

Wall sensing with the Si1120

By

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for

MINOS 2017



Si1120

PROXIMITY/AMBIENT LIGHT SENSOR WITH PWM OUTPUT

Features

- Typically 50 cm meter proximity range with single pulse
- Seven precision optical measurement modes:
 - 3 proximity ranges
 - 3 dc ambient ranges
 - 1 calibration mode
- Low-noise ambient cancelling circuit allows maximum sensitivity with 8–12 bit resolution
- ALS works in direct sunlight (100 klux)
- Minimum reflectance sensitivity $<1 \mu\text{W}/\text{cm}^2$
- High EMI immunity without shielded packaging
- Power supply: 2.2–3.7 V
- Operating temperature range: -40 to $+85^\circ\text{C}$
- Typical $10 \mu\text{A}$ current consumption
- Programmable 400/50 mA LED constant current driver output
- Allows independent LED supply voltage
- Small outline 3 x 3 mm (ODFN)

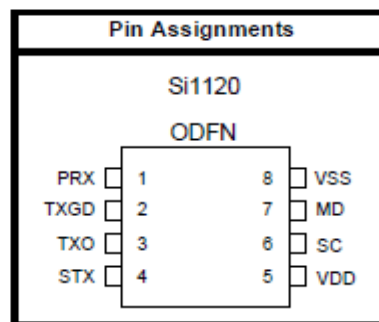
Applications

- Handsets
- Touchless switches
- Occupancy sensors
- Consumer electronics
- Notebooks/PCs
- Industrial automation
- Display backlighting control
- Photo-interrupter

Description

The Si1120 is a low-power, reflectance-based proximity and ambient light sensor with advanced analog signal processing and analog PWM output. It includes an integrated differential photodiode, signal processor, and LED driver. Proximity sensing is based on the measurement of reflected light from an external, optically-isolated, strobed LED. A separate visible light photodiode is used for ambient light sensing. The standard package for the Si1120 is an 8-pin ODFN.

