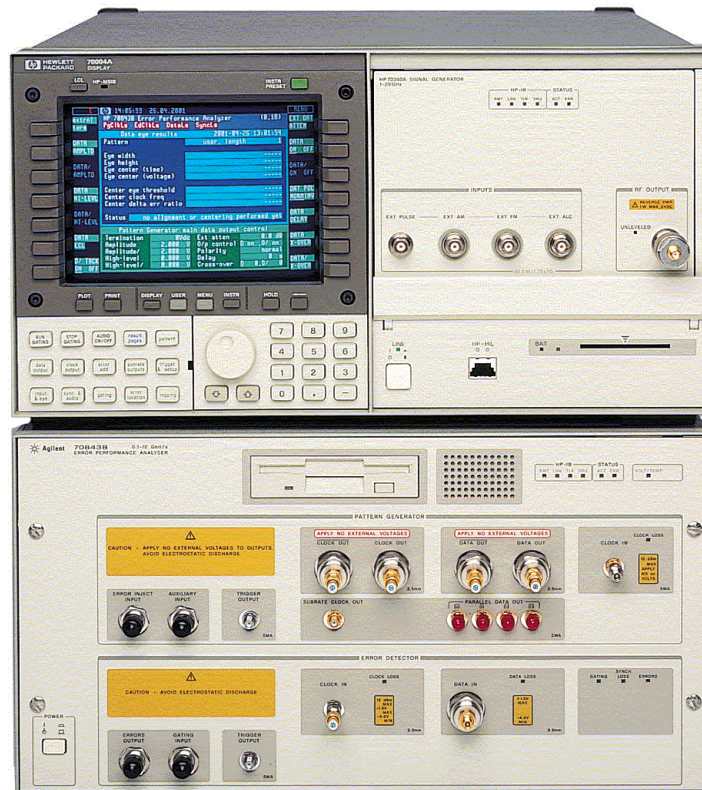# Minimising the Risk of Termination Damage on the Agilent 71612

Introducing the data and clock external termination types (0V, -2V and AC) and how to set -up and connect up the Agilent 71612 12.5 Gb/s error performance analyzer to them safely.

Agilent 71612 12.5 Gb/s Error Performance Analyzer

Introduction

The information given here describes the key interface aspects of the Agilent 71612 12.5 Gb/s error performance analyser Data and Clock outputs. Requirements for driving various devices and logic families are described along with some notes on output protection and voltage ranges.

Agilent 71612 The information is applicable to the following outputs from the pattern generator part of the Agilent 71612 :

DATA, $\overline{\text{DATA}}$	- main data outputs
CLOCK, $\overline{\text{CLOCK}}$	- main clock outputs
SUBRATE CLOCK	-1/4 rate clock output
PARALLEL DATA	-4 x 1/4 rate (subrate) data outputs
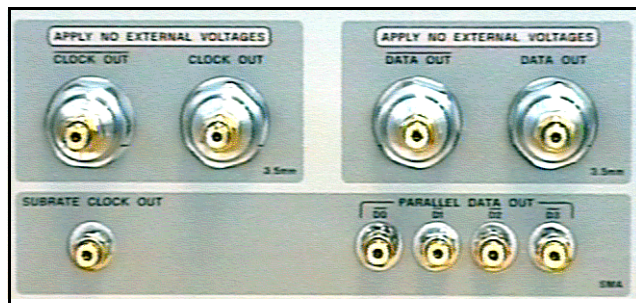
CAUTION	All of the Agilent 71612 data and clock outputs are DC-coupled; do not apply any external voltage to these outputs. Application of an external voltage may damage the internal amplifiers.

CAUTION	Observe ESD precautions when connecting to the Agilent 71612 outputs. Terminate all unused ouputs with a 50 ohm load.

Termination Types

The Agilent 71612 Data and Clock outputs have been designed to be used in the testing of a variety of devices and logic families. In order to achieve both safe operation and optimum performance, the appropriate external termination type must be selected on the Agilent 71612 corresponding to the device under test (DUT)

The same external termination choices are available for the Data outputs, the Clock outputs, Parallel Data outputs and Subrate Clock output. Each set has its own menu selections from the Agilent 71612 display. For clarity the remainder of this document will refer only to the main Data outputs, but the same procedures and constraints apply equally to the Clock, Parallel Data and Subrate Clock outputs. The choice of external termination types are :

- 0V for 50 ohm to ground terminations (eg. SCFL logic devices)

- -2V for 50 ohm to -2V terminations (eg. ECL logic devices)

- AC for 50 ohm ac-coupled terminations (eg. ac-coupled amplifiers and bias tees)

