times, the low jitter and full parameter flexibility make it an ideal pulse, clock and data source.

PRBS from 2^5-1 to $2^{31}-1$

You can evaluate the performance of a device in eye diagram measurements with PRBS from 2^5-1 to $2^{31}-1$.

Full signal manipulation

You can add jitter to clock or data signals with the *Delay Control Input* and deform the eye with the *Variable Crossover Point*.

Predefined Levels

You can use the predefined levels to easily set up channels for commonly used logic families. These are: ECL, LVPECL, LVDS.

Data can be 8 kB of pattern memory

You can create large data patterns with 8 kB of pattern memory.

Keysight Email Updates

<http://www.keysight.com/find/emailupdates>

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describes our commitment to you. Please direct any questions about Keysight's privacy program to privacy_advocate@keysight.com

Requirements and Possibilities for Remote Control

Using the Pulse Generator's Remote Control Interfaces

You can integrate the Pulse Generator in your production environment. Its remote programming interfaces (USB, LAN, GPIB) allow you to set up extensive tests that involve several instruments. The accompanying Keysight I/O Libraries for instrument control must be installed on the controlling PC.

It is possible that your Generator's firmware is not set up for USB. USB functionality will be included in a later release of the firmware. Check the Keysight Web page for update information.

For detailed information on how to connect the instrument physically to your external PC, and what you have to do to talk to the instrument, please refer to the Programming Guide delivered on the Product CD.

Keysight Corporate Information, Product Numbers

For more information, please visit us at:

www.keysight.com/find/pulse_generator

Ordering Information

Keysight 81133A	3.35 GHz 1-channel Pulse/Pattern Generator
Keysight 81134A	3.35 GHz 2-channel Pulse/Pattern Generator

Options

Keysight 8113xA-UK6	Commerical Calibration Certificate with Test Data
Keysight 8113xA-1CP	Rackmount and Handle kit
Keysight 1494-0059	Rack Slide Kit

Accessories

Keysight 15435 A	Transition Time Converter	150ps
Keysight 15432 B	Transition Time Converter	250ps
Keysight 15433 B	Transition Time Converter	500ps
Keysight 15434 B	Transition Time Converter	1000ps
Keysight 15438 A	Transition Time Converter	2000ps

Calibration and service

- Commercial Calibration for 3 years
- Commercial Calibration for 5 years
- Standard Compliant Calibration for 3 years
- Standard Compliant Calibration for 5 years

Related keysight Literature

- Keysight Family of Pulse/Pattern Generators Brochure 5980-0489E
- Keysight 81100 Family Pulse/Pattern Produkt Overview 5980-1215E
- Keysight 3.35 GHz Pulse/Pattern Generators Photocard 5988-5935EN
- Keysight Technologies 81133A and 81134A 3.35 GHz Pulse/Pattern Generators, Technical Specifications 5988-5549EN
- Need to test jitter? 5988-7050EN



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