



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

You only need a few minutes to get started with the Agilent 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 Agilent 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.*



**Agilent Technologies**

# Notice

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

<http://www.agilent.com/Service/English/index.html>

# 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.

Agilent 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.

## 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 Agilent 81133A and 81134A

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



The Agilent Pulse Generator  
81133A or 81134A



power cable



USB cable



The Product CDs



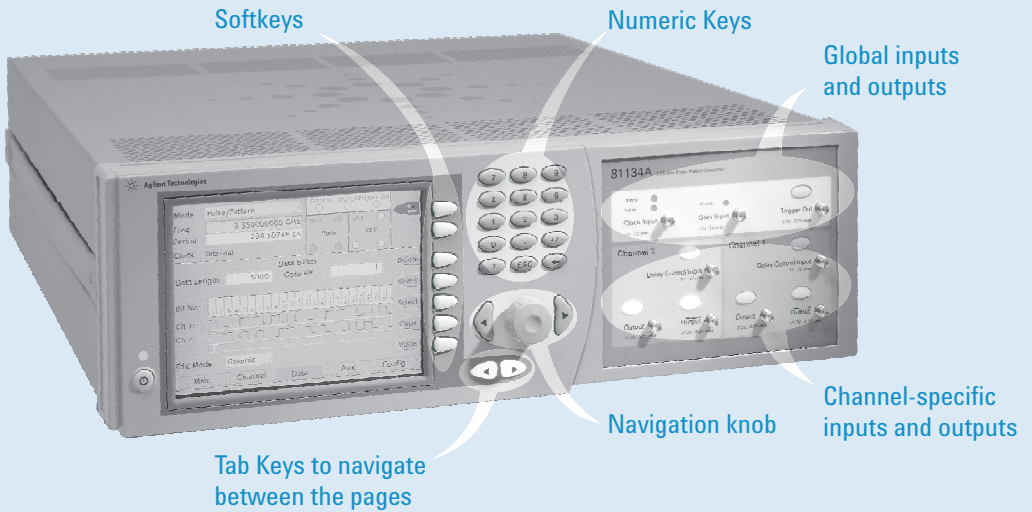
This Getting Started Brochure

- If the contents are incomplete, if there is mechanical damage, or if the instrument does not work within its specifications, notify the nearest Agilent office. The Agilent 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.**

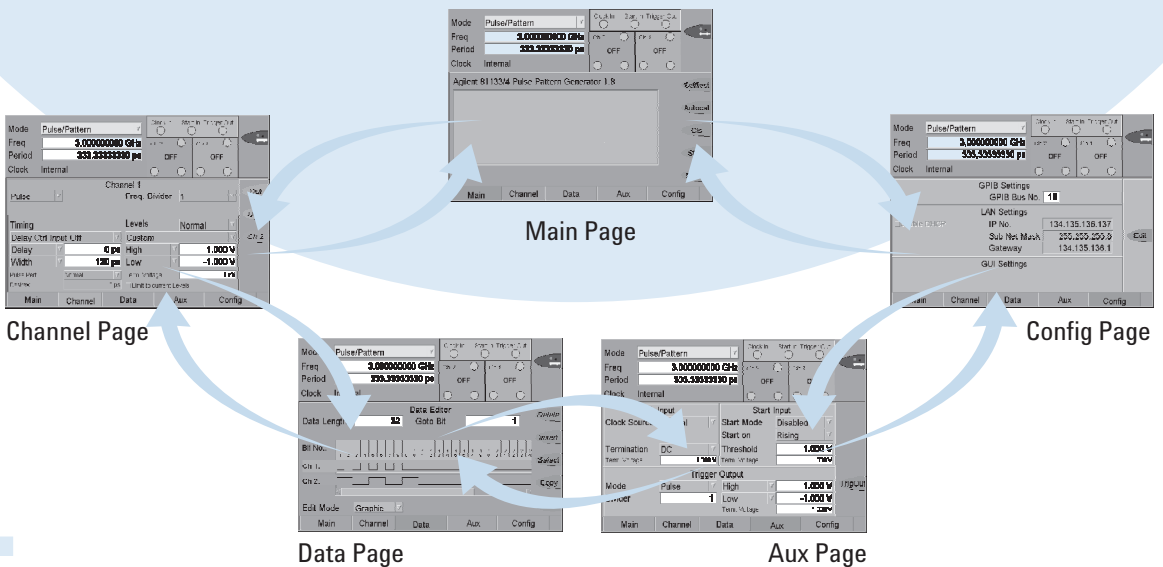
# Getting Started with the Agilent 81133A and 81134A

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

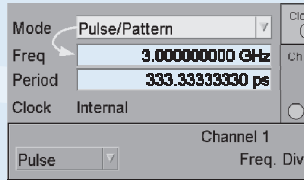


# Changing Parameters

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



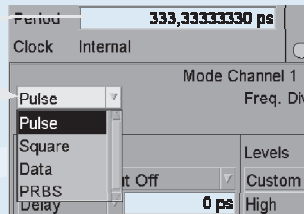
Rotate the navigation knob to move from one parameter to the next.



