Čerenkov Detectors for Electron Detection in LUXE

More updates from the Lab

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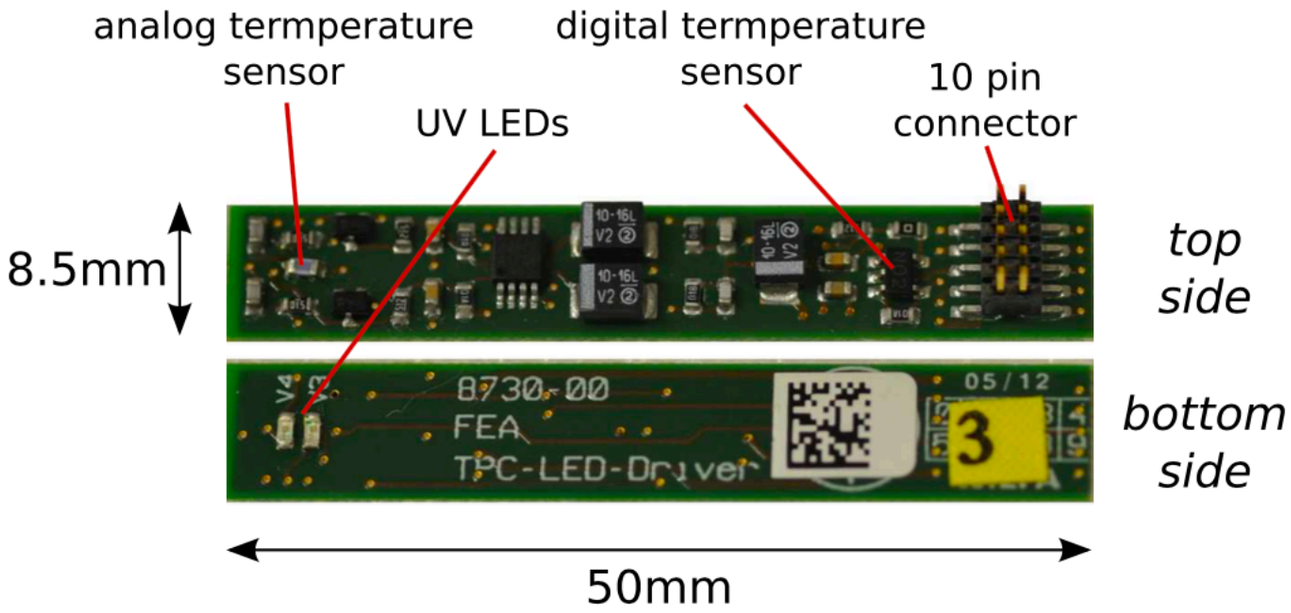
Luxe Technical Meeting, 13th February 2020

