

Scalable and modular architecture for a lab-on-a-chip genetic analysis instrument

*G. V. Kaigala[†], M. Behnam[†], A. C. E. Bidulock, C. Bargaen, R. W. Johnstone,
D. G. Elliott and C. J. Backhouse**

Department of Electrical and Computer Engineering, University of Alberta,
Edmonton, AB T6G2V4, Canada.

[†] equal contribution

We here present details of the component cost for our low-cost and reconfigurable instrument.

Break-up of system component cost:

This component cost (based on USD currency) listed here is of the instrument based on low volume ordering. This cost we believe will significantly reduce with high volume purchase.

Component	Quantity	Cost	Notes
Dielectric optical filter <i>(HQ710/50m; Chroma Technology Corporation, Rockingham)</i>	1	\$40	We have separately also tested an absorption filter – if this is used, the cost is ~\$0.
GRIN lens <i>(LGI630-6, Newport)</i>	1	\$30	
Diode laser <i>(M635-5, US Lasers, Hazlehurst)</i>	1	\$35	
DC to DC converter <i>(C60, EMCO, Sutter Creek, CA, USA)</i>	1	\$160	In a related demonstration, we have made use of a ~\$50 DC-DC converter from Matsusada Precision Inc., Shiga, Japan (up to 300 V). We have demonstrated short distance electrophoresis using 300 V with comparable resolution as in this demonstration.
Pneumatic valves <i>(LHDA1233115H; The Lee, Company, Westbrook)</i>	4	\$140	
High voltage relays <i>(DAT71210, Crydom, San Diego)</i>	4	\$60	We have also reduced the relay cost by using solid-state relays (by COTO Technologies) for 300 V switching. The cost for 4 relays is \$25.
Other electronics <i>(ADC, DAC, Op-amps, PCBs)</i>	-	~\$200	
TOTAL COST	~\$665		