

Lab 2

How to use Oscilloscope Probe Kit

CEG 2136 A/B/C – Fall2017

Prepared by Heli Amarasinghe



Lab 2 Synchronous Counters

Lab 2 has two parts

- (a) Modulo 6 counter
- (b) BCD counter

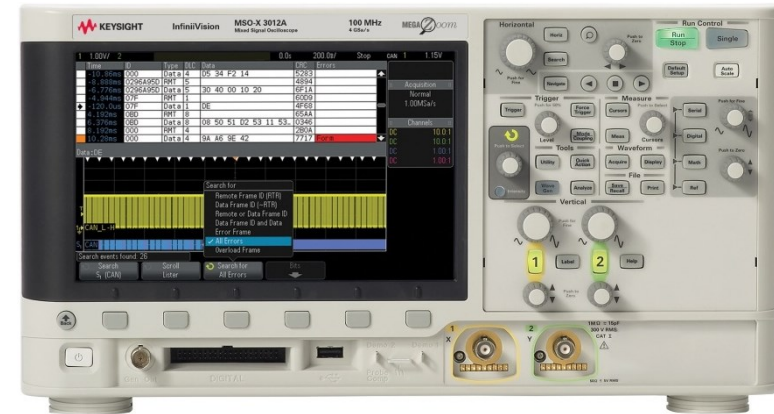
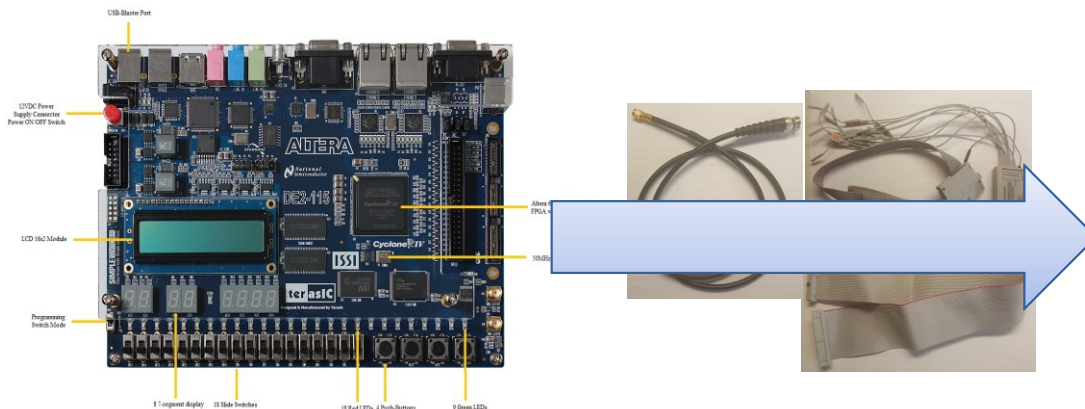
Two Experiments

