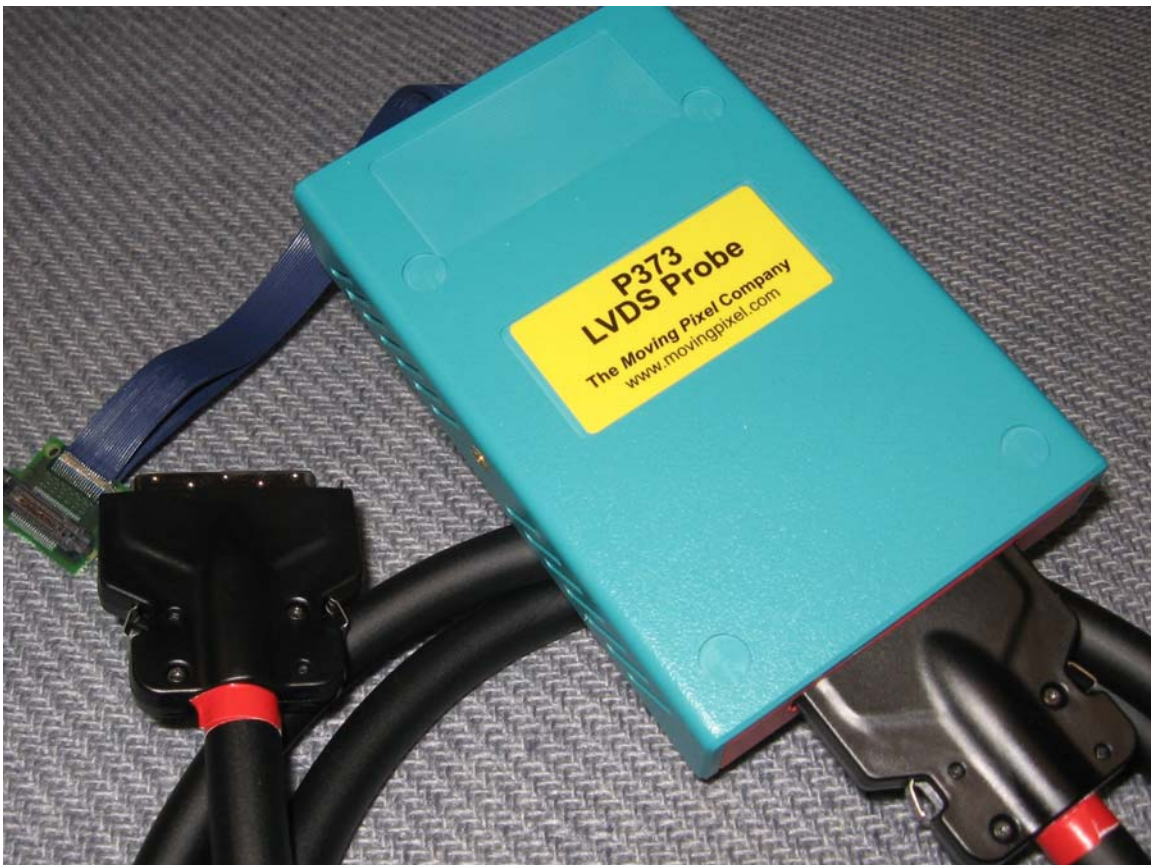# P373
Data Sheet and User Manual

PG3A Pattern Generator
P373 – LVDS probe
November 2008 - Rev 1.2

1.0 General

The P373 probe features 16 LVDS outputs running at up to 300 MHz as well as a clock and a strobe. To preserve the signal integrity associated with the very fast risetimes (210pS) of the output drivers, we have chosen to make the connection from the probe to the user system via a AMP Mictor connector and a high-speed, multi-coax ribbon cable.

The probe expects the user system to be differentially terminated in a purely resistive 100 ohms. All specifications assume this resistive termination.

The two inhibit inputs are TTL levels. There is an independent inhibit for each data byte. The probe data byte outputs are enabled when these are no-connect or pulled low. The probe does not drive the data byte outputs when the inhibit pin is driven high.

