



LED notched fibre distributing system

QMB1 single LED slice

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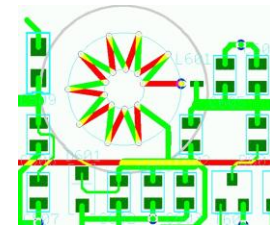
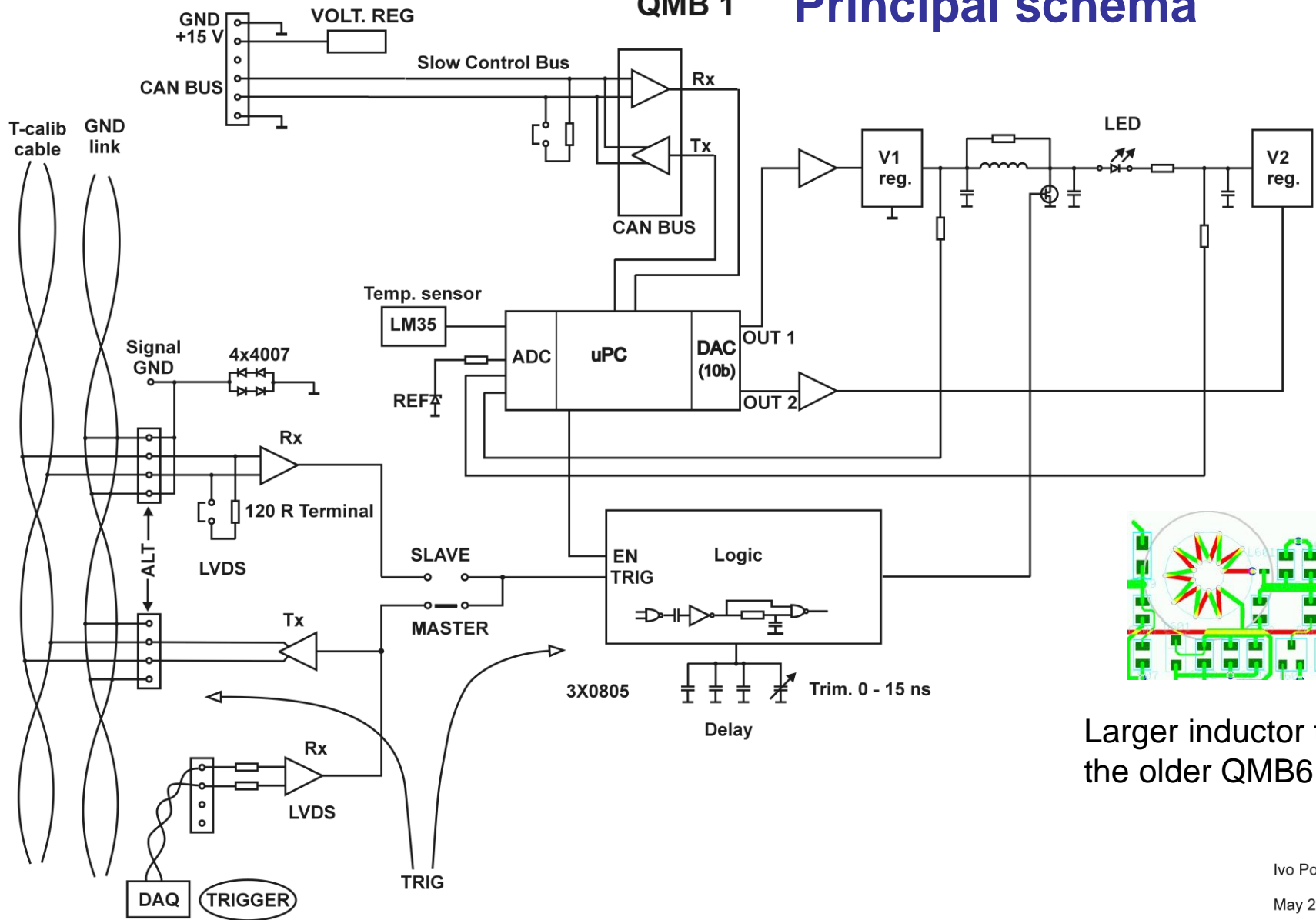
1. QMB1 specifications
2. QMB1 with Toroidal inductor at PCB
3. Trigger distribution
4. Notched fibre light distribution systems 3x24
5. Resume