How to Select a Termination

To select an appropriate external termination type for the Data outputs, first press the 'data output' key to bring up the data output softkey menu; then press softkey 'extrnl term' to bring up the external termination sub-menu. The softkey menu choices are :
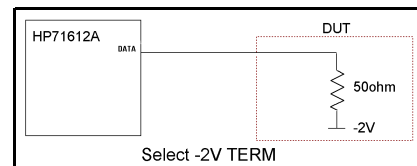
- EXT AC COUPLE eg:
  for ac coupled DUT's and bias tees
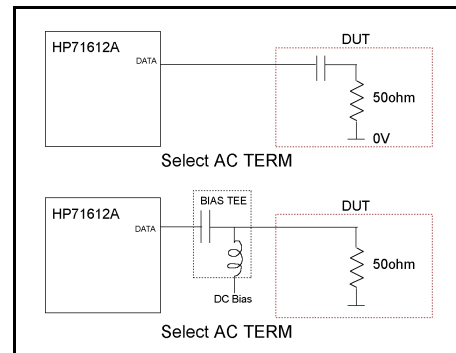
- EXT DC TERM 0V eg:
  for 50 ohm to ground DUT's
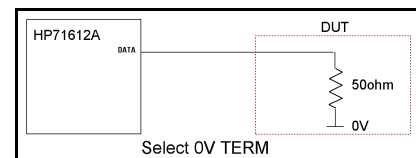
- EXT DC TERM -2V eg:
  for 50 ohm to -2V DUT's

- exit - to return to previous menu
  without changing anthing

CAUTION	The Agilent 71612 data outputs are alway DC-coupled even when 'EXT AC COUPLE' is selected. Do not apply any external voltage to these outputs. Users should take particular care when using external bias tees to ensure correct orientation of the bias tee.

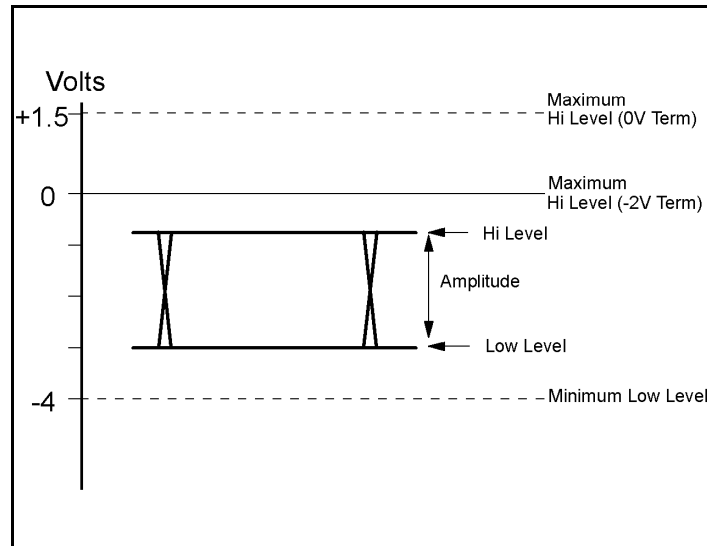|	
NOTE	**Selecting a termination type (even re-selecting the current one) resets default (safe) amplitude and hi level values for the data outputs.**

Once the correct termination has been selected, set the data amplitude and hi level as desired.

For ECL devices a softkey on the data output menu presets the amplitude to 900mV and hi-level to -850mV. Note that the termination type has to be set **first** to -2V.

Appendix - Data, Clock, Parallel Data and Subrate Clock Output Levels

The figure below shows a data ouput eye diagram, and a definition of some relevant terms. The two parameters which control the offset and amplitude of the data outputs are "Hi Level" (i.e. the average voltage of the top of the eye) and "Amplitude" (ie. the peak-peak voltage of the eye).

In simple terms, the data ouput pattern can have an amplitude anywhere between 0.5V and 2V peak-to-peak and lie somewhere within a window of +1.5V (0V for -2V term) down to -4.0V.

Volts

+1.5 — — — — — — — — — — — — — — Maximum Hi Level (0V Term)

0 ———————————————— Maximum Hi Level (-2V Term)

Hi Level

Amplitude

Low Level

-4 — — — — — — — — — — — — — — Minimum Low Level

The limits of the data output high level and amplitude are :

Data/Clock :

Parameter	0V Termination	-2V Termination	AC Termination
High Level	+ 1.5V	0V	n/a
Amplitude	0.5 to 2.0V	0.5 to 2.0V	0.5 to 2.0V
Low Level	-4.0V	-4.0V	n/a

P**arallel Data/Subrate Clock:**

Parameter	0V Termination	-2V Termination	AC Termination
High Level	0V	0V	n/a
Amplitude	0.5 to 1.0V	0.5 to 1.0V	0.5 to 1.0V
Low Level	-2.0V	-2.0V	n/a

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