2.0 Requirements:

The P373 probe works with all current PG3AMod and PG3ACab models. The instrument firmware must be V1.0 or higher. The PGApp software must be V2.0.006 or higher. Updated versions of the instrument firmware and the PGApp software can be freely downloaded from the PG3A website: www.movingpixel.com/PG3A.html.

3.0 P373 Pinouts:

The pinout for the Mictor connector is as follows. We use the AMP numbering convention (as opposed to the Tektronix numbering convention found in some Tektronix documentation):

Pin 1: Low Byte Inhibit input	Pin 2: Strobe_p
Pin 3: Low Byte Inhibit input	Pin 4: Strobe_n
Pin 5: Clock_p	Pin 6: Clock_n
Pin 7: D1_p	Pin 8: D0_p
Pin 9: D1_n	Pin 10: D0_n
Pin 11: D3_p	Pin 12: D2_p
Pin 13: D3_n	Pin 14: D2_n
Pin 15: D5_p	Pin 16: D4_p
Pin 17: D5_n	Pin 18: D4_n
Pin 19: D7_p	Pin 20: D6_p
Pin 21: D7_n	Pin 22: D6_n
Pin 23: D9_p	Pin 24: D8_p
Pin 25: D9_n	Pin 26: D8_n
Pin 27: D11_p	Pin 28: D10_p
Pin 29: D11_n	Pin 30: D10_n
Pin 31: D13_p	Pin 32: D12_p
Pin 33: D13_n	Pin 34: D12_n
Pin 35: D15_p	Pin 36: D14_p
Pin 37: D15_n	Pin 38: D14_n

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The probe expects the user system to be differentially terminated in a purely resistive 100 ohms. All specifications assume this resistive termination.

3.1 Channel Associations

The labeling in the PG control application (PGApp or PGAppDotNet) associated with a particular output connector on the PG correspond to the above-listed pin names as follows:

Group A
A0[7..0] ⇔ Data[7..0]
A1[7..0] ⇔ Data[15..8]
A0(Inh) ⇔ Low Byte Inhibit
A1(Inh) ⇔ High Byte Inhibit

Group B
B0[7..0] ⇔ Data[7..0]
B1[7..0] ⇔ Data[15..8]
B0(Inh) ⇔ Low Byte Inhibit
B1(Inh) ⇔ High Byte Inhibit

Group C
C0[7..0] ⇔ Data[7..0]
C1[7..0] ⇔ Data[15..8]
C0(Inh) ⇔ Low Byte Inhibit
C1(Inh) ⇔ High Byte Inhibit

Group D
D0[7..0] ⇔ Data[7..0]
D1[7..0] ⇔ Data[15..8]
D0(Inh) ⇔ Low Byte Inhibit
D1(Inh) ⇔ High Byte Inhibit

4.0 Electrical specification for the P373 probe

All specifications assume 100 ohm differential load unless otherwise noted.
All specifications are at 25 degrees Celsius ambient temperature, 30 minutes for
stabilization of both the PG and the probe.

Characteristic	Specification	Notes
Output Risetime	210pS, typ	
Output Enable time	300nS max	Yes, three hundred nS!
Output Disable time	12nS max	
Skew, nybble	+/- 65pS	4 consecutive bits starting with D0
Skew, worst case, probe-probe	+/- 550pS	Any bit in any probe to any other bit in any other probe
Clock before data	50ps – 400pS typical	Within one probe, all bits

Output Characteristic	Min	Typ	Max
Vod (differential voltage)	250mV	500mV	600mV
Vcm (common mode)	1.05 V	1.18 V	1.475 V
Weight	150 grams		approximate
Overall Dimensions	Length: 130mm, Width 80mm, Height: 29mm		approximate

5.0 Backside Test Connector Pinout

The P373 features a Tektronix P6980 connection from the backside to facilitate connection to a logic analyzer during pattern debug (and perhaps even during system test).