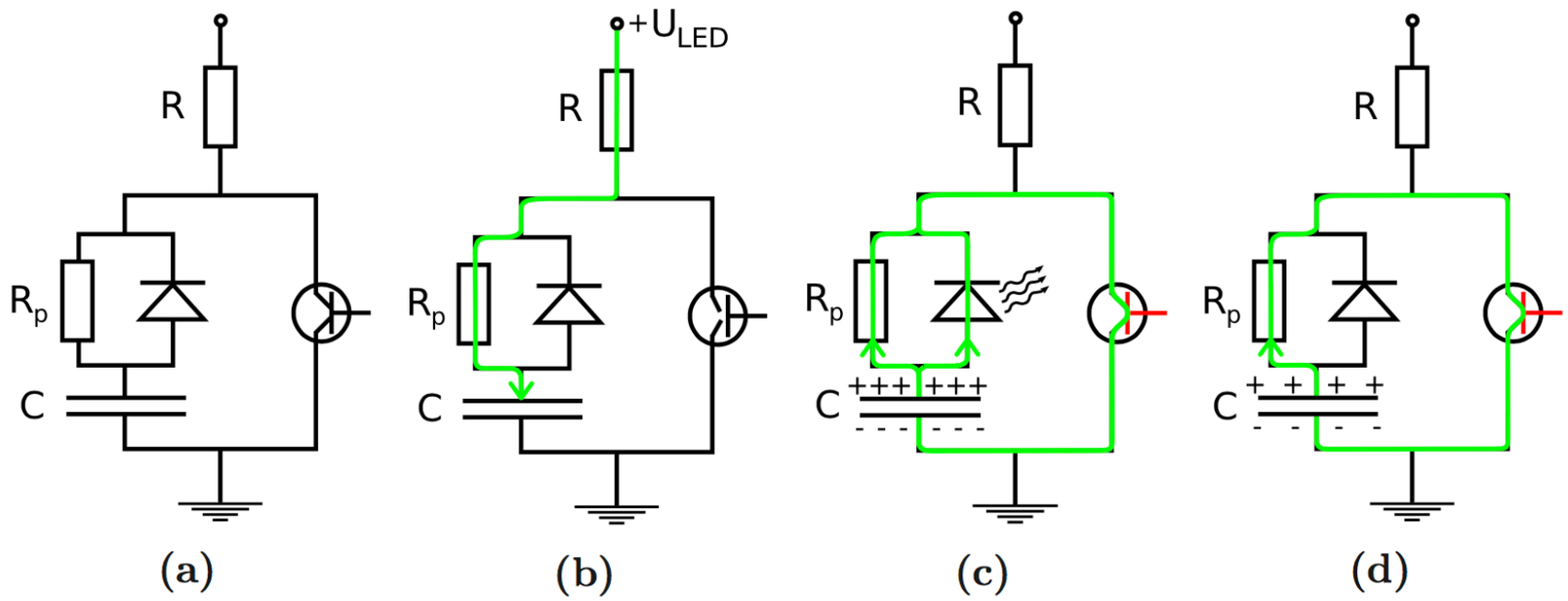
HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

DESY.

