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

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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

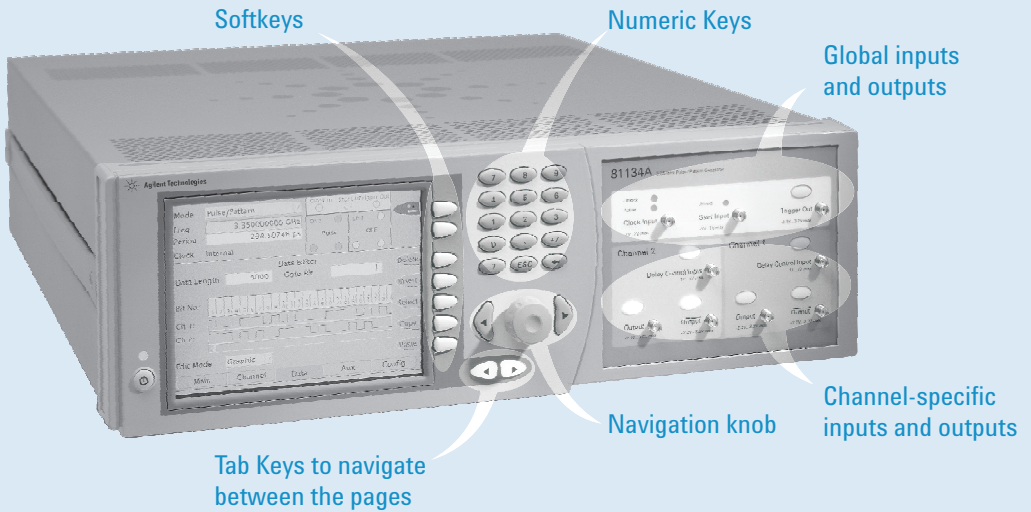power cable

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.

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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.

Softkeys   Numeric Keys

Global inputs and outputs

Channel-specific inputs and outputs

Navigation knob

Tab Keys to navigate between the pages

- 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.

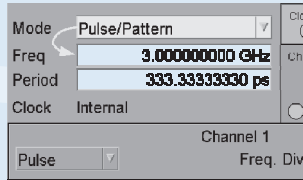## Navigate through the pages with the Tab Keys

Main Page

Channel Page

Config Page

Data Page

Aux Page

4
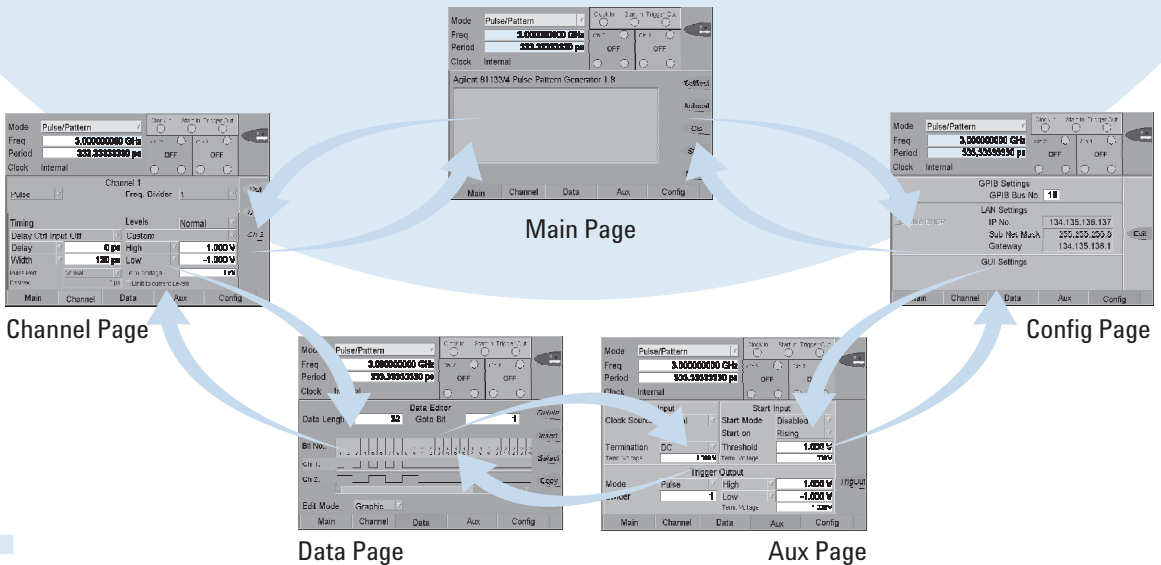
Changing Parameters

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.

Mode	Pulse/Pattern
Freq	3.000000000 GHz
Period	333.33333330 ps
Clock	Internal

Channel 1
Pulse — Freq. Divi

Let's select a parameter from a selection list.

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

Period	333.33333330 ps
Clock	Internal

Mode Channel 1
Freq. Div
Pulse
Pulse
Square
Data
PRBS
Delay
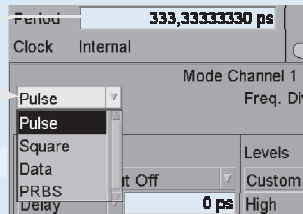
Rotate the navigation knob to scroll through the list.