- 1. Free run with Oscilloscope
- 2. Manual clock with push button

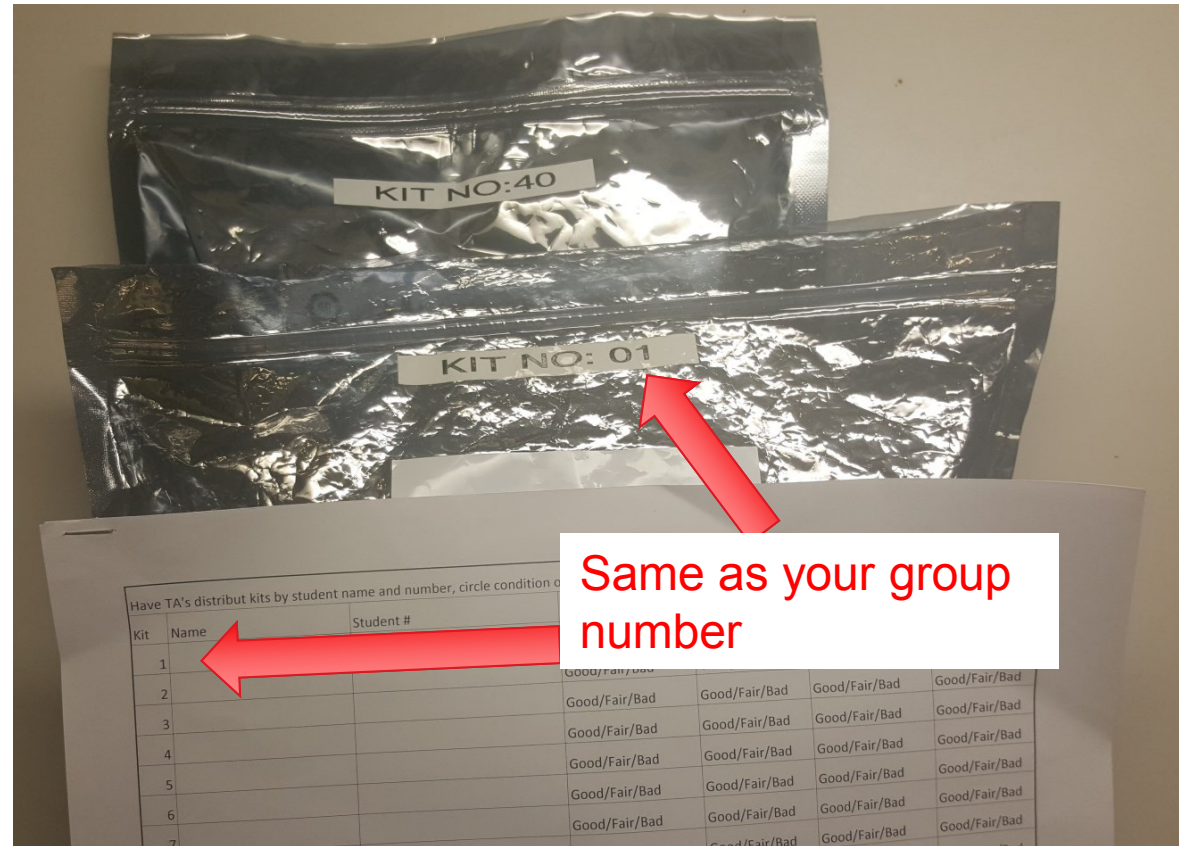
If you do part (a) with Oscilloscope, do part (b) with push button or vice versa

Free run with Oscilloscope

Probe kits are required to connect DE2-115 board to Oscilloscope



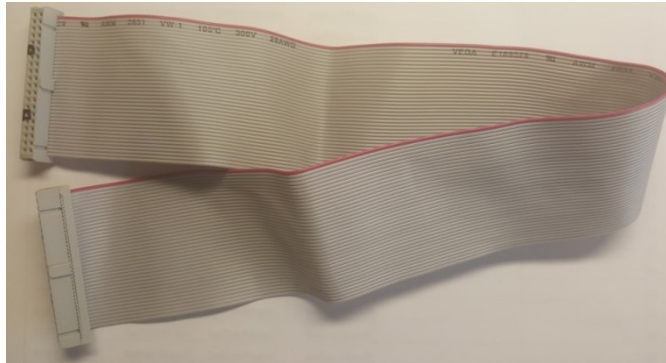
Oscilloscope Probe kit



1. Each probe kit is worth \$800 ~\$1000
2. Probe kits are given based on **Group numbers**
3. One member from each group take responsibility of the kit writing name and std#
4. Damaging cable will result in reduction of marks and other penalties
5. Kits **Must be returned** at the end of the lab session

Contents of the probe kit and their prices

Flat Ribbon
(\$8~\$10)



BNC to SMA cable for
Clock reference (\$50 ~ \$60)

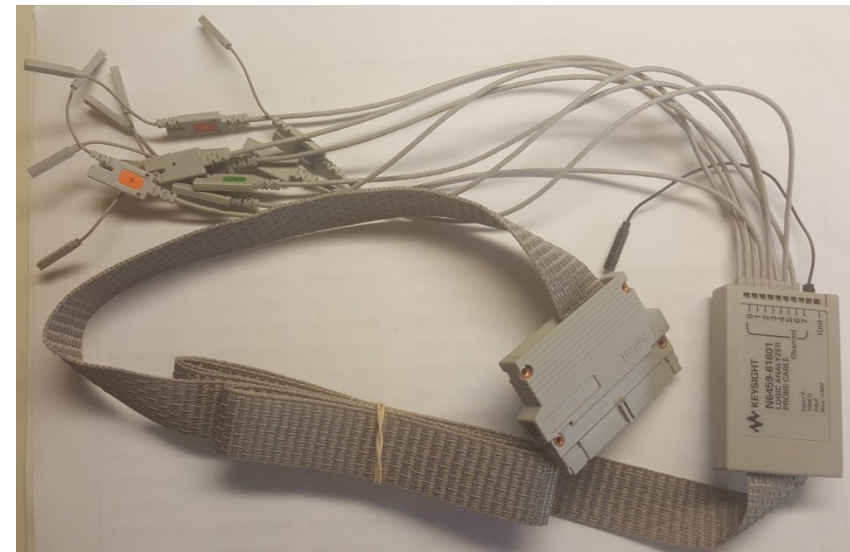


Analogue probe
(\$120 ~ \$150)