LED Driver boards

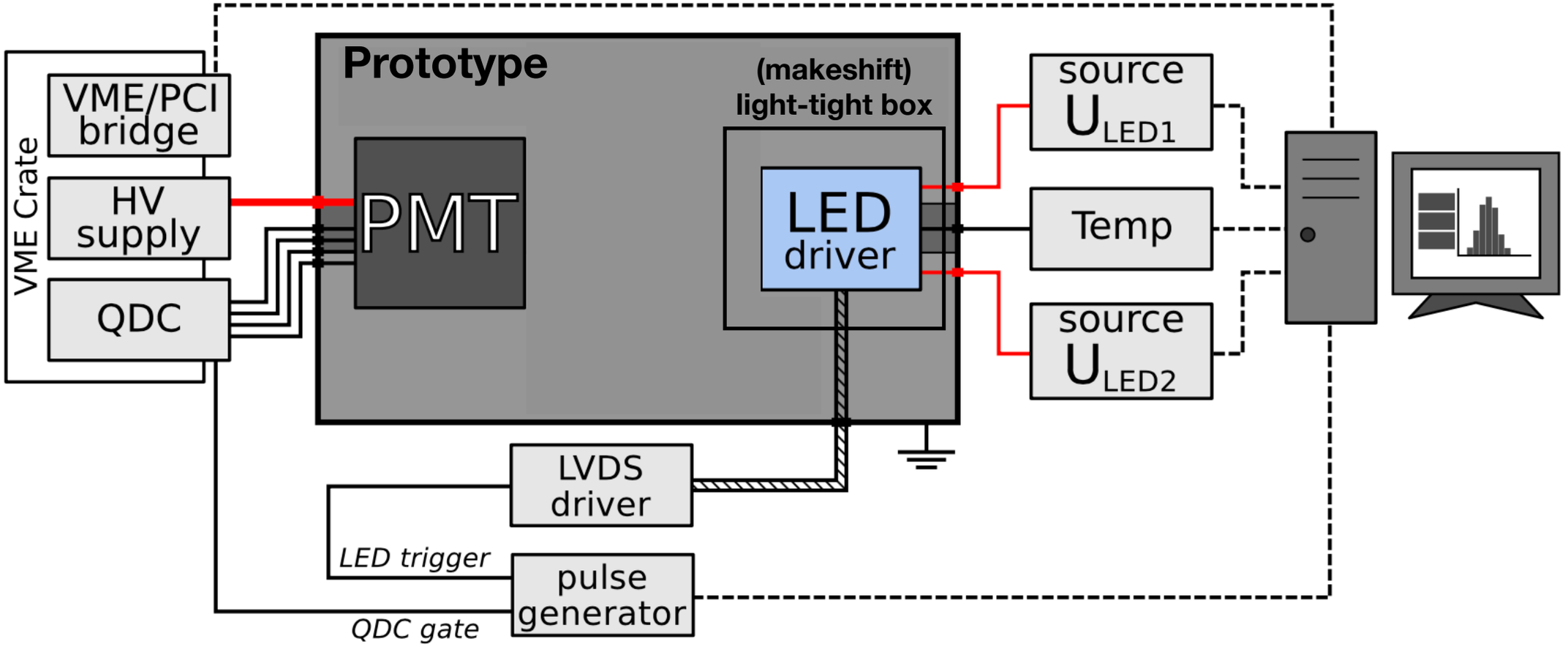
thesis B. Vormwald



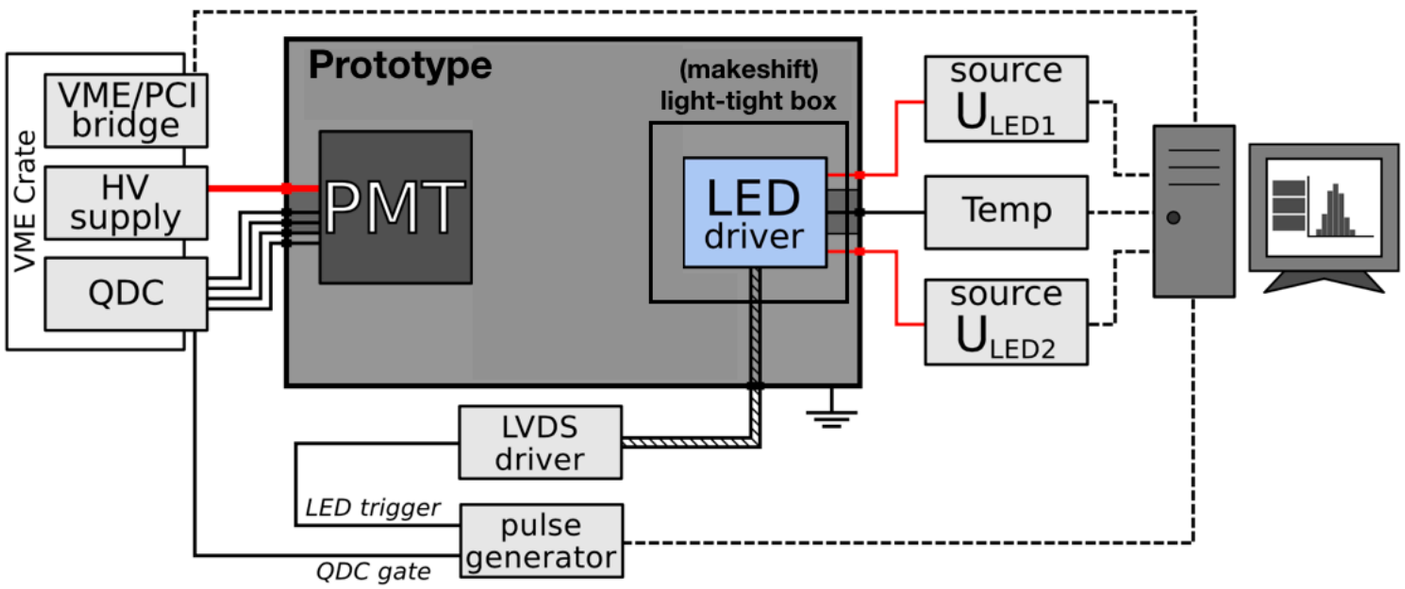


LED board creates very short light pulse for calibration/linearization of photodetectors

