60802 Time Sync Temperature Ramp Rates

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Background

- The initial stated goals of 60802 are to address 80%+ of the industrial market, the "majority use cases"

- As such, most industrial equipment in use today whether in discrete manufacturing, process applications or other applications are in a relatively controlled environment.
  - An oscillator is on a PCB with heat generating chips
  - The PCB is enclosed in a form of device packaging
  - The device is enclosed in a cabinet
  - The cabinet is in a room/building/protected space

Amusement Park Operator Control Room

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Current Time Simulations

- 60802 dynamic time error simulations have been based on assumed operation in an environment where temperatures are changing 1°C/sec (60°C/min).

- The simulation conditions are extreme compared to more nominal expected rates of change.

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Suggested Approach

- Rather than simulating based on a minority use case, let's let existing standards form the basis for future temperature simulations as sources of time error

  - Example: IEC 61131-2 Testing Standard for PLC's specifies Change of Temperature Immunity testing 3°C/min $\pm$ 0.6°C/min across its temperature range.

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Future Proposed Work

- Agree on a realistic number for temperature ramping and run more dynamic time error simulations

  - Proposal: Run a set of dynamic time error simulations with a 125ms sync and pdelay rate, and a temperature ramp not exceeding 3.6°C/min over a limited temperature range.

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Thank You