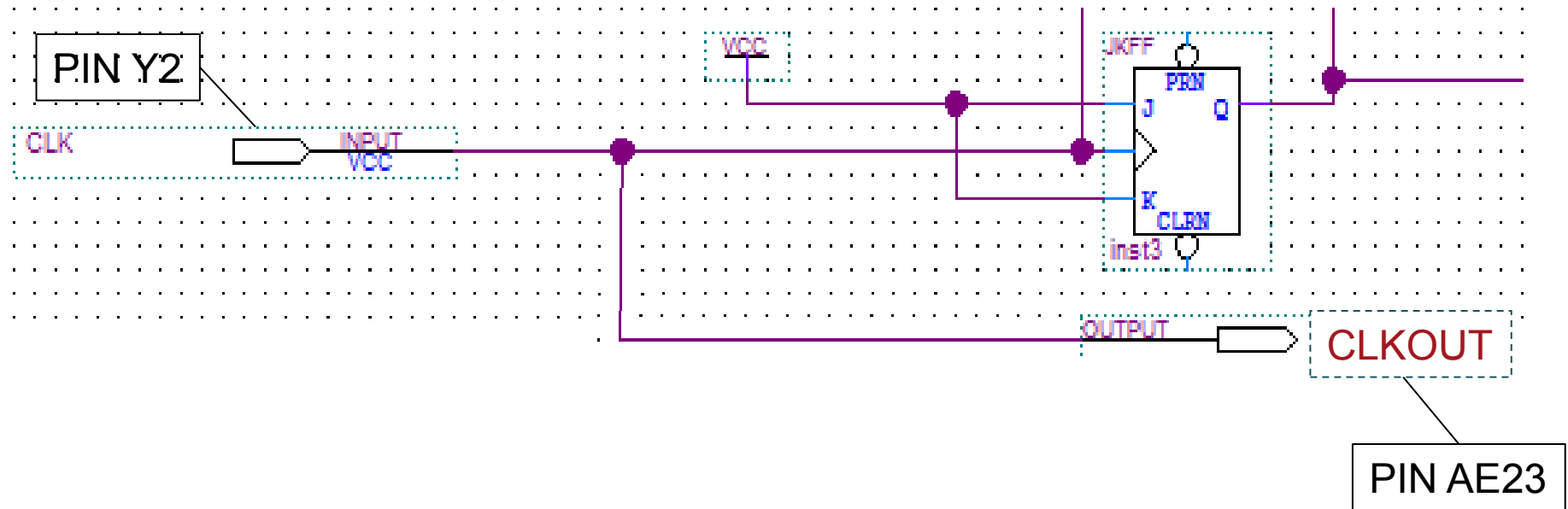


Will not
be used

Digital Probe
(\$600 ~ \$800)



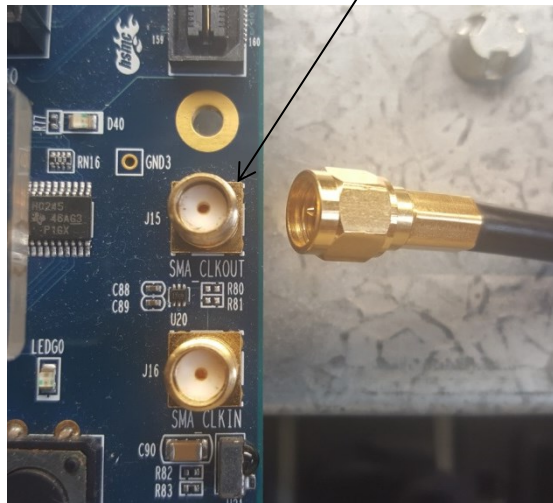
Getting onboard Clock signal on Oscilloscope Display (as a reference)



Onboard Clock Signal



PIN AE23



BNC Connector in the Oscilloscope



Flat Ribbon

Connects Digital probe of the Oscilloscope with DE2 board

Protects expensive Digital cable

Key hole of the DE2 board socket

Key in the flat ribbon connector



Flat Ribbon

- Pin Diagram on lab manual shows back side of cable Connector
- Connecting **5V/3.3v** of board with GND of Oscilloscope may burn/damage wires
- TAs will deduct marks and students may face other penalties

