# Projector controller requirements

1. Functional requirements
   1. Projector shall never exceed 65 deg. C. Rationale: this is the critical temperature for PCB materials.
   2. To switch the projector on:
      1. The user must press the off/on button for at least 0.5 sec.
      2. The projector temp should be below 48 deg. C.
   3. To switch the projector off, the user must press the off/on button for at least 2 sec.
   4. When the projector is on, the fan shall always be on.
   5. When the projector switches on, the fan shall activate for 2 seconds before the lamp activates.
   6. Normally, the fan speed shall be low.
   7. If the projector temp exceeds 58 deg. C, the projector fan shall run at maximum speed.
   8. If the projector fan is running at maximum speed and the system is not in overheat mode, the fan shall return to normal speed when the temperature has been below 58 deg. C for 10 sec.
   9. If projector temperature exceeds 65 deg. C, the controller shall enter an overheat mode for 15 sec. In overheat mode:
      1. The lamp deactivates
      2. The lamp cannot activate
      3. The fan shall run at the maximum speed
   10. After overheat mode the system shall return to standby mode.
2. Functional requirements test scenarios
   1. Scenario 1: Normal on/off: Turn the projector on. Wait 20 seconds, then turn it off
      1. Parameters: External temperature 75 deg.
      2. On/off button press until fan on
      3. Wait 20 seconds
      4. On/off button press until fan off
   2. Scenario 2: Test the on/off button
      1. Start with system in standby. Push the button for less than 0.5 seconds. The projector should not turn on.
      2. Start with system in standby. Push the button and hold for more than 3 seconds. The system should stay on and not turn off.
      3. Start with the system on. Push the on/off button for more than three seconds. The system should turn off.
      4. Start with the system on. Push the on/off button for 0.7 seconds, twice, within 6 seconds. The system should not turn off.
   3. Scenario 3: Overheat test: Ramp the projector temperature to 70 deg. C
      1. Ensure the system operates per the functional requirements
      2. Before the system reaches the minimum time in overheat mode, push on/off button. The system should not turn on.
      3. Ensure the system cannot turn on until the minimum time is reached
   4. Scenario 4: Try to turn on and off if Tproj is high
      1. Set the temperature to 50 C
      2. Try to turn on.
      3. The system should not turn on
      4. Set the temperature to 50 C
      5. Try to turn off.
      6. The system should turn off.