QMB1

- Quasi resonant Main Board
 - Modular system, 1 LED per board
 - Operation mode:
 - DAQ + CANbus control
 - stand-alone mode
 - LVDS Trigger distribution system
 - Variable amplitude, zero to maximum (~1Amp) smooth
 - Pulse width fixed to ~ 5ns (UV or blue LED)
 - Voltages and temperature monitoring
 - Size of PCB: width 30mm, depth 140mm

QMB 1

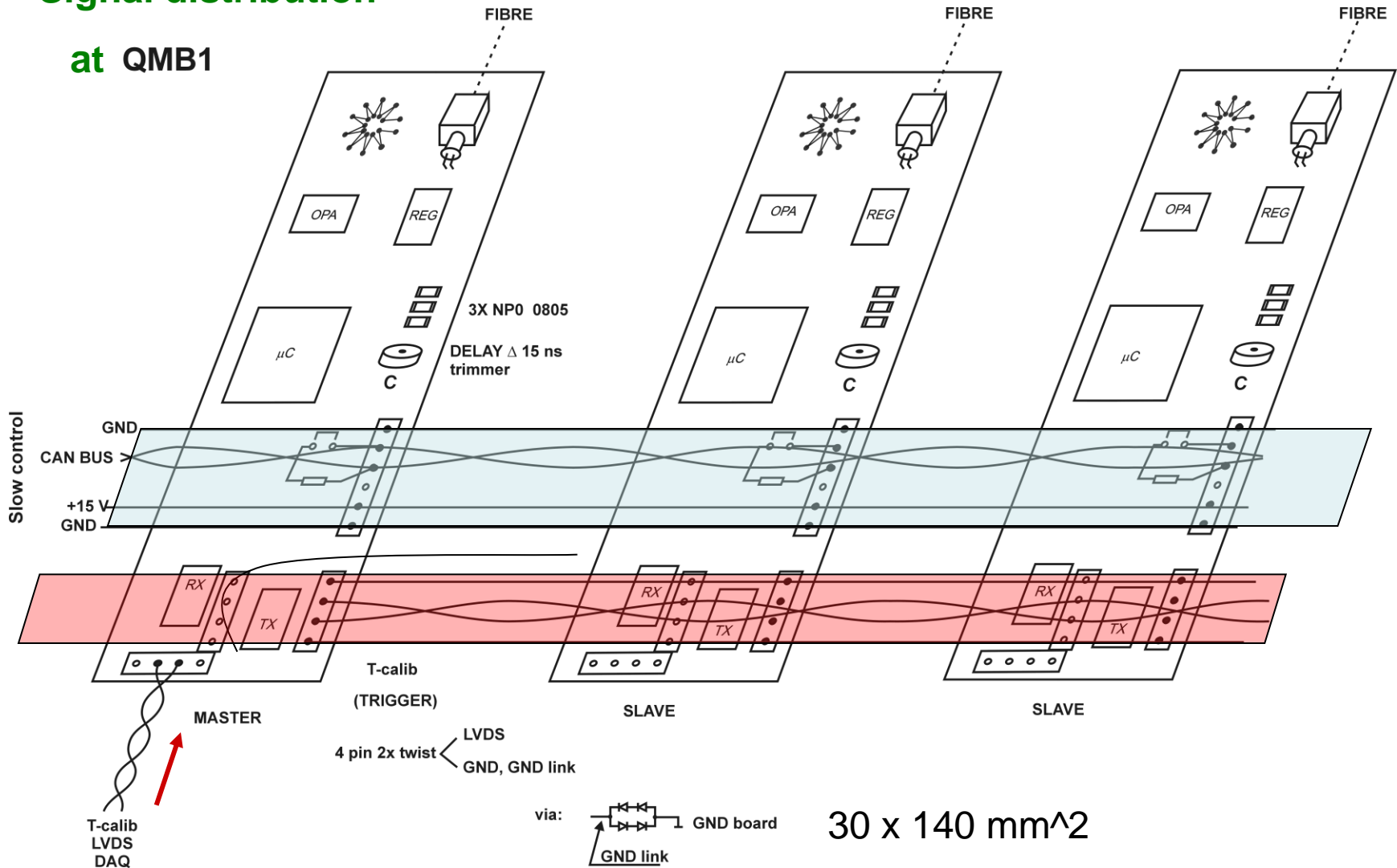
Principal schema



Larger inductor than the older QMB6

Signal distribution

at QMB1

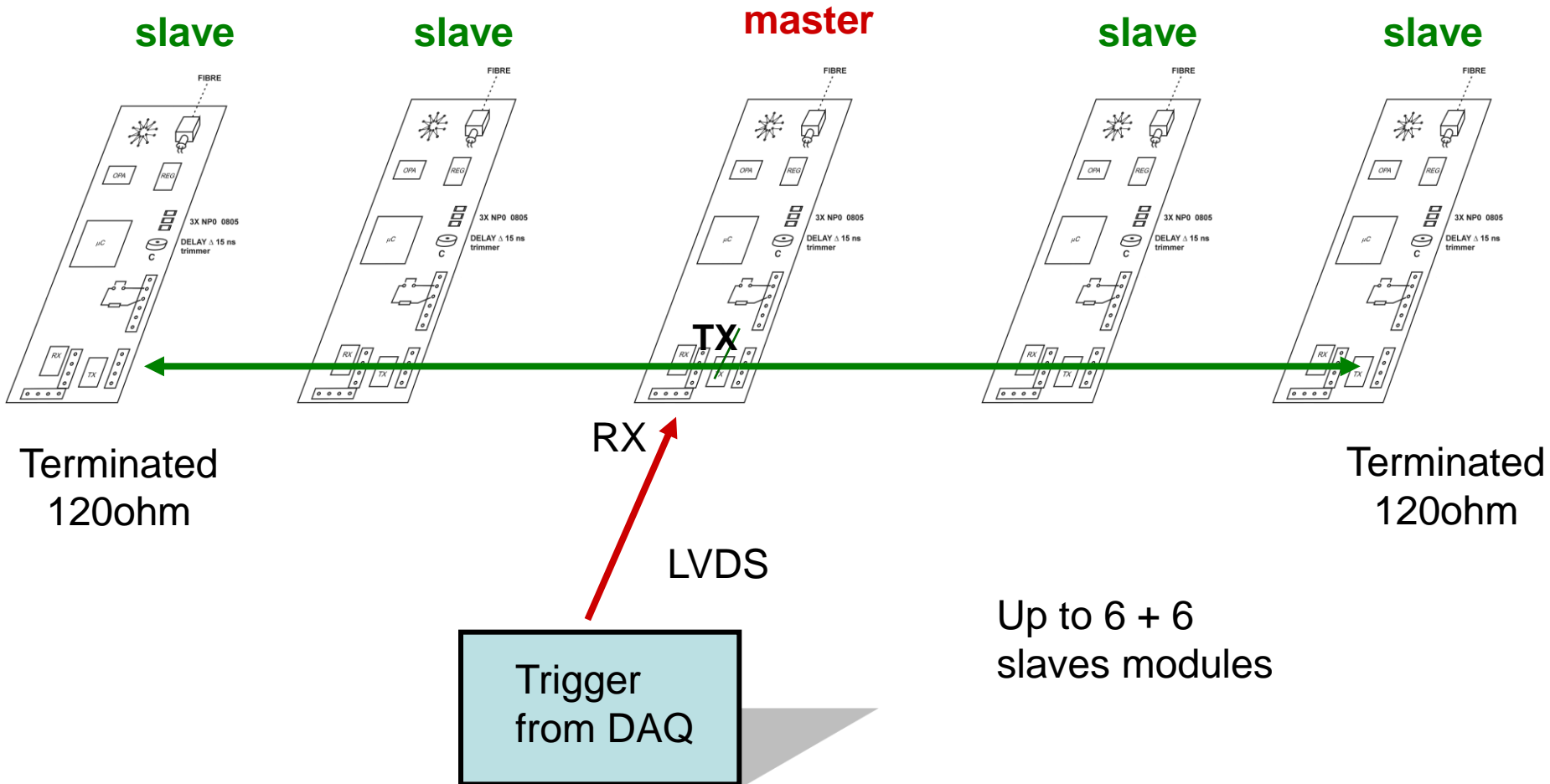


Two flat cables,
Twisted pair for Trigger