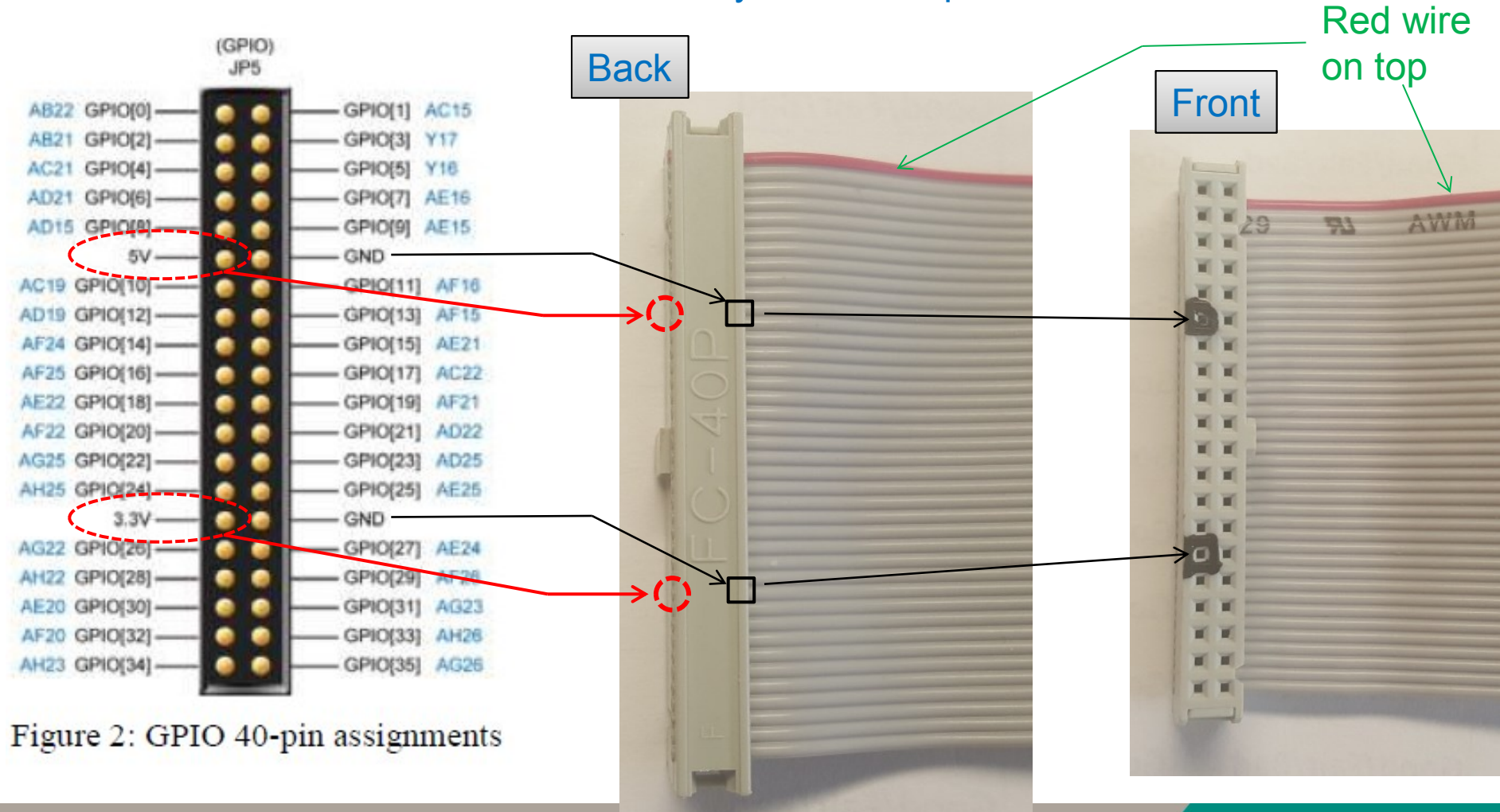
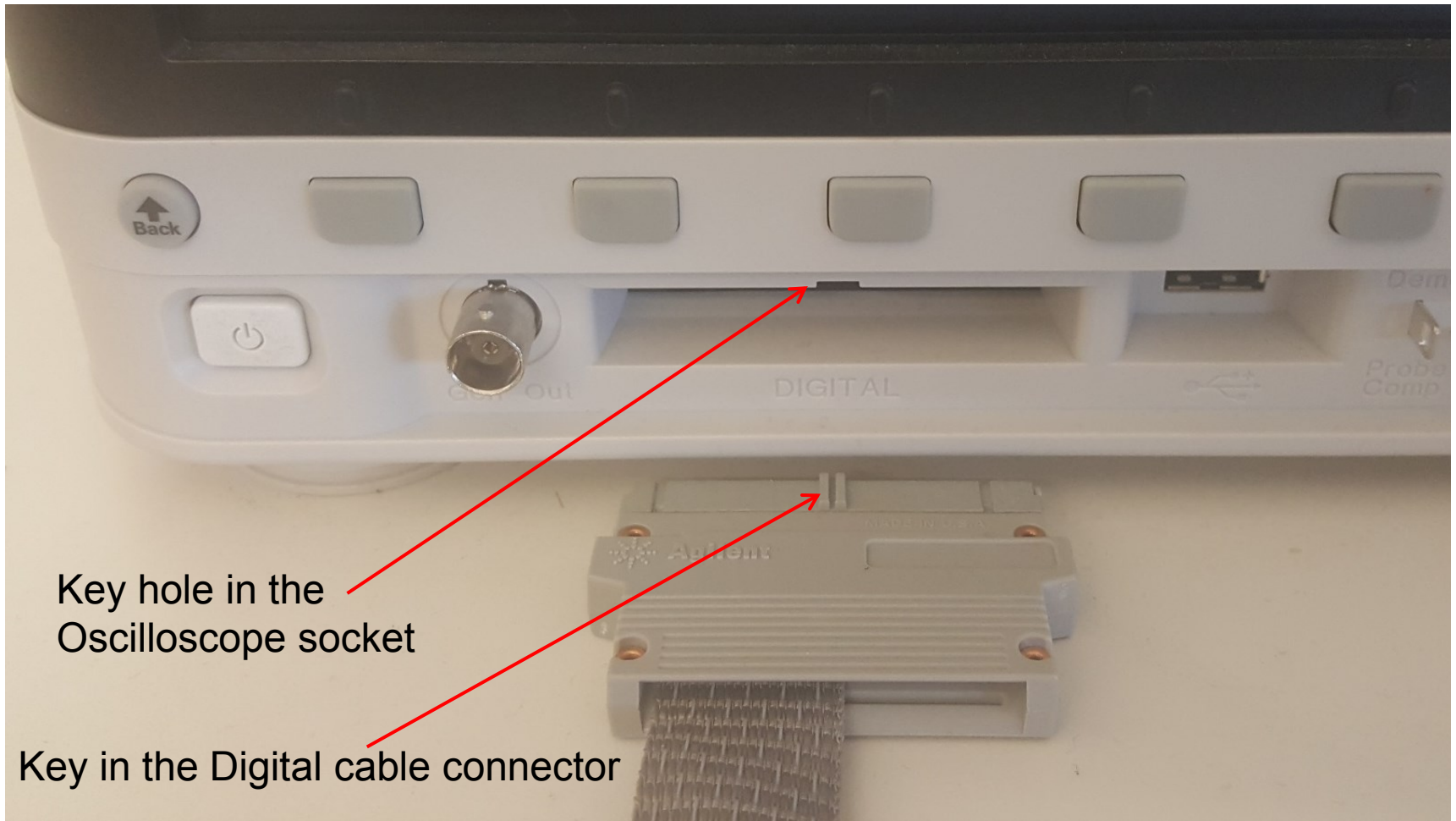


