Bundesamt für Kartographie und Geodäsie

TECHNISCHE UNIVERSITÄT MÜNCHEN

BKG
Wir geben Orientierung.

ELT Safety Concept @ WLRS

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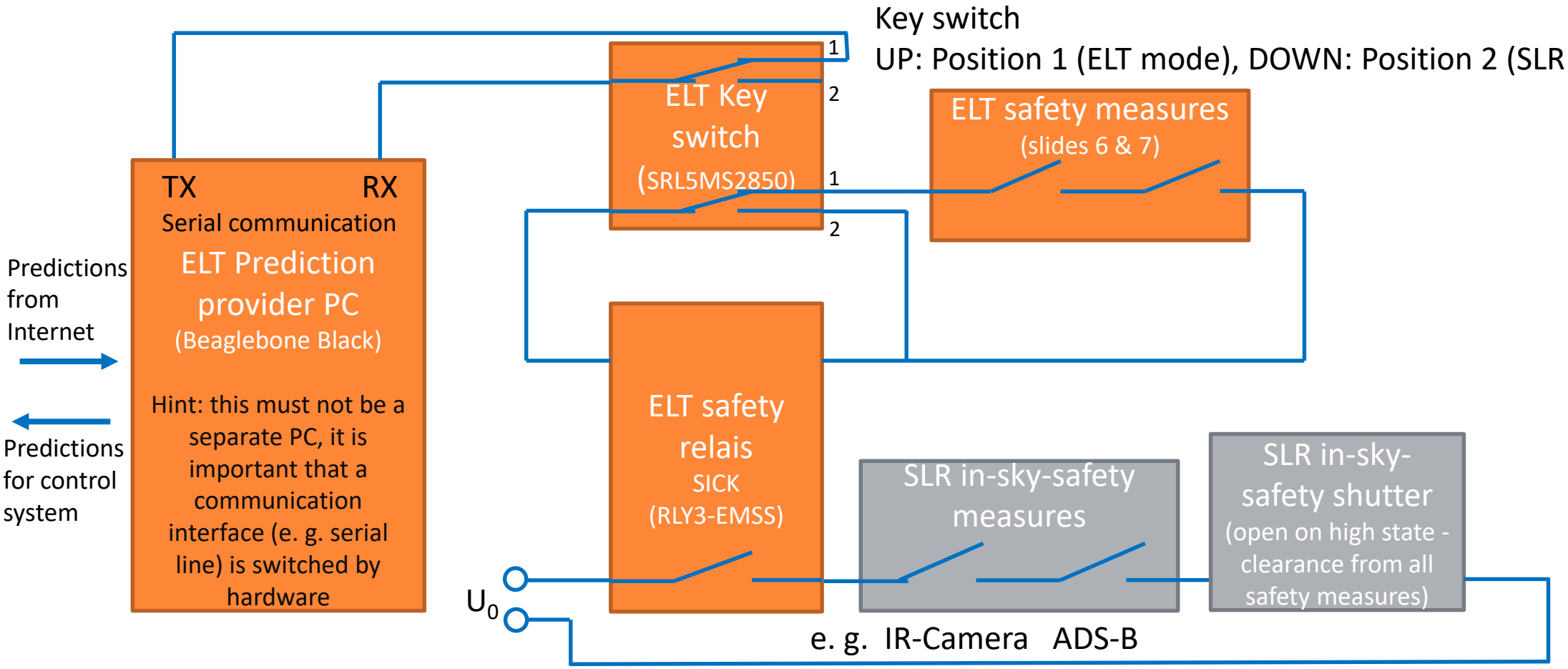
ELT safety
- realisation @ WLRS -