Operating Prototype with LED driver boards



Step 1: Operating the LED board stand-alone



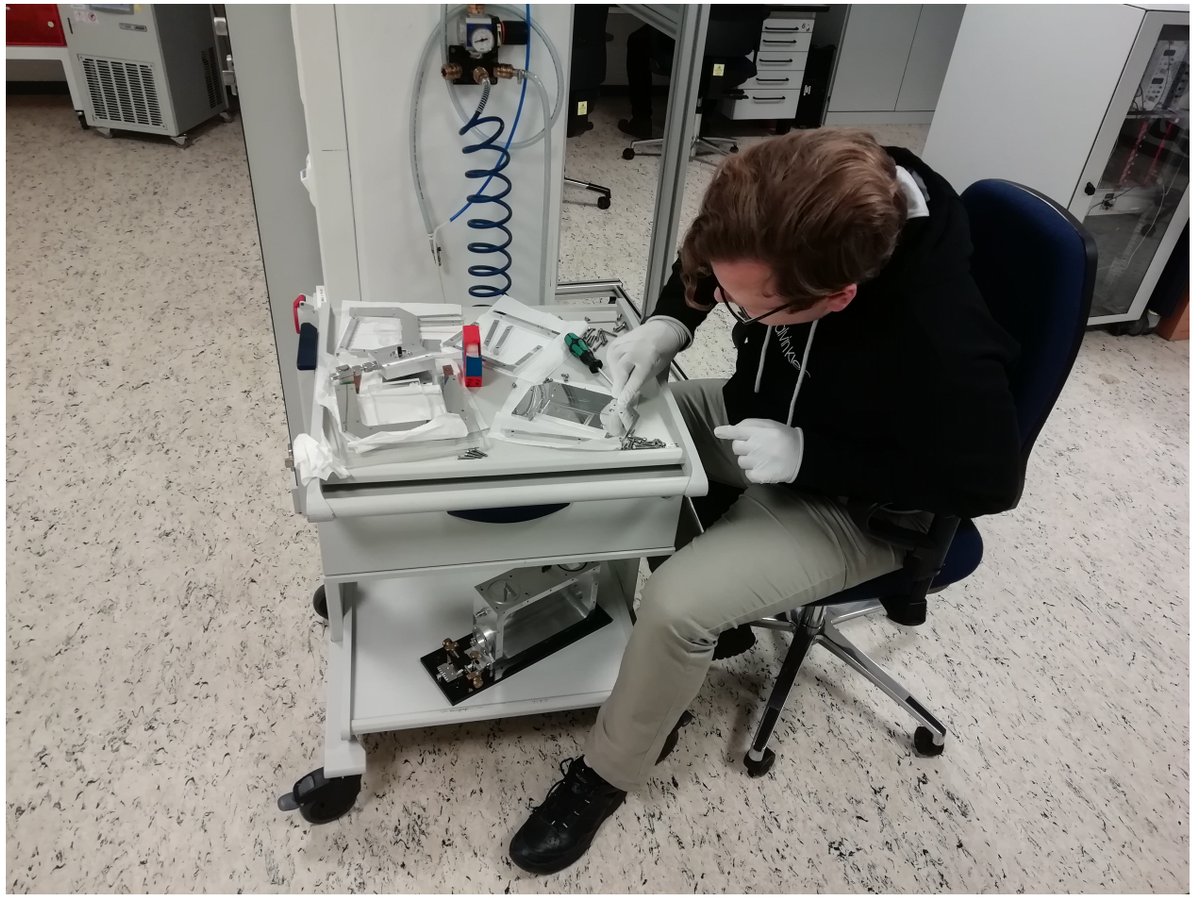
pin allocation