Figure 2: GPIO 40-pin assignments

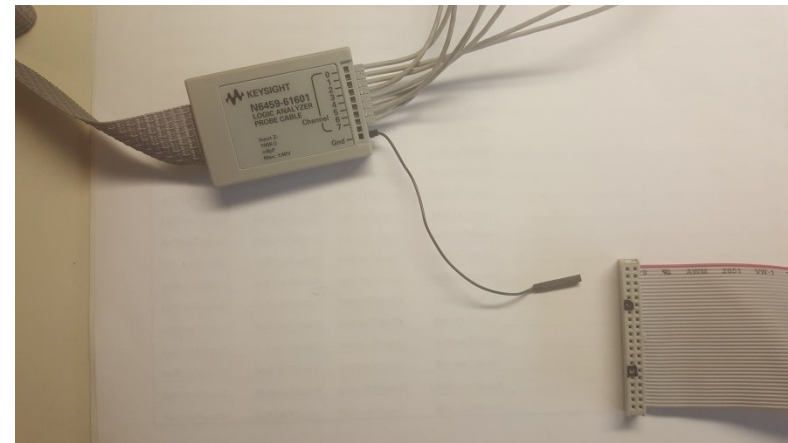
Digital cable



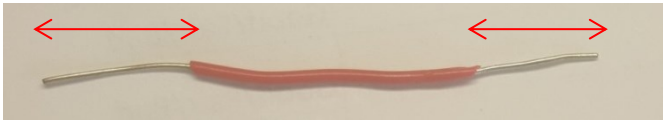
Key hole in the
Oscilloscope socket

Key in the Digital cable connector

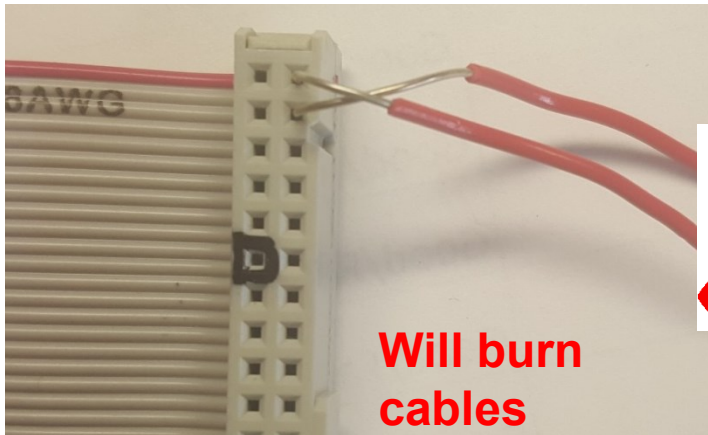
Connecting Digital probe and Flat Ribbon



