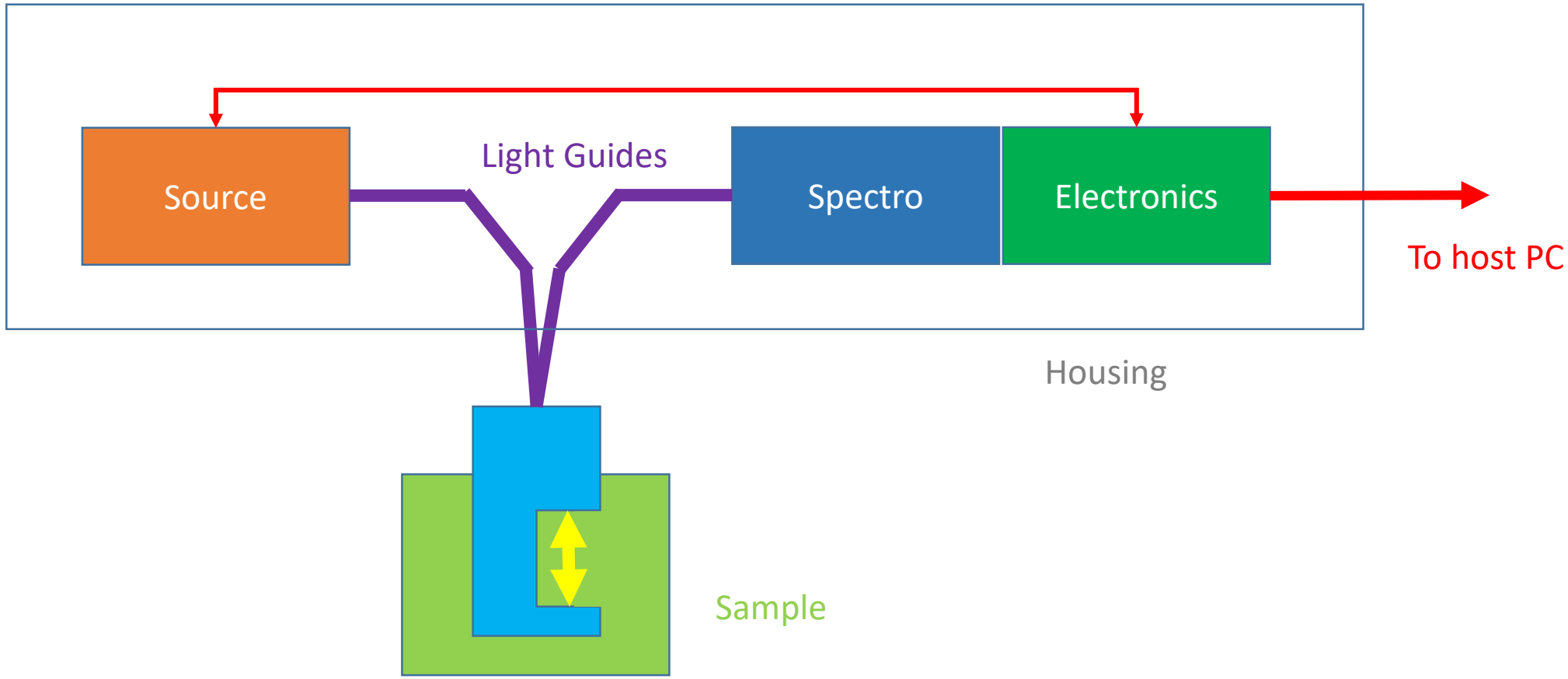
Selection of Spectrometer Systems

A Guide to Perfect Hardware

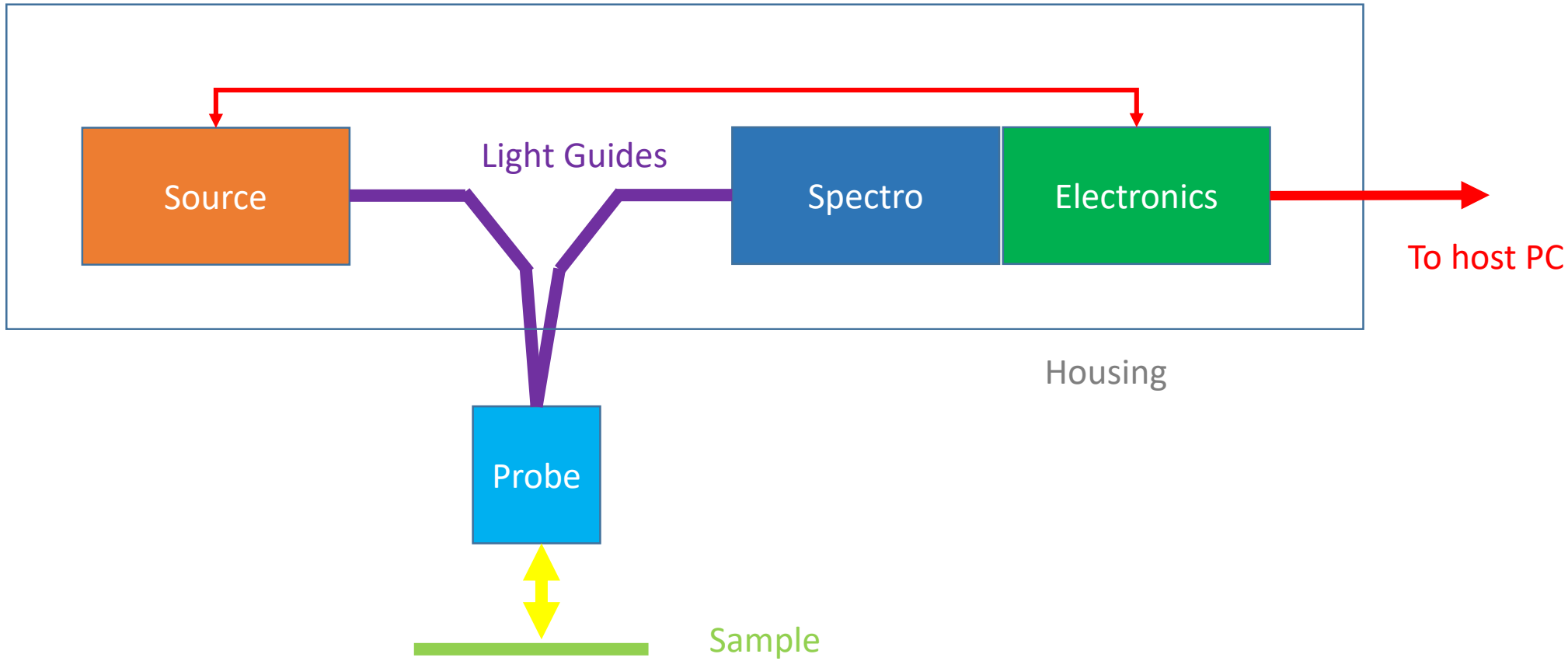
Overview

- Analyzation of available spectrum or spectral information
- Spectral range
- Sensitivity
- Matched light source
- Electronics
- Protection