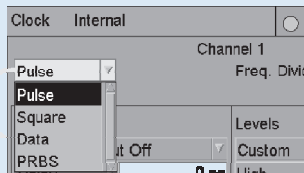
Let's select a parameter from a selection list.



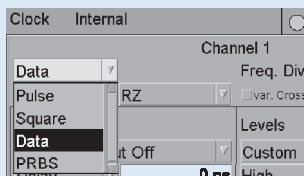
Press the navigation knob to open the selection list (like clicking with the mouse).



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



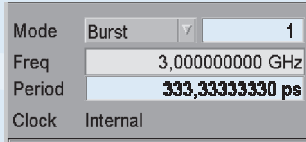
press and rotate

# Changing Parameters



## Now let's change a number field

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



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



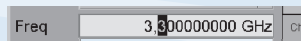
## Or, to change one digit

Press and rotate the navigation knob to select the digit.

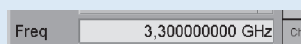
You can also press the arrows next to the navigation knob.



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



Press the navigation knob once when you are done.



## You can also:

Use the arrows next 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.

**1** First, disconnect the outputs to protect the DUT

**2** Choose the Pulse/Pattern Mode for the Signal

**3** Enter the Frequency value using the keypad

**4** Select the Unit

The diagram shows the following configuration steps on the Agilent 81133/4 Pulse Pattern Generator 1 B interface:

- Step 1:** The output control knob is shown with the contactor open.
- Step 2:** The Mode is set to Pulse/Pattern.
- Step 3:** The Frequency (Freq) is set to 3.3 MHz and the Period is set to 50.000000 ns.
- Step 4:** The unit is set to GHz.

# 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

Channel configuration parameters shown in the screenshot:

- Mode: Pulse/Pattern
- Freq: 3.300000000 GHz
- Period: 303.030303 ps
- Clock: Internal
- Channel 1 Data: NRZ
- Timing: Delay 0 ps, DCycle 100%, Pulse Perf. Fast
- Levels: Normal
- Ampl: -800 mV
- Offset: -1.350 V
- Term. Voltage: -2.000 V

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

Data Editor parameters shown in the screenshot:

- Data Length: 32
- Goto Bit: 1
- Bit No.: 1-32
- Ch 1: 1111100111001100100101001
- Ch 2: 1100110011000000000000000
- Edit Mode: Numeric



# 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

Mode	Pulse/Pattern	Clock In	Start In	Trigger Out
Freq	3.000000000 GHz	Ch 2	Ch 1	
Period	333.33333330 ps	OFF	Data, NRZ	
Clock	Internal			
Clock Input		Start Input		
Clock Source	Internal	Start Mode	Disabled	
Divider	1	Start on	Rising	
Term. Voltage	1.000 V	Threshold	1.000 V	
		Term. Voltage	1.000 V	
Trigger Output				
Mode	Pulse	High	1.000 V	TrigOut
Divider	1	Low	-1.000 V	
		Term. Voltage	1.000 V	
Main	Channel	Data	Aux	Config

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

# What Else You Can Do

The Agilent 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.

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# 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 Agilent 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 Agilent 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.

# Agilent Corporate Information, Product Numbers

For more information, please visit us at:

[www.agilent.com/find/pulse\\_generator](http://www.agilent.com/find/pulse_generator)

## Ordering Information

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

## Options

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

## Accessories

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

## Warranty and service

3 years Return-to-Agilent (Standard with every Order)  
5 years Return-to-Agilent

Commercial Calibration for 3 years  
Commercial Calibration for 5 years

Standard Compliant Calibration for 3 years  
Standard Compliant Calibration for 5 years

## Related Agilent Literature

Agilent Family of Pulse/Pattern  
Generators Brochure  
P/N 5980-0489E

Agilent 81100 Family Pulse/Pattern  
Produkt Overview P/N 5980-1215E

Agilent 3.35 GHz Pulse/Pattern  
Generators Photocard P/N 5988-5935EN

Agilent Technologies 81133A  
and 81134A 3.35 GHz Pulse/Pattern  
Generators, Technical Specifications  
P/N 5988-5549EN

Need to test jitter?  
P/N 5988-7050EN