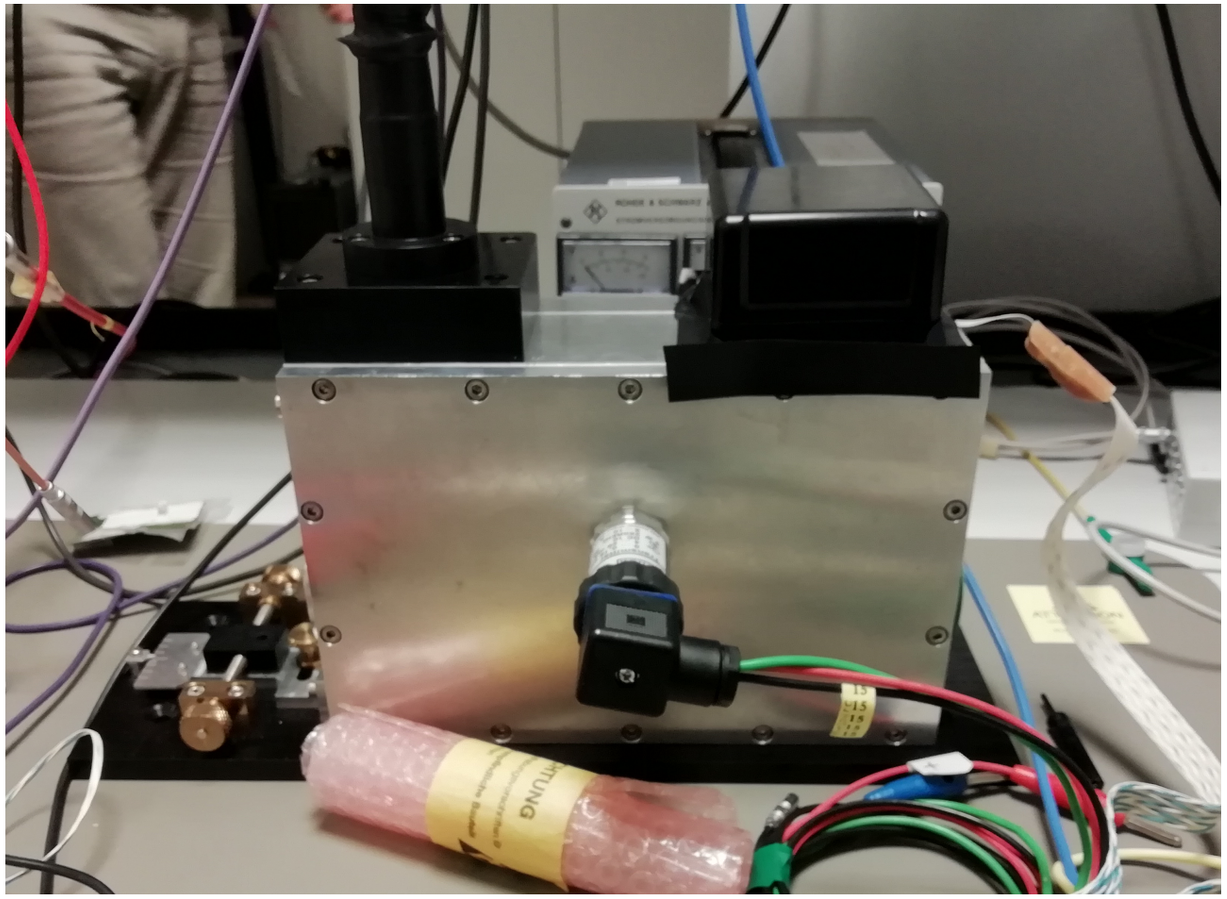
U_{LED1}	**10**	**9**	GND
$+3.3\,\mathrm{V}$	**8**	**7**	T_{analog}
LVDS+	**6**	**5**	LVDS-
T_{digital}	**4**	**3**	GND
U_{LED2}	**2**	**1**	GND