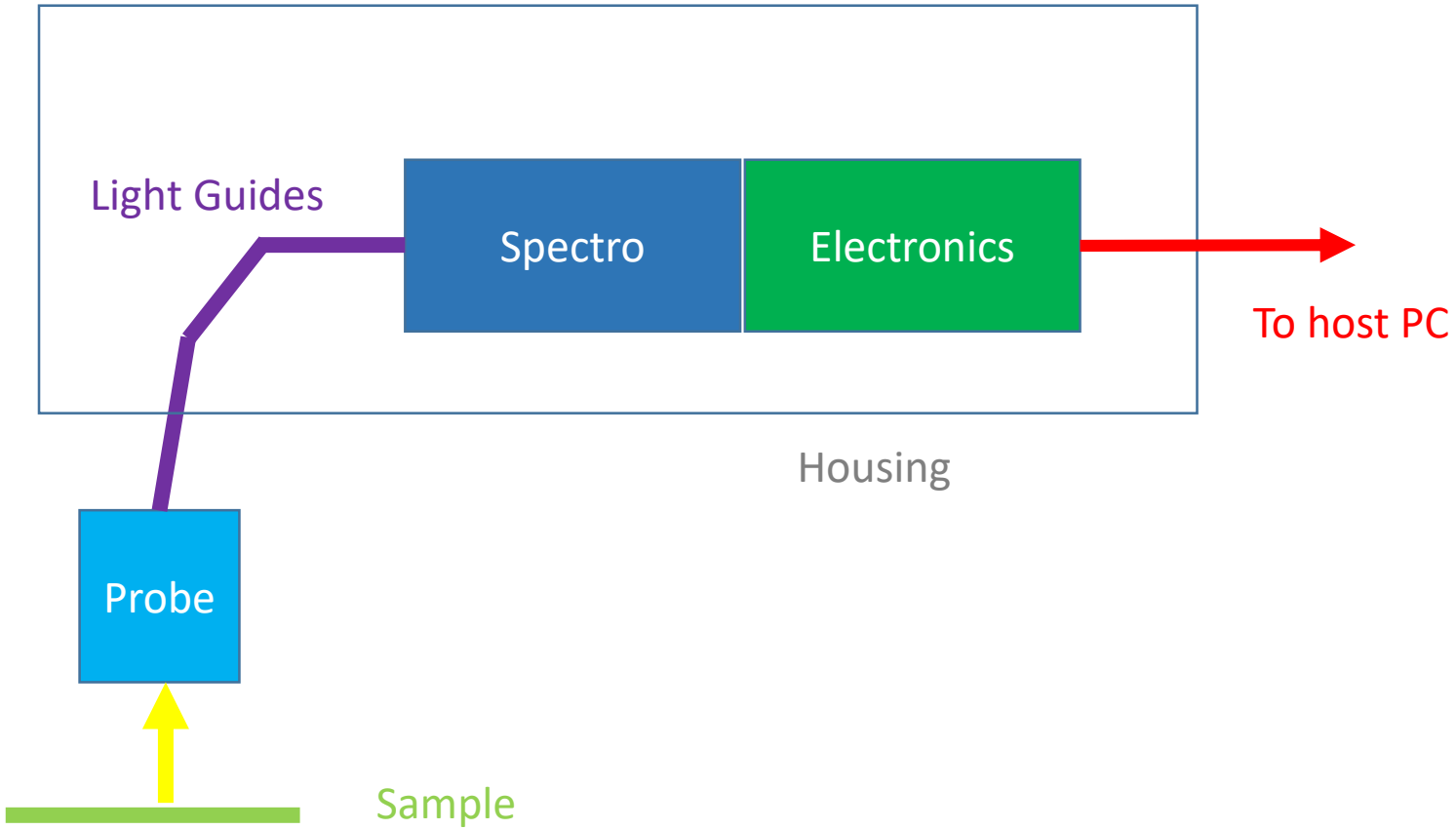
System for Transmission/Absorption



System for Reflection