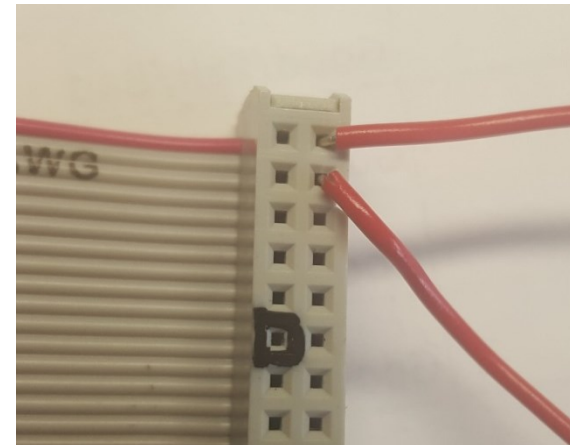
Clearance more than 5mm



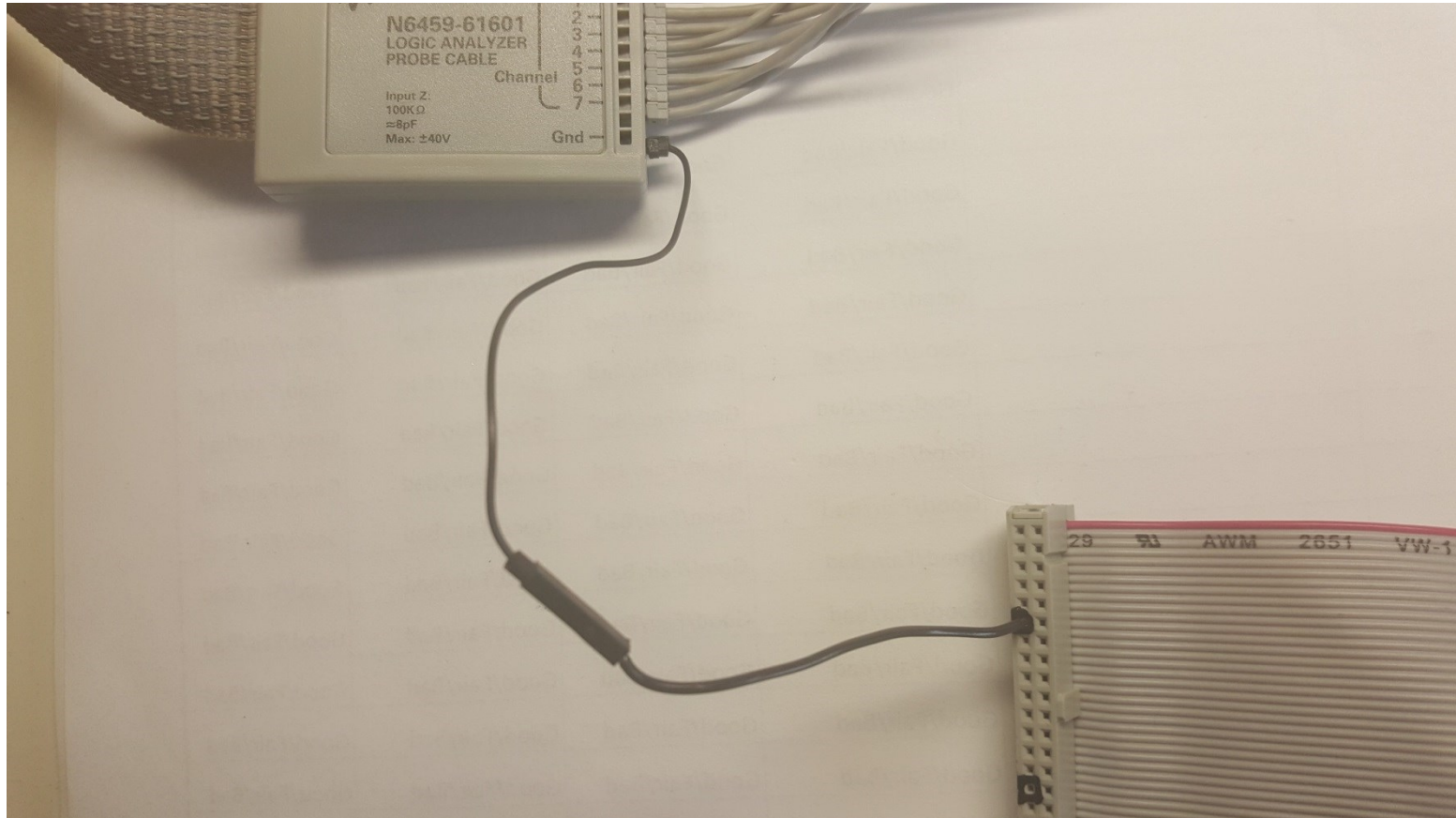
3 ~ 5 mm clearance