Clock   Internal
Channel 1
Freq. Divic
Pulse
Pulse
Square
Data
PRBS
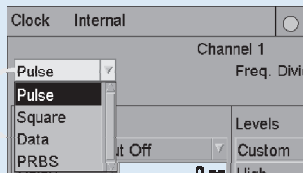
Select an item by pressing the navigation knob.

Clock   Internal
Channel 1
Freq. Divi
Data
Pulse   RZ
Square
Data
PRBS
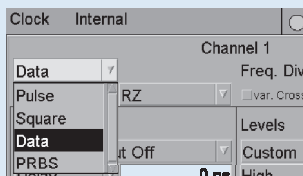
You have three options for using the navigation knob.

rotate   press   press and rotate

5

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.
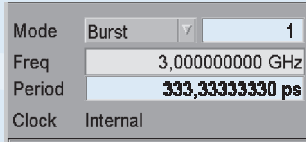
Turn the navigation knob to set the number

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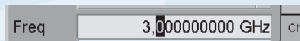
Release the navigation knob. Now when you rotate it, the number changes.

Freq   3,300000000 GHz   Ch

Press the navigation knob once when you are done.

Freq   3,300000000 GHz   Ch
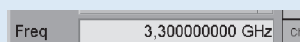
You can also:

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

Enter a value with the key pad.

6

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

Enter the Frequency value using the keypad

Mode   Pulse/Pattern
Freq   3. MHz
Period   50.0000000 ns
Clock   Internal

Clock In   Start In Trigger Out
Ch 2   Ch 1
OFF   OFF

Mode   Pulse/Pattern
Freq   20,000000 MHz
Period   50,000000 ns
Clock   Internal

Clock In   Start In Trigger Out
Ch 2   Ch 1
OFF   OFF

Agilent 8133/4 Pulse Pattern Generator 1 8

Selftest

Autocal

GHz

MHz

kHz

Hz

1

First, disconnect the outputs to protect the DUT

2

Pulse/Pattern

20.000000

Choose the Pulse / Pattern Mode for the Signal

7

Setting Up a Data Pattern

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

4

Normal
| ECL | ▾ |
| | ▾ | -950 |

Select the ECL level format

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

3

| | ▾ | NRZ | ▾ | ☐ var. Cro |

Select Pulse Type NRZ

Mode   Pulse/Pattern
Freq   3.300000000 GHz
Period   303.030303 ps
Clock   Internal

Clock In   Start In   Trigger Out
Ch 2   Ch 1
        OFF   OFF

Channel 1

Data	▾	Freq. Divider	1	▾
Normal	▾	NRZ	▾	☐ var. Crossover
Timing		Levels	Normal	▾
Delay Ctrl Input Off		ECL		▾
Delay	▾	0 ps	Ampl	▾	- 800 mV
DCycle	▾	100 %	Offset		-1.350 V
Pulse Perf.	Fast	▾	Term. Voltage		-2.000 V
Deskew	0 ps	☐ Limit to current Levels

Main   Channel   Data   Aux   Config

Out
Out
Ch 2

5

Out

Enable the Channel 1 normal Output
by pressing the respective softkey

You can switch
between the two channels
by pressing this softkey

2

| Data | ▾ |
| Normal | ▾ | E |

Select Pulse Mode Data

1

...ain   Channel   Da...

Switch to the Channel Page

Now let's set the data

3

Data Length   32

Enter a data pattern
length of 32 bits

Mode   Pulse/Pattern   Clock In   Start In   Trigger Out
Freq   3.300000000 GHz   Ch 2   Ch 1
Period   303.03030 ps   OFF   Data, NRZ
Clock   Internal

Data Editor
Data Length   32   Goto Bit   1

Bit No.:
Ch 1: 1 1 1 1 0 0 1 1 1 0 0 1 1 0 0 1 0 0 1 0 1 0 0 1
Ch 2: 1 1 0 0 1 1 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Edit Mode   Numeric   ▾

Main   Channel   Data   Aux   Config

Delete
Insert
Select
Copy
Paste

4

1 0 0 1 1 1 0 0 1 1 0 0 1 0
1 0 0 1 1 0 0 0 ...

Enter your data pattern

2

Edit Mode   Numeric   ▾

Switch to the Numeric Edit Mode

1

...hannel   Data   Aux

Switch to the Data Page

8

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

Mode	Pulse/Pattern	
Freq	3.000000000 GHz
Period	333.33333330 ps
Clock	Internal

Clock Input
Clock Source	Internal	
Divider	1	
Term. Voltage	1,000 V

Start Input
Start Mode	Disabled	
Start on	Rising	
Treshold	1.000 V
Term. Voltage	1.000 V

Trigger Output
Mode	Pulse		High	1.000 V
Divider	1		Low	-1.000 V
			Term. Voltage	1.000 V

| Main | Channel | Data | Aux | Config |

2

.000 V TrigOut

Enable the Trigger Output ...

... or press the
Trigger Out softkey

1

Data   Aux   Config

Switch to Aux Page

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

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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.

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For more information, please visit us at:

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	Commerical 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

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