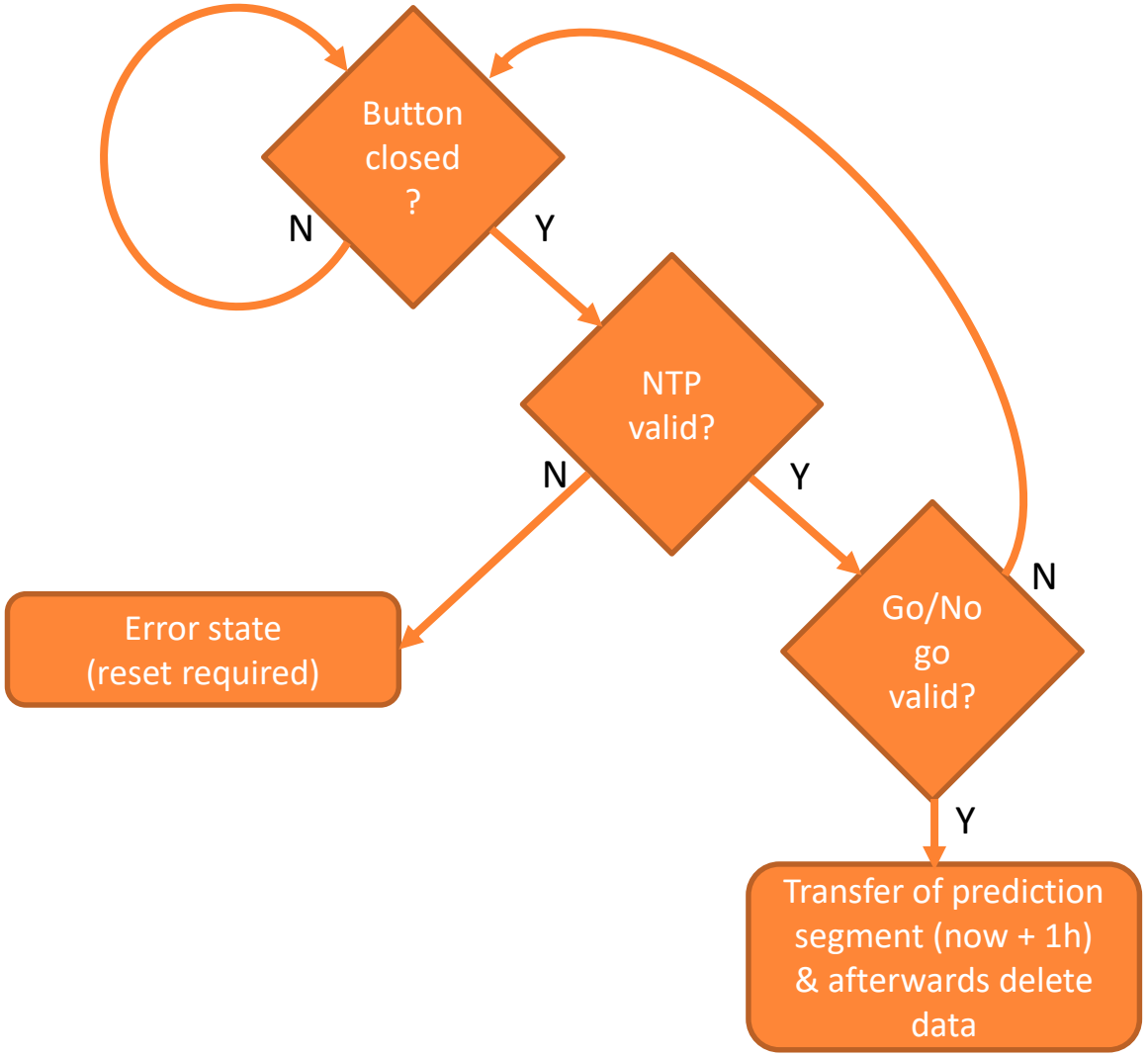
- ISS orbit predictions available **only, if** hardware key switch is in position 1 (as shown below)
- In position 1 the hardware measures to **ensure** eyesafe operation are **active**



