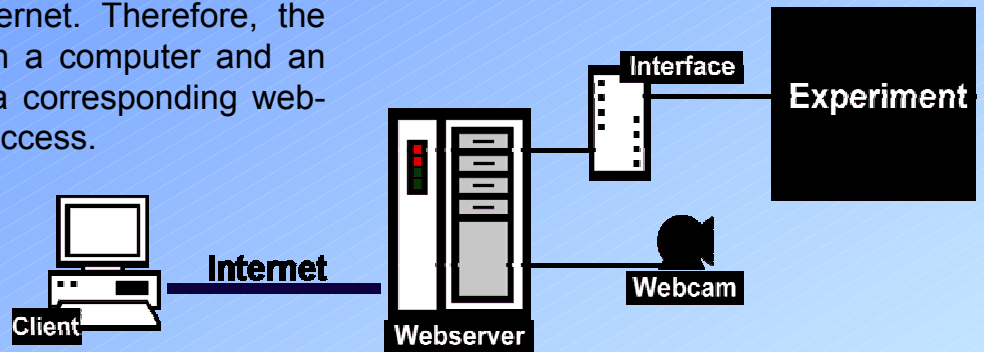
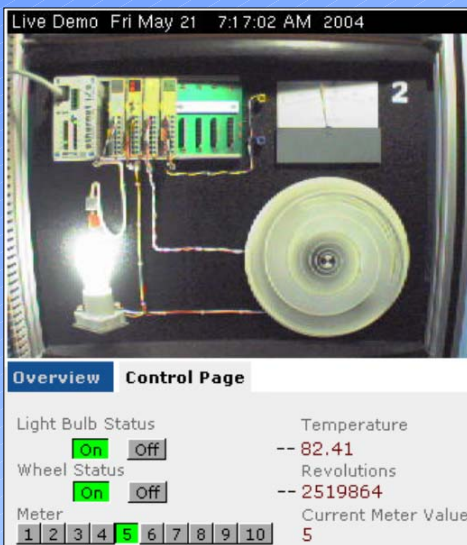


## What is a Remote Controlled Laboratory (RCL)?

An RCL is an experiment that can be accessed and controlled online using the internet. Therefore, the setup has to be connected with a computer and an interface. The computer hosts a corresponding web-page and allows and manages access.



A good RCL should consist of a real setup that can be viewed using a camera.

It should be easily accessible and controls should be simple.

Results should be available in realtime (or at least as fast as possible).

## Why Remote Controlled Laboratories?

Areas of application:

- Distance education
- Self-studies
- Tutorials and exercises

Causes of application:

- Dangerous experiments
- Difficult experiments
- Expensive experiments

## Results of a world-wide-web search (May 2004)

- Overall, 65 RCL were found and checked
- 20 RCL could not be used due to access restrictions (only students, paying members, etc.)
- Of the rest, only approximately 8 worked without major technical problems
  - “dead” links
  - “out-of-order”
  - no “real” RCL (but simulations)
  - Applets do not work or crash



**Overall, a very disappointing result.**

**Technical problems (different interfaces, browsers, ...) seem to dominate over didactical ambitions.**

**Most developers underestimate the work and money needed to build and maintain an RCL.**

**The many individual solutions due to missing standards result in (otherwise unnecessary) efforts for developers and users.**