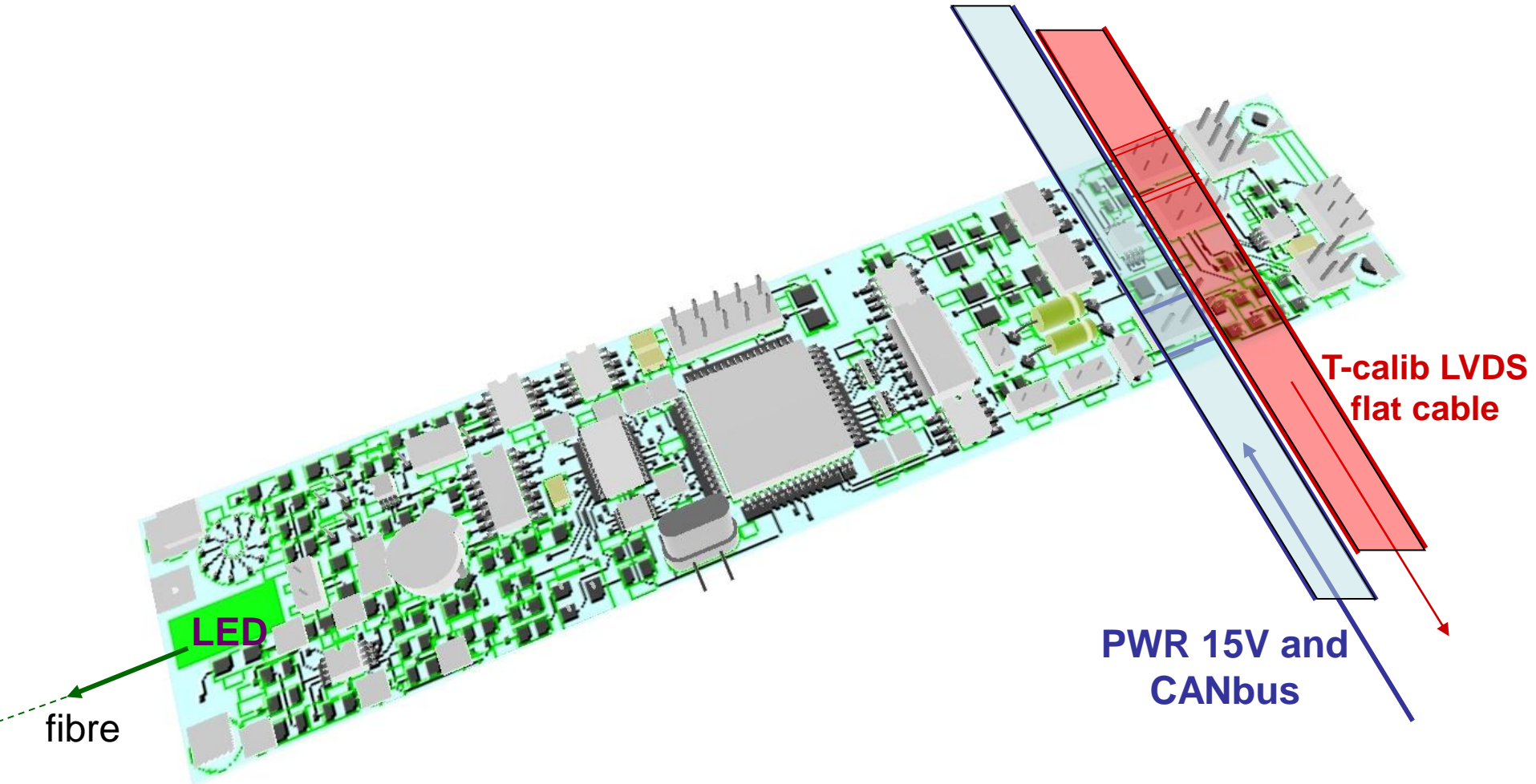
Ivo Polák

May 2011

TRIGGER (T-calib) LVDS distribution to QMB1

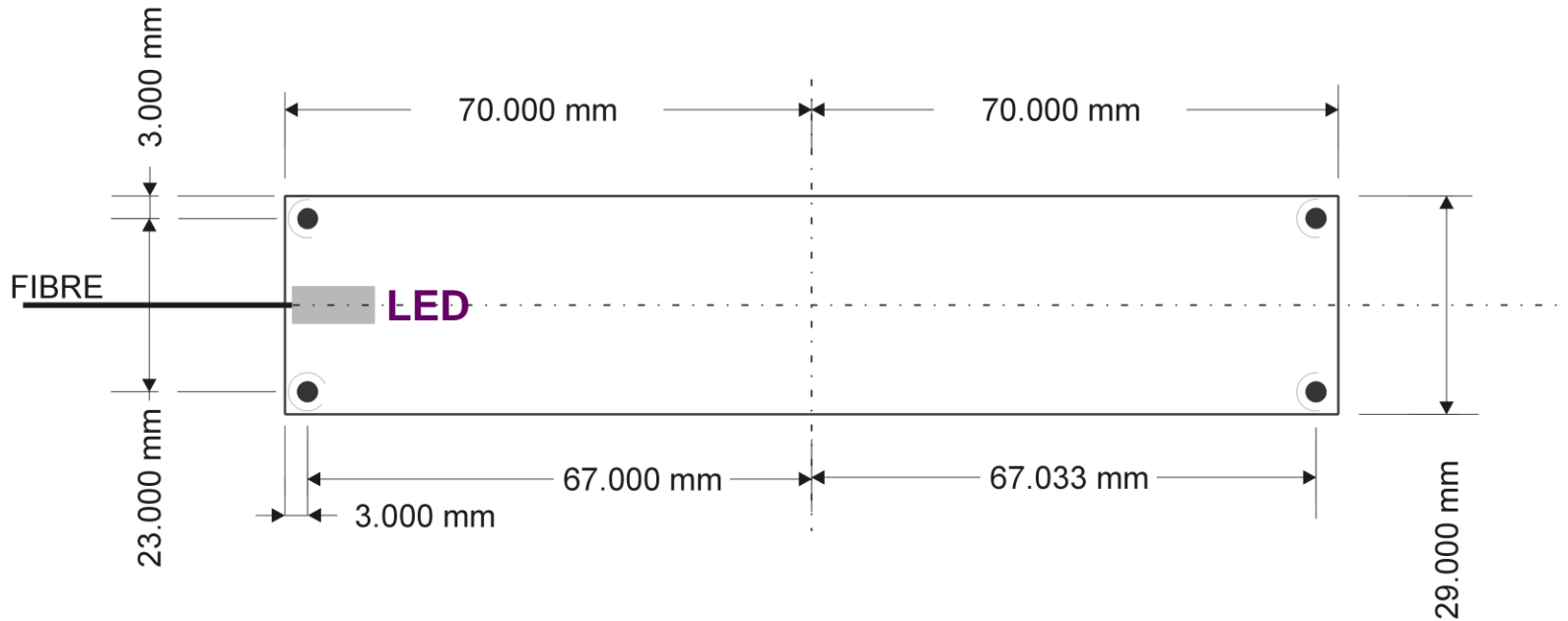


3D draw of QMB1



Mechanical layout of QMB1

QMB1



Outer line: 30 (29) x 140 mm*2

4 mounting holes for M2.5 screw

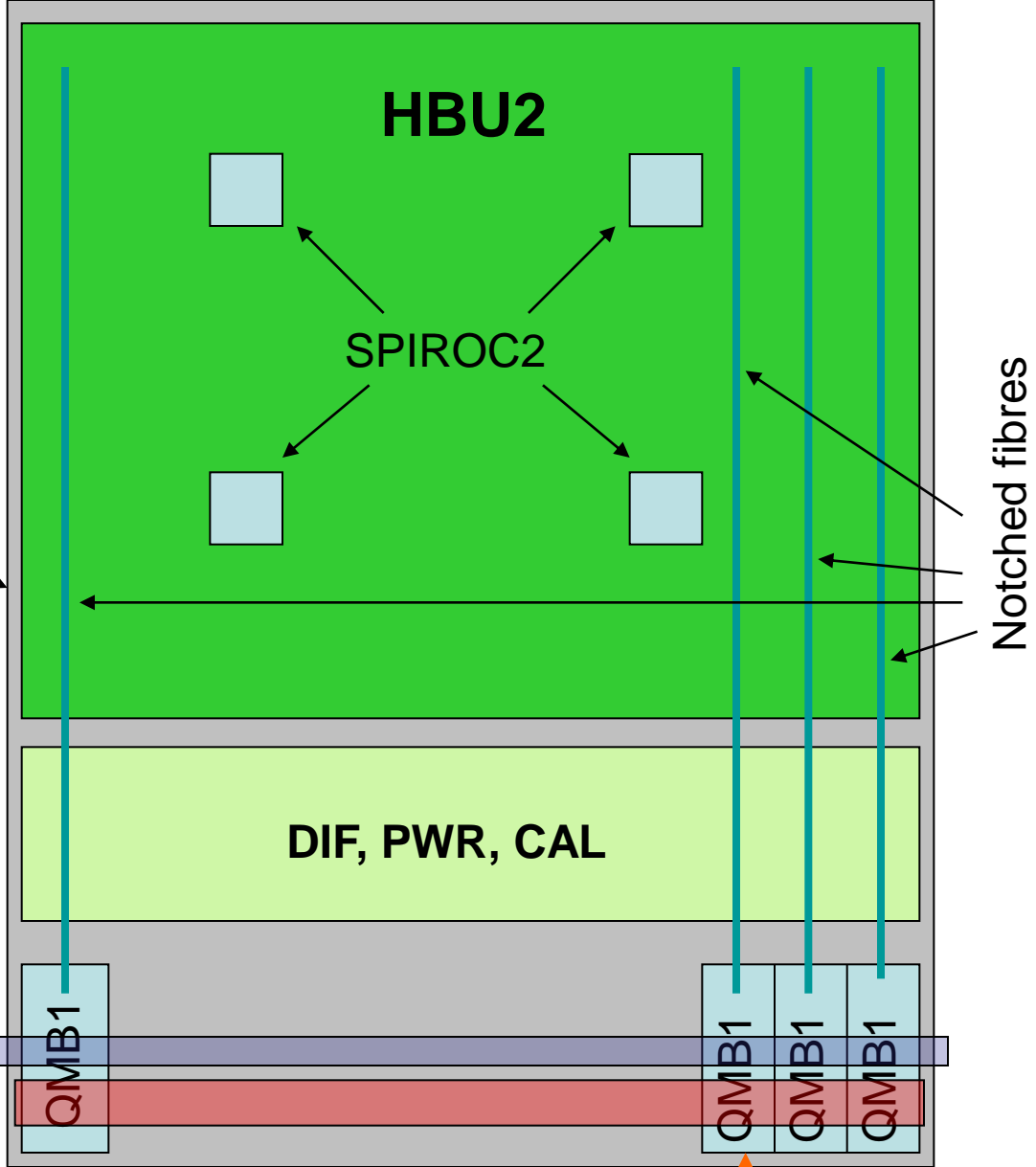