(b)

- took patch panel (banana to 10-pin connector) from Quartz prototype for now
- Keithley Power supplies for powering LVDS driver & board
- Fluke function generator (on loan from FEPOS)
  Good news: Tektronix AFG function generator found!
- LED boards 1 and 5 work

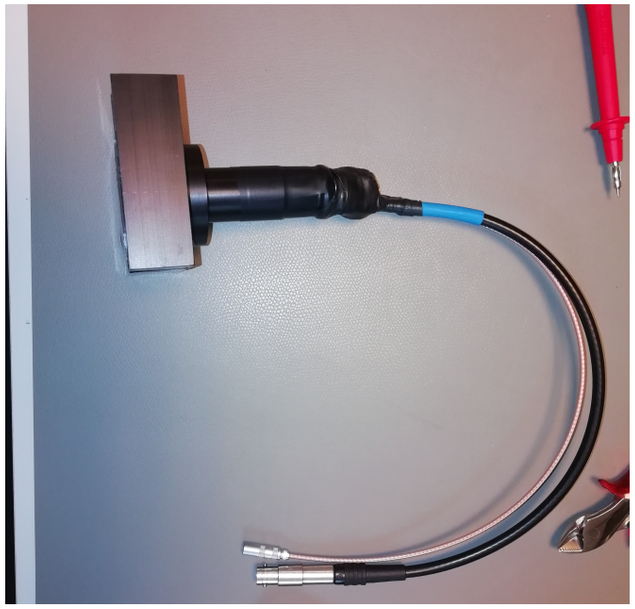
Step 2: Making Prototype light tight (& clean)