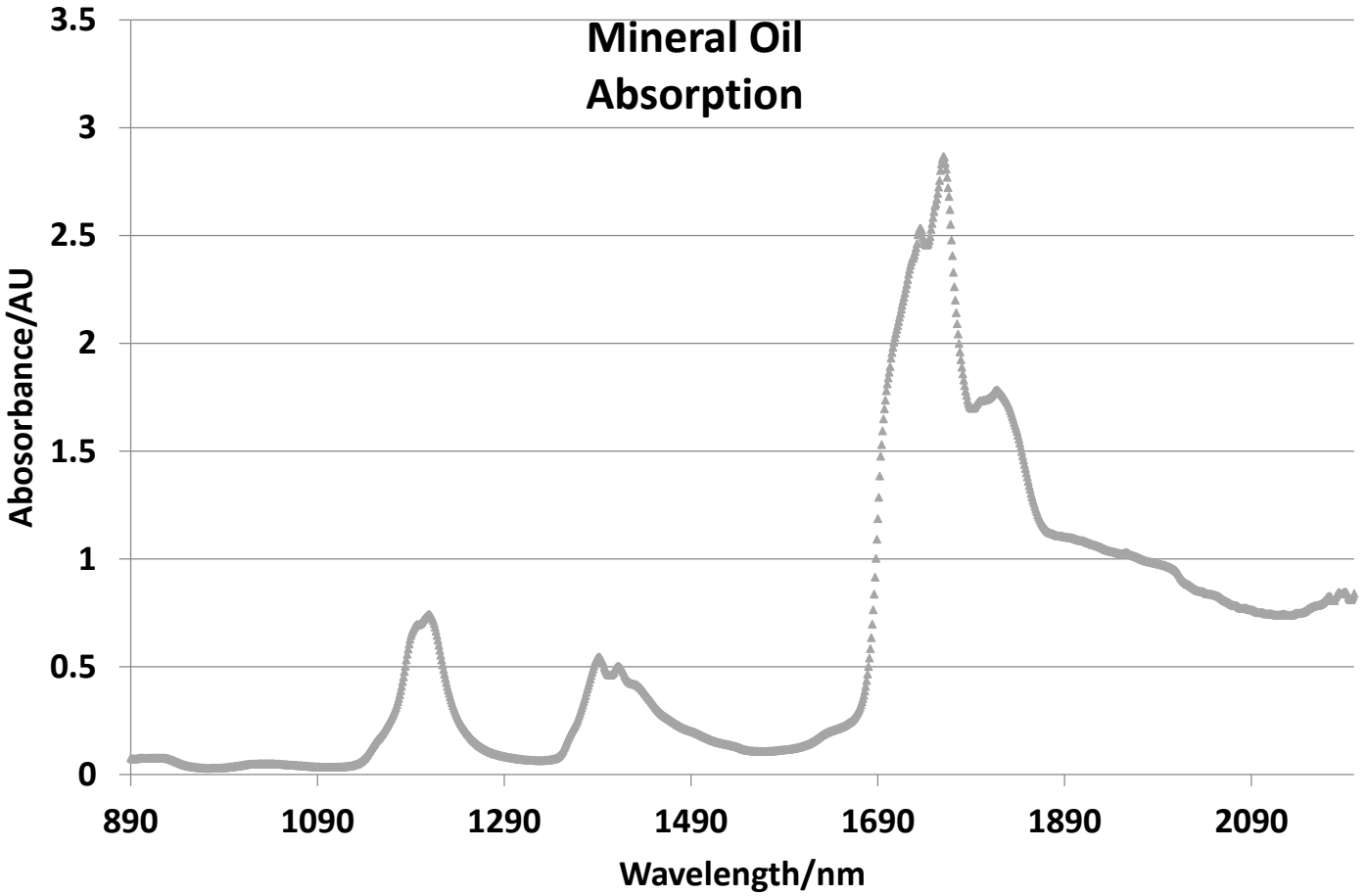


System for Emission

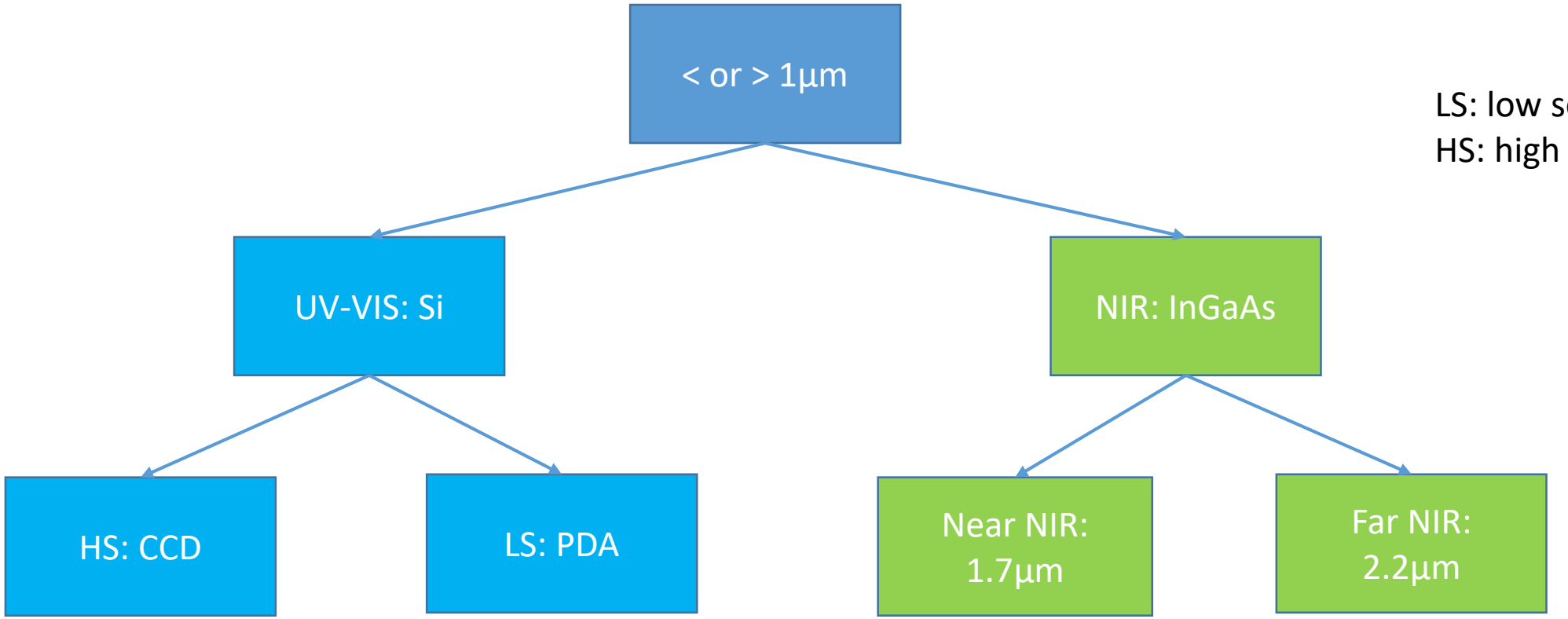


Analyzation Spectrum

- Check what range has to be covered
- Which lines are important?
- Adjacent lines to be resolved?