DESY test setup in November

Single layer
frame

PWR 15V

CANbus

combiner



Notched fibres

2011 Sept 14-16

Ivo Polák, FZU, Prague

T-calib from DAQ

work at 2011

- **QMB1 (1-chanel LED driver):**

- Done

- Topology, PCB design
 - Communicating bus (CAN)
 - CPU (Atmel AVR)
 - Trigger distribution (LVDS)
 - Trigger delay can be tuned by C trimmer (~10ns)
 - 4 mounting holes for screw M2.5
 - Fibre(LED) position set to center of PCB

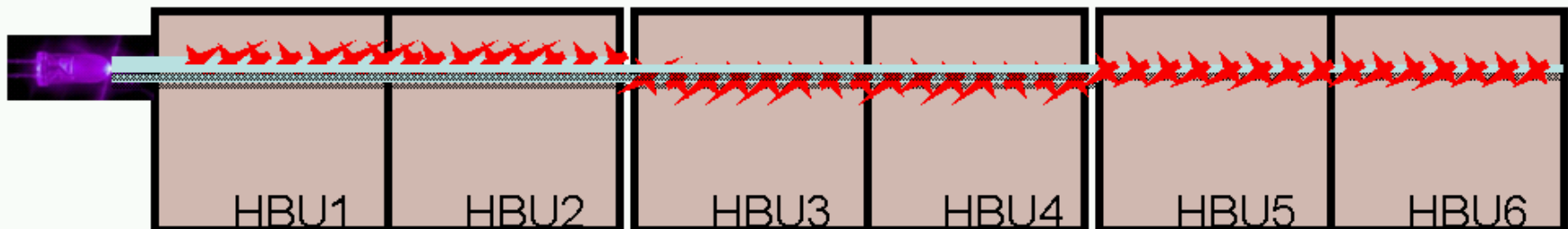
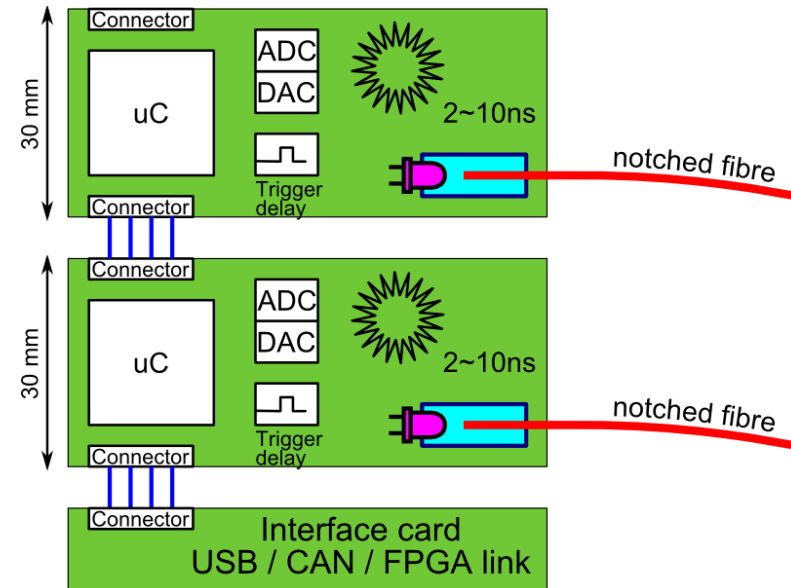
- PCB in production + assembly