Pin Assignments

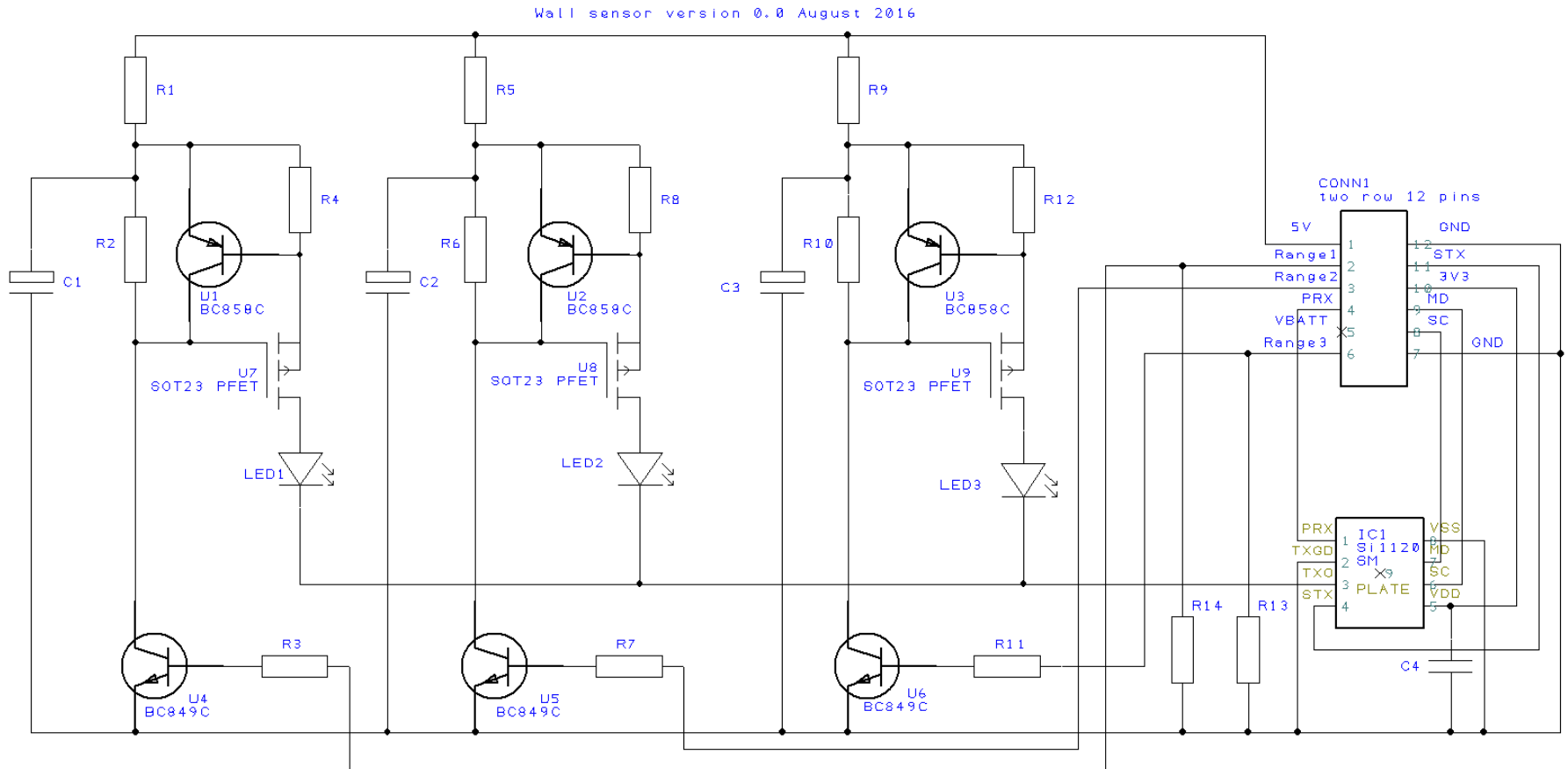


U.S. Patent #5,864,591

U.S. Patent #6,198,118

Other patents pending

Circuit for three channels



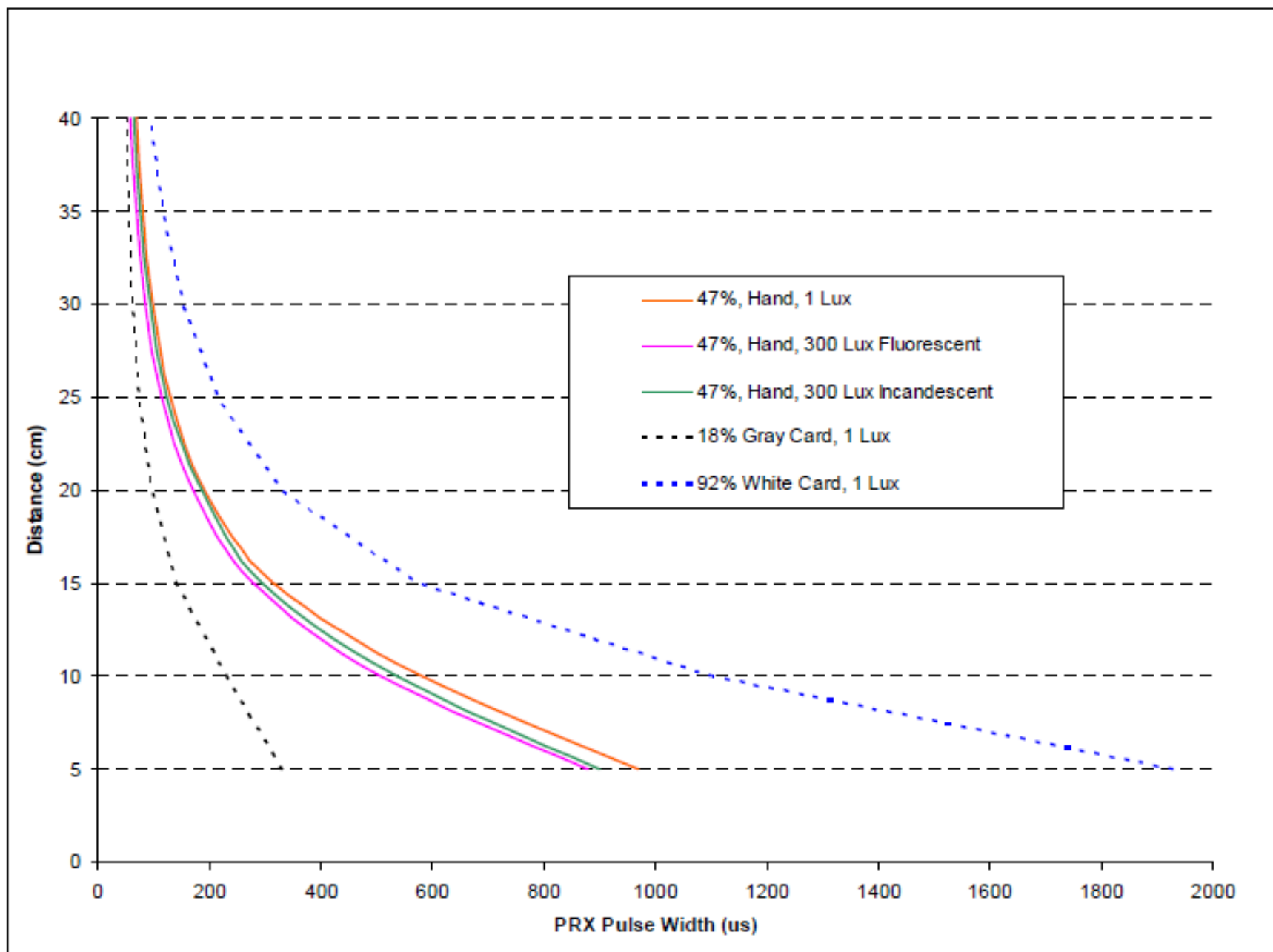


Figure 5. PRX400 Mode 0

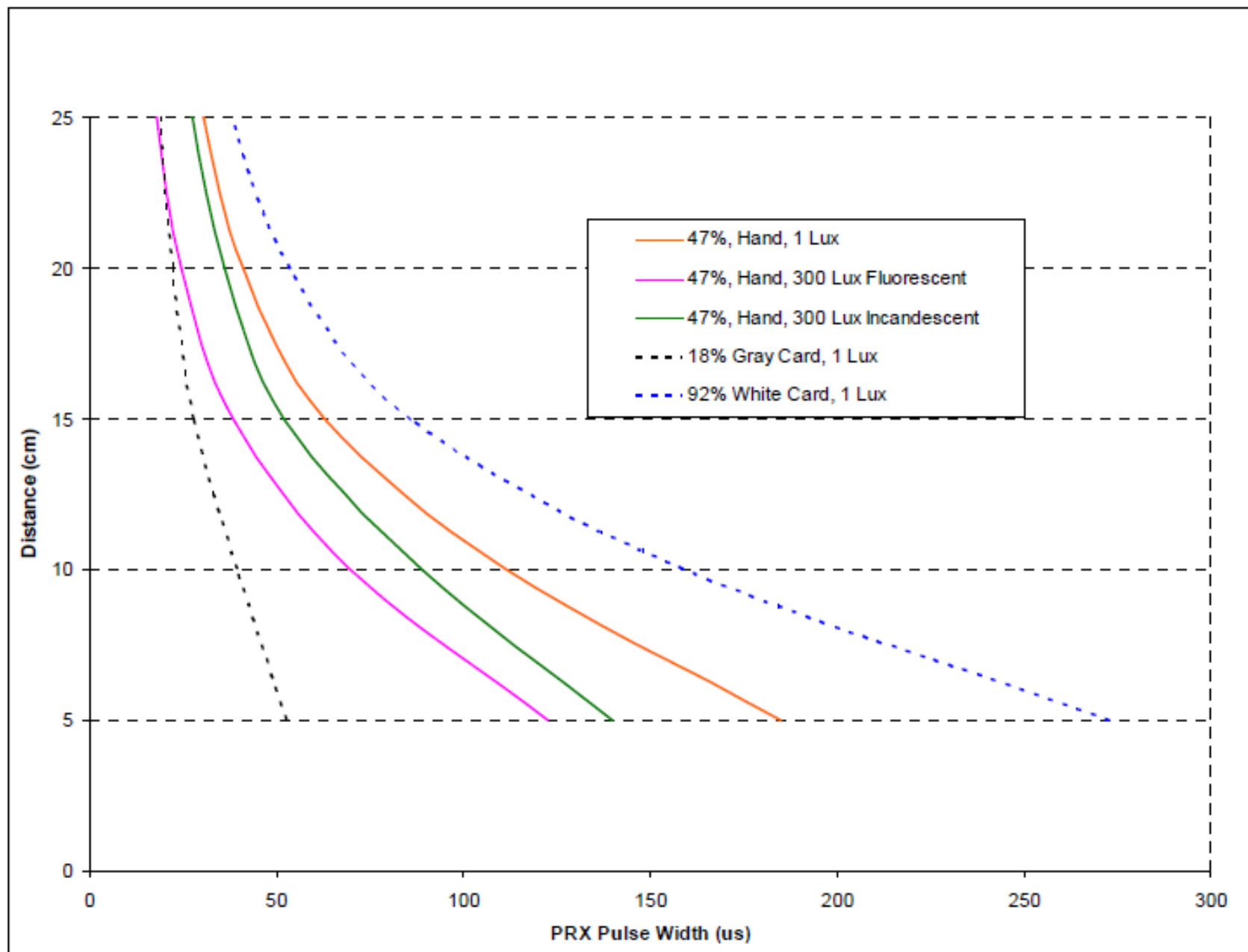