ELT safety
- PC software workflow -

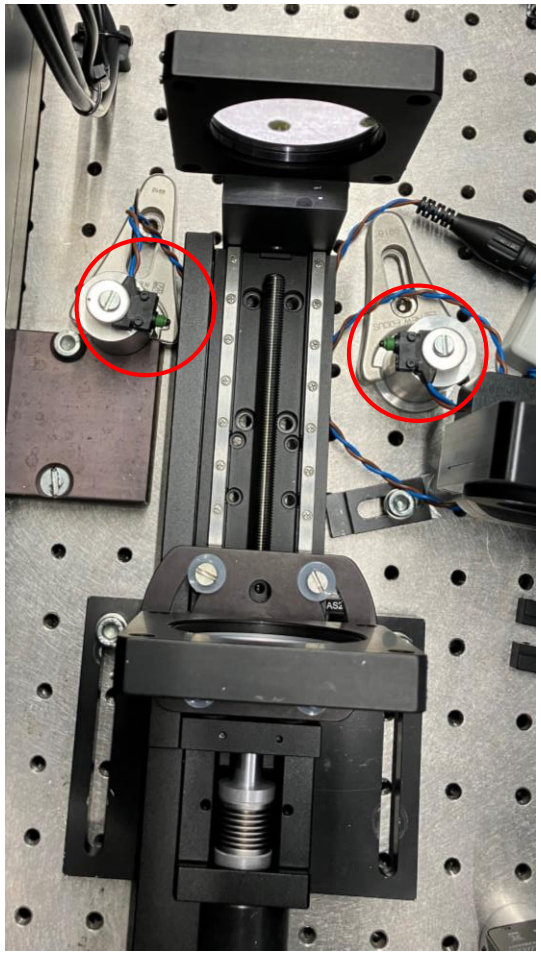
- Hardware Switch position 1:
  1. The switch closes a serial line from /dev/ttyO1 (transmitter) to /dev/ttyO4 (receiver) of the implemented BeagleBone Black PC
  2. Simultaneously this activates the hardware ELT safety measures (Hardware switches).
  3. The ntp time synchronization process on the BeagleBone Black PC is checked for correct operation
  4. The GO/NOGO file is checked for valid timestamp & GO-state
  5. The prediction data is cut to an interval starting from “now” to “now+1h” and is transfered over the serial line & stored into internal buffer of the BeagleBone Black PC
  6. Once the prediction data is fetched from the SLR-system control software, the data is deleted (the data is provided just one time)

ELT safety
- software flowchart -

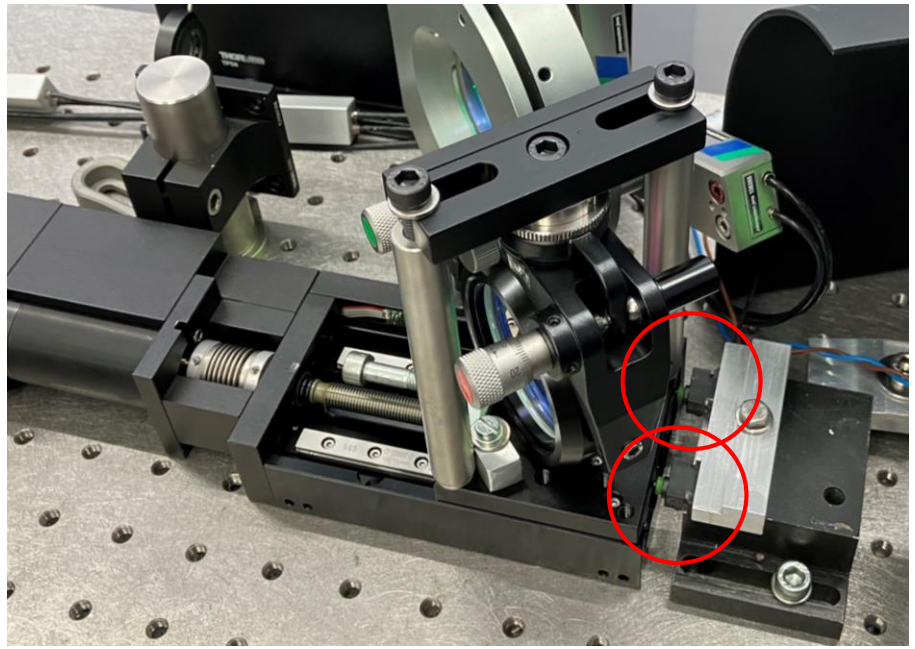


ELT safety
- safety measures 1 @ WLRS -

- All safety measures **must** be connected in series!