- To be done Debugging in October/beginning of Nov

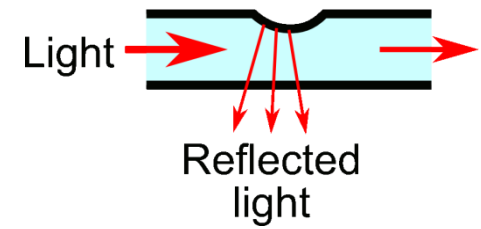
- **Set of notched fibers, semiautomat machine under development**

- Set: 3*fibre with 24 notches, creating a line of 72 notches.
 - 3 sets will be delivered in November

2010 Idea



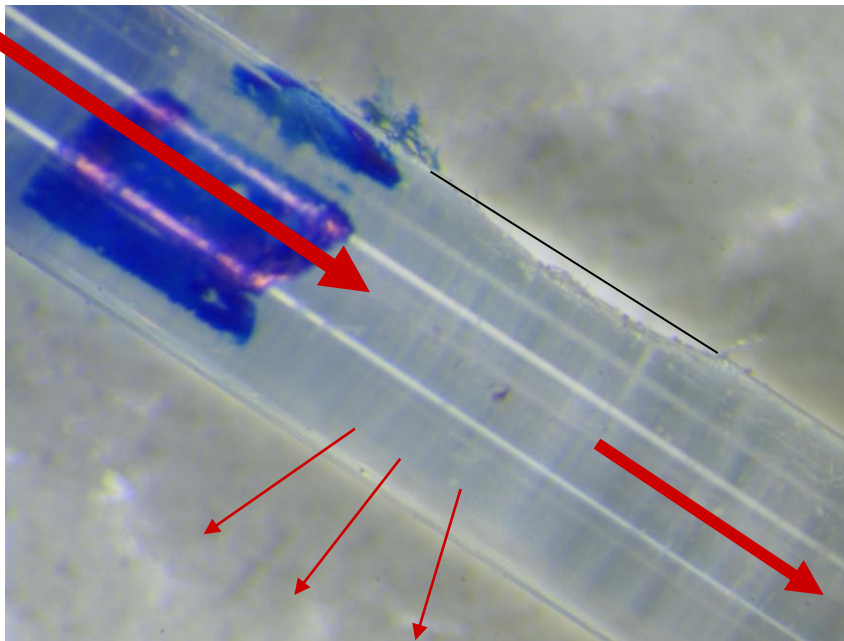
Notches at one long fibre (24 notches total)