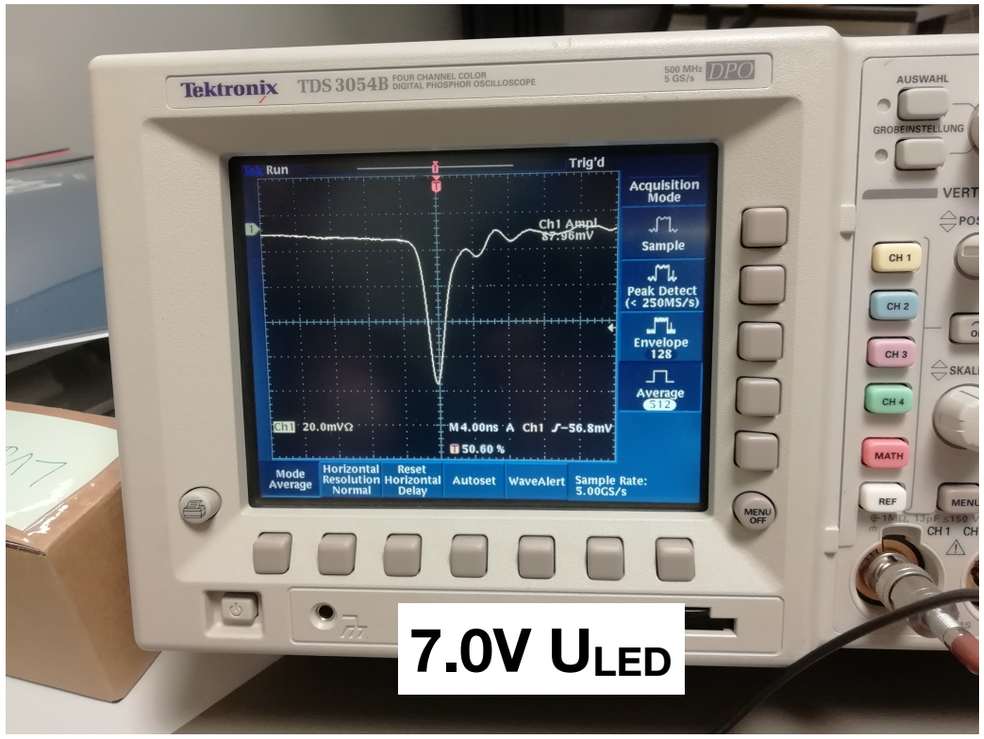




- removed clear Plexi glass walls and replaced with metal ones
- exchanged O-Rings, cleaned surfaces
- made a make-shift light-tight box (there is no proper mounting for LED boards for gas prototype yet)
- have plastic holding clam for LED board, for now use double-sided tape to stick it to prototype such that LEDs shine in one channel, other one sealed with black tape

Step 3: PMT & LED board





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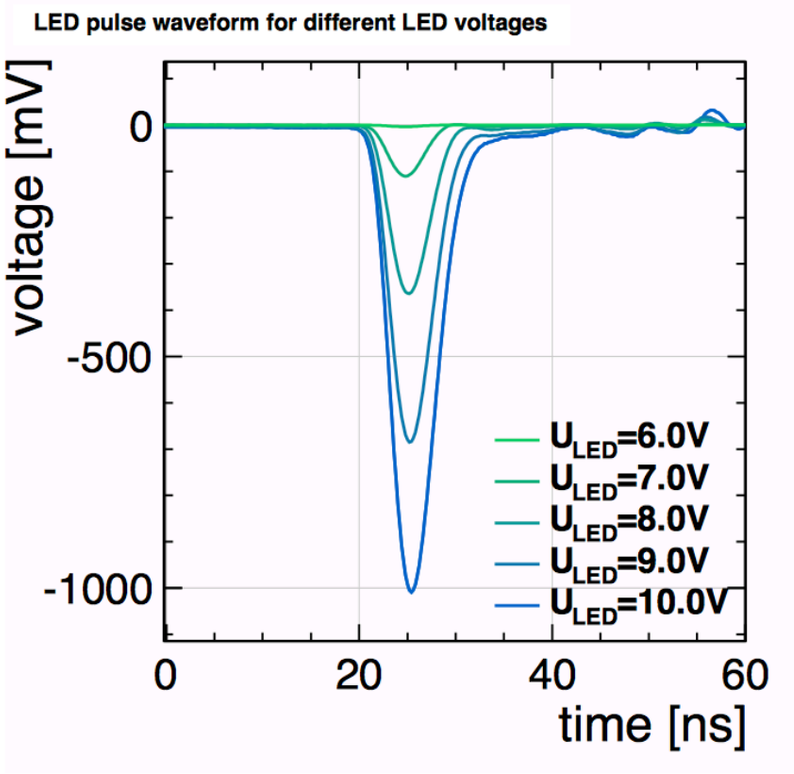
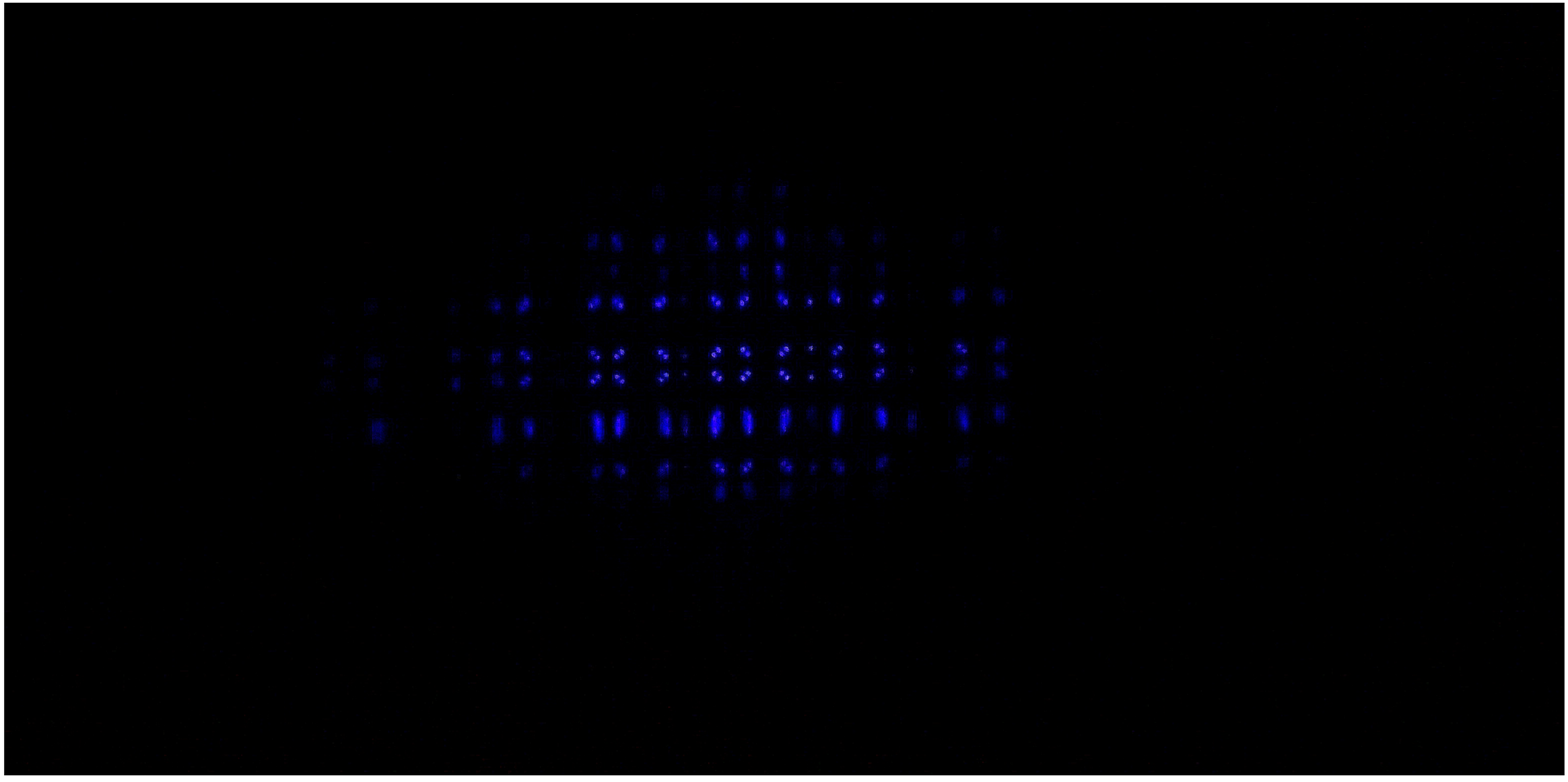


- currently mounted: Hamamatsu R4125, single anode, operating voltage 1500V
- use TestbeamGUI to steer VME Power supply
- PMT output to Oscilloscope
- we saw something looking like a signal… but it persisted when we turned off the trigger for the LED board (from this morning: 10-pin-connector wasn't attached properly, will try again after meeting)
- further steps (once we ascertain our signal): Test full DAQ chain with PMT signal to QDC, trigger from pulse generator

Update: LED board through channel

Probably not visible on Projector :)



Other ToDos

Gas supply:

- there should still be a bottle of Cerenkov gas (C_4F_{10}) in Container in Halle Hera West
- will check if something is still in there
- we don’t need supply in the lab/TB area, can fill up outside
- ToDo: - test gas-tightness and pressure logging, temperature logging
  - LED base with gas valve entering channels is currently not gas-tight, find a quick solution for TB

Trigger for TB:

- idea was to synchronize triggering with Telescope
- problem (my understanding): TLU (trigger logic unit) provides more complicated output (unique event number) than just a NIM gate
- if we just count and e.g. miss an event we can get out of sync with the event numbering
- can we figure things out via a time-stamp?