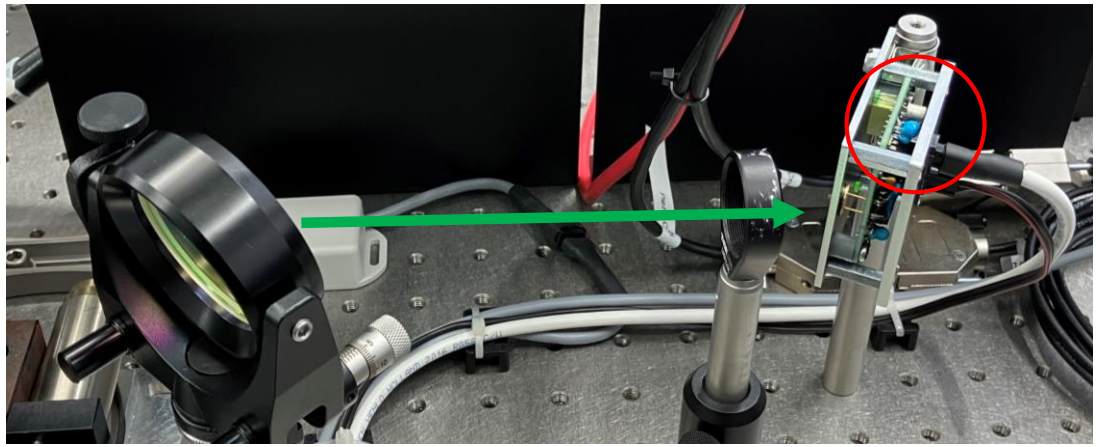


Safety measure 1:
Divergence control.
When the lens on the linear table is in the right position, the two micro-switches are pressed and close the micro-switch contacts

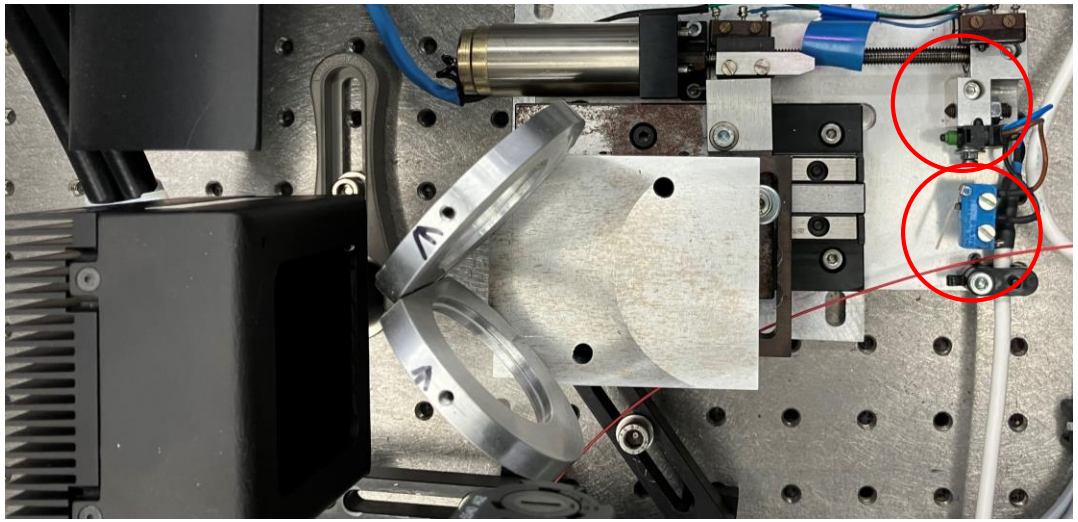


Safety measure 2:
Deflection mirror high power amplifier output.
When the mirror is out of the beam-path the two micro-switches are pressed and close the micro-switch contacts

ELT safety
- safety measures 2 @ WLRS -



Safety measure 3:
Laser pulse energy monitoring. When the laser pulse energy is at the right level the laser pulse energy monitoring device closes a relay contact



Safety measure 4:
NIR radiation outcoupler. When the NIR radiation deflection mirrors are in the beam-path, the micro-switches are pressed and close the micro-switch contacts

Safety measure 5:
Deflection mirror high power amplifier input. When the mirror is in the beam-path the two micro-switches are pressed and close the micro-switch contacts

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Thank you for your attention!