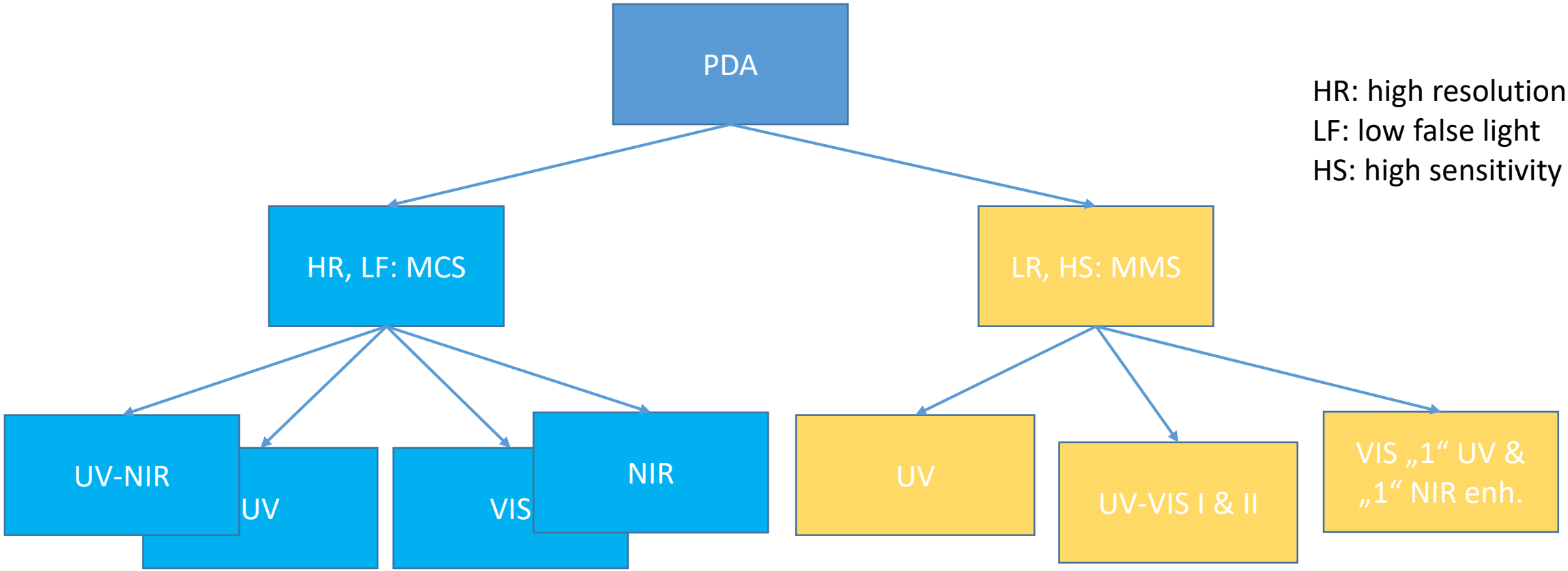


Selection Spectrometer



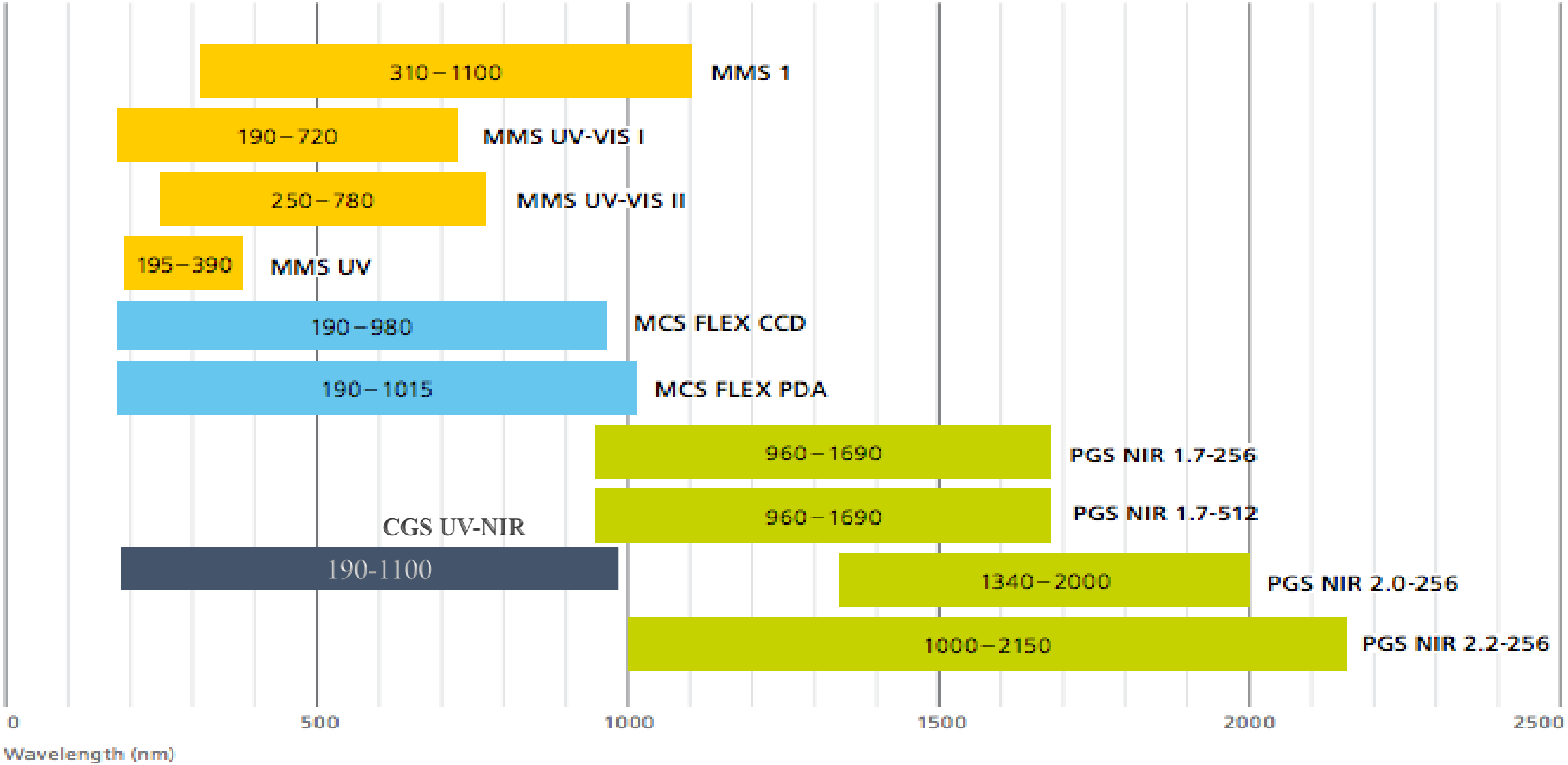
LS: low sensitivity
HS: high sensitivity

Selection PDA Spectrometer



HR: high resolution
LF: low false light
HS: high sensitivity

Overview Spectrometer modules



Sensitivity

- Check what measurement setup is required
  - Transmission / Absorption / Reflection: high efficiency:
    - PDA is fine, low power light source
  - Diffuse Reflection / Fluorescence
    - CCD is best / required
    - Strong light source