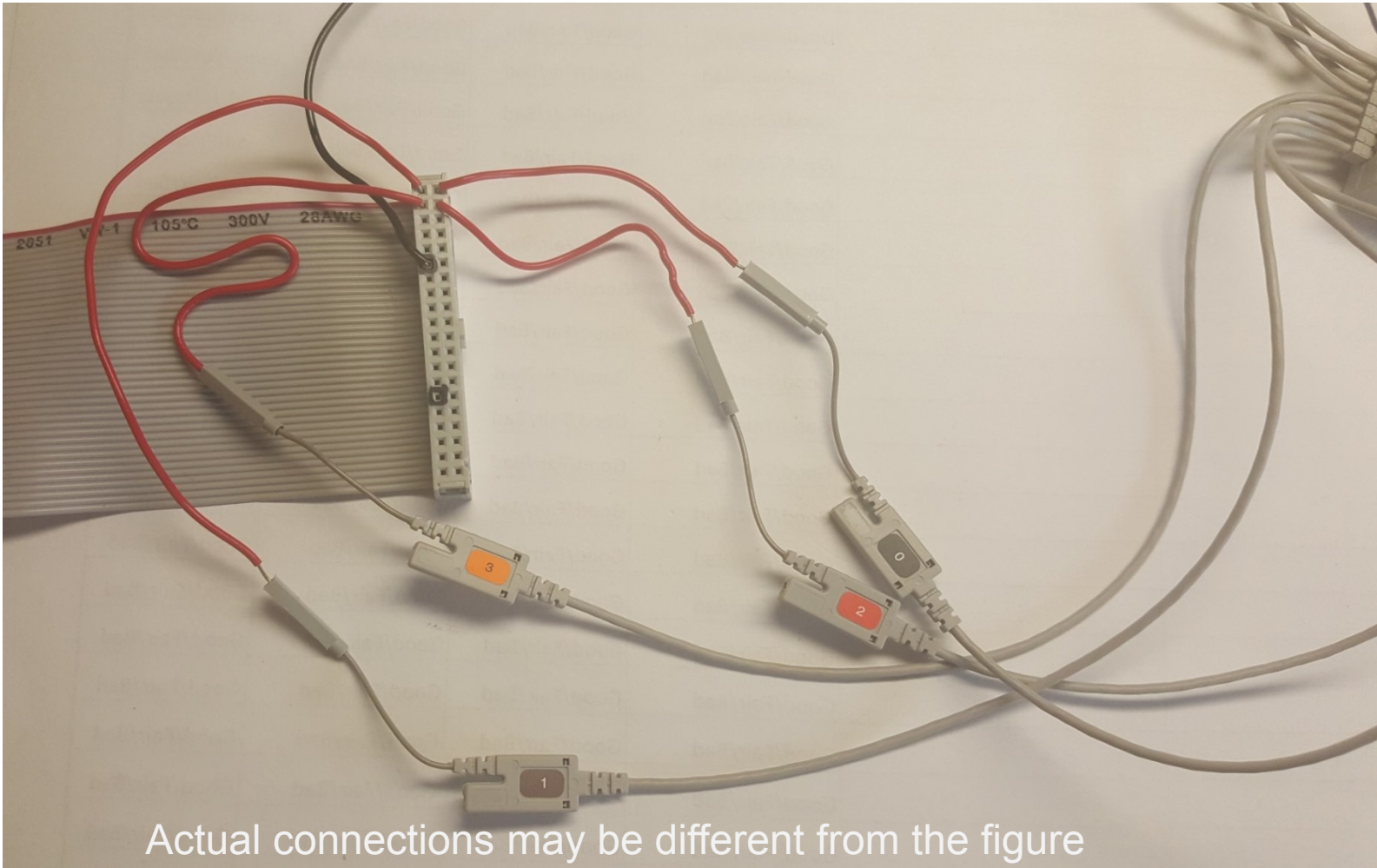
Will burn
cables



Connecting Ground

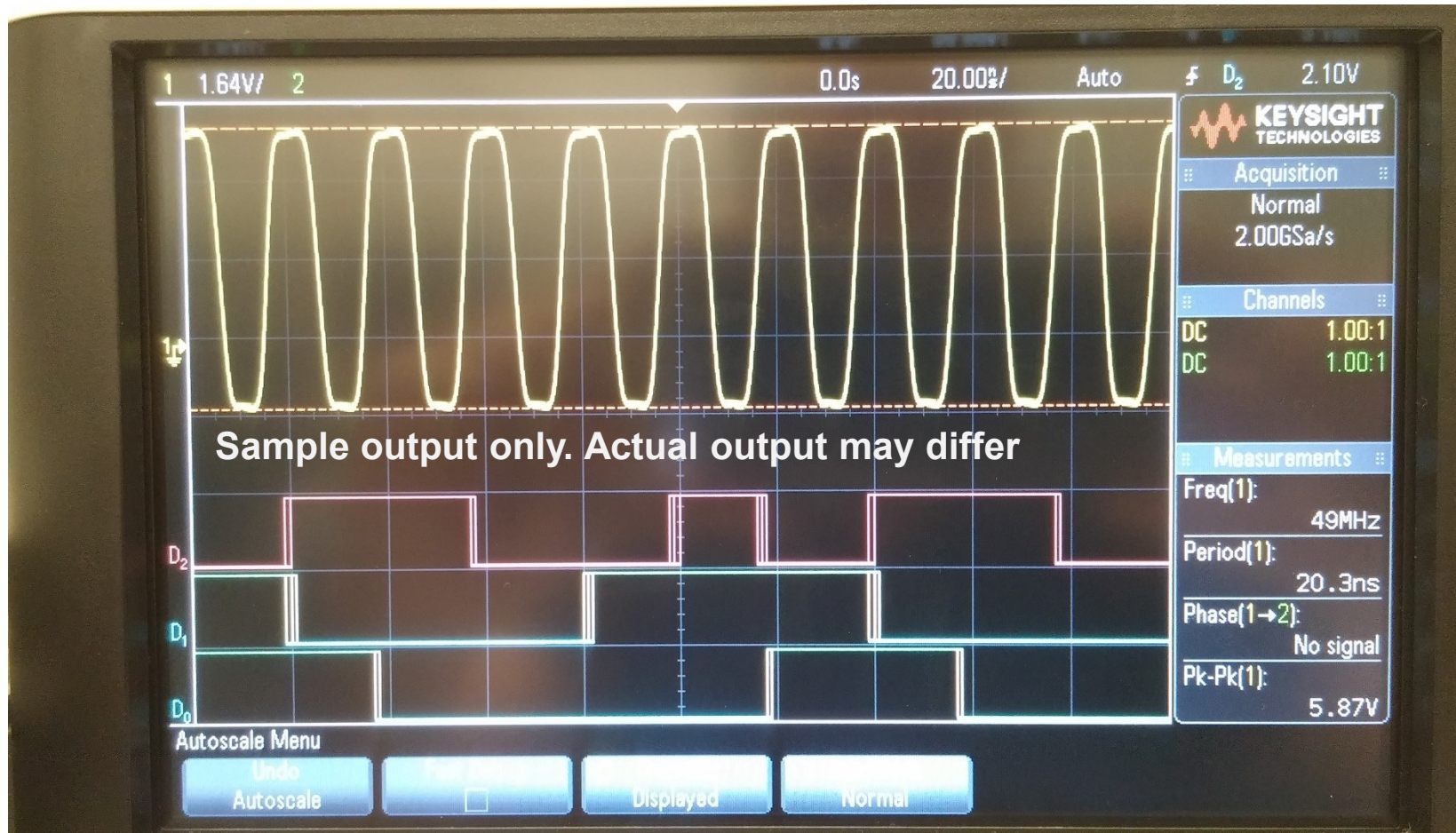


Connecting Outputs to Digital Probe



Actual connections may be different from the figure

Output on Oscilloscope



Thank You