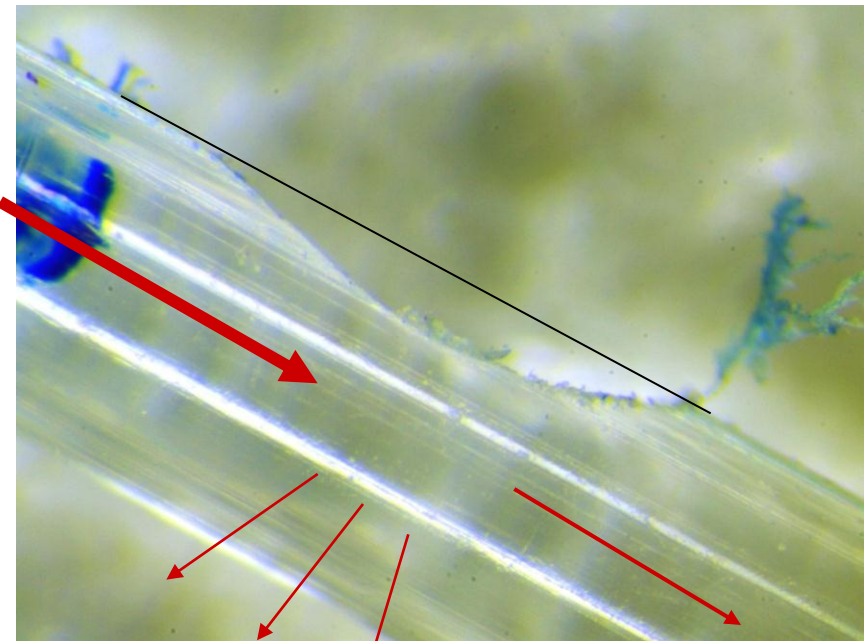
LED side

Notch # 4

Notch # 24 last one, biggest



Light coupled
from tap



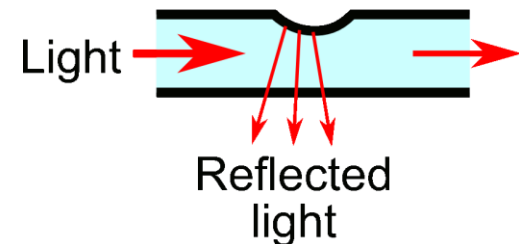
Taken on microscope with zoom ~50

illuminated by
Green laser

24 notches

Notched fibres

- external company Safibra preparing the setup (semiautomat) to produce precise notches in the fibres
- We will have prototype fibres made by new technology in November, we assume less spread of the light at taps (<15%).
- as backup, we have old 3 + 1 fibres (12 notches, spread <10%) in hand for November test with HBU at DESY

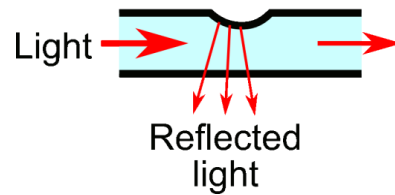


Resume

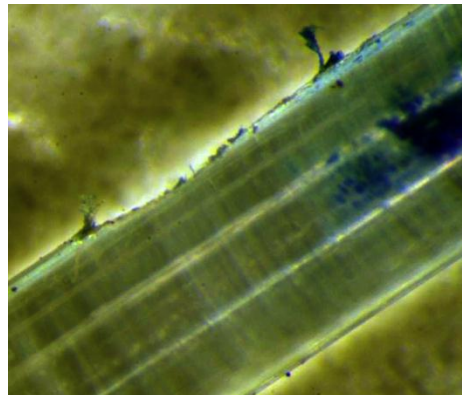
- QMB1 is in production stage
 - First 4 samples promised in October
 - Coupling to fibre to be defined
- QMB1 in hand with fw - expected in autumn
- 3 sets of Notched fibres scheduled to be delivered in November
- semiautomatic machine is under development

Distribution of light: Notched Fiber

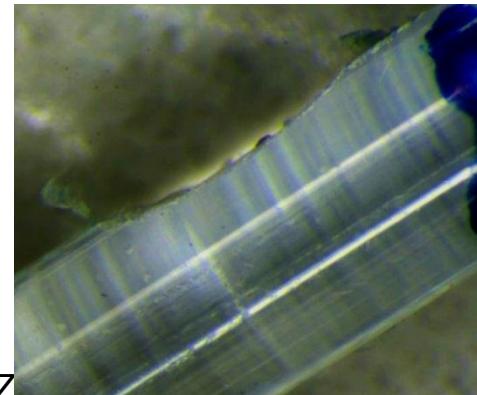
- Light is emitted from the **notches**
- The **notch** is a special scratch to the fiber, which reflects the light to the opposite direction
- The size of the notch varies from the beginning to the end of the fiber to maintain homogeneity of the light, which comes from notches



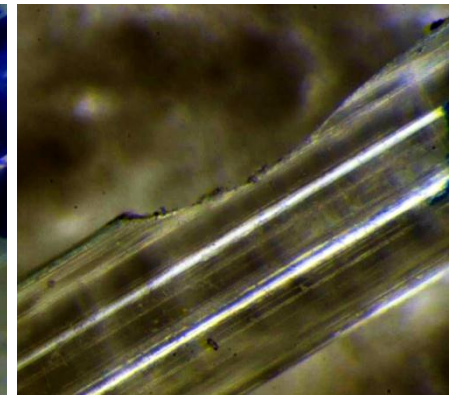
First notch



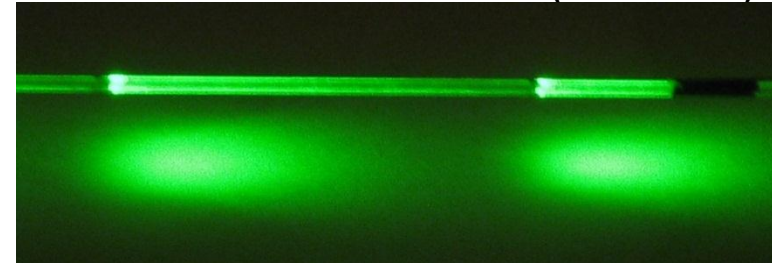
Middle notch



End position notch



Emission from the fiber (side view)



Illuminated by
Green laser

24 notches

Notched fibre illuminated by green laser pointer