Pinout:

A1:	D0_p	B1:	Ground
A2:	D0_n	B2:	D1_n
A3:	Ground	B3:	D1_p
A4:	D2_p	B4:	Ground
A5:	D2_n	B5:	D3_n
A6:	Ground	B6:	D3_p
A7:	D4_p	B7:	Ground
A8:	D4_n	B8:	D5_n
A9:	Ground	B9:	D5_p
A10:	D6_p	B10:	Ground
A11:	D6_n	B11:	D7_n
A12:	Ground	B12:	D7_p
A13:	No Connect	B13:	Ground
A14:	No Connect	B14:	Clock_n
A15:	Ground	B15:	Clock_p
A16:	D8_p	B16:	Ground
A17:	D8_n	B17:	D9_n
A18:	Ground	B18:	D9_p
A19:	D10_p	B19:	Ground
A20:	D10_n	B20:	D11_n
A21:	Ground	B21:	D11_p
A22:	D12_p	B22:	Ground
A23:	D12_n	B23:	D13_n
A24:	Ground	B24:	D13_p
A25:	D14_p	B25:	Ground
A26:	D14_n	B26:	D15_n
A27:	Ground	B27:	D15_p

6.0 Pre-emphasis

The P373 probe has the ability to add pre-emphasis to the output signals. There are three jumpers accessible from the bottom of the probe that allow you to select pre-emphasis. Pre-emphasis is useful if you are driving long, lossy wires (greater than a couple of feet). Jumper J5: pre-emphasis control for Clock and Strobe. ON is toward the J5 silkscreen.

Jumper J3/ Jumper J2: pre-emphasis controls for the data. Both off (away from the J3/J2 reference designator silkscreen) is pre-emphasis off. Binary selection for more pre-emphasis (low, medium, and high). J2 is the most significant bit.
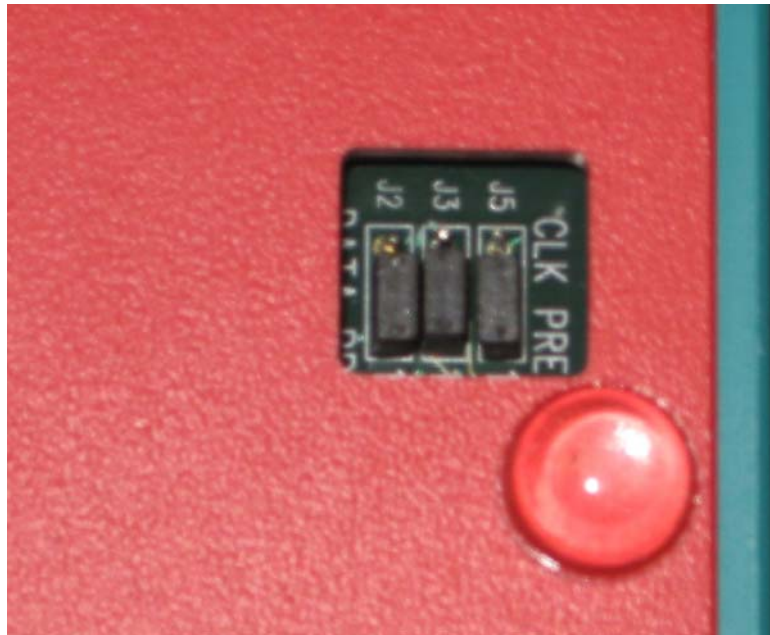

Figure 1 P373 Pre-emphasis Jumpers

7.0 Other useful information:

Part number for a connector that will mate with the probe output cable:
        Amp 767054-1

Part number of the probe output cable:
        Tyco/Precision Interconnect 913850038015AA21

The LVDS driver we use inside the probe is the National Semiconductor DS90LV004. Data on this device can be found at http://cache.national.com/ds/DS/DS90LV004.pdf.

If a user system does not need to run at the highest speeds the probe supports and does not want to connect to the user system via a Mictor, there are adapters available for Mictor to square pins like the Nexus Technology Nex-HD20 (http://www.nexustechnology.com/products/laAccessories/hd20/).

Using an adapter from the Mictor will like cause signal integrity to suffer as the risetime on the output of the probe is typically 210 pS. Uncontrolled impedances of longer than 5mm will be noticed in the waveform. Uncontrolled impedances of longer than 3 cm may make the signal unusable, especially the clock signal.

Also note that all the probes except the P300 can be stacked on top of each other. Metal inserts are provided in each side of the probe for assisting in probe mounting. The screw thread is a UNC #4-40. Any screw thread inserted into this should not exceed 0.25 inches in length else the probe could be damaged.