Figure 6. PRX50 Mode 2

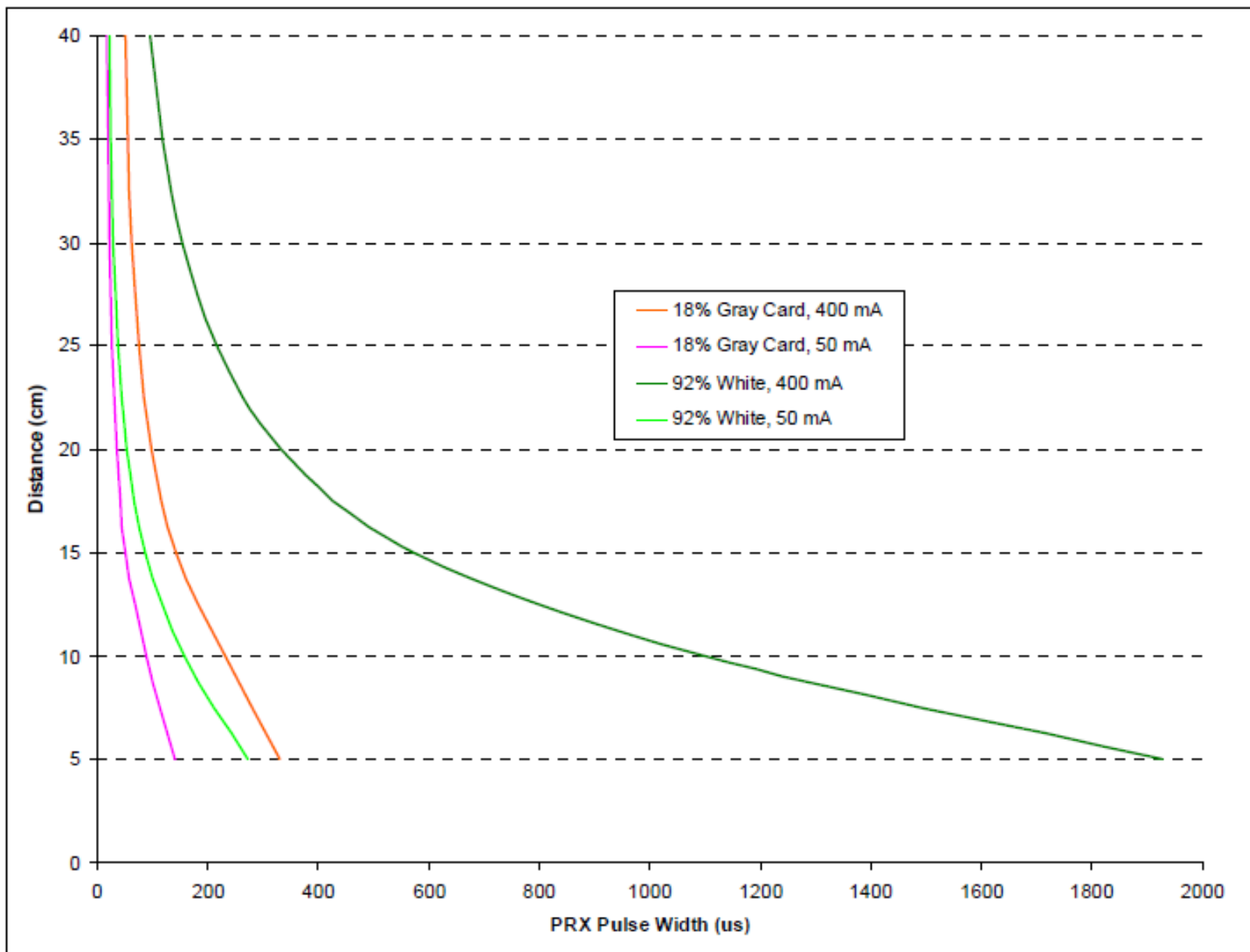


Figure 7. Combined PRX400 and PRX50

Software

- Initialisation
- Reading
- Calibration

Practical stuff

- Recovery time
- Practical results

Summary

- Nearly does what it says on the tin.
- Bright ambient is a serious issue.
- Fast enough.
- Affected by reflectance.
- Can be multiplexed using several LEDs.
- LED current (range) can be tuned externally.
- I expect to use it on the next generation schools' mouse.