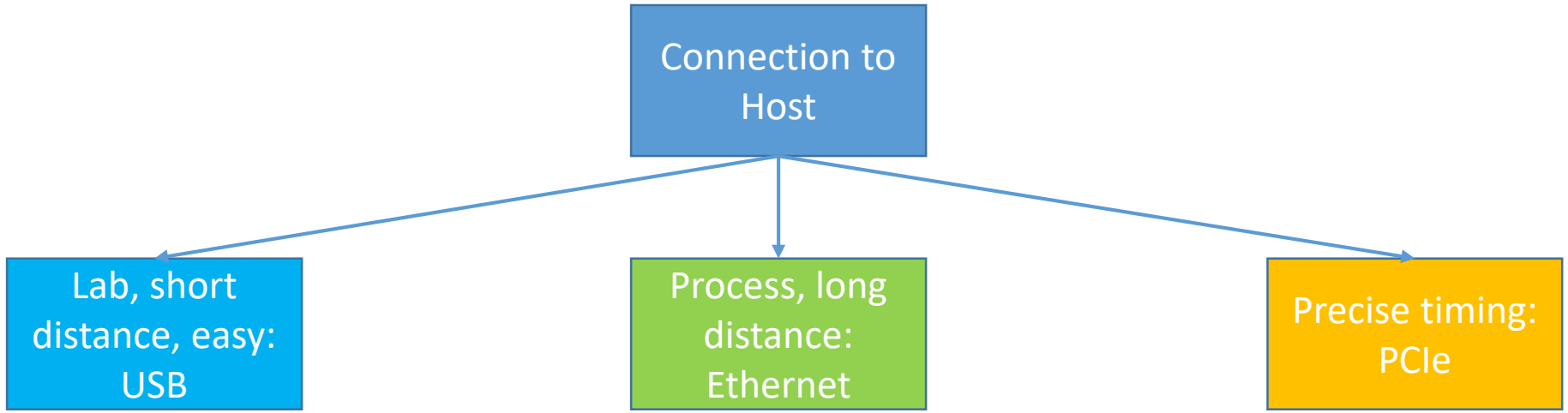
Light Source

- Deuterium-Halogen: all UV-VIS-near NIR
  - 190 to 1,000nm, various UV cut-offs available
  - Very smooth and stable
  - Warm-up required
  - Limited lifetime: 2,000h
- Xenon flash: all UV-VIS-near NIR
  - 190 to 1,000nm, various UV cut-offs available
  - Very spiky and unstable, but flash for short, intense illumination
  - No warm-up required
  - Long lifetime

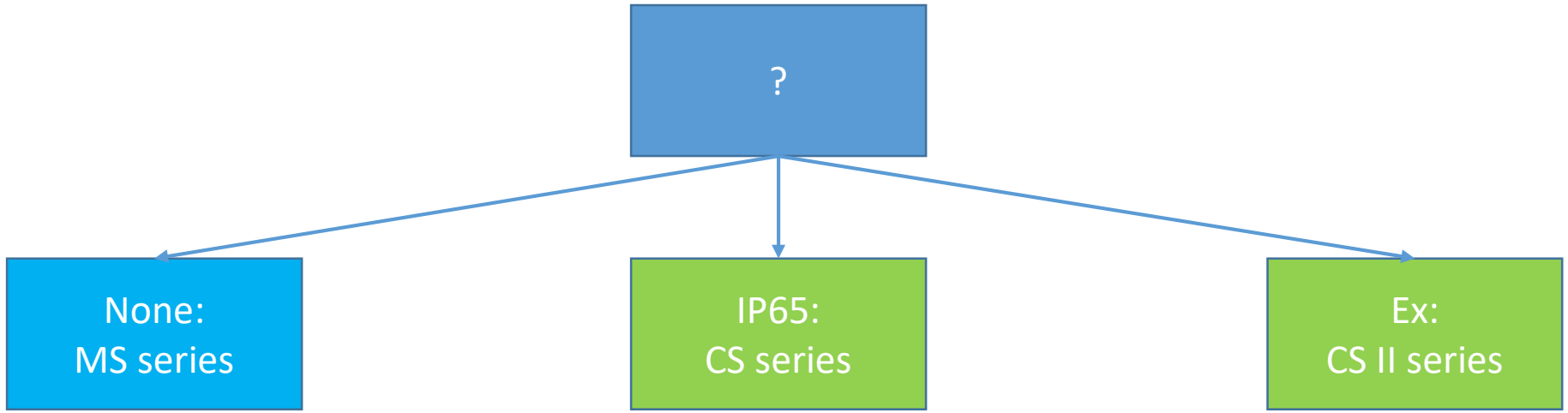
Light Source II

- Halogen standard, 20W, 50W: VIS-NIR
  - 400 to 2,200nm
  - Very smooth and stable
  - Warm-up required
  - Limited lifetime: 2000h
- Halogen longlife, 20W: VIS-NIR
  - 400 to 2,200nm
  - Very smooth and stable
  - Warm-up required
  - Longer lifetime version: 10,000h

Interface


Connection to Host
Lab, short distance, easy: USB
Process, long distance: Ethernet
Precise timing: PCIe

Protection



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